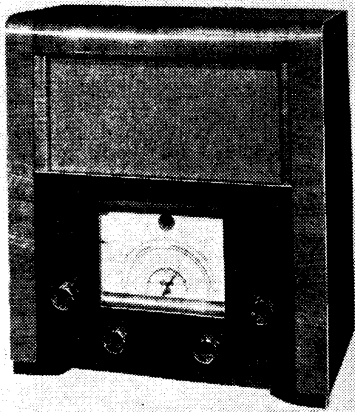


"TRADER" SERVICE SHEET  
**461**

# VIDOR 323

## 4-BAND AC SUPERHET



**T**HE Vidor 323 is a 4-band 4-valve (plus valve rectifier and tuning indicator) AC superhet, suitable for use on 200-250V, 50-100C/S mains.

The wavebands covered are 13.5-50m (SW1); 50-180m (SW2); 180-580m (MW); and 750-2,000m (LW). The wavechange switch has a fifth position for gram., and there is also provision for an external speaker, with internal speaker muting.

Release date: July, 1939.

### CIRCUIT DESCRIPTION

Aerial input via coupling coils L1 (SW1), L2 (SW2), L3 (MW) and L4

(LW) to single tuned circuits L5, C39 (SW1), L6, C39 (SW2), L7, C39 (MW) and L8, C39 (LW), which precede triode heptode valve (V1, Mullard ECH3) operating as frequency changer with internal coupling.

Triode oscillator anode coils L13 (SW1), L14 (SW2), L15 (MW) and L16 (LW) are tuned by C46; parallel trimming by C42 (SW1), C43 (SW2), C44 (MW) and C12, C45 (LW); series tracking by C8 (SW1), C9 (SW2), C10, C40 (MW) and C11, C41 (LW). Reaction by grid coils L9 (SW1), L10 (SW2), L11 (MW) and L12 (LW) via stabilising resistances R6 (on all bands) plus R7 (on SW2 band).

Second valve (V2, Mullard EF9) is a variable-mu RF pentode operating as intermediate frequency amplifier with tuned-primary, tuned-secondary iron-cored transformer couplings C3, L17, L18, C4 and C17, L19, L20, C18.

The tuning condensers are fixed, and alignment is carried out by adjusting the coil-cores.

### Intermediate frequency 473KC/S.

Diode second detector is part of double diode triode valve (V3, Mullard EBC3). Audio frequency component in rectified output is developed across load resistances R12 and R13. On SW1 band the total signal appearing across R12, R13 is passed via C21 and S33, while on the remaining bands only that across R13 is passed via C22 and S34, to volume control R14, and so to CG of

triode section, which operates as AF amplifier.

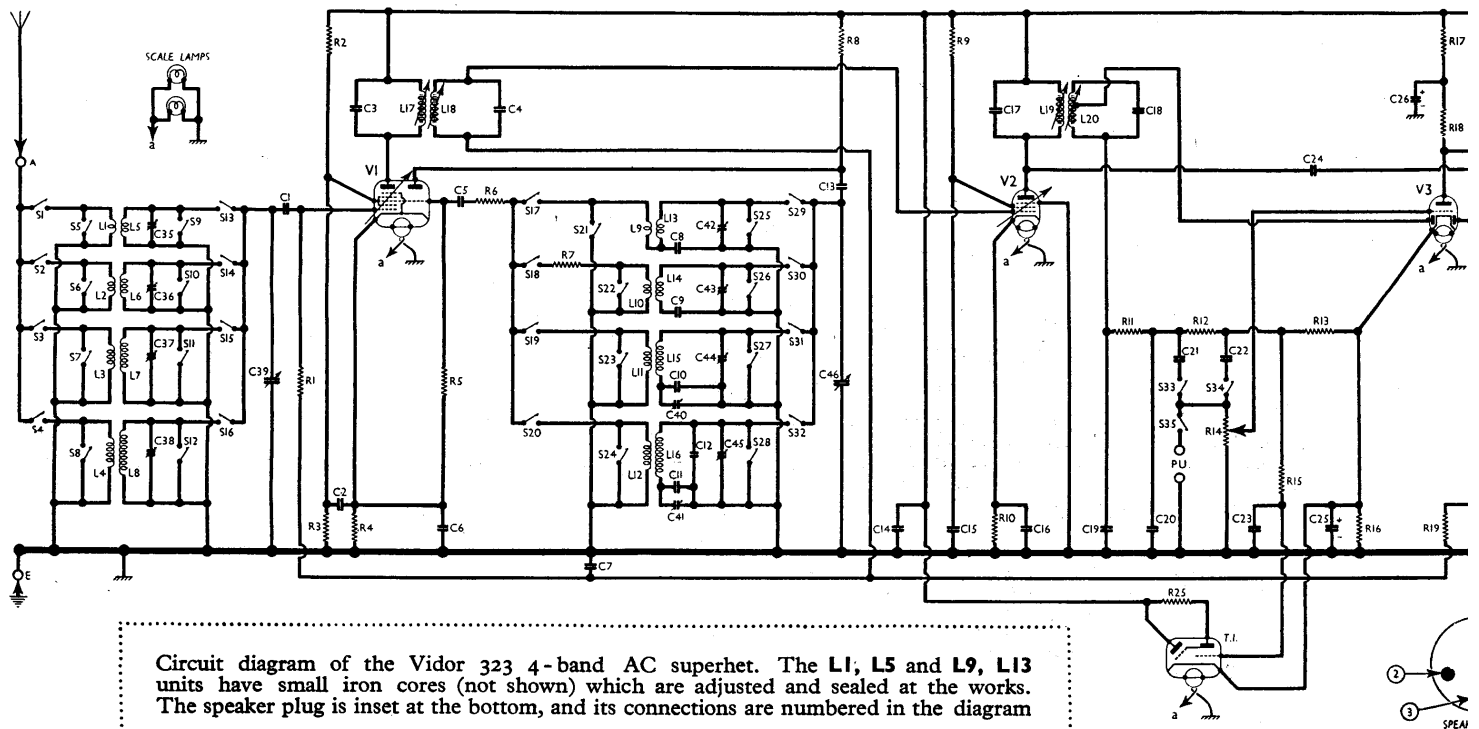
IF filtering by C19, R11 and C20 in diode circuit, and by C27 in triode anode circuit. Provision for connection of gramophone pick-up across R14 via S35.

DC potential developed across R13 is tapped off and fed via decoupling circuit R15, C23 as control voltage to CG of cathode ray tuning indicator (T.I., Mullard EM1).

Second diode of V3, fed from V2 anode via C24, provides DC potential, which is developed across load resistance R20 and fed back through decoupling circuit as GB to FC and IF valves, giving automatic volume control. Delay voltage, together with GB for triode section, is obtained from drop along resistance R16 in cathode lead to chassis.

Resistance-capacity coupling by R18, C28, R21, via grid stopper R22, between V3 triode and pentode output valve (V4, Mullard EL3). Fixed tone correction in anode circuit by C29, and variable tone control by C31, R24, also in anode circuit. Provision for connection of low impedance external speaker across secondary of internal speaker input transformer T1, and for muting internal speaker.

HT current is supplied by IHC full-wave rectifying valve (V5, Mullard AZ3), in which the cathode is connected externally to one side of the rectifier heater circuit. Smoothing is effected by iron-cored choke in associa-

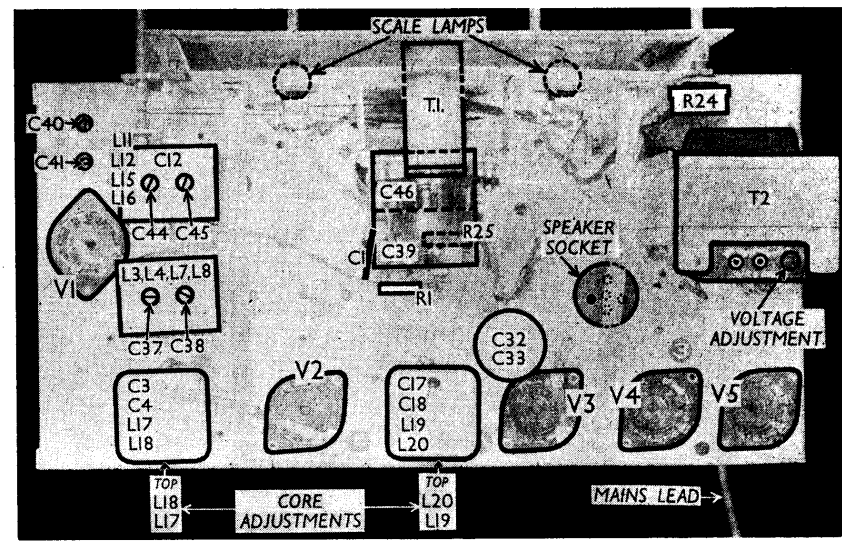


Circuit diagram of the Vidor 323 4-band AC superhet. The L1, L5 and L9, L13 units have small iron cores (not shown) which are adjusted and sealed at the works. The speaker plug is inset at the bottom, and its connections are numbered in the diagram

tion with electrolytic condensers C32, C33. Mains circuit filtering by C34.

**COMPONENTS AND VALUES**

CONDENSERS		Values (μF)
C1	V1 heptode CG condenser	0-0001
C2	V1 SG decoupling	0-1
C3	1st IF transformer tuning	0-00015
C4	condensers	0-00015
C5	V1 osc. CG condenser	0-0001
C6	V1 cathode by-pass	0-1
C7	AVC line decoupling	0-1
C8	Osc. circuit SW1 tracker	0-005
C9	Osc. circuit SW2 tracker	0-002
C10	Osc. circ. MW fixed tracker	0-0005
C11	Osc. circ. LW fixed tracker	0-00015
C12	Osc. circ. LW fixed trimmer	0-00005
C13	V1 osc. anode coupling	0-0001
C14	HT circuit RF by-pass	0-25
C15	V2 SG decoupling	0-1
C16	V2 cathode by-pass	0-1
C17	2nd IF transformer tuning	0-00015
C18	condensers	0-00017
C19	IF by-pass condensers	0-0002
C20		0-0002
C21	AF coupling condensers to	0-002
C22	V3 triode	0-05
C23	T.I. CG decoupling	0-05
C24	Coupling to V3 AVC diode	0-0001
C25*	V3 and T.I. cathodes by-pass	20-0
C26*	V3 triode anode decoupling	2-0
C27	IF by-pass	0-0002
C28	V3 triode to V4 AF coupling	0-05
C29	Fixed tone corrector	0-01
C30*	V4 cathode by-pass	20-0
C31	Part of variable tone control	0-05
C32*	HT smoothing condensers	16-0
C33*		24-0
C34	Mains RF by-pass	0-01
C35†	Aerial circ. SW1 trimmer	0-00003
C36†	Aerial circ. SW2 trimmer	0-00003
C37†	Aerial circ. MW trimmer	0-00003
C38†	Aerial circ. LW trimmer	0-00003
C39†	Aerial circuit tuning	—
C40†	Osc. circuit MW tracker	0-0001
C41†	Osc. circuit LW tracker	0-0001
C42†	Osc. circuit SW1 trimmer	0-00003
C43†	Osc. circuit SW2 trimmer	0-00003
C44†	Osc. circuit MW trimmer	0-00003
C45†	Osc. circuit LW trimmer	0-00003
C46†	Oscillator circuit tuning	—



Plan chassis view, showing many of the trimmers and core adjustments. R25 is under the cover behind the T.I. holder

RESISTANCES		Values (ohms)
R1	V1 heptode CG resistance	500,000
R2	V1 SG HT feed potential divider	30,000
R3		20,000
R4	V1 fixed GB resistance	200
R5	V1 osc. CG resistance	50,000
R6	Oscillator reaction stabilising resistances	100
R7		250
R8	V1 osc. anode HT feed	20,000
R9	V2 SG HT feed	100,000
R10	V2 fixed GB resistance	300
R11	IF stopper	10,000
R12	V3 signal diode load resistances	250,000
R13		100,000
R14	Manual volume control	500,000
R15	T.I. CG decoupling	1,000,000
R16	V3 GB; AVC delay resistance	2,000
R17	V3 triode anode decoupling	20,000
R18	V3 triode anode load	50,000
R19	AVC line decoupling	500,000
R20	V3 AVC diode load	1,000,000
R21	V4 CG resistance	250,000
R22	V4 grid stopper	50,000
R23	V4 GB resistance	140
R24	Variable tone control	50,000
R25	T.I. anode HT feed	5,000,000

**DISMANTLING THE SET**

The cabinet is fitted with a detachable bottom, upon removal of which access may be gained to most of the components beneath the chassis.

**Removing Chassis.**—Remove the four control knobs (recessed grub screws); withdraw speaker connecting plug from socket on chassis deck; remove the four bolts (with claw washers and lock-washers) holding the chassis to the bottom of the cabinet.

When replacing, a felt washer should be fitted to each control spindle, between the knob and the cabinet.

**Removing Speaker.**—Withdraw the connecting plug from the socket on the chassis deck;

remove the LS control panel (two round-head wood screws) from the top right-hand corner of the rear of the cabinet;

remove the four nuts (with lock-washers) holding the speaker to the sub-baffle.

When replacing, the transformer should be on the right.

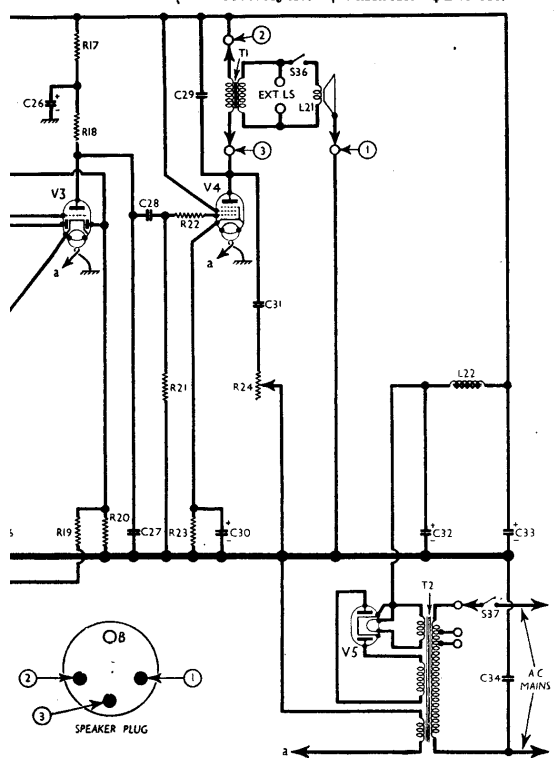
**VALVE ANALYSIS**

Valve voltages and currents given in the table below are those measured in our receiver when it was operating on mains of 238 V, using the 240-250 V

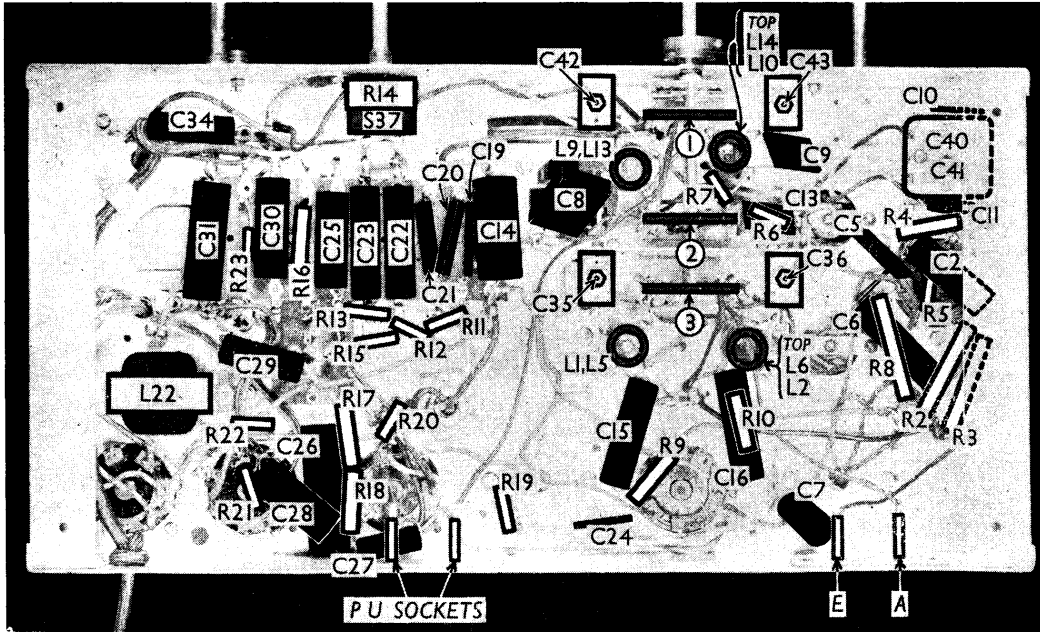
Valve	Anode Voltage (V)	Anode Current (mA)	Screen Voltage (V)	Screen Current (mA)
V1 ECH3	257	1.5	80	2.1
	Oscillator	—		
V2 EF9	257	5.7	83	1.6
	—	—		
V3 BBC3	200	1.7	—	—
V4 EL3	236	41.0	257	4.8
V5 AZ3	253†	—	—	—
	10	0.05		
T.I. EM1	257	0.4	—	—
	Target	—		

†Each anode, AC.

\* Electrolytic. † Variable. ‡ Pre-set.



OTHER COMPONENTS		Approx. Values (ohms)
L1	Aerial SW1 coupling coil	0.4
L2	Aerial SW2 coupling coil	0.3
L3	Aerial MW coupling coil	1.0
L4	Aerial LW coupling coil	90.0
L5	Aerial SW1 tuning coil	Very low
L6	Aerial SW2 tuning coil	0.3
L7	Aerial MW tuning coil	2.0
L8	Aerial LW tuning coil	9.0
L9	Oscillator SW1 reaction	0.5
L10	Oscillator SW2 reaction	38.0
L11	Oscillator MW reaction	70.0
L12	Oscillator LW reaction	1.4
L13	Osc. circ. SW1 tuning coil	Very low
L14	Osc. circ. SW2 tuning coil	0.3
L15	Osc. circuit MW tuning coil	6.0
L16	Osc. circuit LW tuning coil	4.75
L17	1st IF trans. Pri.	4.4
L18	Sec.	4.4
L19	2nd IF trans. Pri.	4.4
L20	Sec., total	4.4
L21	Speaker speech coil	2.5
L22	HT smoothing choke	380.0
T1	Speaker input trans. Pri.	500.0
	Sec.	0.6
	Pri., total	32.0
T2	Mains Heater sec.	0.1
	Rect. heat. sec.	0.1
	HT sec., total	360.0
S1-S34	Waveband switches	—
S35	Gram pick-up switch	—
S36	Speaker muting switch	—
S37	Mains switch, ganged R14	—



Under - chassis view. The core adjustments of the L1, L5 and L9, L13 units are not shown, as they will not normally need alteration. Diagrams of the three switch units are in col. 2 below. C40, C41 are adjusted through holes in the chassis deck

tapping on the mains transformer. The receiver was tuned to the lowest wavelength on the medium band and the volume control was at maximum, but there was no signal input.

Voltages were measured on the 400 V scale of a model 7 Universal Avometer, chassis being negative.

**GENERAL NOTES**

**Switches.**—S1-S34 are the waveband switches, and S35 the pick-up switch, ganged in three rotary units beneath the chassis, two of which are double sided. The units are indicated in our under-chassis view, and shown in detail in the diagrams (col. 2), where they are drawn as seen looking from the rear of the underside of the chassis. It should be noted that the switches at the backs of the double-sided units, looking from the rear of the chassis, are used merely for shorting out all the coils not in use on each waveband.

The table (col. 3) gives the switch positions for the five control settings, starting from fully anti-clockwise. A dash indicates open, and C, closed.

S36 is the internal speaker muting switch, associated with the external speaker sockets, on the panel at the rear of the cabinet. On inserting the external speaker plug and rotating it anti-clockwise, S36 opens and mutes the internal speaker.

S37 is the QMB mains switch, ganged with the volume control R14.

**Coils.**—L1, L5; L2, L6; L9, L13 and L10, L14 are in four unscreened tubular units beneath the chassis. L3, L4, L7, L8; L11, L12, L15, L16; and the IF transformers L17, L18 and L19, L20 are in four screened units on the chassis deck. The first two of these also contain two trimmers each, while C12 is included in the first one as well. The IF transformers have core adjustments at the rear of the cans (indicated in our plan chassis view), and also contain their fixed trimmer condensers.

L22 is an iron-cored choke beneath the chassis.

**Scale Lamps.**—These are two Osram MES types, rated at 6.5V, 0.3A.

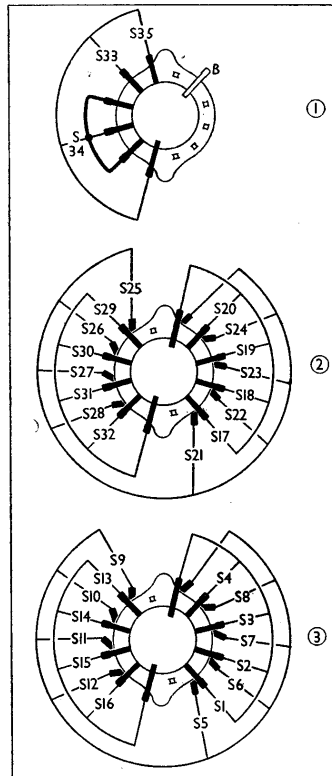
**External Speaker.**—Two sockets are provided on a panel at the rear of the cabinet for a low impedance (about

30) external speaker. On inserting the external speaker plug and rotating it anti-clockwise, S36 opens and mutes the internal speaker.

**Condensers C32, C33.**—These are two dry electrolytics in a single metal-cased tubular unit on the chassis deck, the black lead being the common negative connection. The yellow lead is the positive of C32 (16μF) and the red lead is the positive of C33 (24μF).

**Pre-Set Condensers.**—Apart from the four trimmers in two of the coil units, there are two trackers reached through holes in the chassis deck, and four trimmers beneath the chassis.

**Speaker Plug.**—The speaker leads



Diagrams of the switch units, as seen from the rear of the underside of the chassis. Units 2 and 3 are double-sided

**SWITCH TABLE**

Switch	Gram (G)	SW1 (1)	SW2 (2)	MW (3)	LW (4)
S1	—	C	—	—	—
S2	—	—	—	—	—
S3	—	—	—	—	—
S4	—	—	—	C	—
S5	—	—	—	—	—
S6	—	—	—	C	—
S7	—	—	—	—	—
S8	—	—	—	C	—
S9	—	—	—	—	—
S10	—	—	—	C	—
S11	—	—	—	—	—
S12	—	—	—	C	—
S13	—	—	—	—	—
S14	—	—	—	C	—
S15	—	—	—	—	—
S16	—	—	—	C	—
S17	—	—	—	—	—
S18	—	—	—	C	—
S19	—	—	—	—	—
S20	—	—	—	C	—
S21	—	—	—	—	—
S22	—	—	—	C	—
S23	—	—	—	—	—
S24	—	—	—	C	—
S25	—	—	—	—	—
S26	—	—	—	C	—
S27	—	—	—	—	—
S28	—	—	—	C	—
S29	—	—	—	—	—
S30	—	—	—	C	—
S31	—	—	—	—	—
S32	—	—	—	C	—
S33	—	—	—	—	—
S34	—	—	—	C	—
S35	C	—	—	—	—

terminate in a 4-pin plug (of which three pins are used) and this fits a corresponding socket on the chassis deck. The connections are indicated in the circuit diagram, and a diagram of the plug, looking at the free ends of the pins, is inset beneath the circuit. The colour-coding of the leads to the plug is: 1, black; 2, blue; 3, red.

**Resistance R25.**—This is mounted at the rear of the T.I. holder, beneath the protecting cover.

### CIRCUIT ALIGNMENT

**IF Stages.**—Remove top cap connection of V1, and connect signal generator to top cap of valve and chassis. Connect a 0.25 MO resistance from top cap to chassis. Short-circuit C46, and turn volume control to maximum.

Feed in a 473 KC/S signal, and adjust cores of L20, L19, L18 and L17, in that

order, for maximum output. Repeat these adjustments, then remove short circuit from C46, and the 0.25 MO resistor, and replace normal top cap connection of V1.

**RF and Oscillator Stages.**—With gang at maximum, pointer should cover horizontal black line at upper wavelength end of LW scale. Connect signal generator to A and E sockets, via a suitable dummy aerial.

**LW.**—Switch set to LW, tune to 750m on scale, feed in a 750m (400 KC/S) signal, and adjust C45, then C38, for maximum output. Feed in a 2,000m (150 KC/S) signal, tune it in, and adjust C41 for maximum output, while rocking the gang for optimum results.

**MW.**—Switch set to MW, tune to 200m on scale, feed in a 200m (1,500 KC/S) signal, and adjust C44, then

C37, for maximum output. Feed in a 550m (545 KC/S) signal, tune it in, and adjust C40 for maximum output, while rocking the gang for optimum results.

**SW2.**—Switch set to SW2, tune to 50m on scale, feed in a 50m (6 MC/S) signal, and adjust C43, then C36, for maximum output. Tracking is fixed on this band.

**SW1.**—Switch set to SW1, tune to 13.5m on scale, feed in a 13.5m (22.2 MC/S) signal, and adjust C42, then C35, for maximum output. There is no variable tracking condenser on this band, and tracking is adjusted at the works by means of variable iron cores (not shown in the circuit) in the L1, L5 and L9, L13 coil units. Normally these will never need adjustment, but if they have been tampered with, adjustment should be carried out at 50m.

## HERE AND THERE INCOME TAX TIP

A tip which may assist dealers requiring assistance in assessing the life of hire accumulators for income tax purposes comes from H. Creighton, of Moorthorpe, Pontefract.

On the advice of a manufacturing firm he suggested that the initial purchases should be ignored, but the cost of all replacements be counted as depreciation.

"On normal depreciation calculation my tax collector was only prepared to allow 9 per cent.," writes Mr. Creighton, "but he readily agreed to the replacement method."

## FLUORESCENT LIGHTING

Evidence that fluorescent lighting is making progress is provided by a new GEC installation at Paddington, where the 30-ft. arrival indicator board has been treated in this manner to make it easily visible during black-out hours.

No fewer than 8,000 letters were treated with fluorescent powders, which were brushed on after an adhesive base had been applied. The board is irradiated by three 125W Osira black glass ultra-violet lamps in wide-angle dispersive reflectors.

Fluorescent Ostram posters are now exhibited at ten important railway stations.

## 24,942 PENNIES FOR EIBA

A number of EIBA enthusiasts collect bun pennies (early Victorian coins with the "bun" style of hair-dressing) as a means of augmenting EIBA funds. C. S. Rogers, of Bristol, aimed to raise £100 by this means before the end of April, and has already reached and passed his goal with a total collection of £103 18s. 6d., which represents 24,942 pence.

The industry should be very grateful to such people for their enthusiasm on behalf of its benevolent fund, and it is to be hoped that others will be infected with a similar keenness and by the same or other means will help EIBA, particularly in these times when there are so many extra demands on its funds.

## VALVE DATA

### Special Issue of "The Wireless World"

IN its May issue (on sale April 20) *The Wireless World* publishes twenty-one pages of tabular valve data, giving such information as application; heater, anode and screen voltages and currents; impedance and mutual conductance; optimum load and power output; base reference; and retail price.

This data, hitherto published in *The Wireless World* editorial columns, appears this year in the advertiser's announcements. The information is set out on lines suggested by *The Wireless World* technical department as being the most convenient for readers.

Other special features of the issue are—Valve base connections and valve symbols.

Article on 1.4V valves, dealing with advantages of dry-cell LT for intermittent use, and explaining how it has been possible to attain good performance despite low filament wattage. Also discussing the relative drop in voltage of HT and LT batteries, and giving data (in terms of sensitivity) on the useful part of the discharge curve of both batteries.

Article on valve and circuit noise, showing the part played by valve and circuit in improving signal/noise ratio.

Article giving data on the operation of valves at abnormally low anode voltages, from the point of view of designers of "soldier's sets" and other ultra-lightweight portables.

It is understood that a good supply of extra copies of the May issue of *The Wireless World* has been printed, and traders who want the valve data for filing should place their orders with a news-agent or send direct to *The Wireless World*, Dorset House, Stamford Street, London, S.E.1. The post-paid price is 1s. 2d. a copy.

## CEB REPORT

The twelfth annual report of the Central Electricity Board shows that in 1939 the revenue credit balance from trading was £3,134,128, an increase of £379,760 over that for 1938. The corresponding increase for 1938 over that for 1937 was £739,860.

## FOIRE DE PARIS

### Special Travel Facilities

ON presentation of the official Fair Voucher—Carte de Légitimation (see footnote)—visitors to the Foire de Paris from Great Britain are entitled to specially reduced through return tickets (London/Paris), incorporating a reduction of approximately 40 per cent. on the French railways and of 33½ per cent. on the English part of the journey.

### FARES (Subject to alteration)

London to Paris:	RETURN								
	1st Cl.		2nd Cl.		3rd Cl.				
	£	s. d.	£	s. d.	£	s. d.			
via Folkestone/Calais	5	12	10	4	5	5	3	6	7
„ Newhaven/Dieppe	4	4	4	3	11	8	2	12	3
„ Southampton/Havre	4	4	4	3	11	8	3	7	3

Dates of availability (service permitting):  
Outward journey: May 6 to 27, inclusive.  
Return journey: May 11 to 29, inclusive.

In addition to a valid passport, all passengers must be in possession of an *exit permit*, issued by the Passport Office, and of a *visa*, issued by French consulates.

By special arrangement with the authorities concerned, *exit permits* may be procured for holders of the Carte de Légitimation by the London office of the Foire de Paris, at 17 Tothill St., Westminster, London, S.W.1. Visitors wishing to avail themselves of this facility should apply here for the necessary documents that have to be completed in this connection.

In the case of *visas*, personal application is essential, but the necessary forms for such applications may also be obtained at the above address. Visitors wishing to stay in Paris for a few days only should, when presenting these documents at the Consulate, make special application for a "aller et retour" (go and return) *visa*, thereby enabling them to leave France without further formalities.

Note: The Carte de Légitimation is issued to bona fide trade visitors to the Fair by the following organisations:—

- The London office of the Foire de Paris (address as above).
- The French Commercial Attaché in London and Dublin.
- French Consuls and Consular Agents.
- The French Chamber of Commerce in London and Liverpool.

## NEW PREMISES

A. E. Smith has moved from 116 Lowtown, to 19 Lowtown, Pudsey, near Leeds, where extensive alterations have been made, including a new shop-front, office and show-room.