

FREED



TRANSFORMERS

FREED TRANSFORMER CO., N.Y., N.Y.



Since 1929, Freed has been one of the foremost manufacturers of standard and special transformers for every application in the electrical, electronic and communications field. Like other large manufacturers who played an important part in the war production effort, Freed's research department has developed many types of hermetically sealed and special transformers. The most advanced methods, the latest types of metals and insulating materials, and modern windings have all contributed to space and weight saving and faultless operation under the most adverse conditions of humidity and temperature.

But this is only part of the outstanding accomplishment which has resulted in a new line of units for industry and general use far superior



to anything heretofore known. Among the unusual types of products have been special band pass filters, multi-channel filters, supersonic frequency components, etc. Part of the engineering activities were devoted to research and development of audio systems and equipment for production and laboratory testing.

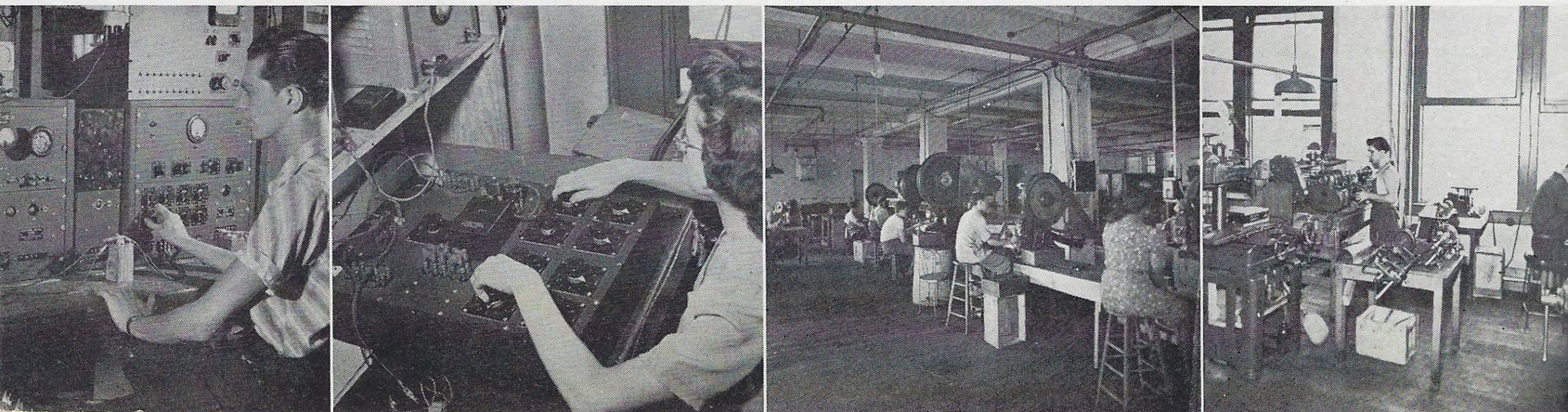
Only those transformers most popularly required are listed in these pages. This does not mean, however, that we cannot supply other transformers to your particular specifications. Whatever your problem, we suggest that you contact us at once. Our engineering department is available for consultation and development of any special systems and equipment in the electronic and communications field.

For Quality, for Service, for Performance, call Freed.

FREED TRANSFORMER COMPANY

72 SPRING STREET

NEW YORK 12, N. Y.





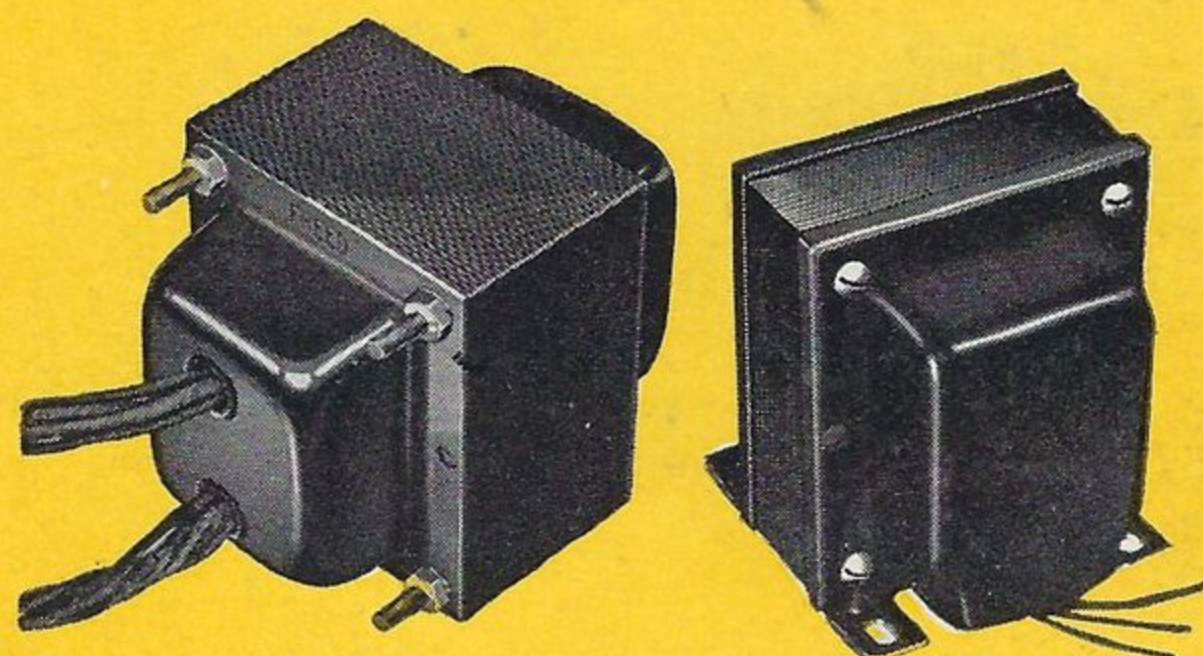
Universal Replacement

POWER TRANSFORMERS

FREED TRANSFORMER CO.

72 SPRING STREET, NEW YORK 12, NEW YORK

Catalog Reference Sheet No. 451



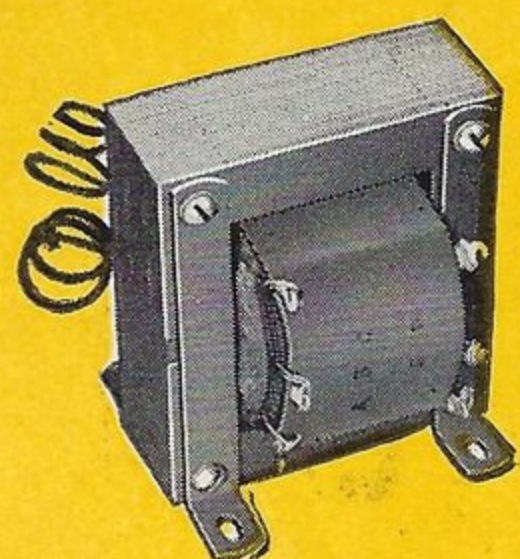
HS-3

PS-1

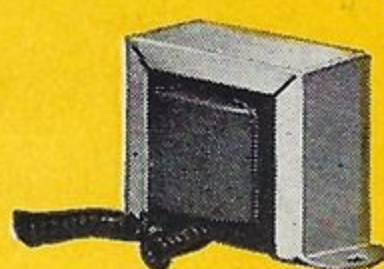
This group of units provides replacement for the majority of existing radio receivers. The design of special mounting angles permits mounting in flush, vertical and horizontal positions. Leads are R.M.A. color coded.

Freed No.	H.V. A.C. Volts	C.T. D.C. Ma.	Rect.		Fil. C.T.		Fil. C.T.		Mounting Type	Mounting Center		Dimensions			Ship. Wt.
			V.	A.	V.	A.	V.	A.		W	D	W	D	H	
F-410 A	480	40	5	2	6.3	2			PS-1	2	1 ¹⁷ / ₁₆	2 ¹⁷ / ₃₂	2 ⁵ / ₈	3 ⁹ / ₆₄	2 ¹ / ₂
F-411 A	650	40	5	2	2.5	4			PS-1	2	1 ¹¹ / ₁₆	2 ¹⁷ / ₃₂	2 ³ / ₄	3 ⁹ / ₆₄	2 ³ / ₄
F-412 A	590	50	5	2	6.3	2			PS-1	2	1 ¹³ / ₁₆	2 ¹⁷ / ₃₂	2 ⁷ / ₈	3 ⁹ / ₆₄	3
F-413 A	650	50	5/6.3	2/.6	6.3	2.5			PS-1	2	1 ¹³ / ₁₆	2 ¹⁷ / ₃₂	2 ⁷ / ₈	3 ⁹ / ₆₄	3
F-414 A	700	50	5	2	2.5	7.5			PS-1	2	1 ¹³ / ₁₆	2 ¹⁷ / ₃₂	2 ⁷ / ₈	3 ⁹ / ₆₄	3
F-415 A	700	70	5	2	2.5	9			PS-1	2 ¹ / ₄	1 ⁷ / ₈	2 ²⁷ / ₃₂	3 ¹ / ₈	3 ³³ / ₆₄	4
F-416 A	700	70	5/6.3	2/.6	6.3	2.5			PS-1	2 ¹ / ₄	2	2 ²⁷ / ₃₂	3 ¹ / ₄	3 ³³ / ₆₄	4 ³ / ₈
F-417 A	700	70	5	2	6.3	2.5			PS-1	2	2 ⁵ / ₁₆	2 ¹⁷ / ₃₂	3 ³ / ₈	3 ⁹ / ₆₄	4 ³ / ₈
F-418 A	700	90	5	2	2.5	12.5			PS-1	2 ¹ / ₂	2 ⁷ / ₁₆	3 ⁵ / ₃₂	3 ³ / ₄	3 ⁵⁷ / ₆₄	5 ¹ / ₄
F-419 A	700	90	5	2	6.3	3.5			PS-1	2 ¹ / ₂	2 ¹ / ₈	3 ⁵ / ₃₂	3 ⁷ / ₁₆	3 ⁵⁷ / ₆₄	5
F-420 A	700	120	5	3	2.5	3.5	2.5	12.5	PS-1	3	2 ⁵ / ₁₆	3 ²⁵ / ₃₂	3 ¹ / ₂	4 ⁴¹ / ₆₄	6 ¹ / ₂
F-421 A	700	120	5	3	6.3	5			PS-1	2 ¹ / ₂	2 ⁵ / ₁₆	3 ⁵ / ₃₂	3 ⁵ / ₈	3 ⁵⁷ / ₆₄	5 ¹ / ₄
F-422 A	750	150	5	3	6.3	5			PS-1	3	2 ⁹ / ₁₆	3 ²⁵ / ₃₂	3 ³ / ₄	4 ⁴¹ / ₆₄	6 ¹ / ₂
F-423 A	750	150	5	3	6.3	5	2.5	5	PS-1	3	2 ⁹ / ₁₆	3 ²⁵ / ₃₂	3 ³ / ₄	4 ⁴¹ / ₆₄	7
F-424 A	800	200	5	4	6.3	5			PS-1	3	2 ¹¹ / ₁₆	3 ²⁵ / ₃₂	3 ⁷ / ₈	4 ⁴¹ / ₆₄	7 ³ / ₈
F-410	480	40	5	2	6.3	2			HS-3	2 ¹ / ₂	2	3	2 ¹ / ₂	2 ¹ / ₂	2 ¹ / ₂
F-411	650	40	5	2	2.5	4			HS-3	2 ¹ / ₂	2	3	2 ¹ / ₂	2 ⁵ / ₈	2 ³ / ₄
F-412	590	50	5	2	6.3	2			HS-3	2 ¹ / ₂	2	3	2 ¹ / ₂	2 ³ / ₄	3
F-413	650	50	5/6.3	2/.6	6.3	2.5			HS-3	2 ¹ / ₂	2	3	2 ¹ / ₂	2 ³ / ₄	3
F-414	700	50	5	2	2.5	7.5			HS-3	2 ¹ / ₂	2	3	2 ¹ / ₂	2 ³ / ₄	3
F-415	700	70	5	2	2.5	9			HS-3	2 ¹³ / ₁₆	2 ¹ / ₄	3 ³ / ₈	2 ¹³ / ₁₆	3	4
F-416	700	70	5/6.3	2/.6	6.3	2.5			HS-3	2 ¹³ / ₁₆	2 ¹ / ₄	3 ³ / ₈	2 ¹³ / ₁₆	3 ¹ / ₈	4 ³ / ₈
F-417	700	70	5	2	6.3	2.5			HS-3	2 ¹ / ₂	2	3	2	3 ¹ / ₈	4 ³ / ₈
F-418	700	90	5	2	2.5	12.5			HS-3	3 ¹ / ₈	2 ¹ / ₂	3 ³ / ₄	3 ¹ / ₈	3 ¹ / ₂	5 ¹ / ₄
F-419	700	90	5	2	6.3	3.5			HS-3	3 ¹ / ₈	2 ¹ / ₂	3 ³ / ₄	3 ¹ / ₈	3 ¹ / ₄	5
F-420	700	120	5	3	2.5	3.5	2.5	12.5	HS-3	3 ³ / ₄	3	4 ¹ / ₂	3 ³ / ₄	3 ¹ / ₄	6 ¹ / ₂
F-421	700	120	5	3	6.3	5			HS-3	3 ¹ / ₈	2 ¹ / ₂	3 ³ / ₄	3 ¹ / ₈	3 ³ / ₈	5 ¹ / ₄
F-422	750	150	5	3	6.3	5			HS-3	3 ³ / ₄	3	4 ¹ / ₂	3 ³ / ₄	3 ¹ / ₄	6 ¹ / ₂
F-423	750	150	5	3	6.3	5	2.5	5	HS-3	3 ³ / ₄	3	4 ¹ / ₂	3 ³ / ₄	3 ¹ / ₂	7
F-424	800	200	5	4	6.3	5			HS-3	3 ³ / ₄	3	4 ¹ / ₂	3 ³ / ₄	3 ⁵ / ₈	7 ³ / ₈

The above transformers are designed for primary operation of 115 volts 50-60 cycles. They are also available for 220 volts 60 cycles and 115 volts 25 cycles.



BV



CH-1

Replacement **FILTER CHOKES** and **VIBRATOR TRANSFORMERS**

FREED TRANSFORMER CO.

72 SPRING STREET, NEW YORK 12, NEW YORK

Catalog Reference Sheet No. 451A

REPLACEMENT FILTER CHOKES

Freed No.	Ind. Henry	D.C. Cur.	D.C. Res.	R.M.S. Test Volt.	Mounting Type	Mtg. Centers		Dimensions			Weight
						W	D	W	D	H	
F-600	3	40	160	1600	CH-1	2		2 $\frac{3}{8}$	1 $\frac{5}{8}$	1 $\frac{7}{16}$	$\frac{1}{2}$
F-601	4	40	200	1600	CH-1	2		2 $\frac{3}{8}$	1 $\frac{5}{8}$	1 $\frac{7}{16}$	$\frac{1}{2}$
F-602	6	40	300	1600	CH-1	2		2 $\frac{3}{8}$	1 $\frac{5}{8}$	1 $\frac{7}{16}$	$\frac{1}{2}$
F-603	9	40	400	1600	CH-1	2		2 $\frac{3}{8}$	1 $\frac{5}{8}$	1 $\frac{7}{16}$	$\frac{1}{2}$
F-604	11	40	500	1600	CH-1	2		2 $\frac{3}{8}$	1 $\frac{5}{8}$	1 $\frac{7}{16}$	$\frac{1}{2}$
F-605	7	55	200	1600	CH-1	2 $\frac{3}{8}$		2 $\frac{13}{16}$	1 $\frac{3}{4}$	1 $\frac{11}{16}$	$\frac{3}{4}$
F-606	9	55	300	1600	CH-1	2 $\frac{3}{8}$		2 $\frac{13}{16}$	1 $\frac{3}{4}$	1 $\frac{11}{16}$	$\frac{3}{4}$
F-607	10	55	400	1600	CH-1	2 $\frac{3}{8}$		2 $\frac{13}{16}$	1 $\frac{3}{4}$	1 $\frac{11}{16}$	$\frac{3}{4}$
F-608	13	55	500	1600	CH-1	2 $\frac{3}{8}$		2 $\frac{13}{16}$	1 $\frac{3}{4}$	1 $\frac{11}{16}$	$\frac{3}{4}$
F-609	20	30	1250	1600	CH-1	2		2 $\frac{3}{8}$	1 $\frac{5}{8}$	1 $\frac{7}{16}$	$\frac{1}{2}$
F-610	6	50	400	1600	CH-1	2		2 $\frac{3}{8}$	1 $\frac{5}{8}$	1 $\frac{7}{16}$	$\frac{1}{2}$
F-611	4	60	300	1600	CH-1	2		2 $\frac{3}{8}$	1 $\frac{5}{8}$	1 $\frac{7}{16}$	$\frac{1}{2}$
F-612	3	75	200	1600	CH-1	2		2 $\frac{3}{8}$	1 $\frac{5}{8}$	1 $\frac{7}{16}$	$\frac{1}{2}$
F-613	15	35	625	1600	CH-1	2 $\frac{3}{8}$		2 $\frac{13}{16}$	1 $\frac{3}{4}$	1 $\frac{7}{16}$	$\frac{3}{4}$
F-614	5	75	200	1600	CH-1	2 $\frac{3}{8}$		2 $\frac{13}{16}$	1 $\frac{3}{4}$	1 $\frac{7}{16}$	$\frac{3}{4}$
F-615	20	50	475	1600	CH-1	2 $\frac{13}{16}$		3 $\frac{1}{4}$	2	2	1 $\frac{1}{2}$
F-616	10	75	250	1600	CH-1	2 $\frac{13}{16}$		3 $\frac{1}{4}$	2	2	1 $\frac{1}{2}$
F-617	6	100	150	2000	CH-1	2 $\frac{13}{16}$		3 $\frac{1}{4}$	2	2	1 $\frac{1}{2}$
F-618	3.5	150	100	2000	CH-1	2 $\frac{13}{16}$		3 $\frac{1}{4}$	2	2	1 $\frac{1}{2}$
F-619	2	200	60	2000	CH-1	2 $\frac{13}{16}$		3 $\frac{1}{4}$	2	2	1 $\frac{1}{2}$

VIBRATOR TRANSFORMERS

Designed for Automobile Receivers Using
A Vibrator from a Six Volt Battery Source.

Freed No.	D.C. Output Deliver by Sec.		Style Mtg.	Mounting Dimensions		Dimensions			Weight
	Volts	Ma.		W	D	W	D	H	
F-450	225	40	BV	2	1 $\frac{3}{4}$	2 $\frac{1}{2}$	2	3 $\frac{1}{16}$	2
F-451	250	50	BV	2	1 $\frac{7}{8}$	2 $\frac{1}{2}$	2 $\frac{1}{8}$	3 $\frac{1}{16}$	2 $\frac{1}{4}$
F-452	250	60	BV	2 $\frac{1}{4}$	1 $\frac{3}{4}$	2 $\frac{13}{16}$	2 $\frac{1}{8}$	3 $\frac{1}{16}$	2 $\frac{1}{2}$
F-453	275	70	BV	2 $\frac{1}{4}$	1 $\frac{7}{8}$	2 $\frac{13}{16}$	2 $\frac{1}{4}$	3 $\frac{1}{16}$	3
F-454	350	75	BV	2 $\frac{1}{4}$	2	2 $\frac{13}{16}$	2 $\frac{3}{8}$	3 $\frac{1}{16}$	3 $\frac{1}{2}$



CHOKES and AUDIO REACTORS

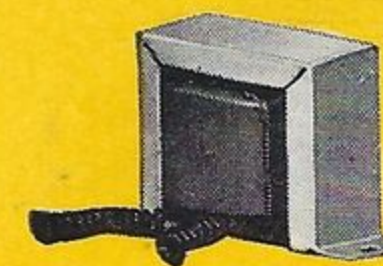
FREED TRANSFORMER CO.

72 SPRING STREET, NEW YORK 12, NEW YORK

Catalog Reference Sheet No. 452



PS-1



CH-1

AMPLIFIER AND SMALL TRANSMITTER FILTER CHOKES

Rated under full D.C. current.

Freed No.	Ind. Hen.	D.C. Cur.	D.C. Resis.	R.M.S. Test Volts	Mounting Type	Mounting Dimensions		Dimensions			Weight
						W	D	W	D	H	
F-620	20	50	475	1600	PS-1	1 1/2	1 5/8	1 7/8	2 1/2	2 5/16	1 3/4
F-621	10	75	250	1600	PS-1	1 1/2	1 3/8	1 7/8	2 1/4	2 5/16	1 1/2
F-622	6	100	150	2000	PS-1	1 1/2	1 3/8	1 7/8	2 1/4	2 5/16	1 1/2
F-623	3.5	150	100	2000	PS-1	1 1/2	1 3/8	1 7/8	2 1/4	2 5/16	1 1/2
F-624	2	200	60	2000	PS-1	1 1/2	1 3/8	1 7/8	2 1/4	2 5/16	1 1/2
F-625	20	75	375	1600	PS-1	1 3/4	1 1/2	2 3/16	2 3/8	2 11/16	2 1/8
F-626	10	110	210	2000	PS-1	1 3/4	1 5/8	2 3/16	2 1/2	2 11/16	2 1/4
F-627	5	150	100	2000	PS-1	1 3/4	1 1/2	2 3/16	2 3/8	2 11/16	2 1/8
F-628	20	100	400	2000	PS-1	2	1 15/16	2 5/8	3	3 9/64	3 1/2
F-629	10	125	240	2000	PS-1	2	1 11/16	2 5/8	2 3/4	3 9/64	3
F-630	12	160	180	2500	PS-1	2	2 1/16	2 5/8	3 1/8	3 9/64	3 1/2
F-631	7	200	100	2500	PS-1	2	1 15/16	2 5/8	3	3 9/64	3 1/2
F-632	5	250	70	3000	PS-1	2	1 15/16	2 5/8	3	3 9/64	3 1/2
F-633	12	180	235	2500	PS-1	2 1/4	1 7/8	2 27/32	3 1/8	3 33/64	4
F-634	10	200	150	2500	PS-1	2 1/4	2	2 27/32	3 1/4	3 33/64	4 1/4
F-635	5	300	65	3000	PS-1	2 1/4	2 1/8	2 27/32	3 3/8	3 33/64	4 1/2
F-636	20	160	330	2500	PS-1	2 1/2	2 1/8	3 5/32	3 7/16	3 57/64	5 1/8
F-637	15	200	200	2500	PS-1	2 1/2	2 5/16	3 5/32	3 5/8	3 57/64	5 1/2
F-638	10	250	135	3000	PS-1	2 1/2	2 5/16	3 5/32	3 5/8	3 57/64	5 1/2
F-639	20	250	160	3000	PS-1	3	3 1/16	3 25/32	4 1/4	4 41/64	10

AMPLIFIER AND SMALL TRANSMITTER SWINGING CHOKES

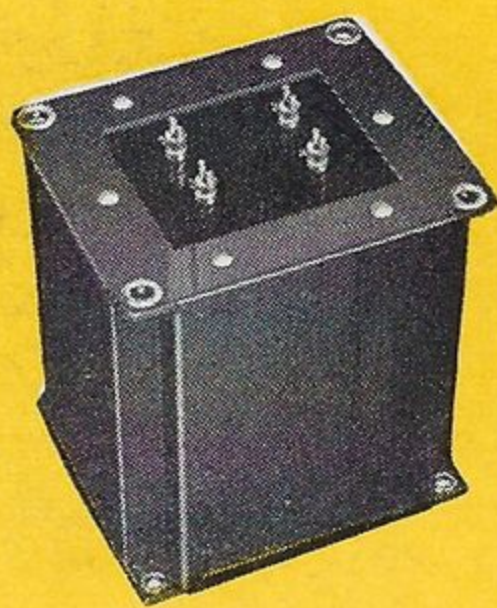
Rated under full D.C. current.

F-640	5-25	160	180	2500	PS-1	2	1 11/16	2 5/8	2 3/4	3 9/64	3
F-641	5-25	180	235	2500	PS-1	2 1/4	1 7/8	2 27/32	3 1/8	3 33/64	4
F-642	5-20	200	150	2500	PS-1	2 1/4	2	2 27/32	3 1/4	3 33/64	4 1/4
F-643	5-30	200	200	2500	PS-1	2 1/2	2 5/16	3 5/32	3 5/8	3 57/64	5 1/2
F-644	5-20	250	135	3000	FS-1	2 1/2	2 5/16	3 5/32	3 5/8	3 57/64	5 1/2

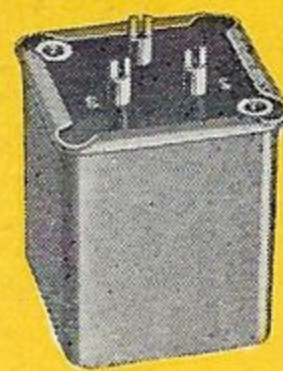
PARALLEL FEED AUDIO REACTORS

Designed to eliminate the direct current component in the primary of audio transformers to be used as plate coupling reactor where the use of a high resistance is objectionable. Low distributed capacity insures excellent high frequency response.

F-645	100	10	3500	1600	CH-1	2		2 3/8	1 5/8	1 7/16	1/2
F-646	350	.5	4900	1600	CH-1	2 3/8		2 13/16	1 3/4	1 11/16	3/4
F-647	500	.5	6150	1600	CH-1	2 13/16		3 1/4	2	2	1 1/2
F-648	700	.5	6150	1600	CH-1	2 13/16		3 1/4	2	2	1 1/2
F-649	30	35	650	1600	CH-1	2 13/16		3 1/4	2	2	1 1/2



OC



A

FILTER CHOKES and HI "Q" REACTORS



FREED TRANSFORMER CO.

72 SPRING STREET, NEW YORK 12, NEW YORK

Catalog Reference Sheet No. 452A

HUM BUCKING CONSTRUCTION FILTER CHOKES

Designed for Series—Parallel Operation at Full Rated Load and Low Temperature Rise

Freed No.	Induct.	D.C. Cur.	D.C. Resis.	R.M.S. Test Volts	Mounting Type	Mtg. Dimensions		Dimensions			Weight Lbs.
						W	D	W	D	H	
F-700	320/80	3/6	6000/1500	2500	OC	2 $\frac{1}{8}$	1 $\frac{3}{4}$	2 $\frac{5}{8}$	2 $\frac{1}{4}$	3 $\frac{1}{8}$	3
F-701	100/25	35/70	1400/350	2500	OC	3 $\frac{9}{16}$	2 $\frac{15}{16}$	4 $\frac{1}{8}$	3 $\frac{1}{2}$	4 $\frac{5}{8}$	7 $\frac{1}{2}$
F-702	50/12.5	50/100	600/150	2500	OC	2 $\frac{9}{16}$	2 $\frac{3}{8}$	3 $\frac{1}{8}$	2 $\frac{15}{16}$	3 $\frac{13}{16}$	5 $\frac{1}{2}$
F-703	50/12.5	100/200	528/132	3000	OC	4 $\frac{1}{2}$	3 $\frac{5}{8}$	5 $\frac{1}{16}$	4 $\frac{3}{16}$	5 $\frac{3}{16}$	10
F-704	16/4	125/250	240/60	3000	OC	3 $\frac{9}{16}$	2 $\frac{15}{16}$	4 $\frac{1}{8}$	3 $\frac{1}{2}$	4 $\frac{5}{8}$	7
F-705	16/4	175/350	88/22	5000	OC	4 $\frac{1}{2}$	3 $\frac{5}{8}$	5 $\frac{1}{16}$	4 $\frac{3}{16}$	5 $\frac{3}{16}$	10
F-706	24/6	200/400	160/40	7500	OC	5 $\frac{1}{2}$	5 $\frac{1}{2}$	6 $\frac{5}{8}$	6 $\frac{5}{8}$	7 $\frac{1}{4}$	20

HI "Q" REACTORS

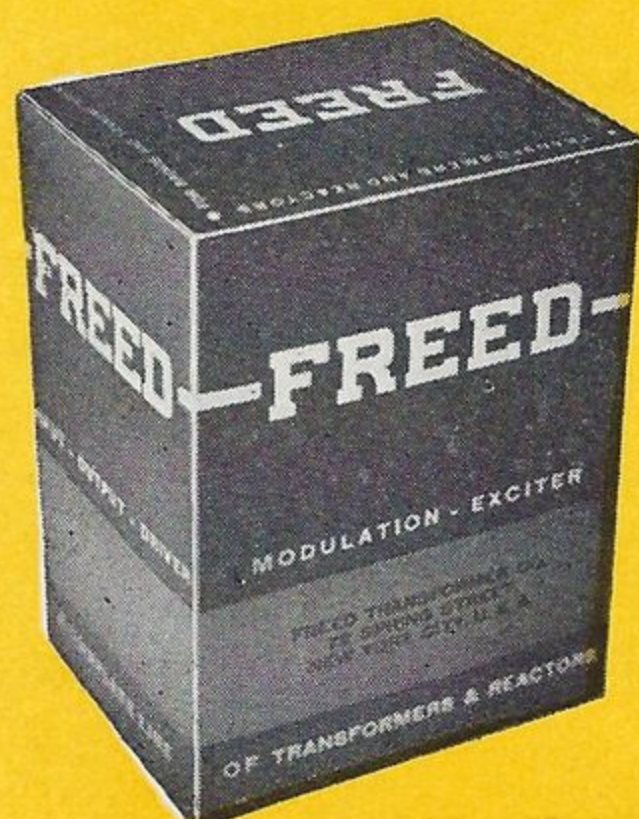
To be used in filters or tuned circuits.

Standard values range from 10 millihenries to 50 henries

Freed No.	Application	Ind. Hen.	Cur. MA	DC Ohms	Mounting Type	Mounting Dimensions		Dimensions			Weight Lbs.
						W	D	D	W	H	
F-750	Filters, tuned circuits	10	10	1200	A	1 $\frac{5}{8}$	*	1 $\frac{11}{16}$	1 $\frac{11}{16}$	2"	$\frac{1}{2}$
F-751	Filter or tuned circuits	1	20	315	A	1 $\frac{5}{8}$	*	1 $\frac{11}{16}$	1 $\frac{11}{16}$	2"	$\frac{1}{2}$
F-752	Filter or tuned circuits	.25	20	30	A	1 $\frac{5}{8}$	*	1 $\frac{11}{16}$	1 $\frac{11}{16}$	2"	$\frac{1}{2}$
F-753	Filter or tuned circuits	2	30	190	OC	2 $\frac{1}{8}$	1 $\frac{3}{4}$	2 $\frac{5}{8}$	2 $\frac{1}{4}$	3 $\frac{1}{8}$	2
F-754	Filter or tuned circuits	.5	30	75	OC	2 $\frac{1}{8}$	1 $\frac{3}{4}$	2 $\frac{5}{8}$	2 $\frac{1}{4}$	3 $\frac{1}{8}$	2

The mounting dimension 1 $\frac{5}{8}$ is given between centers across corners.

PACKAGED PERFORMANCE



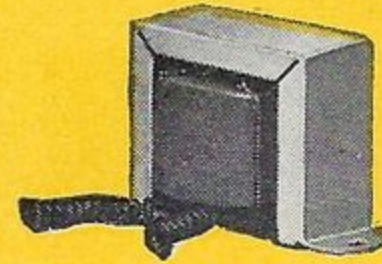
Jobbers, dealers and servicemen who carry this famous blue and yellow package on their shelves are selling quality performance. Each package contains a transformer of marked superiority which will meet exacting requirements and provide dependable service. Each transformer produced by Freed must pass rigid inspections and continuous tests to insure electrical perfection. The line is so complete and standard units are built to such rigid specifications that laboratories and manufacturers can find suitable transformers right out of stock to adopt as standard equipment. . . . There is a Freed Transformer for every application in the electronic and communications fields—building a reputation for itself, for the man who specifies it and for the man who sells it.

FILAMENT, AUTO and ISOLATION TRANSFORMERS

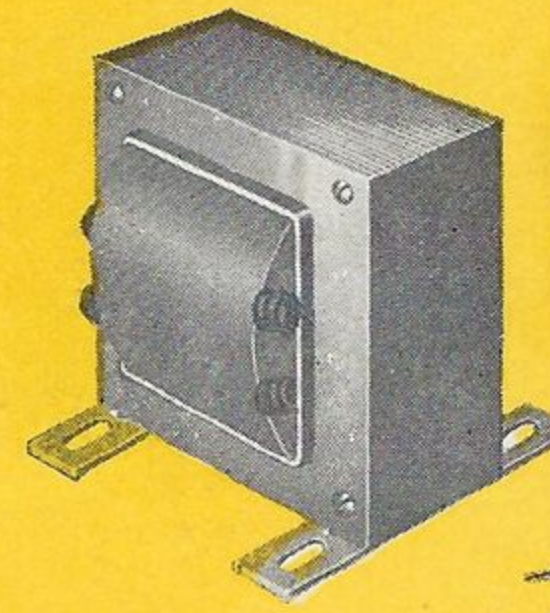
FREED TRANSFORMER CO.

72 SPRING STREET, NEW YORK 12, N. Y.

Catalog Reference Sheet No. 453



CH-1



FV-1



PS-2

FILAMENT TRANSFORMERS

Part No.	Fil. V	C.T. A	Test Volts R.M.S.	Mounting Type	Mounting Centers		Dimensions			Weight Lbs.
					W	D	W	D	H	
F-210	2.5	3	1600	CH-1	2 $\frac{3}{8}$		2 $\frac{13}{16}$	1 $\frac{3}{4}$	1 $\frac{11}{16}$	$\frac{3}{4}$
F-211	2.5	7.5	1600	CH-1	2 $\frac{13}{16}$		3 $\frac{1}{4}$	2	2	1 $\frac{1}{4}$
F-212	2.5	12	1600	CH-1	3 $\frac{1}{8}$		3 $\frac{11}{16}$	2 $\frac{1}{4}$	2 $\frac{5}{16}$	2
F-213	5	1.5	1600	CH-1	2 $\frac{3}{8}$		2 $\frac{13}{16}$	1 $\frac{3}{4}$	1 $\frac{11}{16}$	$\frac{3}{4}$
F-214	5	4	1600	CH-1	2 $\frac{13}{16}$		3 $\frac{1}{4}$	2	2	1 $\frac{1}{4}$
F-215	5	6	1600	CH-1	3 $\frac{1}{8}$		3 $\frac{11}{16}$	2 $\frac{1}{4}$	2 $\frac{5}{16}$	2
F-216	5	8	1600	FV-1	2	2 $\frac{1}{8}$	2 $\frac{1}{2}$	2 $\frac{5}{8}$	3 $\frac{1}{16}$	2 $\frac{3}{4}$
F-217	3	13	1600	FV-1	2 $\frac{1}{4}$	2 $\frac{1}{4}$	2 $\frac{13}{16}$	2 $\frac{7}{8}$	3 $\frac{7}{16}$	4
F-218	6.3	1.35	1600	CH-1	2 $\frac{3}{8}$		2 $\frac{13}{16}$	1 $\frac{3}{4}$	1 $\frac{11}{16}$	$\frac{3}{4}$
F-219	6.3	3	1600	CH-1	2 $\frac{13}{16}$		3 $\frac{1}{4}$	2	2	1 $\frac{1}{4}$
F-220	6.3	5	1600	CH-1	3 $\frac{1}{8}$		3 $\frac{11}{16}$	2 $\frac{1}{4}$	2 $\frac{5}{16}$	2
F-221	6.3	7	1600	FV-1	2	2 $\frac{1}{8}$	2 $\frac{1}{2}$	2 $\frac{5}{8}$	3 $\frac{1}{16}$	2 $\frac{3}{4}$
F-222	6.3	10	1600	FV-1	2 $\frac{1}{4}$	2 $\frac{1}{4}$	2 $\frac{13}{16}$	2 $\frac{7}{8}$	3 $\frac{7}{16}$	4
F-223	7.5	4	1600	CH-1	3 $\frac{1}{8}$		3 $\frac{11}{16}$	2 $\frac{1}{4}$	2 $\frac{5}{16}$	2
F-224	7.5	8	1600	FV-1	2 $\frac{1}{4}$	2 $\frac{1}{4}$	2 $\frac{13}{16}$	2 $\frac{7}{8}$	3 $\frac{7}{16}$	4
F-225	10	12	1600	FV-1	2 $\frac{1}{2}$	2 $\frac{1}{2}$	3 $\frac{1}{8}$	3 $\frac{1}{2}$	3 $\frac{13}{16}$	6

AUTO TRANSFORMERS To be used as a step-down transformer. Equipped with standard receptacle and line cord.

Freed No.	V. A. Rating	230/115 50/60 cy.	Mounting Type	Mounting Centers		Dimensions			Weight
				W	D	W	D	H	
F-900	100	" " "	PS-2	2 $\frac{1}{4}$	1 $\frac{3}{4}$	2 $\frac{27}{32}$	3	3 $\frac{33}{64}$	4 $\frac{1}{2}$
F-901	200	" " "	PS-2	2 $\frac{1}{2}$	2 $\frac{1}{16}$	3 $\frac{5}{32}$	3 $\frac{3}{8}$	3 $\frac{57}{64}$	6 $\frac{1}{4}$
F-902	300	" " "	PS-2	3	2 $\frac{7}{16}$	3 $\frac{25}{32}$	3 $\frac{5}{8}$	4 $\frac{11}{64}$	7 $\frac{1}{4}$
F-903	400	" " "	PS-2	3	2 $\frac{11}{16}$	3 $\frac{25}{32}$	3 $\frac{7}{8}$	4 $\frac{41}{64}$	8.0
F-904	500	" " "	PS-2	3	3 $\frac{11}{16}$	3 $\frac{25}{32}$	4 $\frac{7}{8}$	4 $\frac{41}{64}$	13 $\frac{1}{2}$
F-905	750	" " "	PS-2	3 $\frac{1}{2}$	3 $\frac{7}{8}$	4 $\frac{7}{16}$	5 $\frac{1}{4}$	5 $\frac{7}{32}$	20
F-906	1000	" " "	PS-2	3 $\frac{1}{2}$	5 $\frac{3}{8}$	4 $\frac{7}{16}$	6 $\frac{3}{4}$	5 $\frac{7}{32}$	29
F-907	1500	" " "	PS-2	3 $\frac{1}{2}$	6 $\frac{3}{8}$	4 $\frac{7}{16}$	7 $\frac{3}{4}$	5 $\frac{7}{32}$	36

ISOLATION TRANSFORMERS Electrostatic shield between primary and secondary. Equipped with standard receptacle and line cord

Freed No.	V. A. Rating	115/115 50/60 cy.	Mounting Type	Mounting Centers		Dimensions			Weight
				W	D	W	D	H	
F-920	50	" " "	PS-2	2 $\frac{1}{4}$	1 $\frac{3}{4}$	2 $\frac{27}{32}$	3	3 $\frac{33}{64}$	4 $\frac{1}{2}$
F-921	100	" " "	PS-2	2 $\frac{1}{2}$	2 $\frac{5}{16}$	3 $\frac{5}{32}$	3 $\frac{5}{8}$	3 $\frac{57}{64}$	6 $\frac{1}{4}$
F-922	300	" " "	PS-2	3 $\frac{1}{2}$	3 $\frac{3}{8}$	4 $\frac{7}{16}$	4 $\frac{3}{4}$	5 $\frac{7}{32}$	18
F-923	500	" " "	PS-2	3 $\frac{1}{2}$	4 $\frac{7}{8}$	4 $\frac{7}{16}$	6 $\frac{1}{4}$	5 $\frac{7}{32}$	27

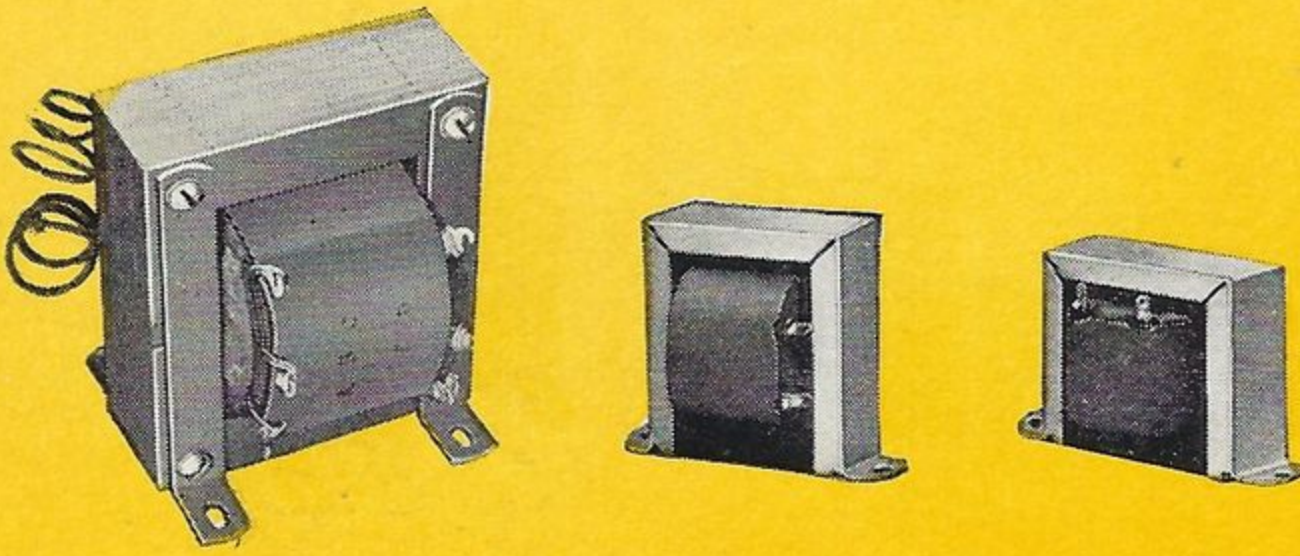
Replacement and Universal

OUTPUT TRANSFORMERS

FREED TRANSFORMER CO.

72 SPRING STREET, NEW YORK 12, NEW YORK

Catalog Reference Sheet No. 453A



BV

CV-2

CH-2

REPLACEMENT OUTPUT TRANSFORMERS

For coupling receiver audio output tube to speaker. These transformers are usually mounted on the loudspeaker frame.

Freed No.	Application or Tube Type	Class	Ohms Impedance		Pri. MA Per Side	Max. Wat.	Mtg. Type	Mtg. Centers	Dimensions			Wt. Lbs.
			Pri.	Sec.					W	D	H	
F-314	1-25L6, 48	A	1,500 or 2,000	3.2	55	5	CH-2	2"	2 ³ / ₈ "	1 ⁵ / ₈ "	1 ⁷ / ₁₆ "	1/2
F-315	1-43, 45, 71-A, 12A5 1-25A6	A	4,000	3.2	40	5	CH-2	2"	2 ³ / ₈ "	1 ⁵ / ₈ "	1 ⁷ / ₁₆ "	1/2
F-316	1-2A5, 6A4, 6F6, 41 1-42, 47, 89	A	7,000	3.2	40	5	CH-2	2"	2 ³ / ₈ "	1 ⁵ / ₈ "	1 ⁷ / ₁₆ "	1/2
F-317	1-3Q5, 3S4, 1Q5, 1C5, 1-1S4, 3A4	A	8,000	3.2	10	5	CH-2	2"	2 ³ / ₈ "	1 ⁵ / ₈ "	1 ⁷ / ₁₆ "	1/2
F-318	1-1D8, 1F5, 1T5, 38	A	14,000 or 16,000	3.2	10	5	CH-2	2"	2 ³ / ₈ "	1 ⁵ / ₈ "	1 ⁷ / ₁₆ "	1/2
F-319	1-3Q4 1-19PP, 1J6GPP, 1G6G 2-30PP, 49PP	A B B	10,000 CT	3.2	15	8	CH-2	2 ³ / ₈ "	2 ¹³ / ₁₆ "	1 ³ / ₄ "	1 ¹¹ / ₁₆ "	3/4
F-320	2-45PP-71PP, 43PP 2-25 AG PP	A	8,000 CT	3.2	40	10	CH-2	2 ¹³ / ₁₆ "	3 ¹ / ₄ "	2"	2"	1 ¹ / ₄ "
F-321	2- 6F6 PP, 42 PP 2- 2A5PP, 6A4 P.P.	A	14,000 CT	3.2	40	8	CH-2	2 ³ / ₈ "	2 ¹³ / ₁₆ "	1 ³ / ₄ "	1 ¹¹ / ₁₆ "	3/4

UNIVERSAL OUTPUT TRANSFORMERS

Covering most applications. Correct matching for the various conditions can be obtained by the wide range of plate or line and voice coil impedances.

Freed No.	Classification or Application	Ohms Impedance		Pri. MA	Max. Watts	Mtg. Type	Mounting Centers		Dimensions			Wt. Lbs.
		Pri.	Sec.				W	D	W	D	H	
F-300 F-301 F-302	Universal single or P.P. tubes to speaker	From 1500 to 20,000	Adjustable .1-29	36 55 80	6 10 15	CH-2 CH-2 CV-2	2 ³ / ₈ " 2 ¹³ / ₁₆ " 2 ¹¹ / ₁₆ "		2 ¹³ / ₁₆ " 3 ¹ / ₄ " 3 ⁵ / ₁₆ "	1 ³ / ₄ " 2" 2 ¹ / ₄ "	1 ¹¹ / ₁₆ " 2" 2 ³ / ₄ "	3/4 1 ¹ / ₄ 2 ¹ / ₄
F-303	Universal single tube to speaker speaker			60	10	CH-2	2 ³ / ₈ "		2 ¹³ / ₁₆ "	1 ⁷ / ₈ "	1 ¹¹ / ₁₆ "	1
F-304	Universal P.P. tubes to speaker	From 3,000 to 10,000	Adjustable .1-29	60	20	CV-2	3 ¹ / ₈ "		3 ⁵ / ₈ "	2 ¹ / ₂ "	3 ¹ / ₈ "	2 ¹ / ₂
F-305	Universal single tube to line	2,500-4,000 5,000-7,000	500 600	60	12	CV-2	3 ¹ / ₈ "		3 ⁵ / ₈ "	2 ¹ / ₂ "	3 ¹ / ₈ "	2 ¹ / ₂
F-306	Universal P.P. tubes to line	8,000-10,000 12,000-14,000	500 600	60	12	CV-2	3 ¹ / ₈ "		3 ⁵ / ₈ "	2 ¹ / ₂ "	3 ¹ / ₈ "	2 ¹ / ₂
F-307 F-308 F-309 F-310	Line to tapped voice coil	{ 500-1,000 1,500-2,000 2,500-3,000	{ Min. .06 to Max. 48		10 15 20 30	CV-2 CV-2 BV-2 BV-2	2 ¹¹ / ₁₆ " 3 ¹ / ₈ " 2 ¹ / ₄ " 2 ¹ / ₂ "	2 ¹ / ₈ " 2 ¹ / ₈ " 2 ¹ / ₈ " 2 ³ / ₁₆ "	3 ⁵ / ₁₆ " 3 ⁵ / ₈ " 2 ¹³ / ₁₆ " 3 ¹ / ₈ "	2 ¹ / ₄ " 2 ¹ / ₂ " 2 ³ / ₄ " 3 ³ / ₁₆ "	2 ³ / ₄ " 3 ¹ / ₈ " 3 ⁷ / ₁₆ " 3 ¹³ / ₁₆ "	1 ¹ / ₄ 2 ¹ / ₂ 3 ¹ / ₂ 4 ¹ / ₄
F-311 F-312	Line to voice coil	500/250 500/250	15-8-4-2 50-25-16-8 4			CV-2 BV-2	2 ³ / ₈ " 2 ¹ / ₂ "	2 ¹ / ₄ "	2 ⁷ / ₈ " 3 ¹ / ₈ "	2" 3 ¹ / ₄ "	2 ³ / ₈ " 3 ¹³ / ₁₆ "	1 ¹ / ₄ 4 ¹ / ₄
F-313	Line to multiple speakers (auto-transformer)	500	250/166 125/100/84		70	BV-2	2 ¹ / ₂ "	2 ¹ / ₄ "	3 ¹ / ₈ "	3 ¹ / ₄ "	3 ¹³ / ₁₆ "	4 ¹ / ₄

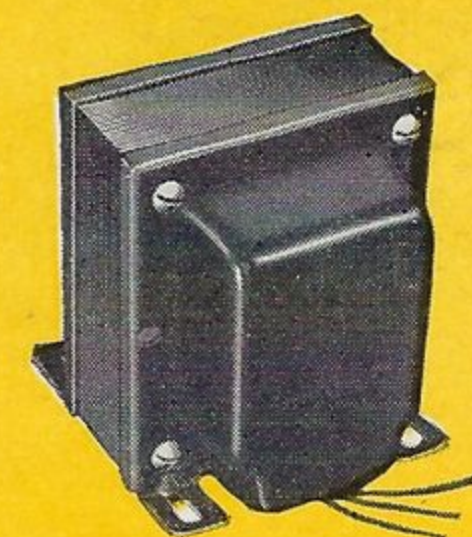
OUTPUT TRANSFORMERS—H.O.T. Series



FREED TRANSFORMER CO.

72 SPRING STREET, NEW YORK 12, NEW YORK

Catalog Reference Sheet No. 454



PS-1

Designed for delivering the maximum audio frequency power from an amplifier to a load (voice coil or line). Good frequency response and low harmonic distortion are the quality factors of the H.O.T. output transformers. Fully enclosed shielded type with leads. All H.O.T. series transformers have multiple secondary impedances.

HEAVY OUTPUT TRANSFORMERS

Freed No.	Application or Tube Type	Class	Ohms Impedance		Pri. Ma. Per Side	Max. Wat.	Inv. Feed-back	Mtg. Type	Mounting Centers		Dimensions			Wt. Lbs.
			Pri.	Sec.					W	D	W	D	H	
F-110	1-6A3, 2A3, 6Y6, 6L6	A	2,500	2-4-8-500	80	8		PS-1	2	1 $\frac{11}{16}$	2 $\frac{5}{8}$	2 $\frac{1}{2}$	3 $\frac{1}{8}$	2 $\frac{1}{2}$
F-111	1-6L6	A	4,000	2-4-8-500	70	10		PS-1	2	1 $\frac{11}{16}$	2 $\frac{5}{8}$	2 $\frac{1}{2}$	3 $\frac{1}{8}$	2 $\frac{1}{2}$
F-112	1-6V6, 1-7C5	A	5,000	2-4-8-500	50	6		PS-1	1 $\frac{3}{4}$	1 $\frac{1}{2}$	2 $\frac{3}{16}$	2 $\frac{3}{8}$	2 $\frac{11}{16}$	1 $\frac{3}{4}$
F-113	1-6F6, 42, 2A5, 47 6N6, 6B5	A	7,000	2-4-8-500	40	5		PS-1	1 $\frac{3}{4}$	1 $\frac{1}{2}$	2 $\frac{3}{16}$	2 $\frac{3}{8}$	2 $\frac{11}{16}$	1 $\frac{3}{4}$
F-114	2-6V6-7C5 PP	AB ₁	8,000	2-4-8-250-500	50	15	10%	PS-1	2 $\frac{1}{4}$	2	2 $\frac{15}{16}$	3 $\frac{1}{4}$	3 $\frac{1}{2}$	3 $\frac{1}{2}$
F-115	2-2A3-PP 6A3 PP 6B4G PP 45 PP 2-6L6 PP 6Y6 PP	AB A	5,000	2-4-8-250-500	80	20		PS-1	2 $\frac{1}{4}$	2	2 $\frac{15}{16}$	3 $\frac{1}{4}$	3 $\frac{1}{2}$	3 $\frac{1}{2}$
F-116	2-6L6 PP	AB ₁	6,600	2-4-8-250-500	80	30	10%	PS-1	2 $\frac{1}{2}$	2 $\frac{3}{16}$	3 $\frac{1}{4}$	3 $\frac{1}{2}$	3 $\frac{7}{8}$	5
F-117	2-6L6 PP	AB ₁	3,800	2-4-8-250-500	80	20	10%	PS-1	2 $\frac{1}{2}$	2 $\frac{3}{16}$	3 $\frac{1}{4}$	3 $\frac{1}{2}$	3 $\frac{7}{8}$	5
F-118	2-6L6 PP	AB ₁	9,000	2-4-8-250-500	60	30	10%	PS-1	2 $\frac{1}{2}$	2 $\frac{3}{16}$	3 $\frac{1}{4}$	3 $\frac{1}{2}$	3 $\frac{7}{8}$	5
F-119	2-6L6 PP	AB ₂	6,000	4-8-16-250-500	80	40	10%	PS-1	2 $\frac{1}{2}$	2 $\frac{3}{16}$	3 $\frac{1}{4}$	3 $\frac{1}{2}$	3 $\frac{7}{8}$	5
F-120	2-6L6 PP	AB ₂	3,800	4-8-16-250-500	110	50	10%	PS-1	2 $\frac{1}{2}$	2 $\frac{3}{16}$	3 $\frac{1}{4}$	3 $\frac{3}{4}$	3 $\frac{7}{8}$	5 $\frac{1}{2}$
F-121	4-6L6 PP Par.	AB ₁	3,300	4-8-16-250-500	160	60	10%	PS-1	2 $\frac{1}{2}$	2 $\frac{3}{16}$	3 $\frac{1}{4}$	3 $\frac{3}{4}$	3 $\frac{7}{8}$	5 $\frac{1}{2}$
F-122	4-6L6 PP Par.	AB ₁	3,300	50-125-200-250 333-500	160	60		PS-1	2 $\frac{1}{2}$	2 $\frac{3}{16}$	3 $\frac{1}{4}$	3 $\frac{3}{4}$	3 $\frac{7}{8}$	5 $\frac{1}{2}$
F-123	4-6L6 PP Par	AB ₂	1,900	84-100-125-166 250-500	220	100	10%	PS-1	3	3 $\frac{13}{16}$	3 $\frac{7}{8}$	5	4 $\frac{5}{8}$	13 $\frac{1}{2}$
F-124	2-6F6-42-2A5 PP 1-6N7, 6A6, 53 PP 2-6N6, 6B5, 2B6, 6AC5	AB ₂ B A	10,000	4-8-15-500	45	20		PS-1	2 $\frac{1}{4}$	2	2 $\frac{15}{16}$	3 $\frac{1}{4}$	3 $\frac{1}{2}$	3 $\frac{1}{2}$
F-125	2-2A3, 6A3, 6B4G 2-48, 25L6	AB A	3,000	4-8-15-500	60	20		PS-1	2 $\frac{1}{4}$	2	2 $\frac{15}{16}$	3 $\frac{1}{4}$	3 $\frac{1}{2}$	3 $\frac{1}{2}$
F-126	4-2A3, 6A3, 6B4G, 45 PP Par.	AB	1,500	4-8-15-500	80	40		PS-1	2 $\frac{1}{4}$	2	2 $\frac{15}{16}$	3 $\frac{1}{4}$	3 $\frac{1}{2}$	3 $\frac{1}{2}$
F-127	2-45, 43, 25 A6 PP 1-6N7, 6A6, 53 PP	A B	8,000	4-8-15-500	36	15		PS-1	2	1 $\frac{11}{16}$	2 $\frac{5}{8}$	2 $\frac{1}{2}$	3 $\frac{1}{8}$	2 $\frac{1}{2}$
F-128	1-12A6-6K6-7B5	A	7,500	4-8-15-500	40	5		PS-1	1 $\frac{3}{4}$	1 $\frac{11}{16}$	2 $\frac{3}{16}$	2 $\frac{3}{8}$	2 $\frac{11}{16}$	1 $\frac{3}{4}$
F-129	2-12A6-6K6-7B5	A	12,000	4-8-15-500	40	15	10%	PS-1	2	1 $\frac{11}{16}$	2 $\frac{5}{8}$	2 $\frac{1}{2}$	3 $\frac{1}{8}$	2 $\frac{1}{2}$
F-130	2-807 PP	AB ₂	4,200	50-125-200-250 333-500	120	75		PS-1	3	3 $\frac{13}{16}$	3 $\frac{7}{8}$	5	4 $\frac{5}{8}$	13 $\frac{1}{2}$
F-131	2-50 PP 2-6F6, 42, 2A5 PP	A AB ₂	8,000	4-8-15-500	55	30		PS-1	2 $\frac{1}{4}$	2	2 $\frac{15}{16}$	3 $\frac{1}{4}$	3 $\frac{1}{2}$	3 $\frac{1}{2}$

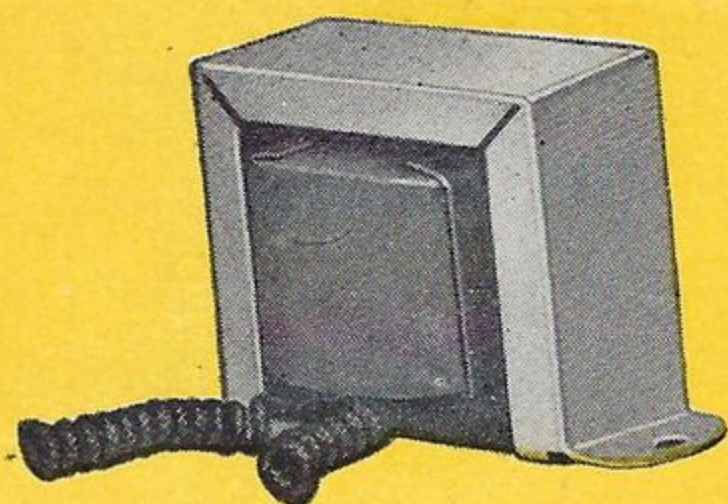
The 500 ohms secondary is designed in such a way that it can be used with a 600 ohm line.

RECEIVER AUDIO TRANSFORMERS

FREED TRANSFORMER CO.

72 SPRING STREET, NEW YORK 12, NEW YORK

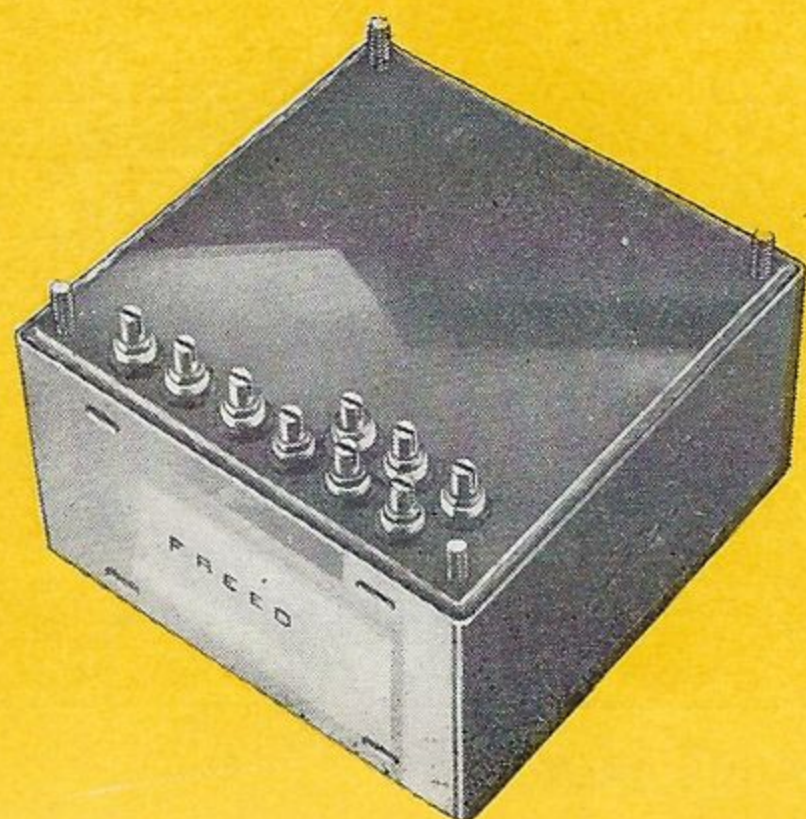
Catalog Reference Sheet No. 454A



CH-1

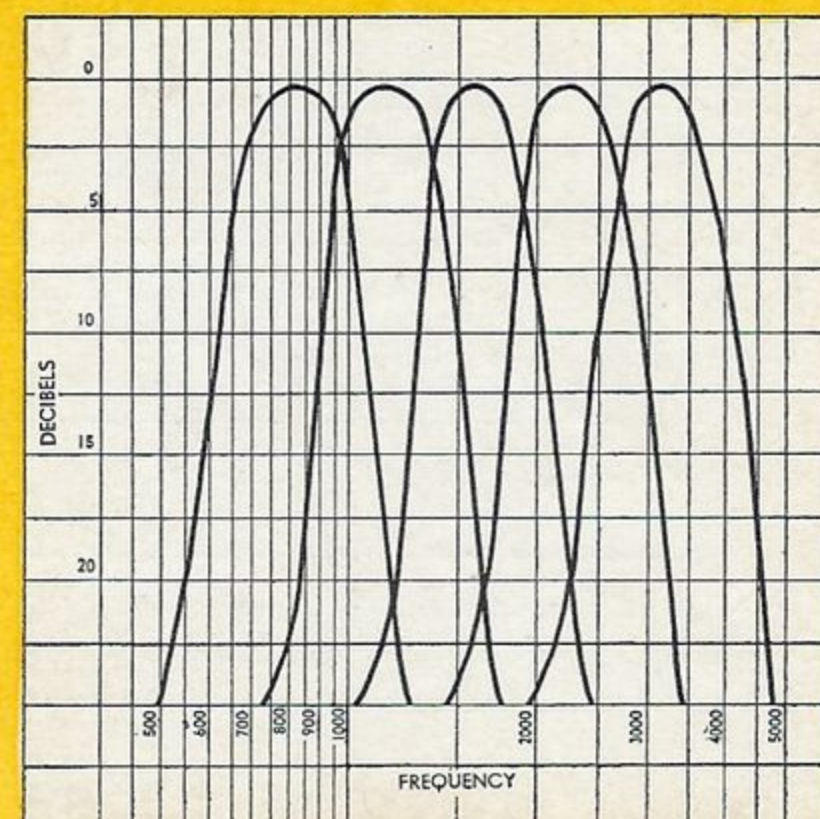
Designed for use in receiver audio circuits where a reasonably good frequency response is required. To be used for Class A applications, i.e., where no great current is drawn.

Freed No.	Classification	Application	Ohms Impedance		Turns Ratio	Pri MA Per Side	Mtg. Type	Mtg. Centers W	Dimensions			Wgt. Lbs.
			Pr.	Sec.					W	D	H	
F-550	Input	DB mike to grid	200/50	100,000	1:22.4		CH-1	2 ¹³ / ₁₆	3 ¹ / ₄	2	2	1 ¹ / ₄
F-551	Input	SB mike to grid	100	100,000	1:31.6	100	CH-1	2 ¹³ / ₁₆	3 ¹ / ₄	2	2	1 ¹ / ₄
F-552	Input	Dyn. mike line or mixer to single or P.P. grid	200/50	100,000 CT	1:22.4		CH-1	2 ¹³ / ₁₆	3 ¹ / ₄	2	2	1 ¹ / ₄
F-553	Input	Line to single or P.P. class A grids	125/500	100,000 CT	1:14.1		CH-1	3 ¹ / ₈	3 ¹¹ / ₁₆	2 ¹ / ₄	2 ¹⁵ / ₁₆	1 ³ / ₄
F-554	Input	Plate and single button mike to grid	10,000 100	100,000 100,000	1:3.16 1:31.6		CH-1	2 ¹³ / ₁₆	3 ¹ / ₄	2	2	1 ¹ / ₄
F-555	Input	Voice coil to grid	4/8	100,000	1:112		CH-1	2 ¹³ / ₁₆	3 ¹ / ₄	2 ¹ / ₄	2	1 ¹ / ₂
F-556	Matching	DB mike to line	200/50	500/125			CH-1	3 ¹ / ₈	3 ¹¹ / ₁₆	2 ¹ / ₄	2 ¹⁵ / ₁₆	1 ³ / ₄
F-557	Matching	High impedance mike to line or mixer	100,000	200/50	1:22.4	8	CH-1	3 ¹ / ₈	3 ¹¹ / ₁₆	2 ¹ / ₄	2 ¹⁵ / ₁₆	1 ³ / ₄
F-558	Interstage	Single plate to single grid	10,000	90,000	1:3	8	CH-1	2 ¹³ / ₁₆	3 ¹ / ₄	2	2	1 ¹ / ₄
F-559	Interstage	Single plate to P.P. grids	10,000	90,000 CT	1:3	2	CH-1	2 ¹³ / ₁₆	3 ¹ / ₄	2	2	1 ¹ / ₄
F-560	Interstage	Single High Imp. plate to single grid	50,000	50,000	1:1		CH-1	2 ¹³ / ₁₆	3 ¹ / ₄	2	2	1 ¹ / ₄
F-561	Interstage	P.P. plates to P.P. grids	20,000 CT	20,000 CT	1:1	8	CH-1	2 ¹³ / ₁₆	3 ¹ / ₄	2	2	1 ¹ / ₄
F-562	Output	Single Plate to line or mixer	10,000	200/50	7.1:1	8	CH-1	2 ¹³ / ₁₆	3 ¹ / ₄	2	2	1 ¹ / ₄
F-563	Output	Single plate to line	10,000	500/125	4.8:1		CH-1	2 ¹³ / ₁₆	3 ¹ / ₄	2	2	1 ¹ / ₄
F-564	Output	P.P. plates to line or mixer	20,000	200/50	10:1		CH-1	2 ¹³ / ₁₆	3 ¹ / ₄	2	2	1 ¹ / ₄
F-565	Output	P.P. plates to line	20,000	500/125	6.32:1							



THE FREED MULTICHANNEL FILTER

The unit is a five channel interstage type narrow bandpass filter designed for frequency selective remote control applications. The five inputs are connected in parallel, the five outputs are available separately. The frequency characteristic of each individual filter is ± 1.5 DB for $\pm 10\%$ of the nominal frequency. The attenuation per octave ranges from 35 to 40 DB. Each individual filter provides a step up ratio of 6 DB. The units are designed for a 10,000 ohms input impedance. Filters of this type can be supplied for frequencies from 300 to 10,000 cps.



AMPLIFIER AUDIO TRANSFORMERS

FREED TRANSFORMER CO.

72 SPRING STREET, NEW YORK 12, NEW YORK

Catalog Reference Sheet No. 455



Designed for amplifier and transmitter audio circuits. To be used for Class "A" applications.

Fully enclosed shielded type construction, conservative design and good frequency response are the quality features of the amplifier audio transformers.

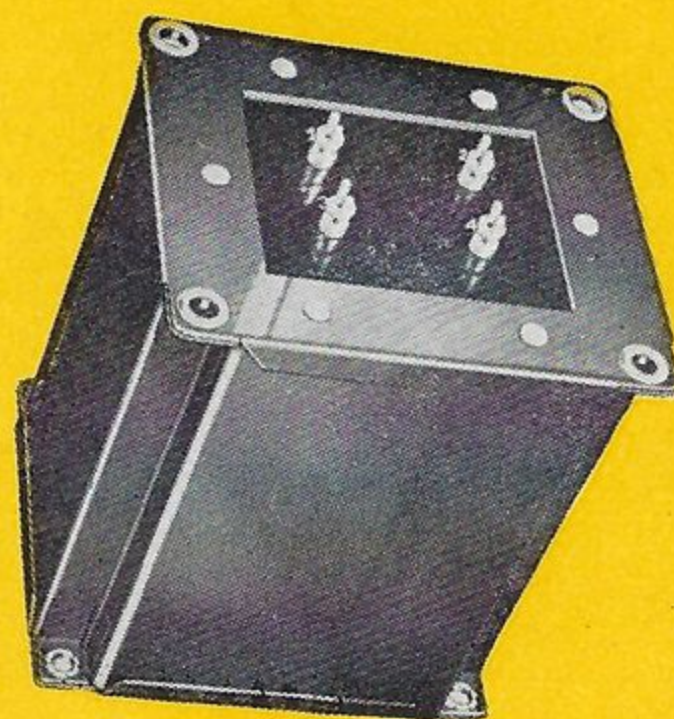


PS-1

AMPLIFIER AUDIO TRANSFORMERS

Freed No.	Classification	Application	Ohms Impedance		Turns Ratio	Pri MA Per Side	Mtg. Type	Mtg. Centers		Dimensions			Wgt. Lbs.
			Pr.	Sec.				W	D	W	D	H	
F-500	Input	DB mike to grid	200/50	100,000	1:22.4		PS-I	1½	1⅞	1⅞	2¼	2⅞	1⅞
F-501	Input	SB mike to grid	100	100,000	1:31.6	100	PS-I	1½	1⅞	1⅞	2¼	2⅞	1⅞
F-502	Input	Dyn. mike line or mixer to single or P.P. grids	200/50	100,000 CT	1:22.4		PS-I	1½	1⅞	1⅞	2¼	2⅞	1⅞
F-503	Input	Line to single or P.P. class A grids	150/600	100,000 CT	1:12.9		PS-I	1¾	1½	2⅞	2⅞	2⅞	2⅞
F-504	Input	Plate and single button mike to grid	10,000 100	100,000 100,000	1:3.16 1:31.6		PS-I	1½	1⅞	1⅞	2¼	2⅞	1⅞
F-505	Input	Voice coil to grid	4/8	100,000	1:112		PS-I	1½	1⅞	1⅞	2¼	2⅞	1¾
F-506	Matching	DB mike to line	200/50	500/125			PS-I	1¾	1½	2⅞	2⅞	2⅞	2⅞
F-507	Matching	High Impedance mike to line or mixer	100,000	200/50	1:224		PS-I	1¾	1½	2⅞	2⅞	2⅞	2⅞
F-508	Interstage	Single plate to single grid	10,000	90,000	1:3	8	PS-I	1½	1⅞	1⅞	2¼	2⅞	1⅞
F-509	Interstage*	Single plate to PP grid	10,000	90,000	1:3	8	PS-I	1½	1⅞	1⅞	2¼	2⅞	1⅞
F-510	Interstage	Single High Imp. plate to single grid	50,000	50,000	1:1	2	PS-I	1½	1⅞	1⅞	2¼	2⅞	1⅞
F-511	Interstage*	PP plate to PP grids	20,000 CT	20,000 CT	1:1		PS-I	1½	1⅞	1⅞	2¼	2⅞	1⅞
F-512	Output	Single plate to line or mixer	10,000	200/50	7.1:1	8	PS-I	1½	1⅞	1⅞	2¼	2⅞	1⅞
F-513	Output	Single plate to line	10,000	500/125	4.8:1	8	PS-I	1½	1⅞	1⅞	2¼	2⅞	1⅞
F-514	Output	PP plate to line or mixer	20,000 CT	200/50	10:1		PS-I	1½	1⅞	1⅞	2¼	2⅞	1⅞
F-515	Output	P.P. plates to line	20,000 CT	500/125	6.32:1		PS-I						

* Has split secondary winding.



FREED BAND PASS FILTER

This unit is designed for use in communication equipment to transmit speech frequencies only. The highly selective property of the filter makes possible the increase of power in the frequency band necessary for special communication work and eliminates undesirable frequency components in the high and low end of the audio spectrum.

THIS FILTER HAS THE FOLLOWING CHARACTERISTICS:

10,000 ohms or 8000 ohms impedance

Low frequency cut-off at 300 cps

High frequency cut-off at 3000 cps

2.5 DB attenuation at the cut-off frequencies

40 DB attenuation at 50% of the high frequency cut-off.

1.5 DB Insertion Loss

40 DB attenuation at 100 cps

Working Level — 0 DB

Maximum Level — ±10 DB.

NEW **FREED** CIRCUIT REVISES WILLIAMSON HI-FIDELITY AMPLIFIER FOR IMPROVED PERFORMANCE

BULLETIN NO. 5402

FREED

TRANSFORMER CO., INC.

BROOKLYN 27, N. Y.

This Freed circuit incorporates several changes from the original Williamson circuit to provide optimum performance at high and low frequency extremes. It is rated at 10 watts with triode connected output tubes. However, by connecting the screen grids of these tubes to taps provided on the Freed KA-10 output transformer, it is possible to double the power output for a given distortion percentage.

Values of the two feedback resistors (R_{11} and R_{12}) are chosen to provide 20 db of negative feedback from the 16 ohm tap. If it is desired to change the screen feedback arrangement, R_{12} , R_{23} and R_{24} should be removed. The screen grids of V_3 and V_4 are then connected to the taps provided on the primary of transformer T_2 .

Recommended power supply is choke-input type with a two-section L-C filter to maintain constant D.C. output and to improve filtering to the voltage amplifiers.

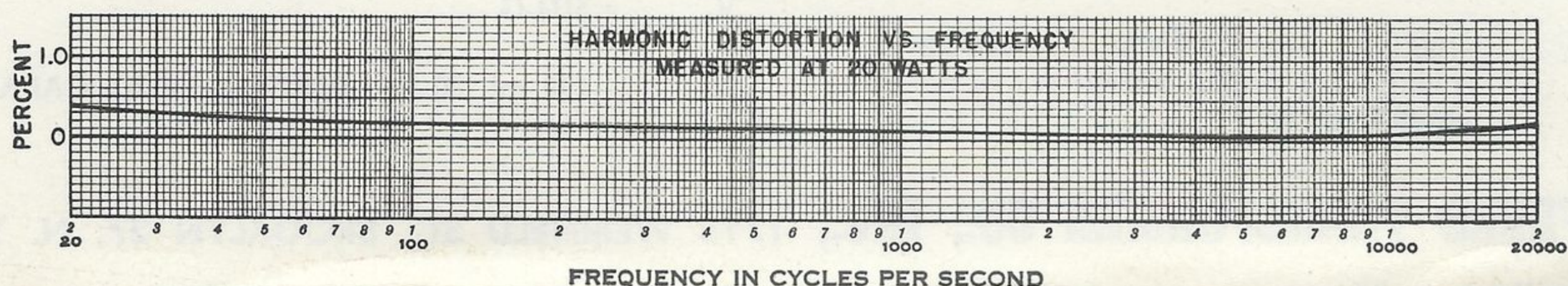
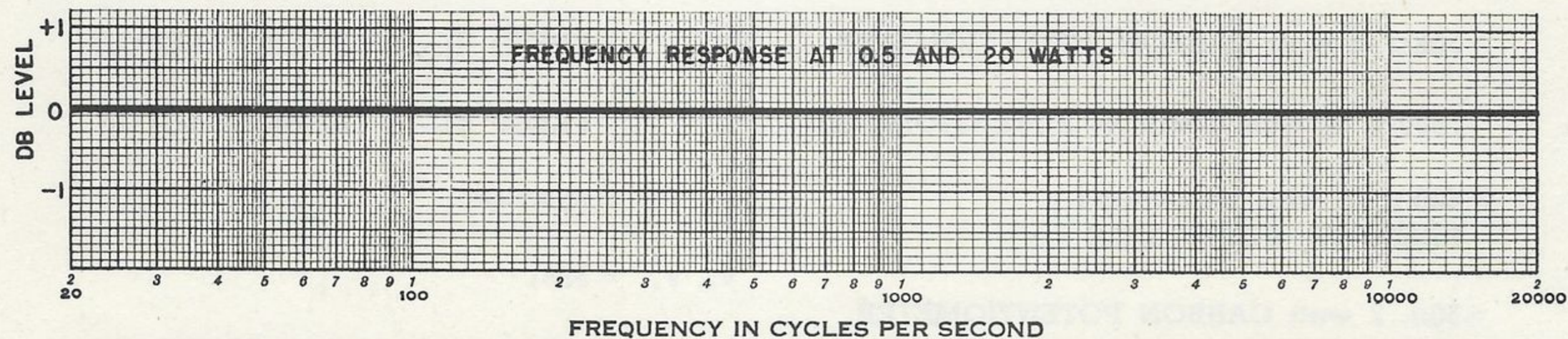
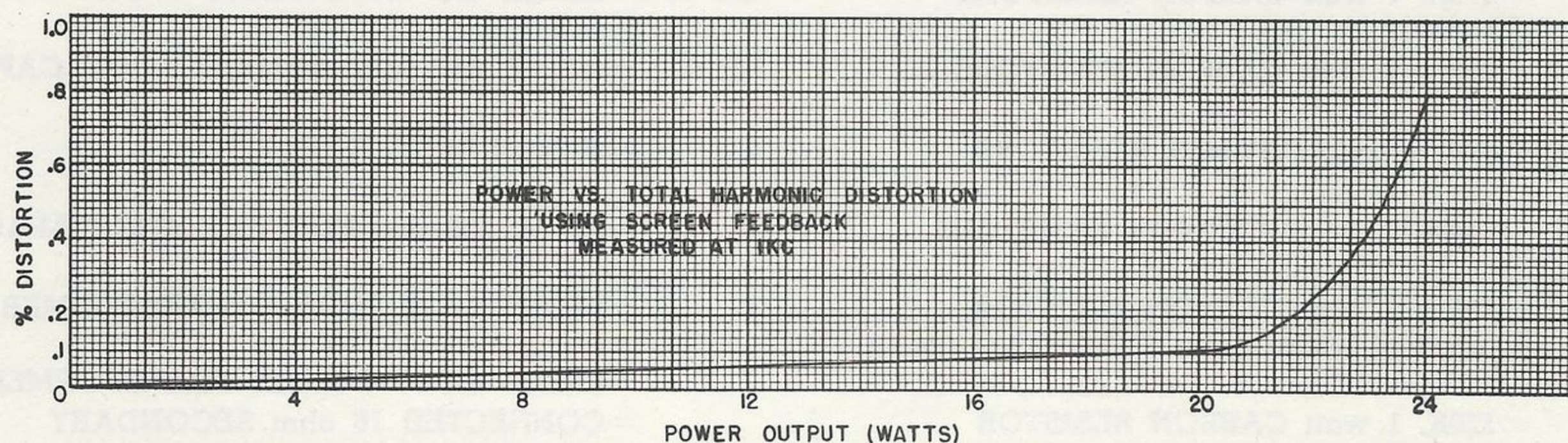
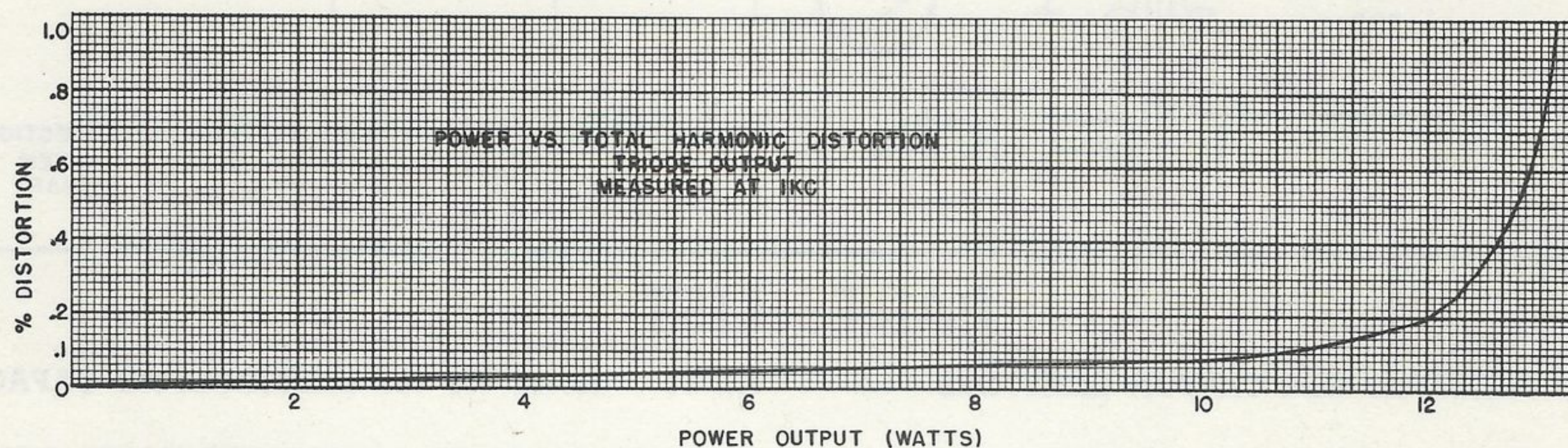
The required 550 volts AC for the rectifier can be furnished by a Freed KP-10 power transformer.

Filtering is provided by Freed KC-10 and KC-11 filter reactors and the 10 mfd. filter condensers.

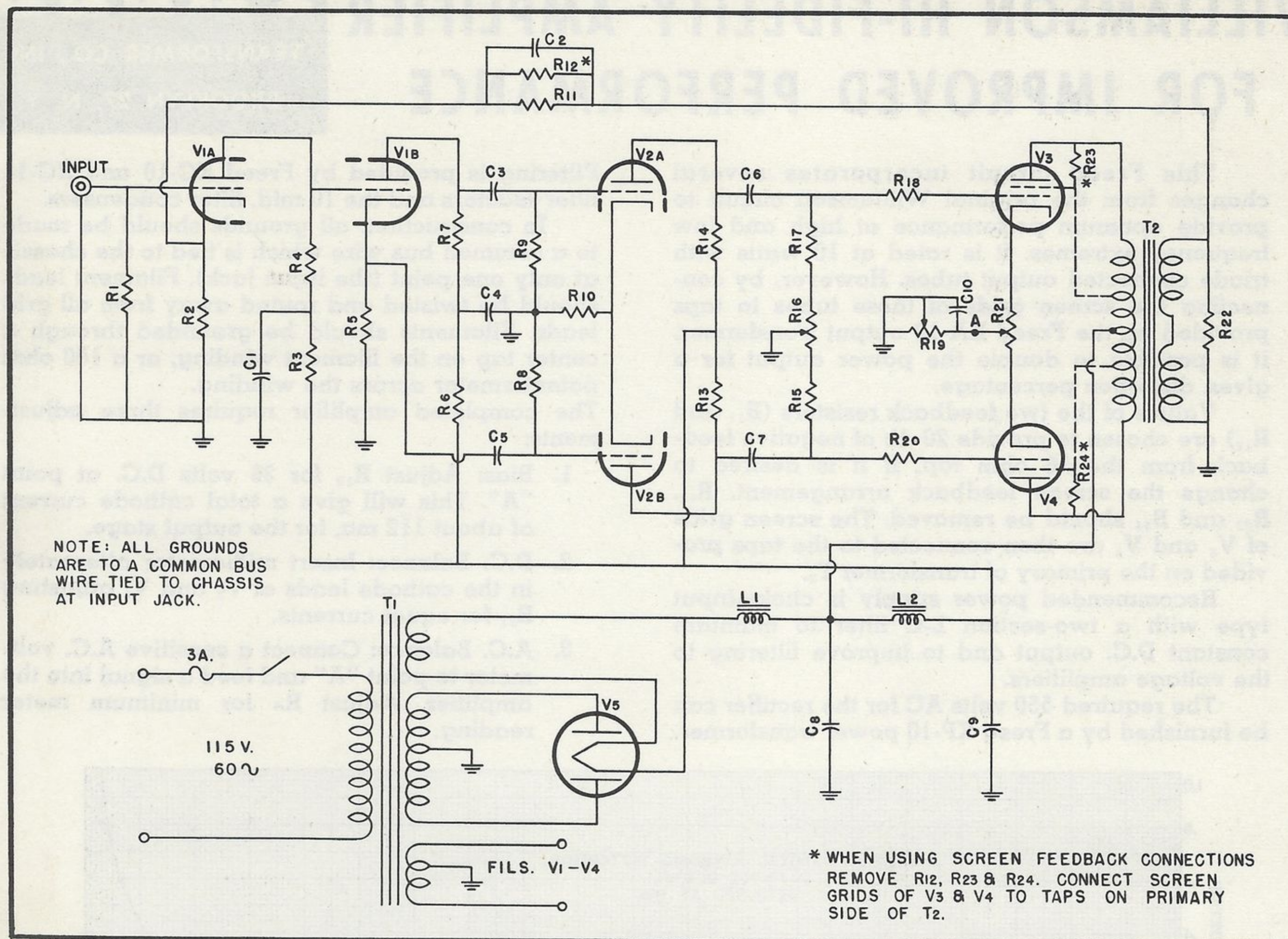
In construction, all grounds should be made to a common bus wire which is tied to the chassis at only one point (the input jack). Filament leads should be twisted and routed away from all grid leads. Filaments should be grounded through a center tap on the filament winding, or a 100 ohm potentiometer across the winding.

The completed amplifier requires three adjustments:

1. Bias: Adjust R_{19} for 36 volts D.C. at point "A". This will give a total cathode current of about 112 ma. for the output stage.
2. D.C. Balance: Insert milliammeter alternately in the cathode leads of V_3 and V_4 adjusting R_{21} for equal currents.
3. A.C. Balance: Connect a sensitive A.C. voltmeter to point "A" and feed a signal into the amplifier. Adjust R_{16} for minimum meter reading.



CIRCUIT DIAGRAM OF THE **FREED** HI-FI AMPLIFIER



PARTS LIST

R_1, R_8, R_9	=470K Ω , 1 watt CARBON RESISTORS	C_1, C_4	=20 mf, 450 volt ELECTROLYTIC CAPACITORS
R_2, R_{10}	=470 Ω , 1 watt CARBON RESISTORS	C_3, C_5	=.22 mf, 400 volt, MOLDED PAPER CAPACITOR
R_3, R_5, R_6, R_7	=20K Ω , 1 watt CARBON RESISTORS	C_6, C_7	=.47 mf, 400 volt, MOLDED PAPER CAPACITOR
R_1, R_{13}, R_{14}	=47K, 2 watt CARBON RESISTORS	C_2	=50 mmf MICA CAPACITOR
R_{11}	=6.800 Ω , 1 watt CARBON RESISTORS	C_8, C_9	=20 mf, 500 volt ELECTROLYTIC CAPACITORS
R_{12}	=15K Ω , 1 watt CARBON RESISTOR (REMOVE WHEN USING SCREEN TAPS ON T ₂)	T ₁	=FREED KP-10 POWER TRANSFORMER
R_{15}, R_{17}	=120K, 1 watt CARBON RESISTOR	T ₂	=FREED KA-10 OUTPUT TRANSFORMER =CONNECTED 16 ohm SECONDARY
R_{16}	=50K Ω , 2 watt CARBON POTENTIOMETER	L ₁	=FREED KC-10 FILTER REACTOR
R_{18}, R_{20}	=1000 Ω , 1/2 watt CARBON POTENTIOMETER	L ₂	=FREED KC-11 FILTER REACTOR
R_{19}	=400 Ω , 10 watt wirewound RESISTOR, ADJUSTABLE	V _{1, V_2}	=6SN7-GT
R_{21}	=50 Ω , 2 watt CARBON POTENTIOMETER	V _{3, V_4}	=5881
R_{23}, R_{24}	=100 Ω , 1/2 watt CARBON RESISTORS (USED WITH TRIODE OUTPUT PLATE TO SCREEN GRID)	V ₅	=5U4-G
		C_{10}	=100 mf, 50 volt ELECTROLYTIC CAPACITOR

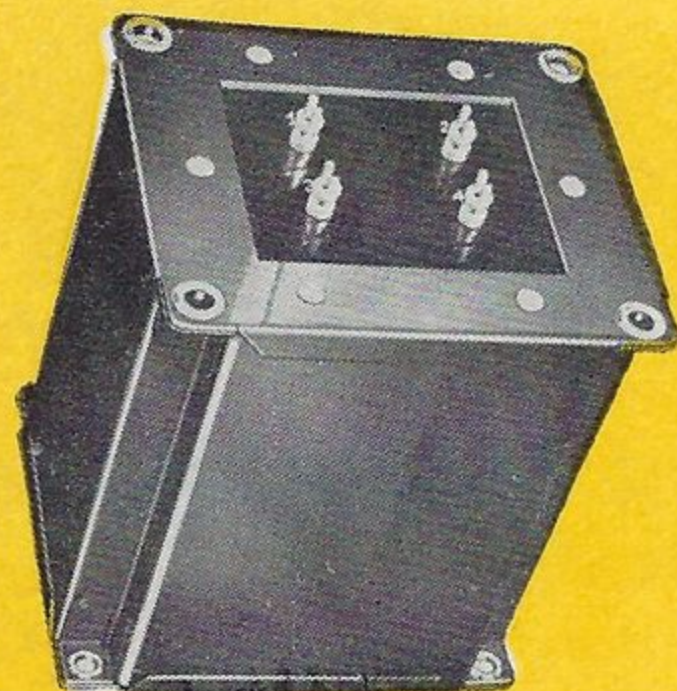
FREED TRANSFORMER CO., INC., 1718 WEIRFIELD ST., BROOKLYN 27, N. Y.

AUDIO TRANSFORMERS—C Series

FREED TRANSFORMER CO.

72 SPRING STREET, NEW YORK 12, NEW YORK

Catalog Reference Sheet No. 455A



OC

A quality line of transformers used in Public Address amplifiers and transmitters. Uniform case design, universal mounting, conservative ratings, vacuum impregnation of coils and moisture proof sealing of all these transformers is one of the outstanding features of the C Series Audio Transformers.

Low level input and output transformers have a balanced hum bucking coil construction. The frequency response of all these units is flat within ± 2 db from 60 to 10,000 cps.

Freed No.	Classification	Application	Ohms Impedance		Turns Ratio	Pri MA Per Side	Mtg. Type	Mtg. Centers		Dimensions			Wgt. Lbs.
			Pr.	Sec.				W	D	W	D	H	
F-150	Input	Microphone, line or mixer to grid	500 ⁺ /333 250/200 ⁺ 125/50	60,000 or 15,000	1:11		OC	2 $\frac{1}{8}$	1 $\frac{3}{4}$	2 $\frac{5}{8}$	2 $\frac{1}{4}$	3 $\frac{1}{8}$	1 $\frac{3}{4}$
F-151	Input	Microphone, line or mixer to P.P. grids	500 ⁺ /333 250/200 ⁺ 125/50	120,000 CT	1:22		OC						1 $\frac{3}{4}$
F-152	Input	Dynamic mike to grid	60/38 30/22 15/10 5.5/2.5	60,000 or 15,000	1:31.6		OC	2 $\frac{1}{8}$	1 $\frac{3}{4}$	2 $\frac{5}{8}$	2 $\frac{1}{4}$	3 $\frac{1}{8}$	1 $\frac{3}{4}$
F-153	Input	Microphone, line or mixer to grid; magnetic shielding	500 ⁺ /333 250/200 ⁺ 125/50	50,000	1:10		OC	2 $\frac{1}{8}$	1 $\frac{3}{4}$	2 $\frac{5}{8}$	2 $\frac{1}{4}$	3 $\frac{1}{8}$	1 $\frac{3}{4}$
F-154	Matching	Microphone, mixer or line to low impedance line	500 ⁺ /333 250/200 ⁺ 125/50	500 ⁺ /333 250/200 ⁺ 125/50	1:1		OC	2 $\frac{1}{8}$	1 $\frac{3}{4}$	2 $\frac{5}{8}$	2 $\frac{1}{4}$	3 $\frac{1}{8}$	1 $\frac{3}{4}$
F-155	Matching	Dynamic mike or mixer to low impedance line	60/38 30/22 15/10 5.5/2.5	500 ⁺ /333 250/200 ⁺ 125/50	1:2.9		OC	2 $\frac{1}{8}$	1 $\frac{3}{4}$	2 $\frac{5}{8}$	2 $\frac{1}{4}$	3 $\frac{1}{8}$	1 $\frac{3}{4}$
F-156	Output	Single plate to line or mixer	10,000 to 15,000	500 ⁺ /333 250/200 ⁺ 125/50		8	OC	2 $\frac{1}{8}$	1 $\frac{3}{4}$	2 $\frac{5}{8}$	2 $\frac{1}{4}$	3 $\frac{1}{8}$	1 $\frac{3}{4}$
F-157	Output	Single plate to line or mixer; magnetic shielding	10,000 or 15,000	500 ⁺ /333 250/200 ⁺ 125/50			OC	2 $\frac{1}{8}$	1 $\frac{3}{4}$	2 $\frac{5}{8}$	2 $\frac{1}{4}$	3 $\frac{1}{8}$	1 $\frac{3}{4}$
F-158	Output	P.P. plates to line or mixer	20,000 CT	500 ⁺ /333 250/200 ⁺ 125/50		8	OC	2 $\frac{1}{8}$	1 $\frac{3}{4}$	2 $\frac{5}{8}$	2 $\frac{1}{4}$	3 $\frac{1}{8}$	1 $\frac{3}{4}$

* Indicates balanced C.T.



HERMETICALLY SEALED UNITS AVAILABLE

Made to customer's specifications where temperature and humidity are factors. For performance under most adverse conditions.