PARTRIDGE TRANSFORMERS LTD.

OUTPUT TRANSFORMER TYPE WWFB/O

As specified by Mr. D.T.N. Williamson in "Wireless World" of May 1947 and August 1949.

Mounting Style: DL

The transformer is wound on two bobbins referred to as Bobbin A and Bobbin B. Each bobbin carries four secondary sections. Transformers are available with secondary sections wound for 0.95, 1.7 or 3.6 ohms; these are described as types WWFB/O/0.95, WWFB/O/1.7 and WWFB/O/3.6 respectively.

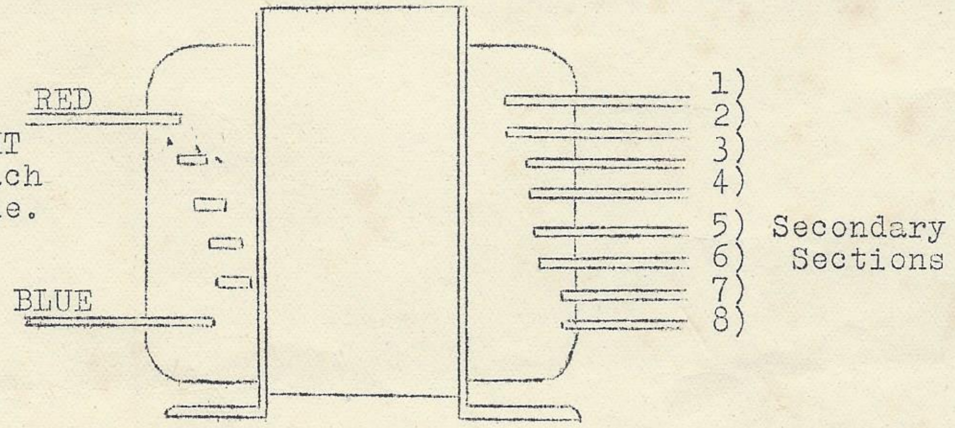
The arrangement of leads is shown in the diagram below. A1 and B1 are the first leads, nearest the core.

Correct secondary loads with various secondary connections are given in the table below.

Correct Secondary Load			Secondary connections
WWFB O/0.95	WWFB O/1.7	WWFB O/3.6	
0.95	1.7	3.6	(a) Join A1-A3-A5-A7-B2-B4-B6-B8. (b) Join A2-A4-A6-A8-B1-B3-B5-B7 (c) Connect load to A1 and A2
3.8	6.8	14.4	(a) Join A2-A3, A6-A7, B2-B3, B6-B7. (b) Join A1-A5-B4-B8. (c) Join A4-A8-B1-B5. (d) Connect load to A1 and A4.
8.5	15.3	32.5	(a) Join A1-A7, A2-A8, B1-B7, B2-B8. (b) Join A2-A3, A4-A5, B2-B3, B4-B5. (c) Join A1-B6, A6-B1. (d) Connect load to A1 and A6.
15.2	27	57.5	(a) Join A2-A3,A4-A5,A6-A7,B2-B3,B4-B5,B6-B7. (b) Join A1-B8, A8-B1. (c) Connect load to A1 and A8.

Primary Connections:

Both REDS to HT
One BLUE to each anode.



August 1949

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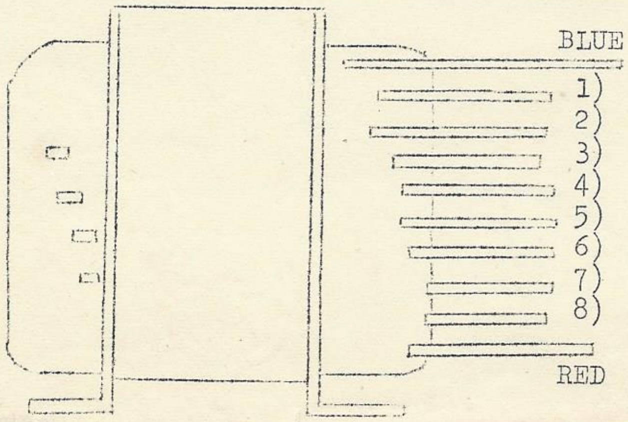
The arrangement of loads is shown in the diagram below. A1 and B1 are the first leads, nearest the core.

Correct secondary loads with various secondary connections are given in the table below.

Correct Secondary Load			Secondary Connections
WWFB 0/0.95	WWFB 0/1.7	WWFB 0/3.6	
0.95	1.7	3.6	(a) Join A1-A3-A5-A7-B2-B4-B6-B8 (b) Join A2-A4-A6-A8-B1-B3-B5-B7 (c) Connect load to A1 and A2
3.8	6.8	14.4	(a) Join A2-A3, A6-A7, B2-B3, B6-B7 (b) Join A1-A5-B4-B8. (c) Join A4-A8-B1-B5. (d) Connect load to A1 and A4
8.5	15.3	32.5	(a) Join A1-A7, A2-A8, B1-B7, B2-B8. (b) Join A2-A3, A4-A5, B2-B3, B4-B5. (c) Join A1-B6, A6-B1. (d) Connect load to A1 and A6.
15.2	27	57.5	(a) Join A2-A3, A4-A5, A6-A7, B2-B3, B4-B5, B6-B7 (b) Join A1-B8, A8-B1. (c) Connect load to A1 and A8.

Primary Connections:

Both REDS to HT
One BLUE to each anode.



Secondary Connections

Nov. 1950.

TECHNICAL DATA SHEET, No. 2

Output Transformer WWFB/ Series.

General.

This range of push-pull output transformers is intended for use in equipment reproducing the full audio-frequency range with the lowest distortion. The characteristics are such that these transformers can be used in circuits where considerable feedback is taken from the secondary winding and injected into a point three or four stages back. A particular application is the circuit published by D. T. N. Williamson in the *Wireless World.*

Power Rating.

16 watts continuous steady tone. Peak power limited by the valves with maximum d.c. of 80 m.a. per half primary. The harmonic distortion curve taken between resistive termination is shown below. Feedback will reduce the percentage scale in proportion, i.e., 20 db will divide the scale by ten.

Anode to Anode Load.

The WWFB Series comprises 4 variations anode to anode load. These are 10 to 12K ohms, 6.6 to 8K ohms, 4 to 5K ohms and 2 to 3K ohms and are designated by the first figure in the type code, e.g., WWFB 1, 2, 3, or 4 respectively.

Secondary Load.

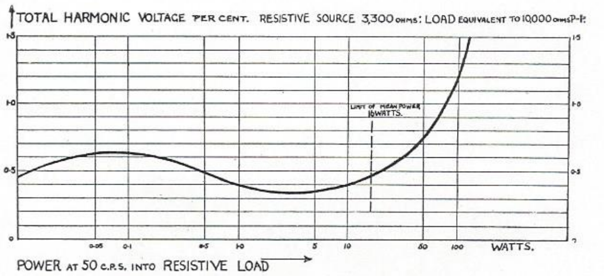
All secondary windings are brought out as eight separate sections which may be connected in series, in parallel or in various combinations of series-parallel thus ensuring that the performance is unaffected over a wide range of impedances. The last figure given in the designation code, i.e., 0.95, 1.7 or 3.6 gives the nominal load with all sections in parallel. n series sections will suit a load of n^2 times the given figure for one section. The three values quoted comprise the standard range, e.g. WWFB/1/0.95.

Permissible d.c. unbalance.

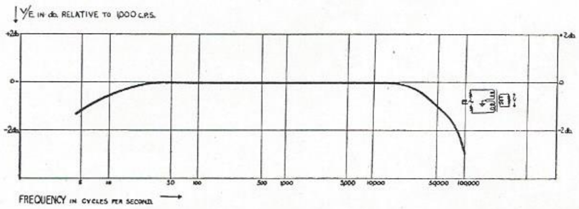
20%.

Frequency Characteristic.

The curve shown below gives the frequency characteristic at 10 watts taken between a resistive source of 3300 ohms and a load equivalent to 10,000 ohms in the primary. No account has been taken in this graph of the effect of negative feedback.



Distortion Curve



Frequency Characteristic

Leakage Inductance. (Measured as a series element in the primary).
15 to 20 millihenrys, for 10 to 12 K ohms model.

Self Capacity. (Measured between either anode connection and the centre point of the primary commoned to the core and one point on the secondary).
500 to 580 p.F. per half primary, for 10 to 12 K ohms model.

Shunt Inductance of the Primary. (Measured at 4 volts 50 c.p.s.).
100 to 130 Henrys, for 10 to 12 K ohms model.

D.C. resistance of Primary Winding.
220 ohms per half winding, for 10 to 12 K ohms model.

Price :

PARTRIDGE TRANSFORMERS LTD., CHESSINGTON, SURREY, ENGLAND.

TECHNICAL DATA SHEET, No. 3

Output Transformers CFB/- Series **CFB/1.7, CFB/0.95, CFB/3.6, CFB/1.7/4000, CFB/1.7/12000, etc.**

General.

The CFB range represents the perfection of the model WWFB/O by the use of new materials and technique. Use is made of the latest grain orientated strip wound 'C' cores. Built to the very highest standards these components are intended for equipment reproducing the full audio band width with the very lowest distortion of any kind. The characteristics are such that a very considerable amount of negative feedback voltage can be taken from the secondary winding and injected into the circuit at a point three or four stages back.

The band width without feedback is 15 octaves.

The complete unit is hermetically sealed for all climates.

Comparison with WWFB Series.

The following table gives briefly the improvement in electrical properties of this CFB series as compared with the WWFB.

Property.	WWFB.	CFB.
Core harmonic distortion at 16 watts 50 c.p.s.	0.5%	0.05%
Coupling between half primaries. Leakage inductance figures for one half with other shorted ...	900 m. Henries	30 m. Henries
Ratio of Primary Shunt L to leakage series L	6,000	13,000
D.C. resistance per half primary	220 ohms	88 ohms
Weight (Potted)	14lbs.	10lbs.

In addition to the above the power efficiency is considerably improved and in line with all this the appearance is greatly enhanced.

Power Rating.

60 watts from 30 c.p.s. to 30,000 c.p.s. with less than 1% distortion with no negative feedback.

Insulation.

The transformer insulation is adequate for a 500 volt supply line with a full class B swing.

Winding Resistances and Ratings.

D.C. resistance per half primary 88 ohms on the 10,000 ohm model. For other plate to plate impedances, resistance values are in proportion.

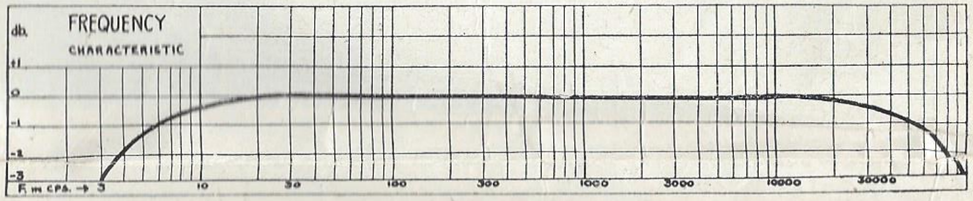
The primary winding (10,000 ohms) will carry continously 180 m.a. rms. Lower plate to plate impedance windings will carry proportionately more.

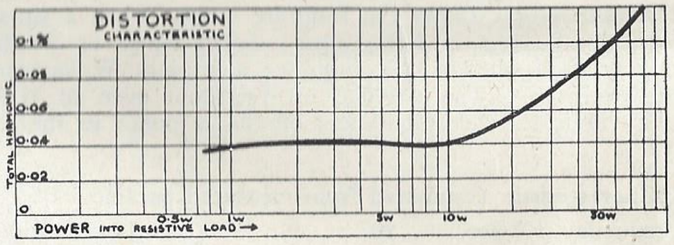
The total resistance of primary and secondary both referred to full primary is 360 ohms (10,000 ohm model.)

Permissable d.c. unbalance. 10%.

Secondary Load.

Secondary windings are brought out as eight separate sections which can be connected in series, in parallel or in various combinations of series-parallel thus ensuring that the performance is unaffected over a wide range of impedance loadings. The first figure given in the designation code, i.e., 1.7, 0.95 or 3.6, gives the nominal load with all sections in parallel. N series sections will suit a load of N^2 times the given figure for one section.





Frequency Characteristic.

The curve shown gives the frequency characteristic as taken between a resistance source of 3,300 ohms (C.T. to ground) and a resistance load equivalent to 10,000 ohms in the primary. The graph does not include the effect of negative feedback.

Harmonic Distortion Curve.

The total harmonic distortion, measured under the equivalent conditions described above, is shown plotted against power output in watts. Again the effect of negative feedback has not been included.

Primary Shunt Inductance.

120 to 160 Henries for the 10,000 ohm model (when measured at 4 volts 50 c.p.s.). For other impedance models the values are proportional.

Self Capacity.

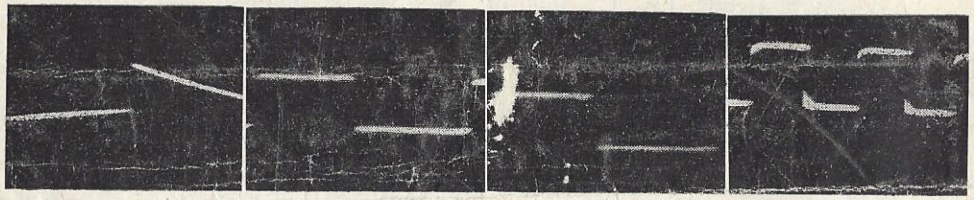
Measured across the full primary with the C.T. and one side of each secondary section connected to core, self capacity = 600 p.F. for the 10,000 ohm model. For other impedances the figures are proportional.

Coupling Between Primary Half-Windings.

Leakage inductance measured on one half primary with complementary half short circuited = 28 m. Henries for the 10,000 ohm model. This technical feature means that the transformer is good for class B working. For other impedance models the figures are proportional.

Series Leakage Inductance.

Measured as series element in the primary = 10 m. Henries for the 10,000 ohm model. For other impedance models the figures are proportional.



30 c.p.s. 1,500 c.p.s. 5,000 c.p.s. 20,000 c.p.s.

Square Wave Tests.

The photograph shows the resulting output when a square wave of frequency 30 c.p.s., 1,500 c.p.s., 5,000 c.p.s. or 20,000 c.p.s. respectively, is applied to the input of a straight Williamson circuit **without** feedback. The absence of overshoot even at the highest frequency indicates the smoothness of the response in the ultrasonic region.

Phase Characteristic (estimated from measured parameters).

Frequency Kc/sec.	20	40	80	160	320	640
Phase angle	17°	34°	64°	108°	142°	161°

Mechanical.

Weight : 10lbs. complete.
Dimensions : $5\frac{5}{8}''$ x $5''$ x $5''$ high over terminals.
Fixing centres : $4''$ x $3\frac{7}{16}''$.
Fixing screws : $\frac{1}{4}''$ B.S.F. (supplied with each unit).
Mounting—either tags upwards or inverted.

Finish.

Durable stoved enamel bronze.

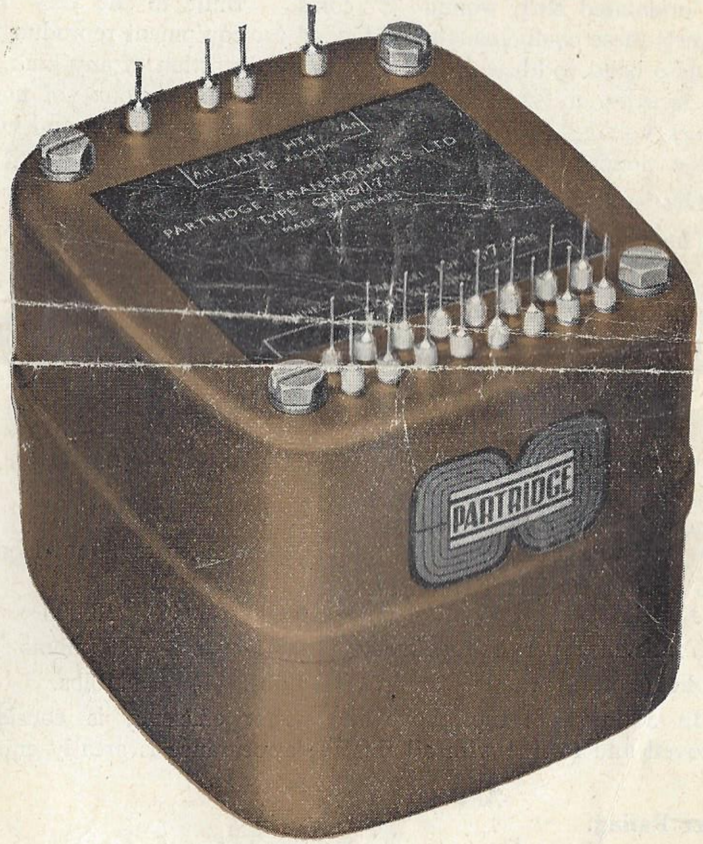
Price: $30. Delivered free to any address in the U.S.A. (the above price does not include import duty).

20,000/1/51/C.P.

PRICE IN GT. BRITAIN
~~£9 - 5s.~~ £11.4.0.
EX. WORKS

PARTRIDGE

AUDIO TRANSFORMERS



PARTRIDGE TRANSFORMERS LTD.
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