

# CHICAGO

## MILITARY and NEW EQUIPMENT TRANSISTOR TRANSFORMERS PULSE TRANSFORMERS



CHICAGO STANDARD TRANSFORMER CORPORATION



### Reduced Inspection Quality Assurance Plan

Since 1955, Chicago Standard Transformer Corporation has been operating continuously under RIQAP, the U. S. Army Signal Corps' Reduced Inspection Quality Assurance Plan. When you specify Chicago Standard transformers, delivery time is reduced and incoming inspection is at a minimum. You are assured of the highest quality units for military applications.

## ULTRA MINIATURE ENCAPSULATED TRANSISTOR TRANSFORMERS

The 27 transformers in the UME series are characterized by high power ratings, low distortion, high efficiency and excellent frequency response. Designed and built in accordance with MIL-T-27A specifications, their ratings match those of most popular transistors. They are ideally suited for printed circuit applications. Dimensions: .312" x .400" x .426". Weight is approximately 1/4 ounce.

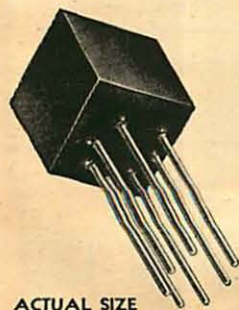


ACTUAL SIZE

CHICAGO Part No.	Application	Pri. Res.	Pri. Impedance in Ohms	D.C. M.A. in Pri.	Sec. Impedance in Ohms	Sec. Res.	Net Price
UME-12	output	120	500	3	50	13	\$5.40
UME-13	output	250	600 1000 1200	3	60 50 60	17	5.40
UME-14	output	70	600	3	3.2	.7	5.40
UME-15	output	170	1200	2	3.2	.75	5.40
UME-16	output	1200	10,000	1	3.2	.7	5.50
UME-18	reactor	1000	3 hy at 2 Mads	2	—	—	4.80
UME-19	output or driver	1100	10,000 CT	1	500 CT	45	5.50
UME-20	driver	1000	12,500 CT 10,000 12,500	1	600 CT 1200 CT 1500 CT	100	6.10
UME-21	driver	1100	10,000 12,500	1	2000 CT 2500 CT	160	6.10
UME-22	single or PP output	25	150 CT	10	12	3	5.45
UME-23	single or PP output	35	200 CT 300 CT 400 CT	7	16 12 16	2.5	5.45
UME-24	single or PP output	75	600 CT/ 800 CT	5	12 16	2	5.50
UME-25	single or PP output	85	800 CT	4	12	2	5.50
UME-26	single or PP output	120	1070 CT 1000 CT 1330 CT	3.5	16 12 16	2	5.50
UME-27	single or PP output	225	1500 CT	3	12 16	2.5	5.50
UME-28	single or PP output	750	2000 CT 7500 CT	1	12 16	2.5	6.00
UME-29	output	35	10,000 CT 300 CT	7	600	110	5.50
UME-30	output	60	500 CT	5.5	600	110	5.50
UME-31	output	105	900 CT	4	600	110	5.50
UME-32	output	200	1500 CT	3	600	120	5.50
UME-33	interstage.	1500	20,000 CT 30,000 CT	.5	800 CT 1200 CT	175	6.50
UME-34	input	6500	200,000 CT	0	1000 CT	250	7.00
UME-35	interstage	1000	10,000 CT 12,000 CT	1	1500 CT 1800 CT	115	6.50
UME-36	reactor	2600	6 hy at 2 Mads	2	—	—	5.45
UME-37	reactor	190	1 hy at 2 Mads	2	—	—	4.80
UME-38	reactor	1800	12 hy at 0 dc	0	—	—	4.80
UME-39	reactor	2700	20 hy at 0 dc	0	—	—	5.50

## PULSE TRANSFORMERS

These ultra-miniature wound core pulse transformers are hermetically encapsulated 3-winding units designed and built in accordance with MIL-T-27A. They feature extremely fast rise time, minimum droop and high temperature stability. The leads are arranged so that they can be soldered directly into the circuit or clipped and plugged into a standard 7-pin miniature tube socket. Oscillograph pictures of pulses for all units and other technical data obtained through use of N.B.S. Preferred circuit No. 46, as found in Navy Aeronautical Preferred Circuits Handbook are listed in Chicago Bulletin CT-45.



ACTUAL SIZE

CHICAGO Part No.	Nominal Pulse Width Microseconds	Rise Time Microseconds	Height	Width	Depth	Weight oz.	Net Price
PE-50	0.5	.07	9/16"	9/16"	9/16"	.16	\$5.86
PE-75	0.75	.07	9/16"	9/16"	9/16"	.16	5.90
PE-100	1	.06	9/16"	9/16"	9/16"	.16	6.03
PE-200	2	.05	11/16"	11/16"	3/4"	.16	6.57
PE-500	5	.07	11/16"	11/16"	3/4"	.16	6.45
PE-700	7	.1	11/16"	11/16"	3/4"	.16	7.05



# CHICAGO

## MILITARY and NEW EQUIPMENT POWER TRANSFORMERS FILTER REACTORS



CHICAGO STANDARD TRANSFORMER CORPORATION

### POWER TRANSFORMERS—PLATE AND FILAMENT SUPPLY—TF4RX03YY

For CAPACITOR INPUT SYSTEMS—Primary 117 Volts, 50-60 Cycles

High Voltage Secondary Volts A-C	Ma. Output D-C V.D-C	Filaments				Wt. Lbs.	YY Case Mounting			S-Type Mounting			C-Type Mounting		
		Rectifier Volts	Others Volts	Amps.	Amps.		Cat. No.	Case No.	Net Price	Cat. No.	Case No.	Net Price	Cat. No.	Case No.	Net Price
250-0-250	10 320	6.3	1.2	6.3	0.6	1 1/4	PHC-10	14	\$11.25						
250-0-250	20 300	6.3	1.2	6.3	0.6	1 1/4	PHC-20	15	11.40						
225-0-225	40 210	5	2	6.3CT	2	3 1/4	PHC-40	17	12.90	PSC-40	17	\$8.85	PCC-40	16	\$5.10
270-0-270	55 260	5	2	6.3CT	2	3 1/2	PHC-55	17	13.14	PSC-55	17	9.30	PCC-55	16	5.49
300-0-300	60 285	5	2	6.3CT	3	4 1/2	PHC-60	19	14.28	PSC-60	19	9.90	PCC-60	18	6.30
335-0-335	70 320	5	2	6.3CT	3	4 1/2	PHC-70	19	14.55	PSC-70	19	10.50	PCC-70	18	6.75
330-0-330	85 320	5	2	6.3CT	3	6	PHC-85	20	15.60	PSC-85	20	11.19	PCC-85	20	7.80
345-0-345	105 320	5	2	6.3CT	3.5	6 1/2	PHC-105	21	16.62	PSC-105	21	11.85	PCC-105	20	8.46
375-0-375	120 380	5	3	6.3CT	4	9 1/2	PHC-120	21	17.58	PSC-120	22	12.48	PCC-120	22	9.51
370-0-370	150 390	5	3	6.3CT	4	11 1/2	PHC-150	22	23.34	PSC-150	22	16.50	PCC-150	22	10.89
385-0-385	200 390	5	3	6.3CT	4.5	12 1/2	PHC-200	22	24.99	PSC-200	22	17.55	PCC-200	22	12.69
400-80-0	250 410	5	6	6.3CT	7	15	PHC-250	24	27.36	PSC-250	24	21.90	PCC-250	24	15.63
80-400				6.3	8										
625-0-625	300 685	5	4	6.3	3	21				PSC-300	24	31.08	PCC-300	24	18.90

### For REACTOR INPUT SYSTEMS—Primary 117 Volts, 50-60 Cycles

High Voltage Secondary Volts A-C	Ma. Output D-C V.D-C	Rectifier Volts	Others Volts	Amps.	Amps.	Wt. Lbs.	YY Case Mounting Cat. No.	Case No.	Net Price	H-Type Mounting Cat. No.	Case No.	Net Price	S-Type Mounting Cat. No.	Case No.	Net Price
350-0-350	55 260	5	2	6.3CT	2	3 1/4	PHR-55	17	\$12.99	PSR-55	17	\$ 9.45	PCR-55	16	\$ 5.70
425-0-425	70 320	5	2	6.3CT	3	4 1/2	PHR-70	19	14.07	PSR-70	19	10.35	PCR-70	18	6.45
440-0-440	85 325	5	2	6.3CT	3	6	PHR-85	20	15.09	PSR-85	20	11.40	PCR-85	20	7.50
450-0-450	105 320	5	2	6.3CT	3.5	6 1/2	PHR-105	21	16.62	PSR-105	21	12.00	PCR-105	20	8.01
500-0-500	120 390	5	3	6.3CT	4	9 1/2	PHR-120	21	17.58	PSR-120	22	12.75	PCR-120	22	8.97
510-0-510	150 395	5	3	6.3CT	4	11 1/2	PHR-150	22	21.78	PSR-150	22	17.70	PCR-150	22	10.50
520-0-520	200 390	5	3	6.3CT	4.5	12 1/2	PHR-200	22	22.92	PSR-200	22	18.90	PCR-200	22	11.70
550-370-75	300 420	5	6	6.3CT	1	17 1/2	PHR-300	24	31.29	PSR-300	24	26.70	PCR-300	24	18.30
0-75-370-550				6.3CT	5										

### For REGULATED POWER SUPPLIES, CAPACITOR INPUT—Primary 117 Volts, 50-60 Cycles

High Voltage Secondary Volts A-C	Ma. Output D-C V.D-C	Rectifier Volts	Others Volts	Amps.	Amps.	Wt. Lbs.	YY Case Mounting Cat. No.	Case No.	Net Price	H-Type Mounting Cat. No.	Case No.	Net Price	S-Type Mounting Cat. No.	Case No.	Net Price
440-0-440	165 430	5	3	6.3	7.5	12	PHC-165	22	\$28.59	PHC-165	22	\$28.59	PSC-165	22	\$23.85
450-0-450	200 442	5	2	6.3	0.6	12	PHC-200A	22	25.77	PHC-200A	22	25.77	PSC-205	22	22.50

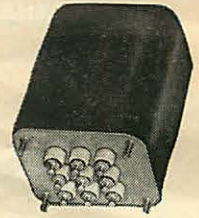
### FILTER REACTORS—TF4RX01YY

Inductance in Henries	Max. Current Ma. D-C	D-C Resistance in Ohms	Insulation Test Volts	Wt. Lbs.	YY Case Mounting Cat. No.	Case No.	Net Price	S-Type Mounting Cat. No.	Case No.	Net Price	C-Type Mounting Cat. No.	Case No.	Net Price
15	10	680	1,000	1	RH-1510	8	\$ 5.85						
15	20	680	1,000	1	RH-1520	8	6.18						
15	40	475	2,500	1 1/2	RH-1540	12	6.24	RS-1540	12	\$ 3.60	RC-1540	12	\$ 2.55
15	55	420	2,500	2	RH-1555	13	6.45	RS-1555	13	4.20	RC-1555	12	3.12
15	85	285	2,500	2 1/4	RH-1585	14	6.84	RS-1585	15	5.07	RC-1585	14	3.78
12	105	170	2,500	4	RH-12105	17	8.01	RS-12105	17	5.70	RC-12105	16	4.41
12	150	150	2,500	5 1/2	RH-12150	19	9.18	RS-12150	19	6.81	RC-12150	18	5.85
12	200	140	2,500	7	RH-12200	20	10.80	RS-12200	21	8.25	RC-12200	20	6.90
10	55	230	2,500	1 3/4	RH-1055	13	6.45	RS-1055	13	3.99	RC-1055	12	2.97
10	85	175	2,500	2 1/2	RH-1085	14	6.84	RS-1085	15	4.20	RC-1085	14	3.51
8	105	100	2,500	3 3/4	RH-8105	17	8.01	RS-8105	17	5.70	RC-8105	16	4.20
8	150	100	2,500	5 1/4	RH-8150	18	9.18	RS-8150	19	6.60	RC-8150	18	5.79
8	200	85	2,500	7	RH-8200	20	10.80	RS-8200	21	7.80	RC-8200	20	6.81
8	250	90	2,500	10 1/2	RH-8250	22	14.10	RS-8250	22	9.45	RC-8250	22	7.74
8	300	55	3,500	12 1/2	RH-8300	22	16.50	RS-8300	22	11.85	RC-8300	22	9.54

### FILAMENT TRANSFORMERS—Primary 115-230 Volts, 50-60 Cycles—TF4RX01YY

Secondary Volts	Amps.	Insulation Test Volts	Wt. Lbs.	YY Case Mounting Cat. No.	Case No.	Net Price	S-Type Mounting Cat. No.	Case No.	Net Price
2.5CT	5.25	3,500	2	FH-25	15	\$ 9.27	F-25	14	\$ 9.72
2.5CT	10.0	5,000	3	FH-210	15	13.29	F-210	17	9.75
2.5CT	10.0	9,000	4	FH-210H	19	15.45	F-210H	19	11.85
2.5CT	15.0	9,000	6	FH-215H	21	18.57	F-215H	20	12.75
5CT	4.0	2,500	2 1/4	FH-54	15	9.66	F-54	15	6.51
5CT	10.0	2,500	3 1/2	FH-58	17	13.29	F-58	17	11.10
5CT	10	8,000	6	FH-510H	21	19.80	F-510H	21	24.00
5CT	20.0	2,500	6 1/2				F-516	21	14.70
5CT	20	10,000	13				F-520HB	22	16.95
5CT	30	2,500	10 1/2	FH-520HB	22	24.75	F-530	22	16.95
5CT	30	2,500	10 1/2				F-530BX*	22	37.44
6.3CT	1.5	2,500	1	FH-615	12	8.10	F-615	12	5.25
6.3CT	3	2,500	2	FH-63	14	9.57	F-63	14	6.30
6.3CT	5.5	2,500	3	FH-65	16	11.13	F-65	17	7.65
6.3CT	10.0	2,500	5	FH-610	19	15.75	F-610	19	10.50
7.5CT	12	2,500	6 1/2				F-712	21	14.70
7.5CT	25.0	2,500	12				F-725	22	16.95
7.5CT	51	2,500	29				F-751	26	35.70
10CT	4.0	2,500	3 1/4	FH-104	17	11.43	F-104	17	8.40
10CT	6.5	2,500	5				F-106	19	11.70
10CT	10.0	2,500	6 1/2				F-1010	21	14.70

\*BX mounting, see page N-879 for illustration and dimensions.

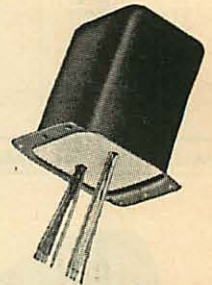


#### MEETS MIL-T-27A SPECS

YY Case. Steel base cover deep-seal soldered into case. Terminals hermetically sealed. Ceramic bushings. Stud-mounted unit.



S-Type. Steel base cover fitted with phenolic terminal board. Conveniently numbered solder lug terminals. Flange-mounted unit.



C-Type. With 10' colored stripped and tinned leads brought out through fibre board base cover. Flange-mounted unit.

#### S-TYPE & C-TYPE CASE DIMENSIONS

(YY Case Dimensions on Page 1311)

Case No.	Depth	Width	Height
12	2 1/4	2 1/4	2 1/16
13	2 1/4	2 1/4	2 1/16
14	2 1/2	2 3/8	3 1/16
15	2 1/2	2 3/8	3 3/16
16	2 3/4	2 1/2	3 1/2
17	2 3/4	2 1/2	3 3/4
18	3 1/4	3	3 3/4
19	3 1/4	3	4 1/4
20	3 1/16	3 3/8	4 3/8
21	3 1/16	3 3/8	4 1/16
22	4 3/8	4 1/2	5 3/8
24	5 3/8	4 1/2	6 3/8



# CHICAGO

MILITARY STANDARD  
**POWER AND FILAMENT TRANSFORMERS**  
**MOLDED TOROIDAL INDUCTORS**

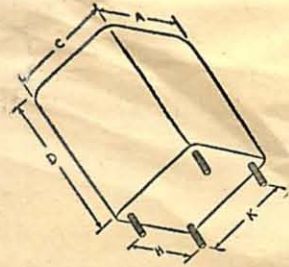


CHICAGO STANDARD TRANSFORMER CORPORATION

**MS (MILITARY STANDARD) POWER AND FILAMENT TRANSFORMERS**



Case Type	Dimensions in Inches					Stud Size
	A	C	D	H	K	
EB	1 13/16	1 13/16	2 1/16	1 3/8	1 3/4	6-32
FB	2 5/16	2 1/16	2 1/2	1 11/16	1 3/8	6-32
GA	2 3/4	2 3/8	3 15/16	2 1/8	1 3/4	6-32
GB	2 5/8	2 3/8	2 15/16	2 1/8	1 3/4	6-32
HB	3 1/16	2 5/8	3 1/16	2 19/64	1 59/64	8-32
HA	3 1/16	2 5/8	4 1/4	2 19/64	1 59/64	8-32
JB	3 3/16	3 1/8	3 3/8	2 5/8	2 1/8	8-32
KA	3 15/16	3 3/8	5 1/4	3	2 5/16	10-32
KB	3 15/16	3 3/8	4 1/16	3	2 1/16	10-32
LB	4 5/16	3 11/16	4 1/2	3 3/16	2 19/16	10-32
MB	4 11/16	4	4 5/16	3 11/16	3	1 1/2-20
NB	5 1/16	4 5/16	5 1/2	4 1/16	3 3/16	1 1/2-20



**POWER TRANSFORMERS—Primary, 105/115/125 V.—Frequency, 54-66 Cycles**

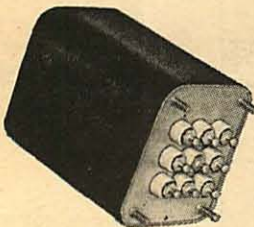
MIL-T-27 Classification	MIL-T-27 Part No.	High Voltage Secondary		D-C V Output	Rect. Fil.		Fil. No. 2		Wt. Lbs.	Case Size	Catalog Number	Net Price
		A-C Volts	D-C Ma.		Volts	Amps	Volts	Amps				
TF4RX03HA001	MS-90026	200-100-0-100-200	70	385	6.3/5	2	6.3	3	4	HA	PMS-70	\$20.70
TF4RX03JB002	MS-90027	325-0-325	70	260	6.3/5	2	6.3	4	5	JB	PMS-70A	17.70
TF4RX03KB006	MS-90028	325-0-325	150	245	6.3	5	5	3	7 1/4	KB	PMS-150	21.90
TF4RX03LB003	MS-90029	400-0-400	175	318	5	3	6.3	8	10	LB	PMS-175	25.50
TF4RX03MB004	MS-90030	450-0-450	250	345	5	3	6.3	8	13	MB	PMS-250	28.50
TF4RX02KB001	MS-90031	350-0-350	250	255					7 1/2	KB	PMS-350	18.90
TF4RX02LB002	MS-90032	550-0-550	250	419					11	LB	PMS-550	21.90
TF4RX02NB003	MS-90036	800-0-800	250	640					16 1/2	NB	PMS-800	29.70

**FILAMENT TRANSFORMERS—Primary, 105/115/125 V.—Frequency, 54-66 Cycles**

MIL-T-27 Classification No.	MIL-T-27 Part No.	Secondary		Insulation Volts RMS	Wt. Lbs.	Case Size	Catalog Number	Net Price
		Volts	Amps					
TF4RX01EB002	MS-90016	2.5	3.0	2500	1 1/2	EB	FMS-23	\$10.17
TF4RX01GB003	MS-90017	2.5	10	2500	2 1/2	GB	FMS-210	14.10
TF4RX01FB004	MS-90018	5.0	3.0	2500	1 3/4	FB	FMS-53	11.10
TF4RX01HB005	MS-90019	5.0	10	2500	4	HB	FMS-510	15.30
TF4RX01FB006	MS-90020	6.3	2.0	2500	1 3/4	FB	FMS-62	11.10
TF4RX01GB007	MS-90021	6.3	5.0	2500	2 3/4	HB	FMS-65	12.90
TF4RX01JB008	MS-90022	6.3	10	2500	5	JB	FMS-610	17.70
TF4RX01KB009	MS-90023	6.3	20	2500	8	KB	FMS-620	21.90
TF4RX01JB012	MS-90024	2.5	10	10000	4 3/4	JB	FMS-210H	16.50
TF4RX01KB013	MS-90025	5.0	10	10000	7	KB	FMS-510H	21.00

**MULTIPLE FILAMENT TRANSFORMERS (TR4RX01—) Primary, 105/115/125 V., Frequency, 50/60 cycles**

Designed and built in accordance with MIL-T-27A, Grade 4, Class R operating temperature; life expectancy X (10,000 hours minimum). Maximum operating altitude 10,000 feet. Also available in type S, Sealed-in-Steel cases (catalog Numbers F-1 through F-8, listed below). Dimensions on page 1308.



Sec. No. 1	Sec. No. 2	Sec. No. 3	Insul. Test	Case Size †	Wt. Lbs.	Catalog No.	Net Price	Catalog No.	Case Size	Net Price
5 V. 2A	6.3 V. CT 2.5 A	—	2500 V.	GA	2 1/2	FMS-1	\$15.90	F-1	15	\$ 9.90
5 V. 2A	16.6 V. CT 1.25A	—	2500 V.	GA	3 1/2	FMS-2	15.90	F-2	15	9.90
5 V. 3A	6.3 V. CT 5A	—	2500 V.	HA	4	FMS-3	17.55	F-3	17	10.35
5 V. 3A	6.3 V. CT 3A	6.3 V. CT 3A	2500 V.	JB	4 3/4	FMS-4	20.70	F-4	18	11.85
	12.6 V. CT 3A	—								
5 V. 3A	6.3 V. CT 1A	6.3 V. CT 5A	2500 V.	JB	4 3/4	FMS-5	20.70	F-5	18	12.00
6.3 V. CT 3A	6.3 V. CT 3A	—	2500 V.	HA	4	FMS-6	17.25	F-6	17	10.35
	12.6 V. CT 3A	—								
6.3 V. CT 6A	6.3 V. CT. 6A	—	2500 V.	KA	6 1/2	FMS-7	20.10	F-7	21	12.30
	12.6 V. CT 6A	—								
5 V. CT 3A	5 V. CT 3A	5 V. CT 6A	5000 V.	KA	7	FMS-8	26.25	F-8	21	12.90

†Refer to case size. All secondary A.C. voltages ± 3%.

**MOLDED TOROIDAL INDUCTORS**

CHICAGO toroids, plastic encapsulated in molded cases, are stocked for immediate delivery. Units may be stacked and mounted with a single screw. CHICAGO toroids are wound on high density, high permeability cores of powdered molybdenum permalloy, with utmost attention given to stability, low temperature co-efficients, insulation and ruggedness. All units are 1 1/2" diameter, 3/2" high, with 90° spacing of terminals and mounting hole for 4-40 screw.

- Features:
- High Q over wide frequency ranges
  - Minimum pickup from external magnetic fields
  - Close tolerance of plus, minus 1%
  - High stability over temperature range of -55° to plus 85° centigrade
  - Not affected by high humidity
  - Resist shock and vibration
  - Small sized, uniform, easily stacked



Catalog No.	Inductance (m.h.)	D.C. Res. (ohms)	Net Price	Catalog No.	Inductance (m.h.)	D.C. Res. (ohms)	Net Price
TM-1A	1	.32	\$4.50	TM-80 A	80	29.5	\$4.50
TM-2 A	2	.72	4.50	TM-100 A	100	32.5	4.50
TM-5 A	5	1.85	4.50	TM-200 A	200	71.5	5.10
TM-8 A	8	2.25	4.50	TM-500 A	500	185	5.70
TM-10 A	10	3.25	4.50	TN-800 A	800	300	5.70
TM-20 A	20	7.0	4.50	TM-1000 A	1000	340	5.70
TM-50 A	50	18.5	4.50				



# CHICAGO

MILITARY and NEW EQUIPMENT

## AUDIO TRANSFORMERS



CHICAGO STANDARD TRANSFORMER CORPORATION

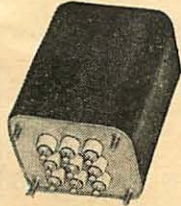
### FULL FREQUENCY RANGE AUDIO TRANSFORMERS

Frequency Response within  $\pm 1/2$  db, 30 to 15,000 Cycles

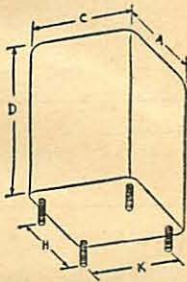
INPUT TRANSFORMERS—TF4RX—YY††

YY Case (Cat. No. BIH) and B-Type (Cat. No. BI) Mountings

B-TYPE MOUNTING



YY CASE

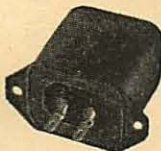


YY Case & H Type Mtg. Dimensions

Case Size	Dimensions in Inches				
	A	C	D	H	K
8	1 1/2	1 1/2	1 13/16	1	1
9	1 1/2	1 1/2	2 1/8	1	1
12	2 1/4	2 1/8	2 1/16	1 1/2	1 3/8
13	2 1/4	2 1/8	2 1/16	1 7/8	1 3/8
14	2 1/2	2 3/8	3 1/16	1 13/16	1 11/16
15	2 1/2	2 3/8	3 1/16	1 13/16	1 11/16
16	2 7/8	2 11/16	3 1/2	2	1 7/8
17	2 7/8	2 11/16	3 3/4	2	1 7/8
18	3 1/4	3	3 3/4	2 1/2	2 3/8
19	3 1/4	3	4 1/4	2 3/4	2 3/8
20	3 11/16	3 3/16	4 3/16	2 3/4	2 3/8
21	3 11/16	3 3/16	4 11/16	2 3/4	2 3/8
22	4 1/16	4 1/16	5 1/16	3 3/8	3
24	5 1/16	4 13/16	6 1/16	3 3/8	3

HIGH CHOKES

For Dynamic Noise Suppression Circuits (S-Type Mounting)



Two efficient reactors, inductance values .8 and 2.4 henrys respectively, are designed for noise suppression circuits, but can be used in any tuned circuit requiring the given inductances. Inductance values accurate within -5% with up to 15 ma. d-c. Minimum Q of 20. Mounted in drawn steel cases, 1 1/2" x 1 1/2" x 1 21/32" high.

Cat. No.	Inductance	Net Price
NSI-1	.8 hy.	\$7.50
NSI-2	2.4 hy.	7.50

(S-Type and C-Type Case Dimensions on Page 1309.)

Application	Impedance Primary—Secondary	Max. Power Level	Hum Shielding, dbm	Case Size	Family Wt. Lbs.	Cat. No.	Net Price
Line to Single or P-P Grids	*Pri: 600/150 ohms CT *Sec: 50,000 ohms CT	+15 dbm.	-70	13	1 1/2	BIH-1	\$23.70
Line to Single or P-P Grids	*Pri: 600/150 ohms CT *Sec: 50,000 ohms CT	+15 dbm.	-90	13	1 1/2	BI-2	22.05
Line bridging to P-P Grids	*Pri: 8,000/6,000 ohms CT *Sec: 50,000 ohms CT	+15 dbm.	-70	13	1 1/2	BI-3	23.74
Line to Line	*Pri: 600/150 ohms CT *Sec: 600/150 ohms CT	+15 dbm.	-70	13	1 1/2	BIH-4	23.70
Line to Line	*Pri: 600/150 ohms CT *Sec: 600/150 ohms CT	+15 dbm.	-70	13	1 1/2	BI-4	17.70
Line to Line	*Pri: 600/150 ohms CT *Sec: 600/150 ohms CT	+30 dbm.	-90	18	3 1/4	BIH-5	37.17
Line to Line	*Pri: 600/150 ohms CT *Sec: 600/150 ohms CT	+30 dbm.	-90	18	3 1/4	BI-5	48.28
Interstage: P-P Plates to Sgl. or P-P Grids	*Pri: 20,000 ohms CT *Sec: 50,000 ohms CT	+15 dbm.	-70	13	1 1/2	BIH-6	24.30
Interstage: P-P Plates to Sgl. or P-P Grids	*Pri: 20,000 ohms CT *Sec: 50,000 ohms CT	+15 dbm.	-70	13	1 1/2	BI-6	17.25
Low Imped. Mike, Pickup, or Multiple Line to Grid	*Pri: 50/150/250/600 *Sec: 50,000 ohms CT	+15 dbm.	-70	13	1 1/2	BIH-7	23.70
Low Imped. Mike, Pickup, or Multiple Line to Grid	*Pri: 50/150/250/600 *Sec: 50,000 ohms CT	+15 dbm.	-70	13	1 1/2	BI-7	22.51
Single Plate to Push-Pull Grids	*Pri: 10,000 ohms *Sec: 50,000 ohms CT	+15 dbm.	-70	13	1 1/2	BIH-8	22.50
Single Plate to Push-Pull Grids	*Pri: 10,000 ohms *Sec: 50,000 ohms CT	+15 dbm.	-70	13	1 1/2	BI-8	22.50

††Refer to family.

### OUTPUT TRANSFORMERS—TR4RX13YY

YY Case (Cat. No. BOH) and B-Type (Cat. No. BO) Mountings

Application	Impedance Primary—Secondary	Max. Power Level	Case Size	Wt. Lbs.	Cat. No.	Net Price
Single Plate to Line	†Pri: 15,000 ohms *Sec: 600/150 ohms CT	+15 dbm. (22 mw)	14	2 1/4	BOH-1	\$16.08
Single Plate to Line	†Pri: 15,000 ohms *Sec: 600/150 ohms CT	+15 dbm. (22 mw)	14	2 1/4	BO-1	10.17
P-P Plates to Line	*Pri: 20,000 ohms CT *Sec: 600/150 ohms CT	+30 dbm. (1 watt)	16	3	BOH-2	23.52
P-P Plates to Line	*Pri: 20,000 ohms CT *Sec: 600/150 ohms CT	+30 dbm. (1 watt)	16	3	BO-2	13.50
P-P Plates to Line	*Pri: 5,000 ohms CT *Sec: 600/150 ohms CT	+40 dbm. (10 watts)	20	5 3/4	BO-3	13.29
P-P Plates to Line	*Pri: 7,500 ohms CT *Sec: 600/150 ohms CT†	+43 dbm. (20 watts)	20	6	BOH-4	22.26
P-P Plates to Line	*Pri: 7,500 ohms CT *Sec: 600/150 ohms CT†	+43 dbm. (20 watts)	20	6	BO-4	22.26
P-P Plates to Line or Voice Coil	*Pri: 10,000 ohms CT *Sec: 600/16/8 ohms CT and 150/4 ohms	+37 dbm. (5 watts)	18	4	BOH-5	29.70
P-P Plates to Line or Voice Coil	*Pri: 10,000 ohms CT *Sec: 600/16/8 ohms CT and 150/4 ohms	+37 dbm. (5 watts)	18	4	BO-5	16.32
P-P Plates to Voice Coil	*Pri: 7,500 ohms CT *Sec: 8/20 ohms†	+43 dbm. (20 watts)	20	6	BO-6	17.55
P-P Parallel Pl. to Line or Voice Coil	*Pri: 1500 ohms CT *Sec: 600/16/8 ohms CT and 150/4 ohms	+45 dbm. (30 watts)	21	6 1/2	BO-8	18.48
P-P Plates to Line or Voice Coil	*Pri: 5000/3000 ohms CT *Sec: 600/16/8 ohms CT and 150/4 ohms	+42 dbm. (15 watts)	20	6	BOH-9	27.24
P-P Plates to Line or Voice Coil	*Pri: 5000/3000 ohms CT *Sec: 600/16/8 ohms CT and 150/4 ohms	+42 dbm. (15 watts)	20	6	BO-9	17.25
P-P Low Level Plates to Line	*Pri: 20,000 ohms CT *Sec: 600/150 ohms CT	+15 dbm. (22 mw)	13	1 1/2	BO-10	16.50
P-P Plates to Line or Voice Coil	*Pri: 3000/2500 ohms CT *Sec: 600/16/8 ohms CT and 150/4 ohms	+46 dbm. (40 watts)	22	9 1/2	BO-11	24.87
P-P Plates to Line or Voice Coil	*Pri: 10,000 ohms CT *Sec: 600/16/8 ohms	+40 dbm. (10 watts)	22	9	BO-12	17.85
P-P Plates to Line or Voice Coil	*Pri: 10,000 ohms *Sec: 16 8 4 ohms	+43 dbm. (20 watts)	21	7	BO-13	17.85
P-P Plates to VC, pentode, triode or Ult.-Lin. Circuits	*Pri: 5000 ohms CT *Sec: 16.8 ohms; 70.7 volts	+50 dbm. (100 vams)	24	24	BO-14	39.75

\*Split and balanced windings. † to 10 ma. D.C. ††Has tertiary winding to provide 15% inverse feedback. \*\*Has D.C. in primary; frequency response  $\pm 2$  db, 30-15,000 cycles.

**LOW PASS FILTER LPF-2**—Hermetically sealed unit for attenuating frequencies above 3,000 cycles in low level speech amplifiers, 50,000 ohm plate to 50,000 ohm grid. Insertion loss 0.8 db. Height 2 1/8", width 1 1/16", depth 1 1/16", mtg. ctrs. 1 13/16". Shpg. wt. 1/2 lb. Net Price \$21.65.

### DETAILS OF NEW EQUIPMENT LINE MOUNTINGS

**YY CASE MOUNTING**—Hermetic sealing meets all MIL-T-27A specifications. Steel base cover is bonded into the case by deep-seal soldering. Terminals are hermetically sealed by unique rubber gasket—ceramic bushing construction. Units are stud mounted.

**C-TYPE MOUNTING**—Moisture-resistant compound surrounds coil and core. Ten-inch E.I.A. color-coded leads, ends stripped and tinned for easy soldering. Flange-mounted drawn steel cases.

**S-TYPE MOUNTING**—Precision-fitted steel base-covers and terminal boards, plus compound filling, keep moisture out. Solder-lug terminals are clearly identified, easy to use. Drawn steel cases are flange-mounted.

**B-TYPE MOUNTING**—Steel bases are bonded into the drawn steel cases by deep-seal soldering to make units completely moisture proof. Stud-mounted cases take minimum chassis space. Convenient, compact, pin-type terminals.

### BIAS TRANSFORMERS—Combination Plate and Filament—Primary 50-60 Cycles

Primary Volts	High Voltage Secondary		Rect. Volts	Fila. Amps.	YY Case Cat. No.	Mounting Case No.	Net Price	S-Type Mounting Case List No. Price		C-Type Mounting Case No. Price			
	AC Volts	CT DC Ma.						No.	Price	No.	Price		
115	180-160-140-120	150	5.0	3.0				1BS-150	19	\$14.70	1BC-150	18	\$6.45
230	180-160-140-120	150	5.0	3.0	1BH-150	19	\$18.90	2BS-150	19	15.30	2BC-150	18	6.30

\*TF4RX03YY.



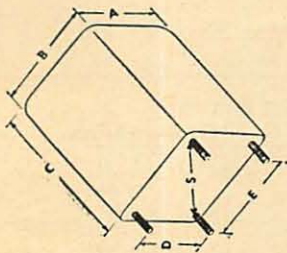
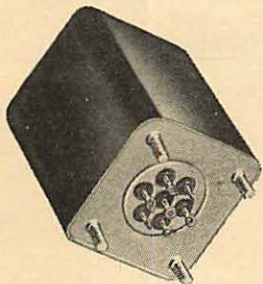
# CHICAGO

**MILITARY STANDARD AUDIOS**  
**MS TRANSISTOR AUDIOS**  
**MIL-T-27A SATURABLE TRANSFORMERS**  
 CHICAGO STANDARD TRANSFORMER CORPORATION



**MILITARY STANDARD AUDIO TRANSFORMERS**

Designed and built in accordance with MIL-T-27A, Grade A, Class R operating temperature; Life Expectancy X (10,000 hrs. min.).  
 Maximum Operating Altitude 50,000 ft.  
 Frequency Response  $\pm 2$  db 300-10,000 cps, AJ Case Size—Max. Wt., 6 lbs.



MIL-T-27A Classification	MIL-T-27A Part No.	Application	Impedance	Operating Level	Pri. DCMA	Catalog No.	Net Pr. ce
TF 1RX 15AJ001	MS-90000	P-P Plates to P-P Grids	Pri: 10,000 ohms CT Sec: 90,000 ohms CT 22,500 ohms CT	15 dbm.	10	AMS-1	\$15.90
TF 1RX 16AJ002	MS-90001	Line to Voice Coil	Pri: 600 ohms CT 150 ohms Sec: 4/8/16 ohms	2W	—	AMS-2	14.70
TF 1RX 10AJ001	MS-90002	Line to P-P Grids	Pri: 600 ohms CT 150 ohms Sec: 135,000 ohms CT	15 dbm.	—	AMS-3	14.10
TF 1RX 16AJ001	MS-90003	Line to Line	Pri: 600 ohms CT 150 ohms Sec: 600 ohms CT 150 ohms	15 dbm.	—	AMS-4	14.10
TF 1RX 13AJ001	MS-90004	Single Plate to Line	Pri: 7600/4800 ohms Sec: 600 ohms CT/150 ohms	2W	40	AMS-5	12.75
TF 1RX 13AJ002	MS-90005	Single Plate to Voice Coil	Pri: 7600/4800 ohms Sec: 4/8/16 ohms	2W	40	AMS-6	12.90
TF 1RX 13AJ003	MS-90006	P-P Plates to Line	Pri: 15,000 ohms CT Sec: 600 ohms CT/150 ohms	2W	10	AMS-7	12.48
TF 1RX 13AJ004	MS-90007	P-P Plates to Line	Pri: 24,000 ohms CT Sec: 600 ohms CT/150 ohms	1W	20	AMS-8	12.90
TF 1RX 13AJ005	MS-90008	P-P Plates to Line	Pri: 60,000 ohms CT Sec: 600 ohms CT/150 ohms	5W	20	AMS-9	12.48

**TRANSISTOR AUDIO TRANSFORMERS—TF4RX— — — — †**

Designed and built in accordance with MIL-T-27A, Grade 4, Class R operating temperature; Life Expectancy X (10,000 hrs. min.).  
 Maximum Operating Altitude 50,000 ft.

Application	Impedance in Ohms		Max. Pri. D.C. Ma.	DC Res. in Ohms		Power in Watts	Case Size †	Family †	Wt. Lbs.	Catalog No.	Net Price
	Pri.	Sec.		Pri.	Sec.						
Input	600 CT	10	20	42	.8	.05	AG	17	2 1/2 oz.	TAMS-1	\$10.20
Interstage	100 CT	10 CT	100	4.3	.8	.25	AH	17	5 oz.	TAMS-2	10.20
Interstage	100	1000 CT	100	5.8	.45	.25	AJ	17	11 oz.	TAMS-3	10.20
Interstage	500 CT	5000 CT	12	37	250	.03	AJ	17	11 oz.	TAMS-4	10.80
Driver	1000	200 CT	10	400	115	.05	AG	17	2 oz.	TAMS-5	13.29
Driver	2000	200 CT	5	720	115	.05	AG	12	2 oz.	TAMS-6	13.29
Driver	100	100 CT	100	12	12	.5	EB	17	1 lb.	TAMS-7	10.20
Output	9800	15	2	640	2	.05	AG	12	2 oz.	TAMS-8	12.90
Output	1000	4/8/16	10	180	3.5	.2	AG	17	2 1/2 oz.	TAMS-9	13.50
Output	2000 CT	4/8/16	—	250	4	.2	AG	12	2 1/2 oz.	TAMS-10	13.98
Output	48 CT	8/16	275	5	1.5	.5	FA	17	1 1/2 lb.	TAMS-11	12.48
Output	20 CT	8	500	.55	.35	10	AJ	17	12 oz.	TAMS-12	10.20

†Refer to Family and Case Size.

**CASE DIMENSIONS**

Case Size	Dimensions in inches					
	A	B	C	D	E	S
AG	1	1	1 3/8	—	—	3/4
AH	1 1/8	1 1/8	1 3/8	—	—	1 1/4
AJ	1 1/8	1 3/8	2 3/8	1 1/8	1 1/8	—
EA	1 1/8	1 3/8	2 3/8	1 3/8	1 1/4	—
EB	1 1/8	1 3/8	2 1/8	1 3/8	1 1/4	—
FA	2 1/8	2 1/8	3 1/8	1 1/8	1 1/8	—

**MIL-T-27A SATURABLE TRANSFORMERS (Magnetic Amplifiers)**

Application: For use with 2 phase 115v. 400 cycle Servo-Motors.  
 Saturable Transformer Ratings Maximum Altitude 50,000 ft.  
 All Primaries 115v., 400 cycles: TF4RX40YY

Catalog No.	STH-3		STH-5	STH-10	STH-18
Power Output in watts	2.7	3.5	5	10	18
Voltage Output, volts	26	115	115	115	115
Load Resistance in ohms	250	3800	2640	1320	775
Tuning Capacitor, MFD	.28	.19	.4	.6	1.0
Primary Current in amps	.085	.1	.13	.24	.35
Control Current, MA	8	8	8	8	8
Control Coil	2900	2900	3100	4200	5600
Res. (Per Coil) in ohms	—	—	—	—	—
Control Coil By pass	.1	.1	.1	.1	.1
Capacitors, MFD	—	—	—	—	—
Base Area, Dimensions, in.	1 1/8 x 1 1/8		1 1/8 x 2 1/8	1 3/8 x 2 1/8	2 1/8 x 3 1/8
Height, in.	2 1/8		2 3/8	3 1/8	3 3/8
Mtg. Ctrs., in.	3/4 x 1 1/8		1 x 1 1/8	1 1/8 x 1 1/8	1 1/8 x 2 1/8
Actual Wt., Lbs.	3/4		1	1 1/2	2 1/2
Typical Servo-Motor Load:	—	—	—	—	—
Kearfott	R-118	R-119-2	R-110-2	R-111-2	R-112-2
G. M. Labs.	—	665-54-19	665-54-47	665-53-40	665-53-14
			665-52-48	665-53-41	665-53-15
Net Price	\$27.00		\$28.50	\$32.25	\$37.50

**400 CYCLE STEP-DOWN TRANSFORMER—TF1RX01YY**

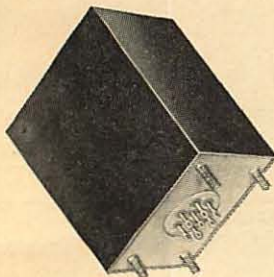
Y-Y connected, HP3-140 is identical to CHICAGO Specification No. 9926A in size and construction, but is rated at 140 va. instead of 88 va. Primary is 115 volts per phase, 3-phase, 400 cycles. Designed primarily for aircraft applications.

Catalog No.	Secondary Volts	Secondary Va. Cap.	Case Size	Terminal Type	Weight Lbs.	Net Price
HP3-140	28.5	140	17	R	3	\$26.10

All secondary A.C. voltages  $\pm 3\%$

**SATURABLE TRANSFORMERS**

are designed and built in accordance with MIL-T-27A, Grade 4, Class R operating temperature and life expectancy X (10,000 hrs. min.).



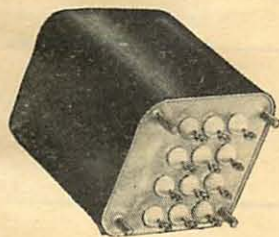


# CHICAGO

MILITARY STANDARD AND MIL-T-27A

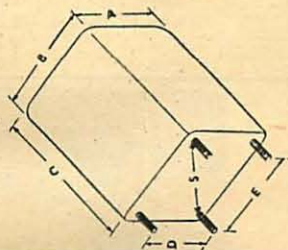
400 CYCLE  
TRANSFORMERS AND REACTORS

CHICAGO STANDARD TRANSFORMER CORPORATION



**MS CASE DIMENSIONS**

Case Size	Dimensions in Inches					
	A	B	C	D	E	S
AH	1 15/16	1 15/16	1 3/4	—	—	1 1/4
AJ	1 15/16	1 15/16	2 3/8	1 15/16	1 15/16	—
EA	1 15/16	1 15/16	2 3/4	1 15/16	1 15/16	—
EB	1 15/16	1 15/16	2 1/2	1 15/16	1 15/16	—
FA	2 1/16	2 1/16	3 3/8	1 15/16	1 15/16	—
GA	2 3/4	2 3/8	3 1/2	2 3/8	1 3/4	—
GB	2 3/4	2 3/8	2 1/2	2 3/8	1 3/4	—
HA	3 1/16	2 3/8	4 1/4	2 5/8	1 5/8	—
JB	3 1/16	3 1/16	3 7/8	2 5/8	2 3/8	—
KA	3 1/16	3 3/8	5 1/4	3	2 1/16	—
KB	3 1/16	3 3/8	4 1/16	3	2 1/16	—



**MILITARY STANDARD CASES**

Designed and built in accordance with MIL-T-27A, Grade 4, Class S\* operating temperature and life expectancy X (10,000 hours minimum). Maximum operating altitude 70,000 feet. The complete line is housed in Chicago's one piece drawn-steel cases. Outside case dimensions and mounting dimensions are within the tolerance of the Military Standard Specifications. \*High Temperature Operation 85° C. ambient, 45° C. rise.

**POWER TRANSFORMERS—TF4SX03—** † (Cap. Input. All pri. 105/115/125 V., 380-1000 c.

High Voltage Secondary		Rectifier Filament		Other Filaments		Case † Size	Wt. Lbs.	Catalog Number	Net Price
A.C. Volts	D.C. Ma.	Volts	Amps.	Volts	Amps.				
255-0-255	40	5.0	2.0	6.3 CT	2.0	GB	1 1/4	4PMS-40	\$22.92
270-0-270	55	5.0	2.0	6.3 CT	2.0	GB	1 3/4	4PMS-55	23.34
335-0-335	70	5.0	2.0	6.3 CT	3.0	GB	1 3/4	4PMS-70	25.50
330-0-330	85	5.0	2.0	6.3 CT	3.0	GA	2 1/4	4PMS-85	25.77
345-0-345	105	5.0	2.0	6.3 CT	3.5	GA	2 1/4	4PMS-105	28.59
375-0-375	120	5.0	3.0	6.3 CT	4.0	GA	3	4PMS-120	29.70
370-0-370	150	5.0	3.0	6.3 CT	4.0	JB	4 1/4	4PMS-150	38.70
440-0-440	165	5.0	3.0	6.3	7.5	KB	6 1/2	4PMS-165	49.05
450-0-450	200	5.0	2.0	6.3	3	KB	6 1/4	4PMS-200A	44.70
550-370-75-0 75-370-550	300	5.0	6.0	6.3	0.6				
				6.3	4				
				6.3	4				
				6.3 CT	0.6				
75-370-550				6.3 CT	1	KA	7 1/2	4PMS-300 †	49.05

**FILTER REACTORS—TF4SX04—** †

Inductance (henries)	Maximum D.C. Ma.	D.C. Resistance (ohms)	Insulation Volts RMS	Case † Size	Wt. Lbs.	Catalog Number	Net Price
2.0	40	190	2,500	AH	1 1/4	4RMS-240	\$ 8.82
2.0	55	160	2,500	AH	1 1/4	4RMS-255	8.10
2.0	70	165	2,500	AJ	3 1/2	4RMS-270	7.80
2.0	85	125	2,500	AH	1 1/4	4RMS-285	8.70
2.0	105	110	2,500	EB	1 1/2	4RMS-2105	8.10
2.0	120	100	2,500	EB	1	4RMS-2120	8.70
2.0	150	95	2,500	EB	1	4RMS-2150	8.40
2.0	165	90	2,500	EB	1	4RMS-2165	8.70
2.0	200	73	2,500	FA	2	4RMS-2200	9.75
2.0	300	47	2,500	HA	4	4RMS-2300 †	12.75

**FILAMENT TRANSFORMERS—TF4SX01—** † (All Prim. 105, 115, 125 V., 380-1000 cys.

Sec. Volts	Sec. Amps.	Insulation Volts RMS	Case Size	Wt. Lbs.	Catalog No.	Net Price
6.3 CT	3	2,500	EB	1	4FMS-63	\$16.65
6.3 CT	5.5	2,500	EA	1 1/4	4FMS-65	17.25
6.3 CT	10	2,500	FA	2	4FMS-610	19.80
6.3 CT	20	2,500	GA	2 1/2	4FMS-620	24.30

† Reactor Input. † Refer to Case Size. All secondary A.C. voltages ±3% \$Max. operating Alt. 50,000 ft

**400 CYCLE TRANSFORMERS AND REACTORS (YY ALTERNATE CASES) (Max. Alt. 10,000 ft.)**

**POWER TRANSFORMERS (All Primaries 105/115/125 V., 380-1000 Cycles)—TF4SX03YY**

High Voltage Secondary		Rect. Fil.		Other Fil.		Case Size	Wt. Lbs.	Catalog Number	Net Price
A. C. Volts	D.C. Ma.	Volts	Amps.	Volts	Amps.				
270-0-270	55	5.0	2.0	6.3 CT	2.0	13	1 1/4	4PHC-55	\$20.10
335-0-335	70	5.0	2.0	6.3 CT	3.0	13	1 3/4	4PHC-70	20.40
375-0-375	120	5.0	3.0	6.3 CT	4.0	17	2 1/2	4PHC-120	23.70
440-0-440	165	5.0	3.0	6.3	7.5	20	6	4PHC-165	38.70
450-0-450	200	5.0	2.0	6.3	3				
				6.3	3				
				6.3	0.6				
				6.3	4				
550-370-75-0 75-370-550	300	5.0	6.0	6.3	0.6	20	5 3/4	4PHC-200A	35.70
				6.3	4				
				6.3 CT	5				
				6.3 CT	1				
						21	6 1/2	4-PHR-300	40.50

**FILTER REACTORS—TF4SX04YY**

Inductance (henries)	Maximum D.C. Ma.	D.C. Resistance (Ohms)	Insulation Volts RMS	Case Size	Wt. Lbs.	Catalog Number	Net Price
2.0	55	160	2,500	3	1 1/4	4RH-255	\$6.60
2.0	70	165	2,500	7	1 1/2	4RH-270	6.90
2.0	120	100	2,500	11	1	4RH-2120	8.10
2.0	165	90	2,500	11	1 1/2	4RH-2165	7.80
2.0	200	73	2,500	13	1 3/4	4RH-2200	8.70
2.0	300	47	2,500	16	3 1/4	4RH-2300	10.50

**FILAMENT TRANSFORMERS (All Prim. 105/115/125 V., 380-1000 cycles)—TF4SX04YY**

Sec. Volts	Sec. Amps.	Insulation Volts RMS	Case Size	Wt. Lbs.	Catalog Number	Net Price
6.3 CT	3	2,500	10	3/4	4FH-63	\$14.70
6.3 CT	5.5	2,500	11	1	4FH-65	15.90
6.3 CT	10	2,500	13	1 1/4	4FH-610	17.70
6.3 CT	20	2,500	15	2 1/2	4FH-620	19.50

**400 CYCLE STEP-DOWN TRANSFORMER (See Page 1312)**



**CASE DIMENSIONS**

Case Size	Dimensions in Inches				
	A	C	D	H	K
3	1 15/16	1 15/16	2	1 1/2	2 Studs
7	1 15/16	1 15/16	2	1 1/2	2 Studs
10	1 15/16	1 3/4	2 1/8	1 1/2	1 1/2
11	1 15/16	1 3/4	2 1/8	1 1/2	1 1/2
12	2 1/4	2 1/8	2 1/8	1 1/2	1 3/8
13	2 1/4	2 1/8	2 1/8	1 1/2	1 3/8
15	2 3/4	2 3/8	3 1/8	1 1/2	1 1/2
16	2 3/4	2 3/8	3 1/8	1 1/2	1 1/2
17	2 3/4	2 3/8	3 3/4	2	1 1/2
20	3 1/16	3 3/8	4 1/8	2 1/2	2 1/2
21	3 1/16	3 3/8	4 1/8	2 1/2	2 1/2



# CHICAGO

**NEW EQUIPMENT**  
**AUDIO**  
**TRANSFORMERS**



CHICAGO STANDARD TRANSFORMER CORPORATION

### TRANSISTOR AUDIO TRANSFORMERS

Here are the smallest iron core audio transformers ever built. They weigh less than 1/10 ounce and are no larger than the transistors they power. Write for Bulletin 462 showing typical circuit application.

Part No.	Application	Pri. Imp.	Sec. Imp.	Pri. DC Res.	Sec. DC Res.	Dimensions (±.015")	Weight in ounces	Net Price
UM-110	Interstage	20,000	1,000	1675	285	1/4" x 3/8" x 3/8"	0.07	\$5.70
UM-111	Output or matching	1,000	50/60	120	9.0	3/8" x 3/8" x 3/8"	0.10	3.90
UM-112	High imp. mic. input	200,000	1,000	4000	195	3/8" x 3/8" x 3/8"	0.10	6.30
UM-113	Interstage	20,000	1,000	1350	205	3/8" x 3/8" x 3/8"	0.10	4.35
UM-114	Output or matching	500	50/60	70	9.0	3/8" x 3/8" x 3/8"	0.10	3.90

### TRANSISTOR TRANSVERTER TRANSFORMERS

For converting 12 V. battery voltage to plate supply voltage. See Chicago Bulletin CT-43 for schematics and parts lists.

Part No.	Application	Mtg. Type	Dimensions	Weight	List Price
DCT-1	Converts 12 VDC to 275 VDC at 125 DCMA	C	1 7/8" x 2 1/16" x 2 1/16"	14 oz.	\$22.04
DCT-2	Converts 12 VDC to 250 VDC at 275 DCMA or 500 VDC at 165 DCMA	C	2 1/4" x 2 11/16" x 2 11/16"	1.5 lbs.	24.93

### MINIATURE HIGH FIDELITY AUDIO TRANSFORMERS

Chicago-Stancor Tinytrans are miniature transformers made with nickel steel laminations. They have an exceptional frequency response for units of this size; ±1 db. 30-15,000 cps, Maximum level 0 db. Write for Bulletin 463 showing frequency response curves on these transformers.

These units are sealed and potted in 7/8" square, anodized aluminum cases with phenolic terminal boards. Total height, including terminals, is 1 1/4". The case has two 2-56 threaded inserts, 11/16" centers, for easy chassis mounting. The entire transformer weighs only 1.3 ounces.



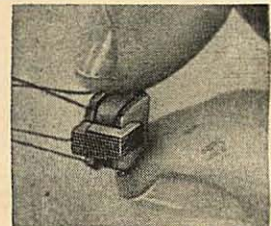
Part No.	Application	Primary Impedance	Secondary Impedance	Net Price
TT-11	Mic., pickup or line to single grid	50, 200/250, 500/600	50,000	\$8.49
TT-12	Mic., pickup or line to push-pull grids	50, 200/250, 500/600	50,000	8.85
TT-13	Dynamic mic. to single grid	7.5/30	50,000	8.07
TT-14	Single plate to single grid	15,000* (No DC in primary)	60,000	6.96

### PUBLIC ADDRESS RANGE TRANSFORMERS

Frequency Response within ±1 db, 50 to 10,000 Cycles

Driver and output transformers in this CHICAGO series are designed for three general power levels to fit a wide range of application. Up-to-date secondary impedances match 600 or 150-ohm lines, 16, 8, and 4-ohm speakers.

(16/8/4-ohm taps also suitable for 20/6/3.2-ohm speakers.) Output transformers have tertiary windings for 10% inverse feedback that minimizes distortion and provides extra audio watts without loss of fidelity.



**DRIVERS** H-Type—TF4RX12YY (Cat. No. PHD), S-Type (Cat. No. PSD) and C-Type (Cat. No. PCD) Mountings

Application	Primary Impedance	Max. D.C. Pri.	Ratio, Pri. to 1/2 Sec.	Case Size	Wt. Lbs.	Cat. No.	Net Price
P-P Plates to P-P Grids	20,000 ohms (Pri. CT)	10 ma.	3:1	14	2 1/4	PHD-10	\$ 9.00
						PSD-10	6.90
						PCD-10	5.01
P-P Plates to P-P Grids	20,000 ohms (Pri. CT)	25 ma.	3:1	15	2 1/4	PHD-25	10.90
						PSD-25	7.50
						PCD-25	10.90
P-P Plates to P-P Grids	5,000/10,000 ohms (Pri. CT)	100 ma.	5:1	18	4 1/2	PHD-100	14.85

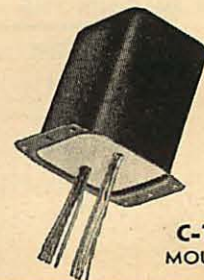


**TYPE UM**  
**YY CASE MOUNTING**

**OUTPUTS** H-Type—TF4RX13YY (Cat. No. PHO), S-Type (Cat. No. PSO) and C-Type (Cat. No. PCO) Mountings

Application	Impedances	Typical Output Tubes	Class	Max. Audio Watts	Max. D.C. Pri. CT	Case Size Wt.	Cat. No.	Net Price
P-P Plates to Line or Voice Coil	Primary: 5,000 ohms, CT Secondary: * 600/150/16/8/4 ohms	6B4G, 6L6, 6V6, etc.	A <sub>1</sub>	20	120 ma.	20: 6 1/2 lbs.	PHO-80	\$18.57
			AB				PSO-80	20.78
P-P Plates to Line or Voice Coil	Primary: 10,000 ohms, CT Secondary: * 600/150/16/8/4 ohms	6V6, 6F6, 6K6, etc.	AB <sub>1</sub>	15	200 ma.	19: 5 lbs.	PSO-150	11.40
			AB <sub>1</sub>				PCO-150	7.50
P-P Plates to Line or Voice Coil	Primary: 6,000 ohms, CT Secondary: * 600/150/16/8/4 ohms	Two 6L6's, Four 6V6's, or similar	B <sub>1</sub>	30	250 ma.	22: 9 lbs.	PSO-200	13.95
			AB <sub>1</sub> †				PCO-200	8.70

**S-TYPE MOUNTING**



See Pages 1311 & 1316 For Mounting Dimensions

**C-TYPE MOUNTING**

\*Has tertiary winding to provide 10% inverse feedback.  
†For low distortion, use fixed bias.



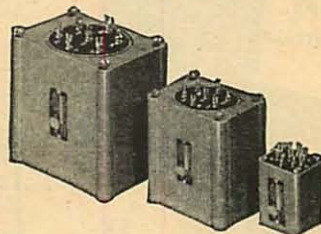
# CHICAGO

NEW EQUIPMENT  
**AUDIO TRANSFORMERS**  
 CHICAGO STANDARD TRANSFORMER CORPORATION



## HF AND WF SERIES HIGH FIDELITY AUDIO TRANSFORMERS

### HF Series



These units have a wide frequency response of 20 to 20,000 cps with  $\pm 1$  db. Correct design reduces harmonic and intermodulation distortion to a negligible amount. Balanced construction minimizes hum pickup. Chicago-Stancor impregnation insures long life. Cases are finished in gray enamel and have four threaded holes at each end for flush mounting. Stud-type terminals are plainly marked for easy identification.

#### LOW IMPEDANCE TO GRID

Part No.	Application	Primary Imp/Ohms	Secondary Imp/Ohms	Max. Hum-Pickup Level	Hum-Reduction*	Mtg. §	Net Price
HF-20	Low Imp. Mic., Pickup, or Line to Grid	50, 125/150, 200, 250, 333, 500/600	60,000 overall, in two sections	15 db	-74 db	HF-1	\$35.03
HF-20X	Low Imp., Mic., Pickup, or Line to Grid	50, 125/150, 200, 250, 333, 500/600	50,000	14 db	-92 db†	HF-1	42.43
HF-22	Low Imp. Mic., Pickup, or Line to P.P. Grids	50, 125/150, 200, 250, 333, 500/600	120,000 overall, in two sections	15 db	-74 db	HF-1	23.70
HF-22X	Low Imp. Mic., Pickup, or Line to P.P. Grids	50, 125/150, 200, 250, 333, 500/600	80,000 overall, in two sections	14 db	-92 db†	HF-1	43.27

#### INTERSTAGE

HF-29	Sgl. Pl. to P.P. Grids - Split secondary	15,000	95,000 (Turn ratio 2.5:1 overall)	17 db	-50 db	HF-1	\$18.72
HF-31	Single Plate to P.P. Grids. Split pri. and sec.	15,000	135,000 (Turn ratio 3:1 overall)	14 db	-74 db	HF-1	23.70
HF-32	P.P. Plates to P.P. Grid. Split pri. and sec.	30,000 Plate to Plate	80,000 (Turn ratio 1.6:1 overall)	26 db	-50 db	HF-2	34.50

#### MIXING

HF-40	Low Imp. Mixer, Mic., Pickup, or Line to Line	50, 125/150, 200, 250, 333, 500/600	50, 125/150, 200, 250, 333, 500/600	17 db	-74 db	HF-1	\$39.48
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#### OUTPUT

HF-65†	P.P. 2A3's, 6L6's, etc. to Line or Voice Coil	3,000 or 5,000 Plate to Plate	1.2, 2.5, 5, 7.5, 10, 15, 20, 30, 50, 125, 200, 250, 333 or 500	20 watts	.....	HF-2	\$25.50
HF-67†	P.P. 2A3's, 6L6's, etc. to Voice Coil	3,000 or 5,000 Plate to Plate	30, 20, 15, 10, 7.5, 5, 2.5, 1.2	20 watts	.....	HF-2	20.70
HF-68†	P.P. Par. 2A3's, 6A5G's, 300A's, 6A3's to Line or Voice Coil	1,500 or 2,500 Plate to Plate	500, 333, 250, 200, 125, 50, 30, 20, 15, 10, 7.5, 5, 2.5, 1.2	40 watts	.....	HF-3	39.00

§HF-1 Case: Shpg. wt., 3.0 lbs. Height overall, 3 3/4". Base area, 2 1/8" x 3 1/8". Mtg. ctrs., 1 1/8" x 2 3/8". HF-2 Case: Shpg. wt., 7.5 lbs. Height overall, 4 3/8". Base area, 3 3/8" x 4 3/8". Mtg. ctrs., 2 1/8" x 3 1/8". HF-3 Case: Shpg. wt., 15.0 lbs. Height overall, 4 1/8". Base area, 4 1/8" x 5 3/8". Mtg. ctrs.,

4 3/8" x 5 1/8".

†Response  $\pm 1$  db from 25 to 20,000 cps.

‡As compared to standard uncased units.

‡Quadruple alloy magnetic shield.

### WF Series

These units are of the same outstanding quality as the HF Series above, and, with the exception of two units, have a frequency response of 30-20,000 cps within  $\pm 2$  db. The WF-21 and WF-35 have a response within  $\pm 2$  db from 50-20,000 cps and have multiple alloy shields for

extremely low hum pickup. All WF units are cased in the WF-b type cast case with phenolic terminal board and four tapped holes for flush mounting. Overall dimensions are 2" high with 1 1/2" x 1 1/2" base area. Mounting centers are 1 3/8" x 1 3/8". Shipping weight is 0.6 lbs.

Part No.	Application	Primary Imp/Ohms	Secondary Imp/Ohms	Ne Price
WF-20	Low Imp. Mic., Pickup, or Line to Grid	50, 125/150, 200, 250, 333, 500/600	50,000	\$11.70
WF-21	Low Imp. Mic., Pickup, or L. to Sgl. or P.P. Grids	50, 200, 500	50,000	12.48
WF-22	Low Imp. Mic., Pickup, or Line to P.P. Grids	50, 125/150, 200, 250, 333, 500/600	80,000 overall, in two sections	11.70
WF-24	Dynamic Microphone to 1 or 2 Grids	30	50,000 overall, in two sections	10.62

#### INTERSTAGE

WF-26	Single Plate to Single Grid	15,000	60,000 (Turn ratio 2:1)	\$ 9.87
WF-28	Sgl. Pl. to 2 Grids. Can use split pri. for P.P. Pl.	15,000	80,000 overall (Turn ratio 2.3:1 overall)	10.92

#### LOW LEVEL OUTPUT

WF-34	Single Plate to Line	15,000	50, 125/150, 200, 250, 333, 500/600	\$11.70
WF-36	P.P. Low Level Plates to Line	30,000 Plate to Plate	50, 125/150, 200, 250, 333, 500/600	11.70
WF-35	Single Plate to Multiple Line Primary D.C. 8.0 ma. Response from 50-20,000 cps within $\pm 2$ db	15,000	50, 125/150, 200, 250, 333, 500/600	10.92

#### MIXING

WF-30	Low Imp. Mixer, Mic., Pickup, or Line to Line	50, 125/150, 200, 250, 333, 500/600	50, 125/150, 200, 250, 333, 500/600	11.70
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# CHICAGO

NEW EQUIPMENT

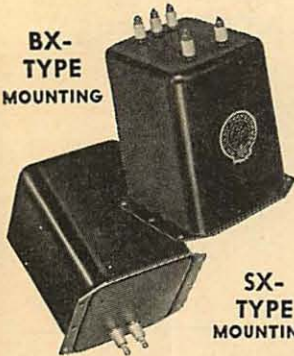
## TRANSFORMERS and REACTORS

for Broadcast, Amateur and Industrial Application

CHICAGO STANDARD TRANSFORMER CORPORATION



**BX-TYPE MOUNTING**



**SX-TYPE MOUNTING**

### LARGE CAPACITY TRANSFORMERS AND REACTORS For Broadcast, Communications and Industrial Use

#### DRIVER TRANSFORMERS

In:	Recommended Application: Tubes:	Ratio Pri./1/2 Sec.	Mtg. Type	Case Size	Wt. Lbs.	Cat. No.	Net Price
250-Watt Transmitter	From two 2A3's, 6B4's, or similar P-P Plates to Class B 838's, 805's, 203-A's, etc.	3.5:1	B*	20	6 1/2	BD-1	\$20.70
1-KW Transmitter	From four 2A3's, 6B4's, or similar P-P Plates to two 833-A's or similar P-P Grids	3:1	†	24	12 1/4	BD-2	25.50
5-KW Transmitter	From four 845's, two 152-TL's or similar P-P Plates to 891-R's or similar P-P Grids	3.5:1	BX	26	24	BD-3	58.50

†Similar to SX-Type mounting, but with screw terminals on a terminal board.  
\*B-Type mounting, but with screw terminals.

#### MODULATION TRANSFORMERS

Recommended Application In:	With:	Impedances (Pri. Plate to Plate)	Modulator Tubes	Mtg. Type	Case Size	Wt. Lbs.	Cat. No.	Net Price
250-Watt Transmitter	Driver Transformer #BD-1	Pri: 7500 ohms CT Sec: 5000 ohms	203-A, 838 805, etc.	BX	26	25	BM-1	\$37.50
1-KW Transmitter	Driver Transformer #BD-2	Pri: 9000 ohms CT Sec: 7500 ohms	833-A, etc.	FS	84	175	BM-2	325.47
500-Watt Transmitter	Driver Transformer #BD-2 Class C Amplifier	Pri: 11000 ohms CT Sec: 5500 ohms	833-A, etc.	FS-1		105	BM-4	114.00

#### MODULATION REACTORS

Recommended Application In:	With:	Inductance	D.C. Ma.	Mtg. Type	Case Size	Wt. Lbs.	Cat. No.	Net Price
250-Watt Transmitter	Mod. Transformer #BM-1	65 hy.	250	BX	28	41	BR-1	\$ 57.30
1-KW Transmitter	Mod. Transformer #BM-2	100 hy.	500	FS	81	165	BR-2	300.00
5-KW Transmitter	Mod. Transformer #BM-3	120 hy.	900	WC		1100	BR-4	

#### PLATE TRANSFORMERS

Primary: Volts	Max. VA.	Secondary: A.C. Load Volts	D.C. Volts after Filter	D.C. Ma.	Mtg. Size	Mtg. Type	Wt. Lbs.	Cat. No.	Net Price
115-230	185	675-0-675 575-0-575	500 400	250	22	S	12	P-45	\$15.30
115-230	250	900-0-900 735-0-735	750 600	250	22	S	13 1/2	P-67	16.80
115-230	310	1150-0-1150 870-0-870	1000 750	250	60	FS	37	P-107	53.70
115-230	360	1425-0-1425* 600-0-600	1250 400	150 200	24	S	26	P-1240	25.50
115-230	550	1710-0-1710 1430-0-1430	1500 1250	300	63	FS	43	P-1512	57.30
115-230	915	2820-0-2820 2260-0-2260	2500 2000	300	71	FS	71	P-2520	76.50
115-230	1600	2900-0-2900 2320-0-2320	2600 2100	500	64	FS	95	P-2126	135.60
115-230	1850	3450-0-3450 2850-0-2850	3000 2500	500	81	FS	137	P-3025	236.66
115-230	3050	4600-0-4600 4050-0-4050 3400-0-3400	4000 3500 3000	600	90	FS	150	P-4353	225.00

\*Both secondaries may be rectified simultaneously.

#### FILTER REACTORS

Inductance in Henrys	Max. D.C. Ma.	D.C. Resistance, Ohms	Insulation Test Volts	Mtg. Type	Mtg. Size	Wt. Lbs.	Cat. No.	Net Price
10	500	40	9,000	FS	62	35	R-105	\$39.90
10	300	40	7,500	SX	26	22	R-103	19.50
6	700	35	10,000	FS	61	35	R-67	51.74
6	500	35	9,000	FS	60	35	R-65	44.65
6	300	35	7,500	SX	24	16 1/2	R-63	23.31

#### Splatter Chokes for High Level "Clipper" Filters

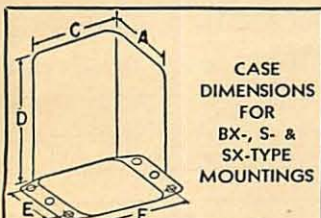
Can withstand high peak voltages. Has tapped windings to cover an inductance from .02 to 1.5 henries at relatively constant Q. Eliminates splatter, caused by heavy modulation; limits band width to 3,000 cycles, effectively increases "get through" ability of phone signals, and prevents negative peak clipping.

Type	D.C. Ma.	Insulation Volts	Inductance in Henrys	Mounting		Net Price
				Type	Size	
SR-300	300	7,500	.02 to 1.5 Hy	BX	22	\$26.59
SR-500	500	10,000	.02 to 1.5 Hv	BX	24	30.26

#### Low Pass Filter No. LPF-1

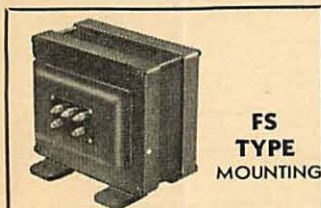
For attenuating frequencies above 3,000 cycles in low level speech amplifiers. Operates out of a 15,000 ohm source, e.g., the plate of 6C5, 6J5, etc. when its 60,000 ohm secondary is connected to an equal impedance output. Operates at signal levels up to -8 db. Complete with operating instructions. S type mtg. Case size 13. (See pg. 1309).

Net Price.....\$22.72

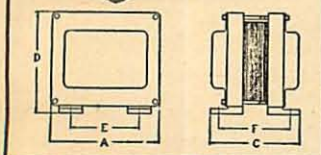


CASE DIMENSIONS FOR BX-, S- & SX-TYPE MOUNTINGS

Case Size	A	C	D	E	F
22	4 1/16	4 1/8	5 1/8	2 1/8	4 3/4
24	5 1/16	5 1/8	6 1/8	3 1/8	5 3/8
26	6 1/16	5 3/4	7 1/8	4 1/8	6
28	7 1/16	6 3/8	8 1/8	5	7



**FS TYPE MOUNTING**



Size	A	D	E	F	C
60	7 1/2	7	4 3/4	5 1/2	6 1/8
61	7 1/2	7	4 3/4	5 5/8	6 7/8
62	7 1/2	7	4 3/4	6 3/4	7 3/8
65	7 1/2	7	4 3/4	6 11/16	7 1/2
64	7 1/2	10	8 3/8	6	7 3/4
65	7 1/2	7	4 3/4	6 7/8	7 15/16
71	8 1/2	8 1/2	5 1/2	6 1/2	8 1/8
81	11 1/2	10 1/2	7 1/2	8 1/4	10 3/4
84	11 1/2	10 1/2	7 1/2	11 1/16	13 1/16
90	13 1/16	12 3/4	9	8 7/8	10 3/8



**WC-TYPE MOUNTING**

Overall Case Dimensions:  
H—31 1/2" W—26 1/2" D—23 1/2"



# CHICAGO

NEW EQUIPMENT

## AUDIO TRANSFORMERS



CHICAGO STANDARD TRANSFORMER CORPORATION

### COMMUNICATIONS RANGE AUDIO TRANSFORMERS

Frequency Response within  $\pm 1$  db, 200 to 3,500 Cycles

These transformers are specifically designed for use in receiving and transmitting equipment such as amateur, police, railroad, and aircraft types, where clear voice reproduction is desired.

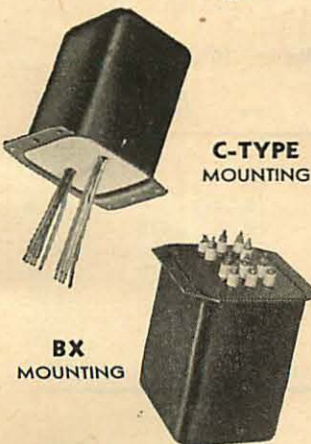
INPUTS H-Type-TF4RX--YY† (Cat. No. CIH), S-Type (Cat. No. CIS) and C-Type (Cat. No. CIC) Mountings\*



Application	Impedances: Primary—Secondary	Case Size	Wt. Lbs.	Cat. No.	Family	Net Price
Low Level Line to Single or Push-Pull Grids	Pri.: 600/150 ohms CT *Sec: 100,000 ohms CT	9	3/4	CIH-1 CIS-1 CIC-1	10 — —	\$14.70 15.01 7.50
Low Level S. B. or D. B. Mike to Sgl. or P-P Grids	Pri: 125/50 ohms @ 80 ma. Sec. 125,000 ohms CT	9	3/4	CIH-2 CIS-2 CIC-2	11 — —	10.50 6.30 3.90

\*\*Split and balanced windings: may be used singly or push-pull. †Refer to family.

OUTPUTS H-Type-TF4RX13YY (Cat. No. COH), S-Type (Cat. No. COS) and C-Type (Cat. No. COC) Mountings\*



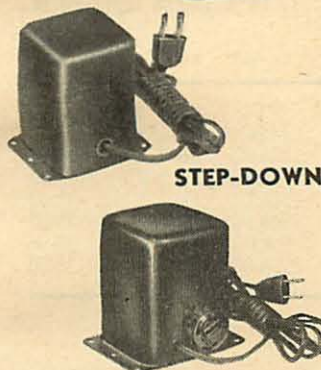
Application	Impedances: Pri.—Sec.	Typical Audio Tubes	Pri. Class	Max. Case Watts	Max. Pri. D.C.	Case Size	Wt. Lbs.	Cat. No.	Net Price
Sgl. P. to Line or Speaker	Pri.: 5000 ohms Sec. ohms: 600/150/16/8/4	6L6, 6V6, 25A6	A	5	55 ma.	14	2 3/4	COH-1 COS-1 COC-1	\$10.50 7.50 4.20
Sgl. Pl. to Line or Speaker	Pri: 8000 ohms Sec. ohms: 600/150/16/8/4	6F6, 6V6, 6K6	A	5	55 ma.	14	2 3/4	COH-2 COS-2 COC-2	11.58 7.50 4.20

DRIVER H-Type (Cat. No. CDH), S-Type (Cat. No. CDS) and C-Type (Cat. No. CDC) Mountings\*

Application	Primary Impedance	Max. D.C. Pri. CT	Ratio, Pri. to 1/2 Sec.	Case Size	Wt. Lbs.	Cat. No.	Net Price
P-P Plates (2A3's, etc.) to P-P Grids	5,000 ohms (Pri. CT)	100 ma.	3:1	17	3 1/2	CDS-1 CDC-1	\$9.30 5.01

\*Mounting Dimensions on Page 1316.

### MODULATION TRANSFORMERS—Class B Plates to Class C Load



Catalog No.	Typical Mod. Tubes	Impedances Primary-Secondary	D.C. Ma. Pri. Sec.	Power Level	Mounting Type	Size	Wt. Lbs.	Net Price
CMS-1	203A's, 805's, 75TL's, 203Z's	Pri: 9000/6700 ohms CT Sec: 8000/6000/4000 ohms	350 350	250-350 watts	SX	26	22	\$ 39.00
CMS-3	810's, 822's, 4-250A's, etc.	Pri: 18,000/12,000 ohms CT Sec: 6250 ohms	500 500	500.750 watts	FS†	64†	43	105.00

†Mounting Dimensions and Illustration on Page 1316.

### STEP-DOWN TRANSFORMERS—Primary, 50/60 cycles

CHICAGO step-down autotransformers solve the problem of operating standard 117-volt radios, amplifiers, and various electrical appliances from 220-volt power sources. They are particularly well adapted to use in Central and South American countries, where 220-volt lines are frequently found, and where the Sealed-in-Steel construction protects them against corrosion caused by excessive humidity. Input side is equipped with 8-foot, rubber-covered cord and plug. Output side has standard female receptacle.

Catalog No.	Input Voltage	Output Voltage	Rating, Continuous Duty	Case Size	Wt., Lbs.	Net Price
SD-50	220-250	110-125	50 watts	16	2 3/4	\$ 5.34
SD-100	220-250	110-125	100 watts	20	4 1/4	6.66
SD-150	220-250	110-125	150 watts	22	7	7.80
SD-250	220-250	110-125	250 watts	22	8 3/4	9.45
SD-500	220-250	110-125	500 watts	24	14 1/2	12.00
SD-1000	220-250	110-125	1000 watts	26	22 1/2	19.50

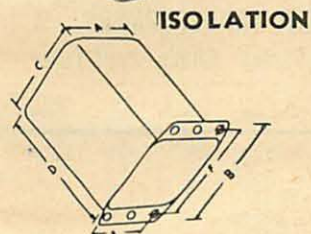
### ISOLATION TRANSFORMERS—Primary, 50/60 cycles

A rotary switch on each CHICAGO isolation transformer adjusts to either of three primary voltages, 125/115/105 volts. With the unit operating on a 115-volt line, the three switch positions also provide varying secondary voltages, 105/115/125 volts isolated from line.

Eight-foot, rubber-covered cord and plug on primary, standard female receptacle on secondary.

Catalog No.	Input Voltage	Output Voltage	Rating, Continuous Duty	Case Size	Wt., Lbs.	Net Price
IS-50	105/115/125	125/115/105*	50 watts	21	5	\$ 8.25
IS-100	105/115/125	125/115/105*	100 watts	22	8 1/2	11.85
IS-150	105/115/125	125/115/105*	150 watts	24	12 1/2	14.10
IS-250	105/115/125	125/115/105*	250 watts	24	18 1/4	16.65

\*With 115-volt primary.



DIMENSIONS for S, SX, STEP-DOWN and ISOLATION TRANSFORMERS

Case Size	Dimensions in Inches					
	A	B	C	D	E	F
16	2 7/8	3 1/4	2 11/16	3 1/2	2	3 5/8
20	3 11/16	4 5/16	3 5/8	4 5/8	2 3/4	3 5/8
21	3 11/16	4 5/16	3 5/8	4 11/16	2 3/4	3 5/8
22	4 5/16	5 3/4	4 3/8	5 5/8	2 3/4	4 3/8
24	4 5/16	5 7/8	4 13/16	6 1/8	3 1/2	5 5/8
26	6 1/8	6 3/4	5 3/4	7 5/8	4 1/4	6