Tru-Fidelity

by

THORDARSON

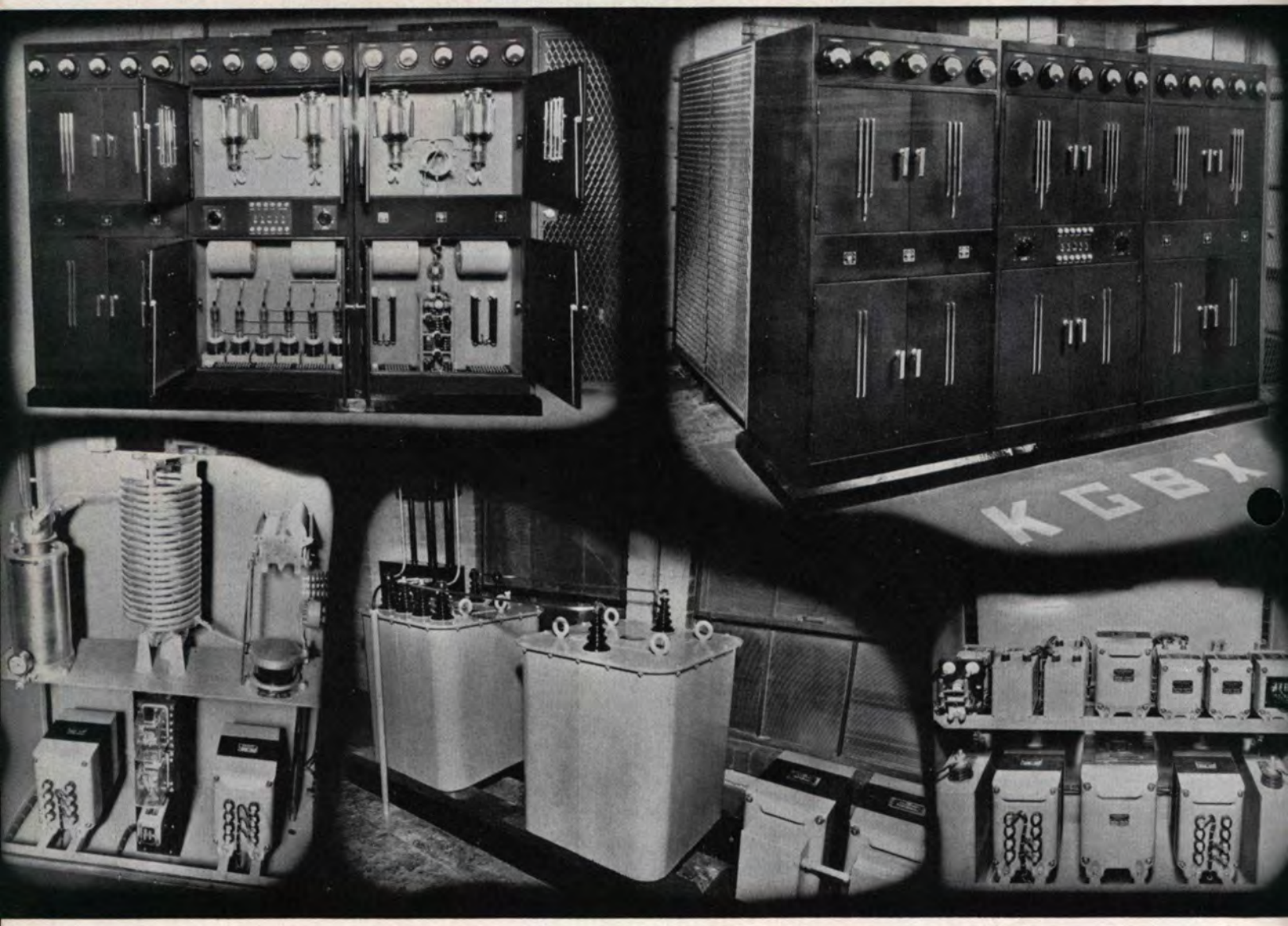
CATALOG No. 500-F
BROADCAST TRANSFORMERS

Tru-Fidelity by THORDARSON

Thordarson Tru-Fidelity components are specifically designed for broadcast station and other highly exacting requirements. Ratings are conservative and features are clearly presented to assist in the selection of proper components.

Prompt and expert attention is given to all inquiries, and special items are designed as required.

The 5000 watt transmitter of station KGBX illustrated below was designed by Mr. F. Bauer, Chief Engineer of the Springfield Broadcasting Co., of Springfield, Mo., using Thordarson Tru-Fidelity components throughout. Of special interest is the use of the filament transformer with socket assembly as illustrated in the upper left view.



INDEX

AUDIO TRANSFORMERS
INCHER SERIES

MAXIMUM OPERATING LEVEL ZERO DB

- Especially small and lightweight. 15/16" diameter, 1 1/8" high and wt. 1 1/4 oz.
- Maximum operating level 0 db (6 milliwatts).
- Uniform frequency response ± 1½ db from 30 to 15,000 c.p.s. (Except where noted.)
- Single coil shell type construction.
- Electrostatic shields. (Except Interstage types.)
- Relative hum reduction −67 db. Reference A, page 5.
- High permeability alloy laminations.
- Moisture-proof compound filled case.
- Grey enamel finish. (Chrome plated case 75c list extra.)
- Sturdy solder lugs machined from solid brass and tinned for quick soldering.

SHIELDED INCHER

- All features of Incher Series. Case style R1S.
- Magnetic shield providing 30 db hum reduction.

Case Style R1S left and right, R1 center, grey enamel finish.

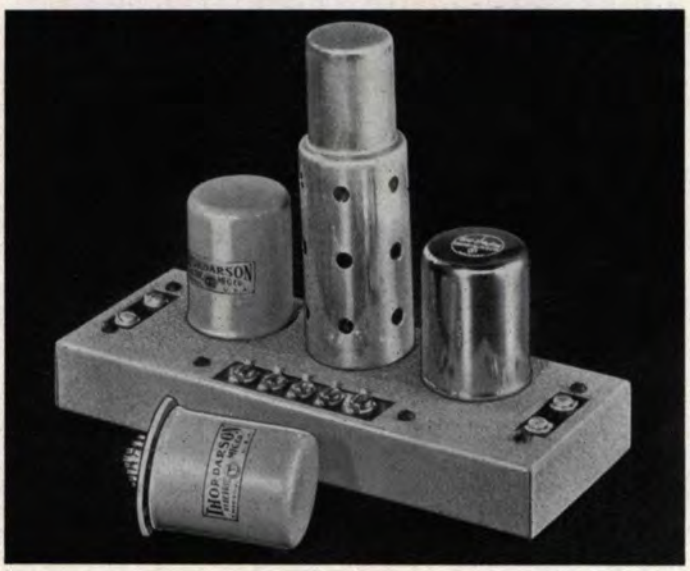
CASE DIMENSIONS	R1	R1S
Diameter	15/16	1
Height (Including lugs)	1 1/4	1 1/2
Height (Case alone)	1 1/8	1 3/8
Weight	1 1/4 oz.	1 3/4 oz.
Mounting Centers	11/16	11/16

APPLICATION	IMPEDANCE OHMS PRIMARY	SECONDARY	PRIMARY M.A. MAX. D.C. PER SIDE	UNBALANCE	CODE WORD	LIST PRICE	TYPE NUMBER
Microphone, Line or Pick-up to Single Grid	50/200*/500*	50,000	25	.5	ABLOOM	$10.50	T-5A1
					(Shielded)	12.00	T-5A1S
Microphone, Line or Pick-up to Push-pull Grids	50/200*/500*	80,000*	25	.5	ABOARD	11.00	T-5A2
					(Shielded)	12.50	T-5A2S
Dynamic Microphone to Single Grid	7.5/30*	50,000	0	0	ABRADE	9.50	T-5A3
					(Shielded)	11.00	T-5A3S
Single Plate to Single Grid, Ratio 1 to 2	10,000 to 15,000	60,000	0	0	ABRUPT	8.75	T-5A4
					(Shielded)	10.25	T-5A4S
★Single Plate to Single Grid, D.C. in Primary, Ratio 1 to 2	10,000 to 15,000	60,000	2	2	ABSENT	8.00	T-5A5
					(Shielded)	9.50	T-5A5S
★Single Plate to Single Grid. Turns Ratio 1 to 10 Overall	10,000 to 15,000	1,000,000	0	0	AIGRET	12.50	T-6A6
					(Shielded)	14.00	T-6A6S
★Single Plate to Single Grid. Turns Ratio 1 to 5 Overall	10,000 to 15,000	250,000	2	2	ANTLER	10.00	T-6A7
					(Shielded)	11.50	T-6A7S
Single Plate to Push-pull Grids, Ratio 1 to 2.5	10,000 to 15,000	95,000*	0	0	ABSORB	10.00	T-5A6
					(Shielded)	11.50	T-5A6S
★Single Plate to Push-pull Grids, D.C. in Primary, Ratio 1 to 2.5	10,000 to 15,000	95,000*	2	2	ABSURD	10.00	T-5A7
					(Shielded)	11.50	T-5A7S
Push-pull Plates to Push-pull Grids, Ratio 1 to 1.5	10,000 to 15,000 each side	67,500*	2	.25	ACACIA	10.50	T-5A8
					(Shielded)	12.00	T-5A8S
Single Plate to Line	10,000 to 15,000	50/200*/500*	0	0	ACCEDE	10.50	T-5A9
					(Shielded)	12.00	T-5A9S
★Single Plate to Line, D.C. in Primary	10,000 to 15,000	50/200*/500*	2	2	ACCENT	10.50	T-6A0
					(Shielded)	12.00	T-6A0S
Push-pull Plates to Line	10,000 to 15,000 each side	50/200*/500*	2	.25	ACCEPT	10.50	T-6A1
					(Shielded)	12.00	T-6A1S
Crystal Microphone or Pick-up to Line	50,000	50/200*/500*	0	0	ACCESS	10.50	T-6A2
					(Shielded)	12.00	T-6A2S
Matching and Mixing	50/200*/500*	50/200*	25	.5	ACCRUE	9.50	T-6A3
					(Shielded)	11.00	T-6A3S
★50:1 Microphone or Line to Single Grid	200	500,000	10	10	ACCUSE	10.00	T-6A4
					(Shielded)	11.50	T-6A4S

★Voice Frequencies Only, 150 to 6000 Cycles. *Center tapped.

INCHER AUDIO REACTOR

APPLICATION	INDUCTANCE NO D.C.	RATED D.C.	M.A. D.C.	D.C. RES. OHMS	CASE STYLE	CODE WORD	LIST PRICE	TYPE NUMBER
Parallel Feed	200 H	50 H	2	5,600	R1	CUBAGE	$7.50	T-6C5
						(Shielded)	9.00	T-6C5S



Case Style R-2. Available in either grey enamel (left) or chrome plated (right) cases as illustrated above mounted on 3" x 6" chassis.

FEATURES

- One piece drawn high permeability alloy case.
- Maximum operating level + 10 db.
- Uniform frequency response ± 1 db from 30 to 15,000 c.p.s. (Except where otherwise noted)
- Balanced (humbucking) coil construction.
- Electrostatic shields. (Except Interstage types.)
- Relative hum reduction 67 db. Reference A, page 5.
- High permeability alloy laminations.
- Moisture-proof compound filled case.
- One-hole ring mounting, permitting rotation of transformers for maximum hum reduction.
- Grey enamel finish. (Chrome plated case $1.25 list extra.)
- Sturdy solder lugs, machined from solid brass and tinned for quick soldering.
- Terminals arranged circularly to fit within standard tube socket hole.

NOTE: The signal level of transformers operating into tubes with greater than 75 volts peak (full secondary) exceeds the +10 db rating. Refer to MAJOR transformers on page 8 for this application.

Mixing (Line to Line) Transformers

APPLICATION	OHMS IMPEDANCE PRIMARY	OHMS IMPEDANCE SECONDARY	PRIMARY M.A. Max. D.C. Per Side	PRIMARY M.A. Un-balance	CODE WORD	LIST PRICE	TYPE NUMBER
Dynamic Microphone or 3 parallel position mixer	7.5/30* 17/67*	50/125 200*/250 333/500*	100	.5	ATRIUM	$13.50	T-1A66
Mixing, low imp. microphone, pick-up or multiple line	50/125 200*/250 333/500*	50/125 200*/250 333/500*	75	.5	ADDUCE	13.50	T-1A61
Crystal Microphone	100,000	50/125/200* 250/333/500*	0	0	ACTUAL	15.50	T-1A58

Bridging Transformers

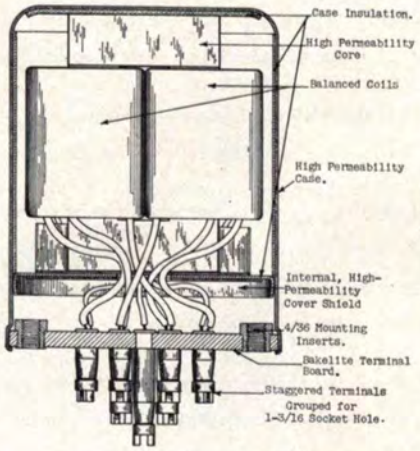
APPLICATION	OHMS IMPEDANCE PRIMARY	OHMS IMPEDANCE SECONDARY	PRIMARY M.A. Max. D.C. Per Side	PRIMARY M.A. Un-balance	CODE WORD	LIST PRICE	TYPE NUMBER
500 ohm line to adjustable line	2500/ 10,000*	50/125/200* 250/333/500*	0	0	AVENGE	$14.00	T-1A67
500 ohm line to single or push-pull grids	2500/ 10,000*	50,000* overall in two sections	0	0	ATTIRE	15.00	T-1A68

Microphone and Line to Grid Transformers

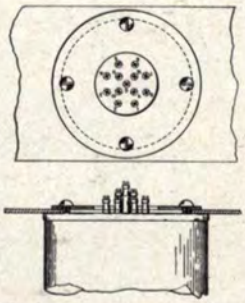
APPLICATION	OHMS IMPEDANCE PRIMARY	OHMS IMPEDANCE SECONDARY	PRIMARY M.A. Max. D.C. Per Side	PRIMARY M.A. Un-balance	CODE WORD	LIST PRICE	TYPE NUMBER
Low impedance mixer, pick-up or multiple line	50/125 200*/250 333/500*	50,000	75	.5	ACETIN	$14.50	T-1A50
Low impedance mixer, pick-up or multiple line	2.5/5.5 10*/22*/30 38/60*	50,000	75	.5	ACHING	14.50	T-1A51
Dynamic Microphone	30*/7.5	50,000 overall in two sections	0	0	ACIDIC	15.50	T-1A52
Low impedance pick-up, microphone or line	50/125 200*/250 333/500*	80,000 overall in two sections	75	.5	ACQUIT	15.50	T-1A53
Line	200*/50 250*	50,000 overall in two sections	75	.5	ATONIC	15.50	T-1A64

*Indicates balanced c.t.

(Bantam Series Audio Transformers Continued on next page.)



Cross sectional view, Bantam Transformer



Bottom view, illustrating ring mounting as used on Bantam, Multi-Shield and Major Series

R2 CASE DIMENSION	
Diameter	1⅝
Height (Including lugs)	2½
Height (Case alone)	1⅞
Mounting centers	1⅝x1⅝

Plate to Line Transformers

APPLICATION	OHMS IMPEDANCE PRIMARY	OHMS IMPEDANCE SECONDARY	PRIMARY M.A. MAX. D.C. PER SIDE	PRIMARY M.A. UN-BALANCE	CODE WORD	LIST PRICE	TYPE NUMBER
Single plate to multiple line No D.C. in primary	10,000 to 15,000	50/125 200*/250 333/500*	0	0	ACROSS	$14.00	T-1A51
Single plate to multiple line D.C. in primary †	10,000	50/125 200*/250 333/500*	4	4	ACTING	14.50	T-1A55
Single triode 6F6 etc. to line D.C. in primary §†	4,000	50/125 200*/250 333/500*	25	25	ACTION	15.00	T-1A56
PP low level plates to multiple line	10,000 to 15,000 each side	50/125 200*/250 333/500*	8	0	ACTIVE	14.00	T-1A57

Interstage Transformers

APPLICATION	OHMS IMPEDANCE PRIMARY	OHMS IMPEDANCE SECONDARY	PRIMARY M.A. MAX. D.C. PER SIDE	PRIMARY M.A. UN-BALANCE	CODE WORD	LIST PRICE	TYPE NUMBER
Single plate to single grid Ratio 1:2	10,000 to 15,000	60,000	0	0	ADAGIO	$14.00	T-1A59
Single plate to push-pull grids Ratio 1:2.31	10,000 to 15,000	80,000* overall 2 sections	0	0	ADDICT	14.00	T-1A60
Push-pull plates to push-pull grids Ratio 1:1.5 overall	10,000 to 15,000 each side	67,500*	8	0	ATTUNE	14.00	T-1A65

Bantam Audio Reactors

APPLICATION	INDUCTANCE NO D.C.	INDUCTANCE RATED D.C.	M.A. D.C.	OHMS RES. D.C.	CODE WORD	LIST PRICE	TYPE NUMBER
Parallel feed	475	320/80	2/4	6,000/1,500	CUDGEL	$10.00	T-1C62
Parallel feed	450	200/50	4/8	5,000/1,250	CONGER	10.00	T-1C63

Tone Control Choke

Hum-bucking coil construction core is of high grade silicon steel.

APPLICATION	INDUCTANCE HENRIES @	D.C. M.A.	MAXIMUM M.A. D.C.	D.C. RESISTANCE	CODE WORD	LIST PRICE	TYPE NUMBER
Tone Control	22	0	5	220 Ohms	CURFEW	$6.00	T-1C69

*Indicates balanced c.t. §Max. +22 db. † 60 to 15,000 c.p.s.

MAGNETIC SHIELDING

Reference A

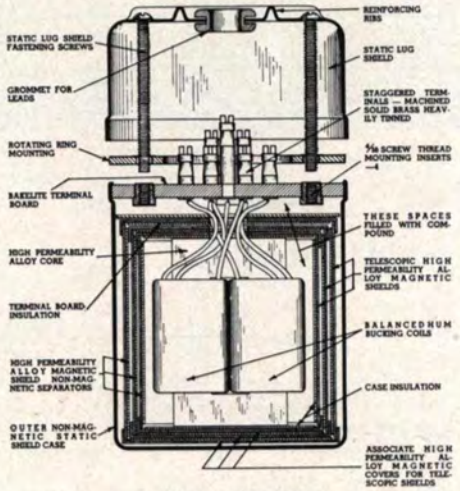
The relative hum reduction of a transformer involves humbucking construction and magnetic shields. Humbucking coil construction alone can accomplish a reduction of 35 db. The hum reduction of magnetic shields depends on their number and the type of material used. While the hum reduction for high permeability shielding may be very accurately measured, the hum reduction attributable to hum-bucking coil construction is relative and depends entirely on the equivalent coil to which the humbucking coil is compared. Thordarson has used a reference level, REFERENCE A, which consists of the humbucking coil under consideration with the windings connected to favor hum pick-up. The same physical size, iron weight and number of turns are thus used as the reference.

Reference B

For example, when a transformer with only cast alloy shielding is said to have 50 db hum reduction, it is probable that about 42 db is being attributed to hum-bucking coil construction since, in general, alloy cases provide approximately 8 db of shielding. If this higher reference of 42 db, which we shall refer to as REFERENCE B, were used the relative hum reduction of Tru-Fidelity transformers would be 12 db higher than values indicated in this catalog. (Continued on page 7.)

AUDIO TRANSFORMERS
MULTI-SHIELD BANTAM SERIES

Case Style R-3



Cross section view
Multi-shield Audio Transformer

- **Bantam type Core and Coil.**
- **Three telescopic high permeability magnetic shields.**
- **Statically shielded lug assembly.**
- **Maximum operating level + 10 db.**
- **Uniform frequency response ± 1 db from 30 to 15,000 c.p.s. (Except where otherwise noted.)**
- **Balanced (humbucking) coil construction.**
- **Electrostatic shields. (Except Interstage types.)**
- **Relative hum reduction of 87 db using Reference A, Page 5.**
- **High permeability alloy laminations.**
- **Moisture-proof compound filled case.**
- **One-hole ring mounting permitting rotation of transformer for maximum hum reduction.**
- **Grey enamel finish. Chrome plated case available at $1.25 list additional.**
- **Sturdy solder lugs machined from solid brass and tinned for quick soldering.**
- **Terminals circularly arranged to fit within standard tube socket hole.**

NOTE: The signal level of transformers operating into tubes with greater than 75 volts peak (full secondary) exceeds the + 10 db rating. Refer to MAJOR transformers on page 8 for this application.

CASE DIMENSIONS

Diameter	1 5/16
Height (Including lugs)	2 3/4
Height (Without lugs)	2 1/4
Mounting Centers	1 5/16 x 1 5/16

Mixing (Line to Line) Transformers

APPLICATION	OHMS IMPEDANCE PRIMARY	OHMS IMPEDANCE SECONDARY	MAX. D.C. PER SIDE	PRI. M. A. UNBALANCE	CODE WORD	LIST PRICE	TYPE NUMBER
Mixing, Low Impedance, Pick-up, Microphone or Multiple Line to Multiple Line	50/125/ 200*/250/ 333/500*	50/125/ 200*/250/ 333/500*	75	.5	APOGEE	$16.50	T-1A83
Dynamic Microphone or 3 Parallel Position Mixer to Line	7.5/30*/ 17/67*	50/125/200* 250/333/500*	100	1	ANONYM	16.50	T-1A84

Bridging Transformers

Bridging Transformer From 500 Ohm Line to Adjustable Line	2500/ 10,000*	50/125/ 200*/250/ 333/500	0	0	ANIMUS	$17.00	T-1A85
Bridging Transformer From 500 Ohm Line to Single or Push-Pull Grids	2500/ 10,000*	50,000* Overall In Two Sections	0	0	AMOEBA	18.00	T-1A86

Microphone and Line to Grid Transformers

APPLICATION	OHMS IMPEDANCE PRIMARY	OHMS IMPEDANCE SECONDARY	MAX. D.C. PER SIDE	PRI. M. A. UNBALANCE	CODE WORD	LIST PRICE	TYPE NUMBER
Low Impedance, Mixer, Pick-up Multiple Line to Single Grid	50/125/ 200*/250/ 333/500*	50,000	75	.5	ALGINE	$17.50	T-1A70
Low Impedance, Mixer, Pick-up or Multiple Line to Single Grid	2.5/5.5/ 10*/15/22* 30/38/60*	50,000	75	.5	ALCOVE	17.50	T-1A71
Dynamic Microphone to 1 or 2 Grids	7.5/30* 12.5/50*	50,000* Overall in two Sections	100	1	ALAHUO	18.50	T-1A72
Low Impedance, Mixer, Pick-up or Multiple Line to Push-Pull Grids	50/125/ 200*/250/ 333/500*	80,000* Overall in Two Sections	75	.5	AIRILY	18.50	T-1A73
Line to One or Two Grids	200*/50 250*	50,000* Overall in Two Sections	75	.5	ALKALI	18.50	T-1A74

*Indicates balanced c.t.

Plate to Line Transformers

APPLICATION	OHMS IMPEDANCE PRIMARY	OHMS IMPEDANCE SECONDARY	PRIMARY M.A. Max. D.C. Per Side	PRIMARY M.A. Un-balance	CODE WORD	LIST PRICE	TYPE NUMBER
Single Plate (Low Level) 6C5, etc. to Multiple Line (No D.C. in Primary)	10,000 to 15,000	50/125/ 200*/250/ 333/500*	0	0	ANSWER	$17.00	T-1A75
Single Plate (6C5, etc.) to Multiple Line (D.C. in Primary)†	10,000	50/125/ 200*/250/ 333/500*	4	4	APIARY	17.50	T-1A76
Single 6F6 Triode, etc. to Multiple Line (D.C. in Primary)†§	4000	50/125/ 200*/250/ 333/500*	25	25	ASSIZE	18.00	T-1A77
Push-Pull Low Level Plates to Multiple Line	10,000 to 15,000 Each Side	50/125/ 200*/250/ 333/500*	8	0	APPEAL	17.00	T-1A78
Crystal Microphone or High Impedance to Multiple Line	100,000	50/125/ 200*/250/ 333/500*	0	0	ARCADE	18.50	T-1A79

Interstage Transformers

APPLICATION	OHMS IMPEDANCE PRIMARY	OHMS IMPEDANCE SECONDARY	PRIMARY M.A. Max. D.C. Per Side	PRIMARY M.A. Un-balance	CODE WORD	LIST PRICE	TYPE NUMBER
Single Plate to Single Grid, 1 to 2 Turns Ratio	10,000 to 15,000	60,000	0	0	ARGENT	$17.00	T-1A80
Single Plate to Push-Pull Grids, 1 to 2.31 Turns Ratio Overall	10,000 to 15,000	80,000* Overall	0	0	ASTERN	17.00	T-1A81
Push-Pull Plates to Push-Pull Grids, 1 to 1.5 Turns Ratio Overall	10,000 to 15,000 Each Side	67,500*	8	0	APLOMB	17.00	T-1A82

Multi-Shield Audio Reactors

APPLICATION	INDUCTANCE NO D.C.	INDUCTANCE RATED D.C.	M.A. D.C.	OHMS RES. D.C.	CODE WORD	LIST PRICE	TYPE NUMBER
Parallel Feed	475	320	2	6000	CURLER	$13.00	T-1C87
		80	4	1500			
Parallel Feed	450	200	4	5000	CURLEW	13.00	T-1C88
		50	8	1250			

* Indicates balanced c.t. § Max. + 22 db. Level. † Frequency response ±1 db from 60 to 15,000 c.p.s.

MAGNETIC SHIELDING (Continued from Page 5)

A coil of wire in an alternating magnetic field will have a voltage induced that is proportional to the number of turns, the area of the coil, the flux density and the frequency. The humbucking transformer consists of two separate windings on a core, so assembled and connected that the voltages induced by the primary will be in series while the voltages induced by the external field will be in opposite phase and cancel. Complete cancellation is possible only when the voltages are equal in magnitude and exactly 180° out of phase. Distorted and non-uniform fields will make this condition difficult to obtain even with coils that are fully symmetrical.

The Thordarson ring mounting feature has been developed and is included with MULTI-SHIELD, BANTAM and MAJOR Tru-Fidelity transformers to allow orientation of the coil for maximum hum cancellation.

Magnetic shielding reduces further hum pickup by decreasing the amount of magnetic flux actually reaching the transformer coils. A shield of very high permeability is used and its construction is carefully designed to make the hum field at the coils as uniform as possible. The cylindrical case results in the most uniform field and it may be rotated for minimum hum without affecting appearance. Cases R-4 page 8, R-2 page 6 and R-1S page 3 are examples of this shielding.

Additional magnetic shields provide further hum reduction because of the additional flux path and the effects of eddy currents in the shields. As the number of shields increases the effectiveness of each becomes less. Careful investigation of shielding has shown the MULTI-SHIELD Series to be sufficiently effective in reducing hum with three high-permeability shields.

The permeability of magnetic materials is not a constant. It varies over a considerable range depending upon flux density and the previous history of the material. The magnetic material used for shielding Thordarson Tru-Fidelity transformers is selected and processed to obtain maximum efficiency in the range of flux densities that will be encountered. Measurements on typical amplifier chassis have shown that the value of stray flux density does not exceed 1 gauss. In most cases the hum field will be much less.

For purpose of standardized measurements we have used the excessive value of 1 gauss. The following method will indicate the amount of hum to be expected.

6 MW across 500 ohms has been used as the zero reference level. The transformer is loaded as in actual operation and the output hum level is measured when the strength of the hum field is 1 gauss. This measurement gives the amount of actual hum that will be impressed upon the grid of the following tube. The ratio of signal to hum at that stage may thus be readily determined.

Measurements made by this method show a hum voltage having the following hum levels:

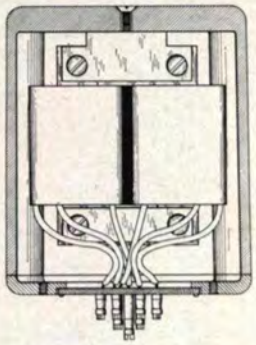
BANTAM SERIES.....100 db below 6 MW maximum hum
MAJOR SERIES..... 95 db " " " " "
MULTI-SHIELD SERIES....120 db " " " " "

*A signal to hum ratio of 50 db will be maintained at the following signal levels in the 1 gauss field.

BANTAM SERIES.....–50 db
MAJOR SERIES.....–45 db
MULTI-SHIELD SERIES.....–70 db

AUDIO TRANSFORMERS
MAJOR SERIES

Case Style C-5, C7, C10



CASE DIMENSIONS

Case Style	C5	C7	C10
Width	3 1/8	3 1/4	3 7/8
Depth	2 5/8	3 5/8	4
Height (Incl. lugs)	4 3/8	4 5/8	5 1/8
Height (lugs)	3 5/8	4 1/8	4 7/8
M. C.	2 1/8 x 2 1/8	1 7/8 x 2 5/8	1 7/8 x 2 5/8

- High operating level.
- Uniform frequency response ± ½ db from 30 to 15,000 c.p.s. (Except where otherwise noted.)
- Balanced (humbucking) coil construction.
- Electrostatic shields. (Except Interstage types.)
- Relative hum reduction, 38 db. (Ref. A, page 5.)
- High permeability alloy laminations.
- Moisture-proof compound filled case.
- One-hole ring mounting, permitting rotation of transformers for maximum hum reduction.
- Grey enamel finish cast case.
- Sturdy solder lugs machined from solid brass and tinned for quick soldering.
- Terminals circularly arranged to fit within standard socket hole.

Special Major transformers to meet other audio requirements will be quoted on application.

Mixing (Line to Line) Transformer

APPLICATION	IMPEDANCE OHMS PRIMARY	IMPEDANCE OHMS SECONDARY	MAX. DB LEVEL	PRIMARY M.A. MAX.D.C. PER SIDE	PRIMARY M.A. UNBALANCE	CASE STYLE	CODE WORD	LIST PRICE	TYPE NUMBER
Adjustable Lines	50/200*/125/500*	50/200*/125/500*	+15	100	.5	C5	ALMOST	$17.00	T-2A97

Microphone and Line to Grid Transformers

Adjustable Line to Single Grid	50/200,* 125/500*	18,750/– 75,000*	+15	100	.5	C5	AFRAID	18.00	T-2A66
Adjustable Line to Push-pull Grids	50/200,* 125/500*	25,000/– 100,000*	+15	100	.5	C5	AGENCY	19.00	T-2A68

Plate to Line Transformers

Single 6C6, 1603, etc. Triode to Line	5000/– 20,000*	50/200,* 125/500*	+15	—	8	C5	SAFETY	$17.50	T-3A30
Single or Push-pull 6C6, 1603, etc. Triode to Line	5000/– 20,000*	50/200,* 125/500*	+20	10	0	C5	SALAAM	17.50	T-3A32
Push-pull 89 Triode, etc. to Line	2500/– 10,000*	50/200* 125/500*	+28	30	.5	C5	SANDAL	17.50	T-3A36
Single 6F6, 89, etc. to Line	1875/– 7500*	50/200,* 125/500*	+24	—	16	C5	SATEEN	17.50	T-3A38
P-P 6F6, 42, etc. Triodes, Single 6F6, etc. to Line	1875/– 7500*	50/200,* 125/500*	+28	35	.75	C5	SCRIBE	17.00	T-3A40

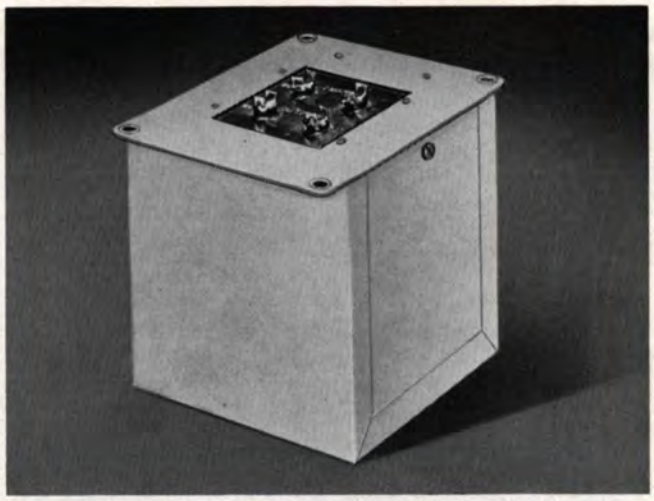
Interstage Transformers

Single 10,000 Ohm Plate to P-P Grids	1:2☆	+15	0	0	C5	ARTIST	17.50	T-2A36
Single 10,000 Ohm Plate to P-P Grids	1:3.25☆	+15	0	0	C5	ARMADA	17.50	T-2A40
P-P 10,000 Ohm Plates to P-P Grids	1:2.25☆	+15	10	.5	C5	AFFORD	17.50	T-2A42
P-P 10,000 Ohm Plates to P.P. Power Grids	1:1☆	+20	10	.5	C5	AFIELD	17.50	T-2A44
P-P 2A3's, 6A3's, 6B4's, etc. to P-P 845 Class A Grids	1:1☆	+32	60	5.0	C7	ASLANT	18.50	T-2A46

High Level Output to Line or Voice Coil Transformers

Push-pull 2A3's, 6B4's, etc. to Line	1250/5000* 750/3000*	50/200* 125/500*	+32	60	5	C7	ARRIVE	$18.00	T-3S20
Push-pull 2A3's, 6B4's, etc. to Voice Coil	1250/5000* 750/3000*	1.25/5* 3.75/15*	+32	60	5	C7	AROUSE	18.00	T-3S21
Push-pull 2A3's, 6B4's etc. to Line or Voice Coil	1250/5000* 750/3000*	50/200*/125/500* 1.25/5*/3.75/15*	+34	60	5	C10	ASCEND	19.00	T-3S22†
Push-pull 6L6's to Line or Voice Coil§	6600* 6000*	62.5/250*/125/500* 1.25/5*/7.5/10 3.75/15*	+37.5	84	7	E2S	SPINET	37.50	T-3S16†
Push-pull 6L6's or Push-pull Par. 6L6's to Line or Voice Coil§	3800* 3300*	62.5/250*/125/500* 1.25/5*/7.5/10 3.75/15*	+40	152	7	E2S	SPOUSE	45.00	T-3S17†
Push-pull Par. 2A3's, 6B4's, 6L6's, etc. to Line or Voice Coil§	2500*/1500*	62.5/250*/125/500* 1.25/5*/7.5/10 3.75/15*	+37	140	7	E2S	SQUIRE	37.50	T-3S23†
Line to Voice Coil	50/200*/125/500*	1.25/5*/3.75/15*	+30	100	.5	C5	AROUND	17.00	T-3S07

* Indicates balanced c.t. † ± 1 Db 30 to 15,000 c.p.s. ☆ Turns ratio. § Tertiary winding is 10% of full primary.



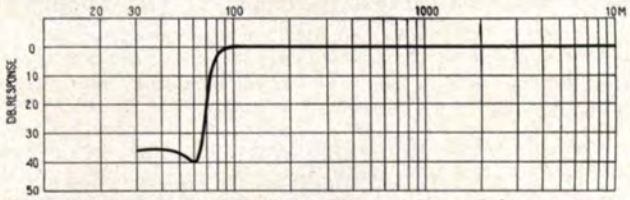
Case Style N1Q

The audio filter is inherently a corrective device used to modify the transmission characteristic of an audio system. The attenuation properties of the filter must be of such nature that it will in effect convert the signal source into an equivalent generator with the desired frequency response. Certain types of filters, known as equalizers, are used to compensate for non-linearity in a transmission line.

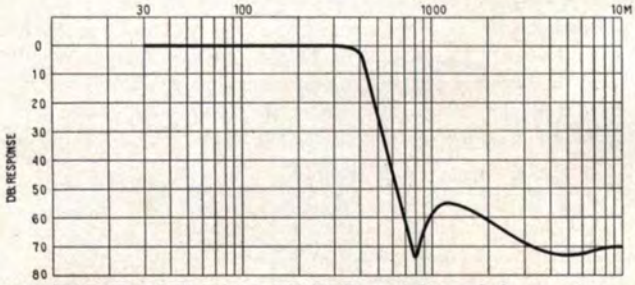
The use of these items will always be accompanied by a loss of gain in the system. The desired frequency characteristic is obtained by using resistive and reactive elements to control the magnitude of the loss introduced at each frequency.

The four general classifications of audio filters are (1) low pass, (2) high pass, (3) band pass, and (4) band rejection. It is possible to combine types to make a single filter with a very complex frequency response.

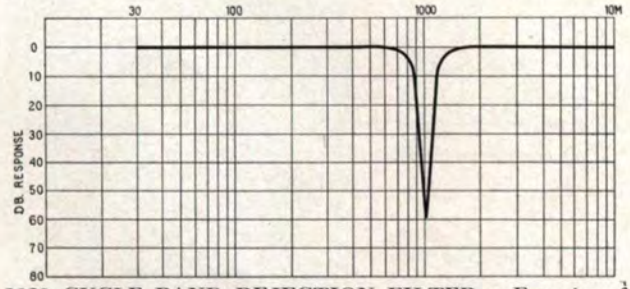
Normal filter characteristics are obtained only when the filter is properly terminated in its characteristic impedance. Circuit design may require the use of suitable matching transformers at the input and output. These transformers may or may not be incorporated in the filter itself. These considerations make it evident that the audio filter will usually be designed for a single application. The filters listed below are representative of those most commonly required. Special filters are quoted on application.



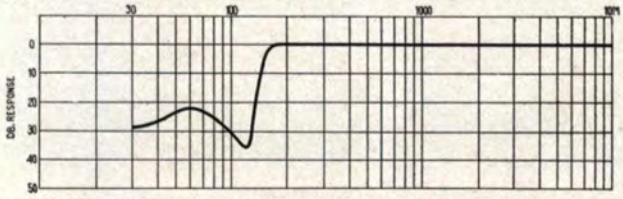
80 CYCLE HIGH PASS FILTER — Adjusted for maximum rejection at 60 c.p.s. 40 db attenuation at 60 c.p.s. as shown by curve. For use on 500-600 ohm line. +20 db maximum level.
Overall dimensions: 4″ x 5⅛″ x 4½″ Wt. 5¼ Lbs.
T-4E01.....**List Price $35.00**



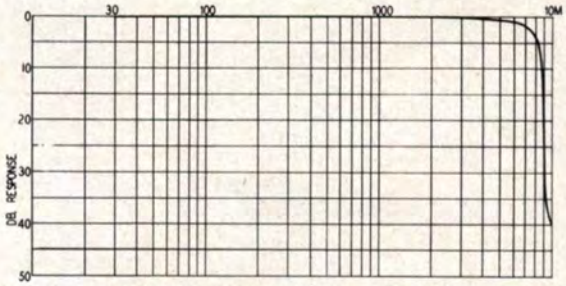
400 CYCLE LOW PASS FILTER — Adjusted for maximum attenuation of 800 cycle second harmonic. 70 db attenuation at 800 c.p.s. as shown by curve. For use on 500-600 ohm line. + 10 db maximum level.
Overall dimensions: 3″ x 4½″ x 2¾″. Wt. 2¾ lbs.
T-4E03.....**List Price $35.00**



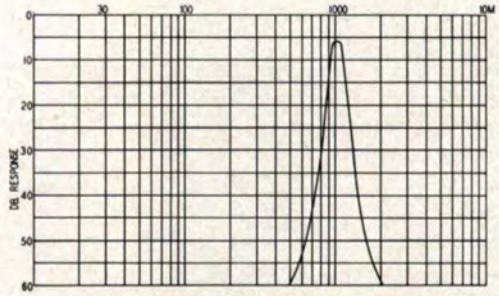
1020 CYCLE BAND REJECTION FILTER — For aircraft or other applications where it is desired to eliminate a 1020 cycle signal and still allow speech passage. For use on 500-600 ohm line. + 10 db maximum level.
Overall dimensions: 3″ x 4½″ x 2¾″ Wt. 2¾ lbs.
T-4E04.....**List Price $25.00**



150 CYCLE HIGH PASS FILTER — Adjusted for maximum attenuation at 120 c.p.s. 35 db attenuation at 120 c.p.s. as shown by curve. For use on 500-600 ohm line. + 20 db maximum level.
Overall dimensions: 4″ x 5⅛″ x 4½″ Wt. 5¼ lbs.
T-4E02.....**List Price $25.00**



7500 CYCLE LOW PASS FILTER — With sharp cut-off at 7500 c.p.s. Suitable for limiting broadcast transmitter side band transmission. For use on 500-600 ohm line. + 10 db maximum level.
Overall dimensions: 3″ x 4½″ x 2¾″ Wt. 2¾ lbs.
T-4E05.....**List Price $30.00**



1020 CYCLE BAND PASS FILTER — For aircraft or other applications where it is desired to transmit only a single frequency. For use on 500-600 ohm line. + 10 db maximum level.
Overall dimensions: 3″ x 4½″ x 2¾″ Wt. 2¾ lbs.
T-4E06.....**List Price $25.00**

Line Equalizer

T-3E90 List Price $12.00

R-2 case at left. Note this compact lightweight unit is as small as the 6C5 tube shown at left.

FEATURES

- Designed for use with a 400 to 600 ohm line.
- Taps for 6/8/10 kilocycle resonant frequency.
- Terminals arranged for extreme flexibility in connection.
- Equalization to 25 db controlled by external resistor.
- Small R-2 case.
- Terminals plainly identified by engraved terminal board.

This equalizer is intended for use in correcting the high frequency response of a program line or similar circuit. The curves will indicate the proper tap and the approximate value of resistor required for the application. The resistor is not incorporated in the unit as most installations involve a fixed setting at a single value.

Figure 1 gives the frequency response characteristic of a two-mile program line, as installed between a studio and a transmitter. Figure 2 shows the frequency characteristic after equalization by means of T-3E90. The connection shown in figure 3 was used with the 10 kilocycle tap and a 250 ohm resistor.

The equalization is obtained by means of attenuation of the lower frequencies with a suitable impedance shunting the load. Additional gain must be supplied to compensate for the equalization losses. The equalizer consists of a condenser-reactor circuit in which a parallel resonance occurs at the higher end of the frequency band, and having the elements of proper value to give the desired impedance characteristic.

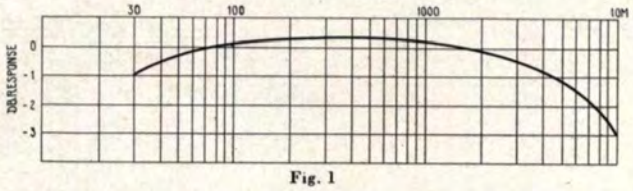


Fig. 1

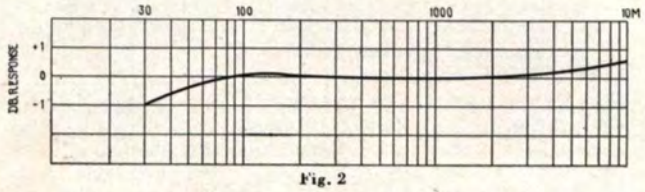


Fig. 2

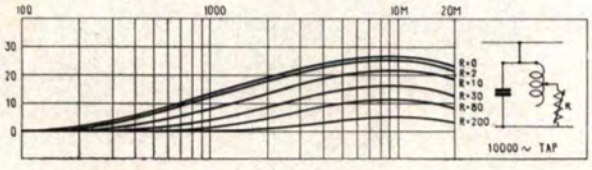


Fig. 3

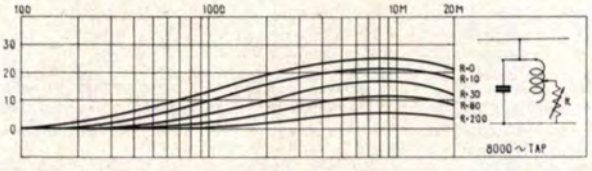


Fig. 4

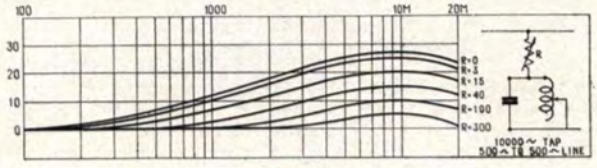


Fig. 5

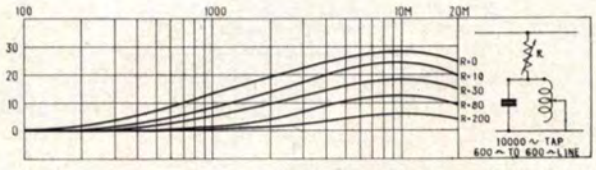


Fig. 6

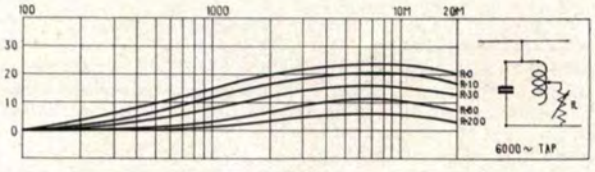


Fig. 7

DRIVER TRANSFORMERS

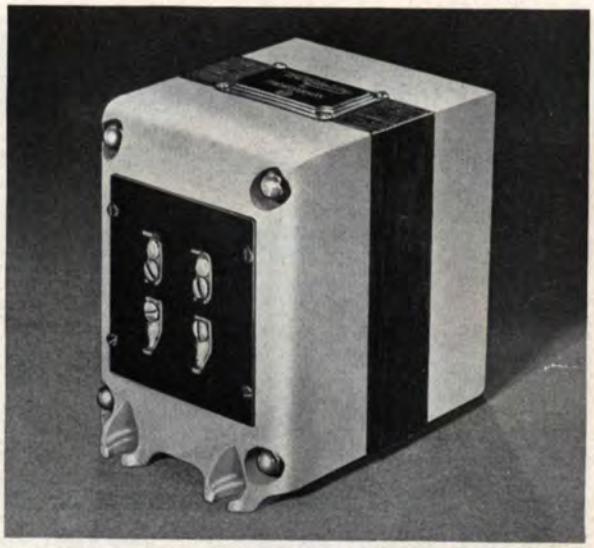
FEATURES

- Uniform frequency response ± ½ db from 30 to 15,000 c.p.s.
- Split primary and secondary.
- Balanced secondary for Class B operation.
- Low leakage inductance.
- Low primary and secondary resistance.
- Cast end case, coils protected with moisture-proof compound.
- Grey enamel finish.

In order to reduce the equivalent source impedance in the class B grid circuit, the transformers are designed with the maximum step-down ratio consistent with operation just below the grid current point of the driver tubes.

The coil construction is such that the leakage inductance is extremely low, thus assuring not only good high frequency response but also excellent results in inverse feedback applications where the driver stage is included in the feedback circuit.

The primary is designed on the basis of an unloaded type so that good low frequency response is obtained at all signal levels. Both the primary and secondary resistances are negligible in comparison with the actual source impedance of the driver stage in the class B grid circuit.



Case Style E-S

CASE DIMENSIONS

Type	Width	Height	Depth*
E1S	3¼	4¼	6½ to 8
E2S	4⅛	5⅜	6¾ to 8
E5S	4¾	6	7¼ to 9
E9S	5⅜	7	9¼ to 13
E9L	6⅜	8½	9¼ to 13

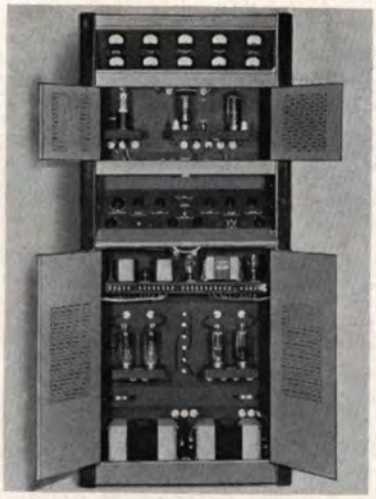
*This dimension will vary between the limits given according to the amount of core required.

Uniform Frequency Characteristic Within ± ½ DB From 30 to 10,000 C. P. S.

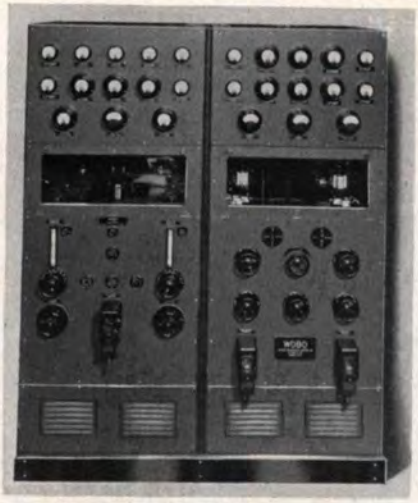
APPLICATION DRIVER TUBES	CLASS B GRIDS	MINIMUM GRID IMPEDANCE OHMS	TURNS RATIO PRI. ½ SEC.	MAX. DB LEVEL	PRIMARY MAX. M.A. PER SIDE	CASE STYLE	CODE WORD	LIST PRICE	TYPE NUMBER
2-2A3's	P.P. 805's, 838's, ZB120's	900	3.2:1	+33	60	E1S	DIMITY	$25.00	T-3D60
4-2A3's	P.P. 805's, P.P. Par. 805's, etc	450	3.2:1	+36	120	E1S	DIESIS	30.00	T-3D61
2-845's	P.P. 833's, P.P. 805's	800	6:1	+36	70	E2S	DIBBLE	37.50	T-3D62
4-845's	P.P. 849's	800	5:1	+39	140	E2S	DIADEM	45.00	T-3D63
6-845's	P.P. 851's	900	5:1	+42	210	E5S	DERAIL	50.00	T-3D64
2-849's	P.P. 891's	20,000	2.5:1	+43	150	E5S	DEODAR	70.00	T-3D65

Tube To Line and Line To Grid Transformers

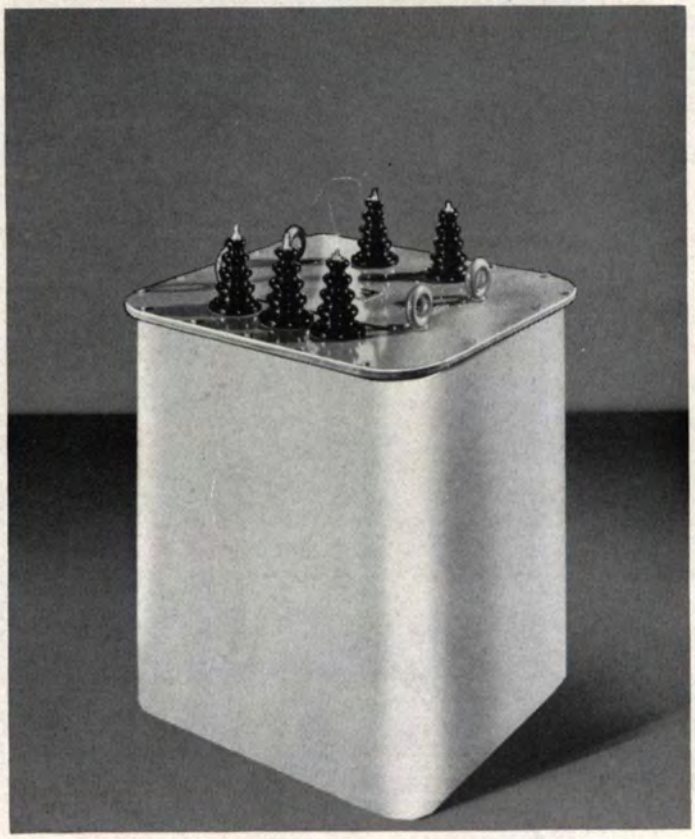
SOURCE	RATIO PRIMARY TO SECONDARY	SECONDARY	CASE STYLE	CODE WORD	LIST PRICE	TYPE NUMBER
2 or 4-2A3's	3.2 to 1	Line (500 Ohm)	E1S	DEVOIR	$25.00	T-3D70
Line (500 Ohm)	1 to 2	Push-Pull 805 Class B Grids	E1S	DEVEST	25.00	T-3D71
2-845's	6 to 1 Tap, 5 to 1	Line (500 Ohm)	E2S	DICKER	35.00	T-3D72
Line (500 Ohm)	1 to 2	Push-Pull 805, 833, Etc., Class B Grids	E2S	DINNER	35.00	T-3D73



WCLS, Joliet, Illinois and WDBO, Orlando, Florida, selected Thordarson transformers and reactors exclusively for their respective stations. WCLS and Thordarson engineers collaborated in designing and constructing this efficient 250 watt transmitter illustrated at the left. WDBO engineers rebuilt and redesigned the 1000 watt transmitter illustrated at the right and used Thordarson components throughout.



HIGH LEVEL MODULATION TRANSFORMERS



Mounting Style TS (See T-4M58 for dimensions)

FEATURES

- **Uniform Frequency Response ± ½ db from 30 to 10,000 c.p.s.**
- **Constant primary impedance over frequency range.**
- **Low insertion loss.**
- **Class B operation with very low distortion.**
- **Low phase shift for inverse feedback applications.**
- **Quiet operation.**
- **Moisture-proof compound filled case. (Except where otherwise noted.)**
- **Ceramic terminal bushings with heavy ¼-20 terminal bolts.**

Tru-Fidelity modulation transformers effect an efficient transfer of audio power from the modulator to the modulated stage. Low insertion loss, minimum distortion and a generous margin of safety factor for emergency conditions of operation, are results of good engineering and manufacturing and characterize these units.

Special modulation transformers with different impedance ratios are available on special order. Prices and delivery are quoted on application.

MODULATION TRANSFORMERS

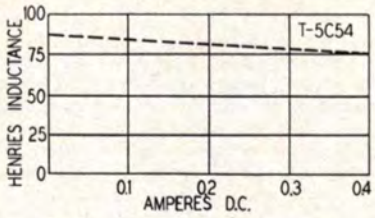
SOURCE	IMPEDANCE OHMS PRIMARY P. TO P.	IMPEDANCE OHMS SECONDARY	AUDIO CAP. WATTS	ANT. POWER WATTS	CASE STYLE AND OVERALL DIM. W.	D.	H.	CASE STYLE	CODE WORD	LIST PRICE	TYPE NO.	WT. LBS.
P.P. 838	6900	5000/4000	110	100	5⅜	10	7	E9S	MACACO	$55.00	T-4M50	45
P.P. 805	6700	3750/2400	225	250	5⅜	11½	7	E9S	MACKLE	80.00	T-4M51	60
P.P. 805	6700	5000/4400	225	250	5⅜	11½	7	E9S	MORTAR	80.00	T-4M60	60
P.P.P. 805	3400	1875	450	500	7⅝	10¼	9⅝	E4S	MACRON	115.00	T-4M52	90
P.P. 849 or P.P. 806	10,000	4800	450	500	7⅝	11¼	9⅝	E4S	MAGUEY	115.00	T-4M53	100
P.P. 833	10,500	5000	800	1000	7⅝	15	9⅝	E4S	MORONE	200.00	T-4M61	150
P.P. 833 or P.P. 849	9500	3750/2400	900	1000	7⅝	15	9⅝	E4S	MALICE	200.00	T-4M54	150
P.P. 833 or P.P. 450TH's	8000	2750/1750	1250	1500	7⅝	16	9⅝	E4S	MALLET	250.00	T-4M55	165
P.P.P. 822	4500	2750/2000/-1750	1250	1500	9	13	12⅝	E4L	MANAGE	250.00	T-4M56	160
P.P. 891-R	14,000	10,000	3500	5000	24	24	34	TS	MARGIN	900.00	T-4M58	1200
P.P. 220-C	9000	4300	7000	10,000	24	24	40 (Oil Filled)	TS	MARKET	1400.00	T-4M59	1600

MODULATION REACTORS

FEATURES

- Very small distributed capacity.
- Windings will carry 50% greater current than rated load during emergency operation.*
- Moisture-proof compound filled case. (Except where otherwise noted.)
- Low insertion loss.
- Ceramic terminal bushings and ¼-20 terminal bolts.
- Grey enamel finish.

*Overload adversely effects distortion.

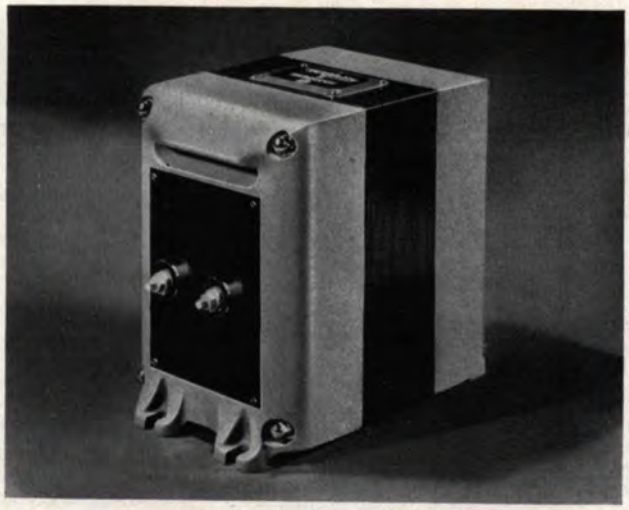


The minimum inductance of the modulation reactor for a desired attenuation at 40 and 100 c.p.s. is given directly by the chart. The curves assume high plate resistance tubes and do not include the effects of blocking and filter condensers.

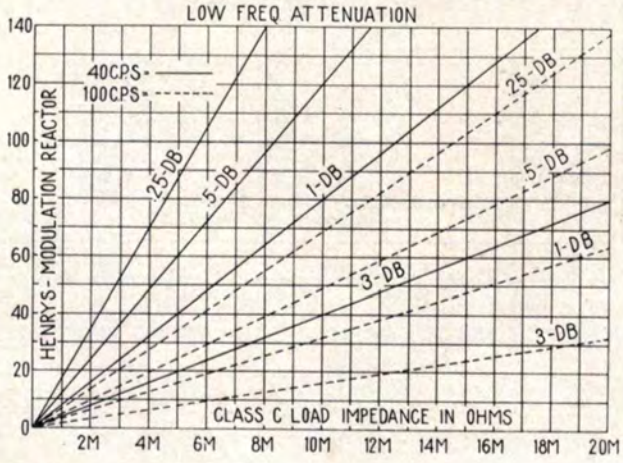
The modulation reactor is used to carry the D.C. component of the input of the Class C RF amplifier. The ratio of reactor impedance to Class C load must be high enough over the operating frequency range to maintain the desired frequency response. The unit will be required to operate with the Class C stage direct current in the winding and a maximum impressed excitation voltage equal to 70% of the D.C. supply voltage.

The inductance characteristic curve of a typical unit shows how the inductance of these reactors remains practically constant regardless of the magnitude of either the A.C. or D.C. components. This assures that the cores are operated well below the saturation point and distortion will not be introduced.

The distributed capacity of these reactors is very small and a unit selected to provide good low frequency response will show practically no attenuation at 15,000 cycles per second.



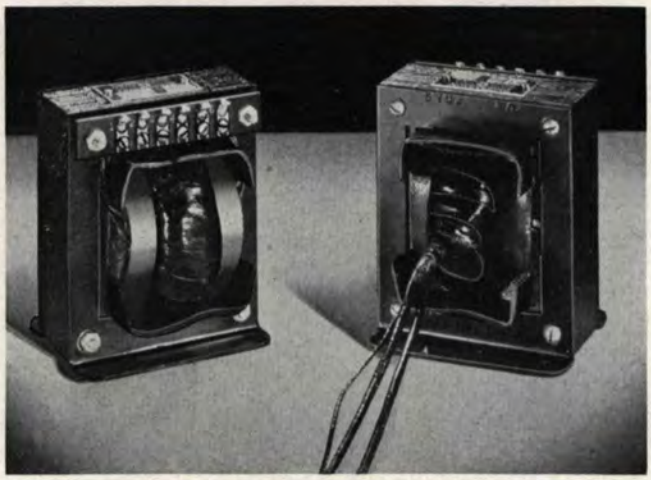
Case Style E-S, E-L



Modulation Reactors

IN-DUCT. HENRIES	@ AMPS. D.C.	D.C. RES. OHMS	EXCITATION VOLTS 40 CYCLES TO GROUND	R.M.S. VOLTS	OVERALL DIMENSIONS W.	D.	H.	WT. LBS.	CASE STYLE	CODE WORD	LIST PRICE	TYPE NUMBER
50	0.20	260	1000	5000	4¾	8	6	30	E5S	CACKLE	$40.00	T-5C50
100	0.20	300	1000	5000	5⅜	11⅜	7	55	E5S	CALASH	50.00	T-5C51
30	0.40	195	3000	10,000	5⅜	11	7	57	E9S	CALLUS	60.00	T-5C52
50	0.40	220	3000	10,000	5⅜	12¼	7	66	E9L	CAMERA	75.00	T-5C53
75	0.40	140	3000	10,000	7⅝	13¼	9⅝	138	E4S	CAMLET	100.00	T-5C54
30	0.80	70	3000	10,000	7⅝	14¼	9⅝	145	E4S	CACTUS	135.00	T-5C55
50	0.80	70	3000	10,000	9	13¼	12⅝	194	E4L	CENTAL	175.00	T-5C56
60	0.60	115	3000	10,000	7⅝	13¾	9⅝	160	E4S	CONFAB	150.00	T-5C71
15	1.0	50	3000	10,000	9	11¼	12⅝	120	E9L	CANARY	120.00	T-5C57
30	1.0	45	3000	10,000	9	13¼	12⅝	197	E4L	CANCAN	170.00	T-5C58
30	1.25	48	3000	10,000	9	14¼	12⅝	221	E4L	CANDID	200.00	T-5C59
20	1.6	35	3000	10,000	9	15¼	12⅝	240	E4L	CANDLE	210.00	T-5C60
60	1.1	100	7500	35,000					TS	CAPRIN	600.00	T-5C61
120	0.9	130	7500	35,000					TS	CAPOTE	750.00	T-5C62
60	1.8	75	7500	35,000				Oil Filled	TS	CAREEN	1200.00	T-5C63
30	2.0	62	10,000	35,000					TS	CASINO	800.00	T-5C64

FILAMENT TRANSFORMERS



Mounting Style OS. Style ES, EL illustrated on opposite page.

CASE DIMENSIONS

Type	Width	Height	Depth*
E1S	3¼	4¼	6½ to 8
E2S	4⅛	5⅛	6¾ to 8
E5S	4¾	6	7¼ to 9
E9S	5⅛	7	9¼ to 13
E9L	6⅛	8½	9¼ to 13
O2S	4¼	5⅛	3 to 4
O4S	7¾	9⅛	5 to 7
O5S	4⅛	5⅛	3¼ to 4½

*This dimension will vary between the limits given according to amount of core required.

FEATURES

- 100-115/200-215-230 volt 50/60 cycle primaries.
- Winding temperature rise less than 30° C.
- Compact construction, completely enclosed ES and EL mountings.
- Excellent regulation (5% on all units).
- Moisture-proof impregnation.
- For most applications use a R.M.S. test voltage of 2.5 times the D.C. operating potential.

These filament transformers are intended for use in heating the filaments of transmitting tubes or for other applications requiring a low, well regulated voltage. The 5% regulation limit means that underloading will not result in the application of excessive filament voltage, and assures low temperature rise. A primary rheostat may be used with the lower voltage taps to accurately adjust the voltage at the tubes.

The transformers are furnished in ES and OS mountings as indicated in the illustrations. OS construction is desirable for high secondary insulation as the necessary insulation clearances would in some instances make a completely enclosed unit too large, or it would be necessary to depend upon the filling compound for insulation. The high insulation units maintain a large safety factor with extra long creepage paths in addition to the coil wrappings. The arrangement of materials used for insulation is carefully chosen to prevent corona when the transformers are in operation. An electrostatic shield is placed over the primary windings and connected to ground. The transformers should be operated with the cores grounded so that this electrostatic shield can properly control the stresses on the primary insulation.

APPLICATION	PRIMARY VOLTS 50-60 CY.	SECONDARY VOLTS	AMPS.	V.A. RATING	TEST VOLTS	CASE STYLE	CODE WORD	LIST PRICE	TYPE NUMBER
1-'66	100/115/– 200/215/230	2.5 ct.	5	12.5	5000	E1S	FAILLE	$12.50	T-6F50
					12,000	E2S	FALLEN	18.00	T-6F51
					20,000	O2S	FASCES	20.00	T-6F52
2-'66	100/115/– 200/215/230	2.5 ct.	10	25	5000	E1S	FASTEN	14.50	T-6F53
					12,000	E2S	FEALTY	19.00	T-6F54
					20,000	O2S	FELINE	21.00	T-6F55
3-'66	100/115/– 200/215/230	2.5 ct.	15	37.5	5000	E1S	FELONY	16.00	T-6F56
					12,000	E2S	FERIAL	20.00	T-6F57
					20,000	O2S	FERVID	21.00	T-6F58
1-'72	100/115/– 200/215/230	5 ct.	10	50	12,000	E2S	FERVOR	20.00	T-6F59
					20,000	O2S	FEUDAL	23.00	T-6F60
2-'72 or 1-'69	100/115/– 200/215/230	5 ct.	20	100	12,000	E2S	FIBRIN	22.00	T-6F61
					20,000	O5S	FINITE	26.00	T-6F62
					35,000	O4S	FITTER	40.00	T-6F63
3-'72	100/115/– 200/215/230	5 ct.	30	150	12,000	E5S	FLEXOR	25.00	T-6F64
					20,000	O5S	FLEECY	28.00	T-6F65
					35,000	O4S	FLINCH	42.50	T-6F66
3 — 872 Windings for 3-phase bridge	100/115/– 200/215/230	5 ct. 5 ct. 5 ct.	10 10 10	150	7500 7500 7500	E5S	FILTER	35.00	T-6F80
3-'69	100/115/200/215/230	5 ct.	60	300	35,000	O4S	FLORIN	55.00	T-6F67
3-802	100/115/200/215/230	6.3 ct.	2.7	17	5000	E1S	FOMENT	12.00	T-6F68
10, 800, 825 or RK-18	100/115/– 200/215/230	7.5 ct.	6.5	49	5000	E1S	FOLLIA	15.00	T-6F69
654	100/115/200/215/230	7.5 ct.	15	112.5	5000	E1S	FOIBLE	20.00	T-6F70
2 — 833's	100/115/– 200/215/230	10 ct. 10 ct.	10 10	200	5000 5000	E2S	FIXITY	25.00	T-6F71
'45, '42A '11 or 03A	100/115/– 200/215/230	10 ct.	8	80	5000	E1S	FRIGHT	16.00	T-6F72
O4A or '49	100/115/– 200/215/230	11 ct.	10	110	5000	E1S	FORMIC	20.00	T-6F73
HK-1554, 2054, 2 — 851's	100/115/– 200/215/230	11 ct.	22	242	5000	E2S	FESTAL	27.50	T-6F76
1 — 891, 892	230†	22 ct.	60	1320	10,000	E4L	FLASHY	75.00	T-6F75*

* Use 2 units for 230 volt 3 phase to 2 phase operation with 2 tubes. † With Scott taps.

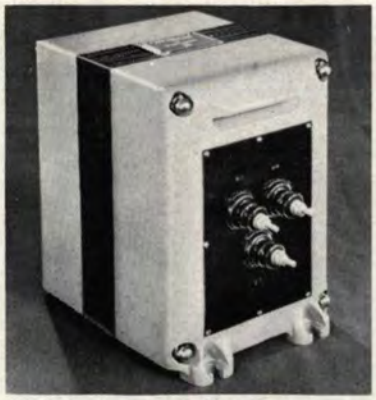
FILAMENT TRANSFORMERS CURRENT LIMITING

The current limiting filament transformer is used to heat the filament of a tube requiring reduced voltage during the warm-up period. This high-reactance type transformer has a secondary voltage-current characteristic that limits the short circuit current to twice rated operating current. Mechanical step-starting is unnecessary and the initial inrush of current to a cold filament can never exceed 200% of normal operating current.

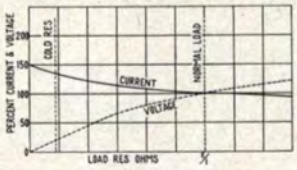
The voltage applied to the tube filaments may be accurately controlled by means of a primary rheostat. A three gang rheostat will be required when a three-phase supply is used. The proper value of resistance is determined from the primary V.A. and the amount of control needed. The change in secondary voltage will be directly proportional to the change in primary voltage if the load resistance remains constant.

Current limiting filament transformers have no moving parts and eliminate the need for costly mechanical step-starting arrangements. The tube starting current is automatically limited to the desired value.

Under rated load operation performance curves of all types will follow very closely to those shown in Figure 1. A primary rheostat may be used to set the tube filaments at the exact voltage required. Three-phase to two-phase Scott connected units provide limited starting current, quarter-phase excitation for filaments of the larger water-cooled tubes.



Case Style ES, EL



APPLICATION	OPERATION	PRIMARY VOLTS FOR S'GLE PHASE	PRIMARY VOLTS FOR 3-PHASE	PRIMARY V.A. RATING	SECONDARY VOLTS @ AMPERES		SECONDARY R.M.S. TEST VOLTS	CASE STYLE	CODE WORD	LIST PRICE	TYPE NUMBER
2–872's	Single Phase Only	230/200		200	5 c.t.	20	12,000	E9S	FLINTY	$30.00	T-6F10
891, 892	Dual Unit Scott Connected		230	2200	11 c.t. @ 60 / 11 c.t. @ 60	2 / Phase	10,000	Dual E9L	FLORAL	140.00	T-6F11*
891, 892	Single Phase or 2 Units 3 Phase Scott Connected	230/200	230	2250	22.2 c.t.	60	10,000	E4L	FLURRY	120.00	T-6F12†
207, 863, F-348-A	Single Phase or 2 Units 3 Phase Scott Connected	230/200	230	2000	22.2 c.t.	52	10,000	E9L	FOREGO	110.00	T-6F13†
228-A, 220-C F-328-A	Single Phase or 2 Units 3 Phase Scott Connected	230/200	230	1550	22.2 c.t.	41	10,000	E9L	FLUENT	100.00	T-6F14†
889	Single Phase or 2 Units 3 Phase Scott Connected	230/200	230	2250	11 c.t.	125	10,000	E4L	FLOWER	125.00	T-6F15

* T-6F11 is a Scott connected unit with a 2 phase secondary for a tube with a double strand filament. Both secondaries have centertaps and the secondary voltages have a 90 degree phase relationship for minimum hum generation.

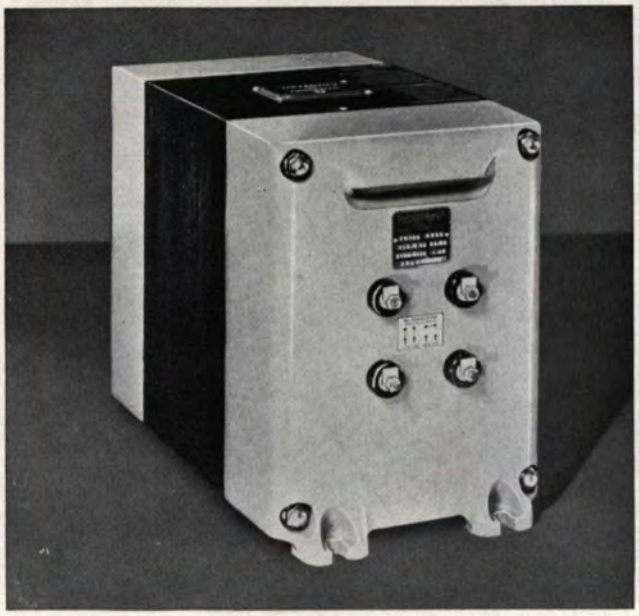
† T-6F12, T-6F13, T-6F14 have primary taps permitting single phase operation with one tube, or two units may be used with Scott Connection on three phase supply to provide quarter phase excitation to push-pull or parallel tubes. The 86.6% primary tap may be used as a 200 volt tap for single phase operation where the line voltage is low.

FILAMENT TRANSFORMER & SOCKET ASSEMBLY

- **50 Watt Socket for rectifier tube.**
- **Secondary leads are connected to filament contacts.**
- **Compound filled case and bushing.**
- **Primary taps for voltage adjustment.**
- **Also illustrated in use in station KGBX on page 2.**

Case Style SA

APPLICATION	PRI. VOLTS 50–60 CYCLES	SECONDARY VOLTS	SECONDARY AMPS.	V.A. RATING	R.M.S. TEST VOLTS	DIMENSIONS W.	D.	H.	CASE STYLE	CODE WORD	LIST PRICE	TYPE NO.
1-872	200/220/225/230/235	5 c.t.	10	50	12,000	6¼	5¼	11	SA	FALLOW	$45.00	T-6F85
1-872	200/220/225/230/235	5 c.t.	10	50	20,000	6¼	5¼	11	SA	FAMOUS	55.00	T-6F86
1-872	200/220/225/230/235	5 c.t.	10	50	35,000	6¼	6¼	12	SA	FELLOW	62.50	T-6F87

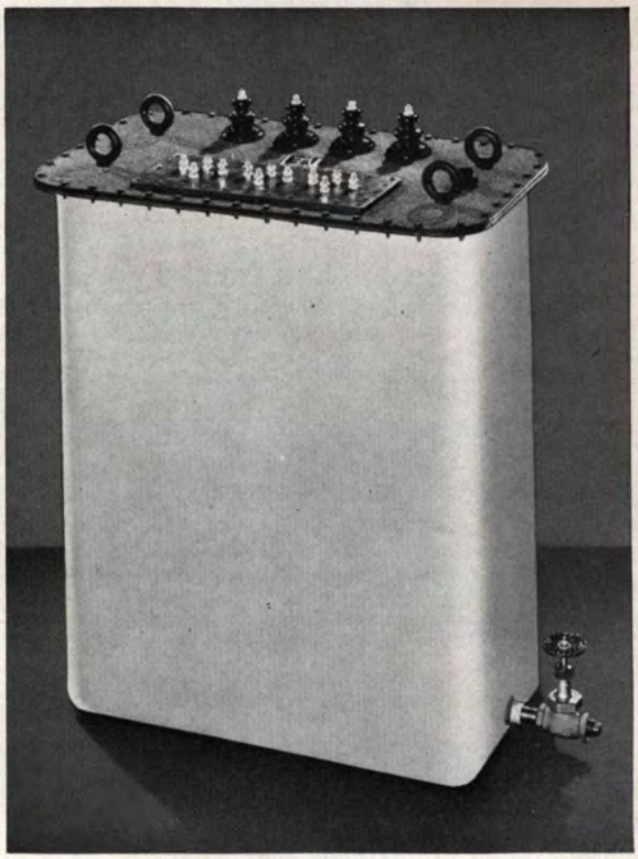


Case Style E-S, E-L

CASE DIMENSIONS

Type	Width	Height	Depth*
E2S	4⅛	5⅜	6¾ to 8
E9L	6⅜	8½	9¼ to 13
E4S	7⅜	9⅝	10½ to 16
E4L	9	12⅝	10½ to 16

*This dimension will vary between the limits given according to the amount of core required.



Case Style T-S

SINGLE-PHASE PLATE TRANSFORMERS

- For full wave rectifier with choke input filter.
- 45° to 50° C. maximum temperature rise at rated load.
- Series parallel primary for 115/230 volt operation (50/60 cycles).
- Moisture proof compound filled case.
- Secondaries tapped for multiple voltages each side of center. and wound in two coils to permit parallel operation.
- Electrostatically shielded.
- Less than 4% D.C. voltage regulation when used with suitable Tru Fidelity filter reactors. (Filter Reactors page 18.)

PRIMARY V.A.	PRI. VOLTS 50/60 CYCLES	SECONDARY R.M.S. VOLTS PER SIDE	SECONDARY R.M.S. AMPS	D.C. VOLTS FULL WAVE	D.C. AMPS FULL WAVE	CASE STYLE	CODE WORD	LIST PRICE	TYPE NUMBER
110	115/230	500/400	0.18	400/300	0.25	E2S	PACKET	$20.00	T-7P50
600	115/230	1510/1330/1230	0.30	1250/1100/1000	0.42	E9L	PADDLE	65.00	T-7P51
1030	115/230	1510/1330/1230	0.50	1250/1100/1000	0.72	E4S	PAGODA	80.00	T-7P52
1430	115/230	1510/1330/1230	0.72	1250/1100/1000	1.00	E4S	PALACE	95.00	T-7P53
935	115/230	2330/1770	0.30	2000/1500	0.42	E4S	PALAEO	90.00	T-7P54
1600	115/230	2330/1770	0.50	2000/1500	0.72	E4S	PALISH	110.00	T-7P55
2200	115/230	2330/1770	0.72	2000/1500	1.00	E4L	PALLID	140.00	T-7P56
1380	115/230	3480/2900	0.30	3000/2500	0.42	E4S	PALTER	110.00	T-7P57
2370	115/230	3480/2900	0.50	3000/2500	0.72	E4L	PALTRY	160.00	T-7P58
3280	115/230	3480/2900	0.72	3000/2500	1.00	E4L	PARIAH	190.00	T-7P59
4950	115/230	3480/2900	1.08	3000/2500	1.50	E4L	PASTEL	250.00	T-7P60
3820	115/230	4740/3480	0.72	3500/3000	1.00	E4L	PATINA	220.00	T-7P61
8750	110/115/120/138* Parallel 220/225/230/235 240/258/276* Series	3480/1740	1.80	3000/1500 2500/1250*	2.5	TS†	PARCEL	350.00	T-7P65

*2500/1250 V. D.C. obtained with 115/230 volts applied to 138/276 volt primary tap. †Compound filled.

3-Phase Single Unit Plate Transformers

- 3-Phase Single Unit Plate Transformers.
- The single unit is lighter and smaller than the three equivalent single phase transformers.
- R.M.S. voltage test from secondary to ground of three times rated D.C. voltage.
- Primary taps to select secondary voltages.
- Link switch for primary taps. External tap switch may be used.
- All units completely enclosed. Dry type, compound filled.
- Terminals insulated with porcelain bushings.

PRIMARY		SECONDARY									
V.A.	VOLTS 3-PHASE	TO NEUTRAL	R.M.S. AMPS.	CONNECTION	RECTIFIER CIRCUIT	APPROX. D.C. VOLTS @ AMPERES		CASE STYLE	CODE WORD	LIST PRICE	TYPE NUMBER
2250	230	1400/1320/1210/1100	0.62	WYE	6 Tube Full Wave Bridge	3200/3000/2750/2500	0.75	TS Dry	PATROL	$125.00	T-7P85
3000	230	1400/1320/1210/1100	0.82	WYE	6 Tube Full Wave Bridge	3200/3000/2750/2500	1.00	TS Dry	PATRON	165.00	T-7P86
4500	230	1400/1320/1210/1100	1.25	WYE	6 Tube Full Wave Bridge	3200/3000/2750/2500	1.50	TS Dry	PAUPER	215.00	T-7P87
4750	230	2300/2210/2000/1760	0.88	Distributed WYE	3 Tube Half Wave	2600/2500/2250/2000	1.50	TS Dry	PATTEN	250.00	T-7P88
7500	230	1400/1320/1210/1100	2.1	WYE	6 Tube Full Wave Bridge	3200/3000/2750/2500	2.50	TS Dry	PEARLY	300.00	T-7P89
8500	230	3750/3520/2200	0.82	WYE	6 Tube Full Wave Bridge	8500/8000/5000	1.0	TS Oil	PEDLER	350.00	T-7P90
17,000	230	3750/3520/2200	1.65	WYE	6 Tube Full Wave Bridge	8500/8000/5000	2.0	TS Oil	PEWTER	600.00	T-7P91

Transformers for Single-Phase Bridge and for Three Phase Service

Use 3 units connected Delta-Wye for 3-phase bridge rectifier

- Single Phase Transformers for Three Phase Service.
- Completely enclosed ES and EL mounting.
- Primary taps for line voltage correction.
- Use three transformers for 3-phase full wave bridge rectifier.
- Extra unit may be installed as spare.
- Winding ratings suitable for efficient use of single phase bridge.

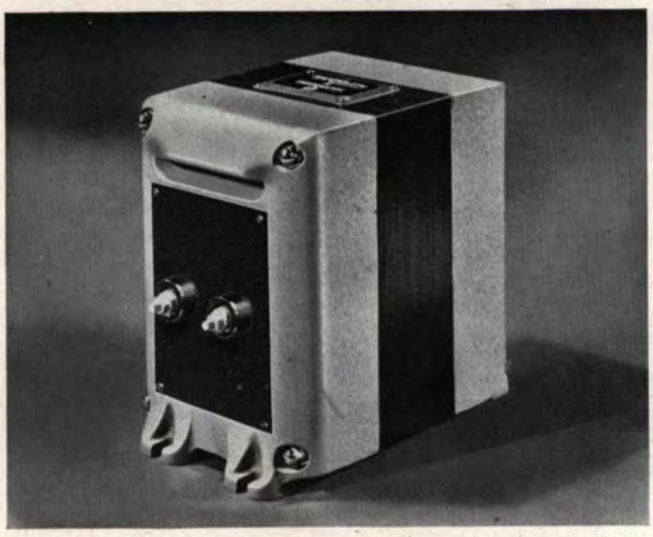
PRI. VOLTS 50/60 CY.	PRI. V.A.	SEC. VOLTS R.M.S.	SEC. AMPS R.M.S.	1 PHASE 4 TUBE BRIDGE ONE TRANSFORMER D.C. VOLTS	D.C. AMPS	3 PHASE 6 TUBE BRIDGE THREE TRANSFORMERS D.C. VOLTS	D.C. AMPS	CASE STYLE	SEC. R.M.S. TEST VOLTS	CODE WORD	LIST PRICE	TYPE NUMBER
220/230 240	7000	3480	2.0	3000	2.1	8000	2.5	E4L	20,000	PELTRY	$235.00	T-7P96
220/230 240	5600	3480	1.6	3000	1.7	8000	2.0	E4L	20,000	PEDANT	210.00	T-7P97
220/230 240	2800	3480	0.8	3000	0.85	8000	1.0	E4L	20,000	PEDDLE	135.00	T-7P98
215/225/230 235/245	5500	2190/2620	2.1	2250 1900	2.2	6000 5000	2.6	E4L	15,000	PARADE	220.00	T-7P95
220/230 240	1650	1330/1120	1.2	1200 1000	1.25	3000 2500	1.5	E4S	7500	PEELER	75.00	T-7P99

Auto Transformers

All types rated for continuous duty operation on 50/60 cycles. Insulation test between windings and case 3000 volts. The following types permit economical and convenient adjustment of line voltage in five or ten volt steps.

APPLICATION	WINDING TAPS	CAP. V.A.	MAX. CURRENT LOW TAP	CASE STYLE	CODE WORD	LIST PRICE	TYPE NUMBER
Line Voltage Correction	±, 90, 95, 100, 105, 110, 115, 120, 125, 130	500	5.5 Amps.	E2S	VANDAL	$26.50	T-9V90
	±, 90, 95, 100, 105, 110, 115, 120, 125, 130	2000	22.0 Amps.	E9S	VALLEY	40.00	T-9V91
	±, 190, 200, 210, 215, 220, 225, 230, 235, 240	2000	11.0 Amps.	E9S	VASSAL	40.00	T-9V92
	±, 90, 95, 100, 105, 110, 115, 120, 125, 130	4000	44.0 Amps.	E9L	VENIAL	60.00	T-9V93
	±, 190, 200, 210, 215, 220, 225, 230, 235, 240	4000	22.0 Amps.	E9L	VERSUS	60.00	T-9V94

FILTER REACTORS



Case Styles, E-S, E-L

FEATURES

- Completely enclosed moisture-proof construction.
- ¼-20 terminal bolts and porcelain bushings.
- 30°C maximum winding temperature rise.
- Low D.C. resistance assures 4% regulation if used with Tru-Fidelity plate transformers.
- R.M.S. Test volts should be 2½ times actual D.C. potential between winding and ground.

CASE DIMENSIONS

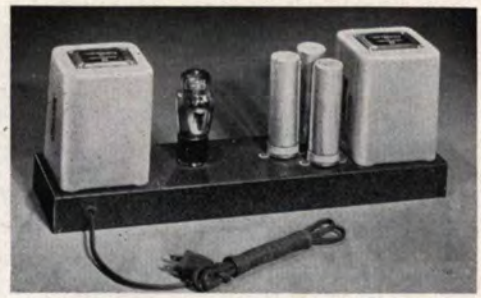
Type	Width	Height	Depth*
E2S	4⅛	5⅜	6¾ to 8
E4S	7⅝	9⅝	10½ to 16
E4L	9	12⅝	10½ to 16
E9S	5⅜	7	9¼ to 13
E9L	6⅜	8½	9¼ to 13

TS (Oil filled tanks, specifications on request.)

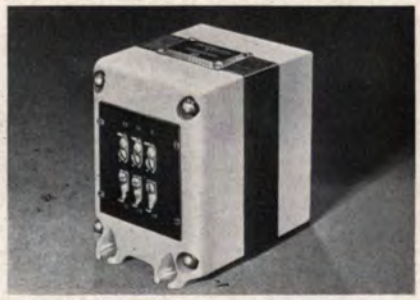
*This dimension will vary between the limits given according to amount of core required.

Inductance Henries	@ Amps. D.C.	Ohms D.C. Res.	Application	R.M.S. Test Volts	Case Style	Code Word	List Price	Type Number
10	0.25	100		3000	E2S	CAJOLE	$17.50	T-8C51
				7500	E2S	CABECA	22.50	T-8C50
10	0.50	55		7500	E9S	CALIPH	35.00	T-8C52
				15,000	E9S	CODGER	40.00	T-8C53
16	0.50	76	Series	7500	E9L	COEVAL	47.50	T-8C54
4	1.0	19	Parallel	15,000	E9L	COHERE	60.00	T-8C55
10	0.75	34		7500	E9L	COLLET	55.00	T-8C56
				15,000	E9L	COLONY	70.00	T-8C57
16	0.75	52	Series	7500	E9L	COLUMN	67.50	T-8C58
4	1.5	13	Parallel	15,000	E9L	COMELY	80.00	T-8C59
10	1.0	22		7500	E4S	COMITY	67.50	T-8C60
				15,000	E4S	COMMIT	80.00	T-8C61
16	1.0	36	Series	7500	E4S	COMPEL	95.00	T-8C62
4	2.0	9	Parallel	15,000	E4S	CONDOR	115.00	T-8C63
10	1.5	18		7500	E4L	CONSUL	125.00	T-8C64
				15,000	E4L	CEREAL	140.00	T-8C65
16	1.5	20	Series	7500	E4L	CONVEX	145.00	T-8C66
4	3.0	5	Parallel	15,000	E4L	COOLIE	170.00	T-8C67
10	2.25	30		7500	E4L	CORKER	200.00	T-8C68
				15,000	E4L	CORDON	230.00	T-8C69
10	2.5	15	Smoothing	20,000	TS	CYGNET	250.00	T-8C70
10	1.0	20	Smoothing	20,000	E4S	CUTTLE	90.00	T-8C71
5 to 16	0.5 to 0.05	50	Input	7500	E9S	CORNEA	35.00	T-8C80
				15,000	E9S	CORRAL	40.00	T-8C81
5 to 16	0.75 to 0.1	30	Input	7500	E9L	COSMOS	55.00	T-8C82
				15,000	E9L	COUPLE	70.00	T-8C83
5 to 16	1.0 to 0.1	20	Input	7500	E4S	COUPON	67.50	T-8C84
				15,000	E4S	COUSIN	80.00	T-8C85
5 to 16	1.5 to 0.15	25	Input	7500	E4L	COWARD	120.00	T-8C86
				15,000	E4L	CREWEL	140.00	T-8C87
5 to 16	2.25 to 0.2	27	Input	7500	E4L	CROCUS	200.00	T-8C88
				15,000	E4L	CRUTCH	230.00	T-8C89
6 to 15	2.5 to .5	15	Input	20,000	TS	CULLET	250.00	T-8C90
6 to 15	1.0 to 0.25	20	Input	20,000	E4S	CUPRIC	90.00	T-8C91

POWER TRANSFORMERS and FILTER REACTORS



Case style C5, C10 mounted on chassis at left. Case style E-S at right.



These matched Tru-Fidelity low power components feature cast alloy shields which effectively reduce stray magnetic fields. This minimizes hum at its source.

PRE-AMP POWER SUPPLY COMPONENTS

Power Transformers

PRIMARY	H.V. SECONDARY	FIL. NO. 1	FIL. NO. 2	FIL. NO. 3	FIL. NO. 4	CASE STYLE	CODE WORD	LIST PRICE	TYPE NUMBER
115 v. 50/60 cy.	220-0-220 A.C. 20 M.A. D.C.	5v. c.t. @ 2 Amps.	6.3v. c.t. @ 1.2 Amps.			C5	RUMBLE	$10.00	T-7R15
115 v. 50/60 cy.	250-0-250 A.C. 80 M.A. D.C.	5v. c.t. @ 3 Amps.	6.3v. c.t. @ 2.6 Amps.			C7	REMISS	14.00	T-7R16
115/230 v. 50/60 cy.	450-0-80-*450 A.C. To give 300 v. D.C. @ 150 M.A.	5v. c.t. @ 3 Amps.	5v. @ 2 Amps.	2.5 v. c.t. @ 5 Amps.	6.3 v. c.t. @ 1.2 Amp.	E2S	RUSSET	25.00	T-7R17

*Tap for fixed bias.

Filter Reactors

INDUCTANCE HENRIES	@ M.A. D.C.	OHMS D.C. RES.	R.M.S. TEST VOLTS	CASE STYLE	CODE WORD	LIST PRICE	TYPE NUMBER
30	.35	650	2700	C5	CESTUS	$8.00	T-8C40
120	17	2600					
12.5	100	250	2700	C5	CHANCE	9.50	T-8C41
50	50	1000					
8	150	175	2700	C5	CHEQUE	8.00	T-8C42
32	75	700					

Filter Units

Filter units consist of three or more reactors mounted in a single cast case and are especially recommended for use in pre-amplifier power supplies.

INDUCTANCE HENRIES		M.A. D.C.	OHMS D.C. RES.	R.M.S. TEST VOLTS	CASE STYLE	CODE WORD	LIST PRICE	TYPE NUMBER
Choke No. 1	10	80	250	2000	C10	CAUCUS	$10.00	T-8C45
Choke No. 2	40	15	2000					
Choke No. 3	300	5	6000					
Choke No. 1	15	20	450	2000	C10	CENTER	10.00	T-8C46
Choke No. 2	15	20	450					
Choke No. 3	40	15	2000					
Choke No. 4	300	5	6000					

BIAS SUPPLY COMPONENTS

Power Transformers (115/230 Volt, 50-60 Cycle Primary)

PRIMARY V.A.	SECONDARY R.M.S. VOLTS	AMPERES	D.C. FROM FILTER VOLTS	AMPERES	CASE STYLE	CODE WORD	LIST PRICE	TYPE NUMBER
90	330 ct. 5 ct.	0.36 6.00	100	0.5	E2S	PREACH	$20.00	T-7P25
110	330 ct.	0.71	100	1.0	E2S	PREFER	25.00	T-7P26
220	440	0.71	200	1.0	E5S	PREFIX	35.00	T-7P27
550	1250/1040 ct.	0.71	500/400	1.0	E9S	PRIMAL	40.00	T-7P28

Reactors

INDUCT. HENRIES	AMPERES D.C.	OHMS D.C. RES.	R.M.S. TEST VOLTS	CASE STYLE	CODE WORD	LIST PRICE	TYPE NUMBER
3.5	0.5	30	2700	E2S	CONINE	$20.00	T-8C25
3.5	1.0	20	2700	E5S	CONSOL	30.00	T-8C26

Tru-Fidelity

by

THORDARSON

THORDARSON ELECTRIC MFG. CO.

CHICAGO, U.S.A.

Transformer Specialists Since 1895