

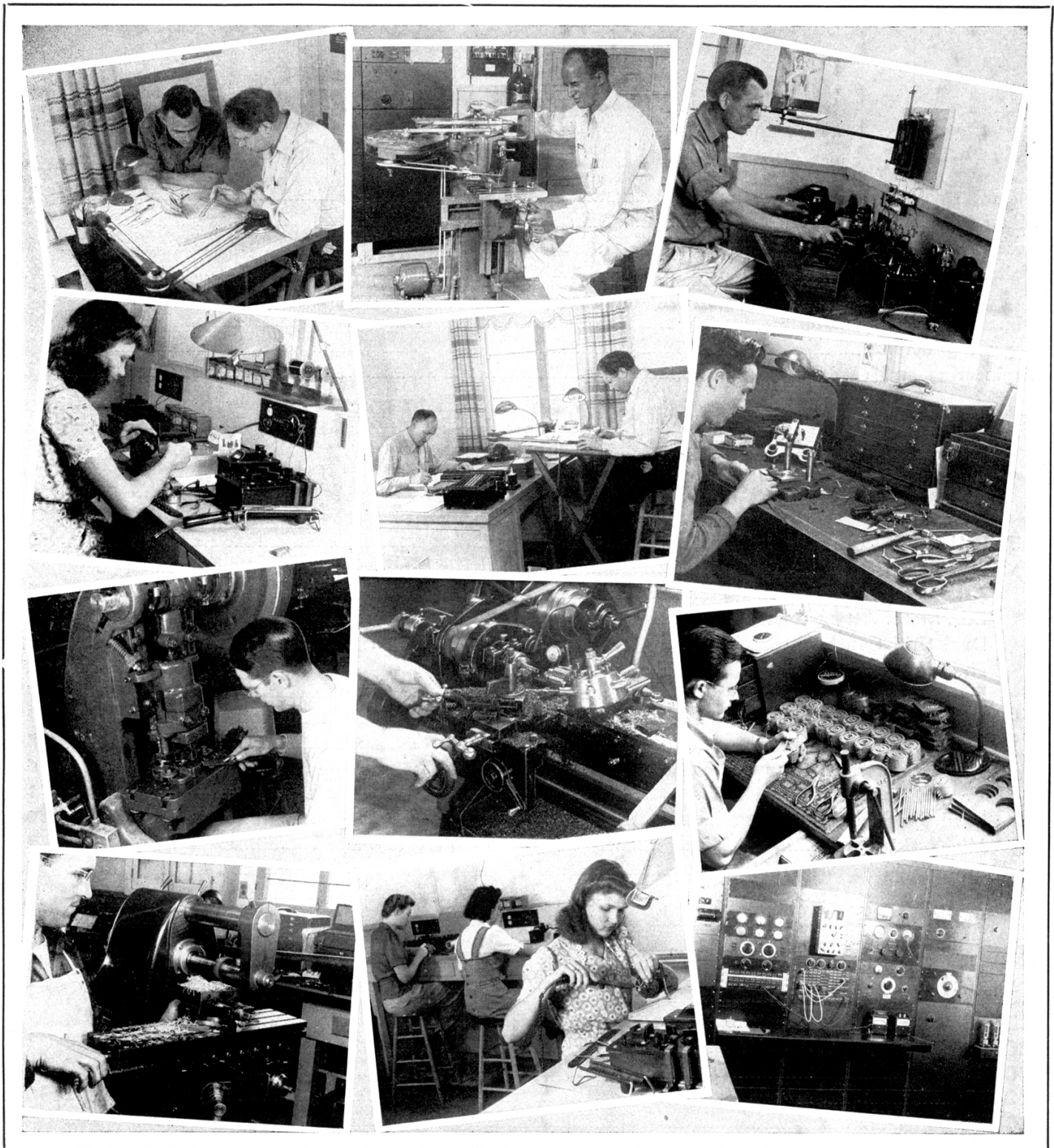
CINEMA

ENGINEERING COMPANY



PRECISION
RESISTORS AND RESISTIVE DEVICES
SOUND EQUIPMENT

CATALOG NO. 10



Modern precision machines operated by skilled workers with a knowledge of the functions of the apparatus they are making, combined with rigid inspection and performance tests, have made Cinema Engineering Company products the standard of excellence in the Motion Picture and Radio Broadcasting Industries.

CINEMA ENGINEERING COMPANY
1510 West Verdugo Avenue
BURBANK, CALIFORNIA
CHarleston 6-3626 • STanley 7-2621

INDEX

TECHNICAL DATA — INDEX

	Page
Mixer Attenuation Curves.....	3
Mixer Circuits.....	25
Loss Calculations of Mixer Circuits.....	26
Voltage Ratio Table.....	26
Pad Formulae.....	25
Dimensions of Attenuator Frames.....	14
Engraving Service.....	24
Engineering and Test Service.....	24

EQUIPMENT — INDEX

ATTENUATORS (General Information).....	2
Attenuator Dials.....	2
Attenuator Frame Dimensions.....	14
D.B. Meter Attenuators (V.I. Controls).....	7
Dual Grid Controls (Precision).....	9
Fixed Attenuators (Pads) Key Operated.....	12
Fixed Attenuators (Precision Pads).....	12
Fixed Attenuators (Midget Pads).....	12
Grid Controls (Precision).....	8
H Attenuators (Balanced Precision).....	6
Impedance Matching H & T Attenuators.....	11
Loud Speaker Controls.....	10
Mixer Controls.....	3
T Attenuators (General Purpose).....	5
T Attenuators (Precision).....	4
Turntable Faders.....	10
V.I Attenuators.....	7
V.U. Meter Attenuators (Controls).....	7
BEE'S WAX.....	23
CERISE WAX.....	23
CONTROL KNOBS AND DIALS.....	23
CORD RACKS.....	21
CORDS.....	19
CORDS, Patch.....	19
D.B. METERS.....	17
DECADE BOXES.....	17
DESIGNATION STRIPS.....	18
DIALS, Attenuator—Special.....	2
EQUALIZER (Program).....	27
EQUALIZER (Orthacoustic).....	28
EQUALIZER (Diameter).....	28
FADERS, Turntable.....	10
FIXED ATTENUATORS (Precision Pads).....	12
FIXED ATTENUATORS (Pads) Key Operated.....	12
FIXED ATTENUATORS (Midget Pads).....	12

INDEX

	Page
GAIN SETS.....	15
GAIN SET KITS.....	15
GRID CONTROLS (Precision).....	8
GRID CONTROLS, Dual (Precision).....	9
H ATTENUATORS (Balanced Precision).....	6
IMPEDANCE MATCHING H & T ATTENUATORS.....	11
JACKS.....	18
JACK PANELS.....	18
JACK STRIP DESIGNATIONS.....	18
KEYS (Telephone Switchboard Type).....	20
LACING TWINE.....	23
LAMPS AND LAMP CAPS (Switchboard Type).....	22
MATCHING NETWORKS.....	12
METERS	
DB Meters.....	17
V.I. Meters.....	17
V.U. Meters.....	17
MIXER CONTROLS.....	3
PADS	
Fixed Attenuators (Pads) Key Operated.....	12
Fixed Attenuators (Midget Pads).....	12
Fixed Attenuators (Precision Pads).....	12
PATCH CORDS.....	19
PATCH CORD PLUGS (Single and Double).....	19
PATCH PANELS (See Jack Panels).....	18
PLUGS, Patch Cord (Single and Double).....	19
RACKS, Cord.....	21
RACK PANELS.....	21
RACKS, Relay.....	21
RELAY RACK SHELF BRACKETS.....	21
RESISTORS	
Resistors SW (Precision) MFRS. Type.....	13
Resistors 22-S (Precision) Laboratory Type.....	13
SHELF BRACKETS for Relay Racks.....	21
SOLDER.....	23
SPEAKER CONTROLS.....	10
SPAGHETTI.....	23
SWITCHBOARD HOOK-UP WIRE.....	22
SWITCHBOARD TYPE KEYS.....	20
T ATTENUATORS (General Purpose).....	5
T ATTENUATORS (Precision).....	4
TRANSMISSION LINE.....	22
TRANSMISSION MEASURING SETS.....	15
TERMINAL BLOCK PARTS.....	22
TERMINAL BLOCKS.....	22
VOLUME INDICATOR PANELS AND BOXES.....	16
V.I. ATTENUATORS.....	7
V.I. METERS.....	17
V.U. ATTENUATORS.....	7
V.U. METERS.....	17
VOLUME UNIT PANELS AND BOXES.....	16

FOREWORD

Looking backward, we realize that the steady growth of the Cinema Engineering Company has been due to a policy which at first we never thought of putting into words. It is simply this:

"In Design, Material and Workmanship we have built into every product we manufacture, the utmost in precision and a sturdiness that insures a long trouble-free life of service."

We have found that this principle of manufacture costs little more than any other and has constantly brought us new customers without expensive promotion and advertising. Looking forward we know that it cannot be improved upon.

The little group that started our operation had a background of knowledge gained from many years of pioneering and development in the industries which we sought to serve and the high standards they set have been required of each added employee.

Our products are widely used by the Motion Picture and Radio Broadcasting Industries, whose requirements are extremely rigid. Specially designed equipment is frequently required and new problems often arise. Our facilities are not limited to the production of the items listed in this catalog. Consult us about your problems.

If you can imagine it, we can make it —

ART DAVIS

●

IMPORTANT NOTICE

All prices and or designs subject to change without notice. Prices are F.O.B. Burbank. No additional charge for packing for shipment to points within Continental United States.

ALL MATERIAL WILL BE INVOICED AT PRICES PREVAILING ON THE DATE OF SHIPMENT.

●

CINEMA ENGINEERING COMPANY

1510 West Verdugo Avenue

BURBANK ★ **CALIFORNIA**

CHarleston 6-3626 • STanley 7-2621

VARIABLE ATTENUATORS

2

All Cinema attenuators are designed and built to have their loss actually independent of frequency.

The windings are all true non inductively wound. Each resistor is terminated directly on the switch points cutting in half the usual number of soldered connections in every attenuator. The wire used in these pots is a type having a very low temperature coefficient and excellent soldering characteristics. The mechanical arrangement of the windings is always made such as to secure the maximum shielding effect from the windings themselves.

After winding, the terminals are added and the windings impregnated with a highly moisture resistant compound. This supports the windings and protects them from mechanical injury and corrosion as well as making possible a Plus 30DB above 6MW rating in actual service.

The best test for attenuators is in a Motion Picture Studio where the most rigid requirements must be met. Signals are mixed at a much lower level than any other type of sound system. Therefore, the Motion Picture Studio sound departments are always on the look out for the most noiseless type of attenuators. That is the reason that Cinema attenuators have become so popular in the motion picture industry in the last few years. Our pots are the quietest and smoothest operating attenuators ever made.

The brush construction on Cinema Engineering attenuators is especially worthy of mention as careful design of the contact springs is an important contributing factor to the superiority and long, trouble-free life of these units. All brushes consist of three laminations. Each lamination is of spring

brass with an unusually high degree of resiliency to assure long and dependable action. Each spring is individually formed and carefully checked before assembly.

The brushes on all Cinema Engineering Company attenuators have square corners rather than the usual rounded corners. This assures lower contact point resistance and more precision alignment of the brush contact surface with the points. Properly aligned square brush faces make possible an extremely smooth action, eliminating the tendency to click between contact points. Long experience in the design and manufacture of precision attenuators has indicated that polished contact point surfaces are not conducive to the most satisfactory and dependable operation. Precision grinding of the surface of the contact points after other assembly is completed, make it unnecessary to polish or round off contact point corners or round the brush contact surfaces in order to provide smooth operation. All brushes are carefully lapped in before delivery to assure full and even contact pressure. The fact that these attenuators have such smooth, easy action and still have actually $\frac{1}{2}$ lb. pressure or more at the contact point of each brush to assure firm contact and good cleaning action is a tribute to the careful design of Cinema Engineering attenuators.

All units are assembled with full reamed sleeve bearing and ground shaft which assures smooth action and makes possible the highest degree of alignment accuracy. All controls are constructed with special stop pins at least $\frac{1}{8}$ " in diameter. No Cinema Engineering control, regardless of price or type, depends upon the contact of the brush springs with a pin to provide end-of-travel stop.

Ordering Information

When ordering attenuators please give complete information as to the type required. The following information is necessary if we are to fill your order properly.

1. Type number.
2. Input impedance.
3. Output impedance.
4. Number of steps.
5. Attenuation per step.
6. Total attenuation or attenuation on last step.
7. Impedance for Grid Control Potentiometers.
8. Type of circuit (ladder, "T", "H", "L", etc.).
9. Degrees rotation on special attenuators.
10. Direction of Attenuation (clockwise or counter-clockwise).
11. Is last step infinity?

Shipping Information

Unless otherwise specified on your order, all merchandise will be shipped the best way in our judgment.

Claims for damage in transit should be made to the carrier.

No material is returnable for exchange or credit unless express permission from us in writing is first obtained.

Unless proper credit is established prior to shipment material will be shipped C. O. D.

All prices and/or designs are subject to change without notice.

ATTENUATOR DIALS — SPECIAL DIALS

The dials on any attenuator or control except the mixers may be calibrated in any way the customer wishes if specified with order. Otherwise, it will be calibrated directly in decibels. Special dials for any purpose—prices on request.

MIXER CONTROLS



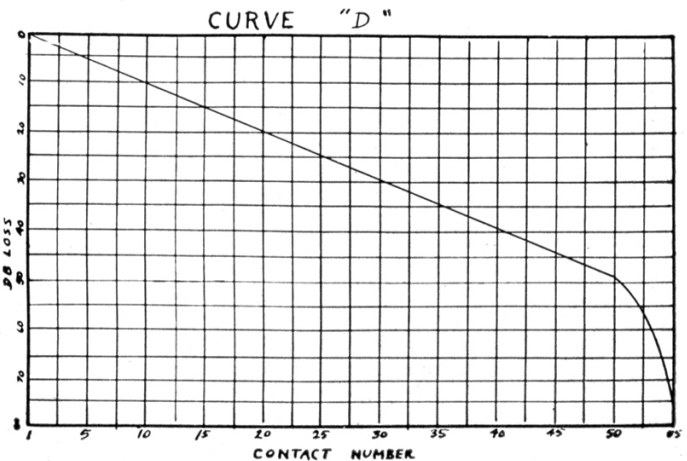
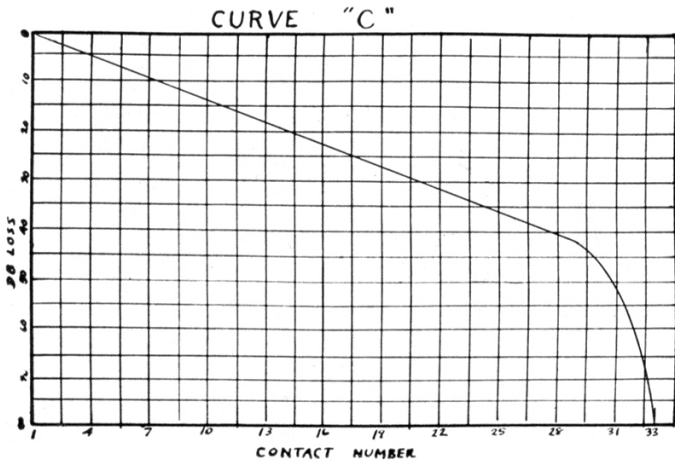
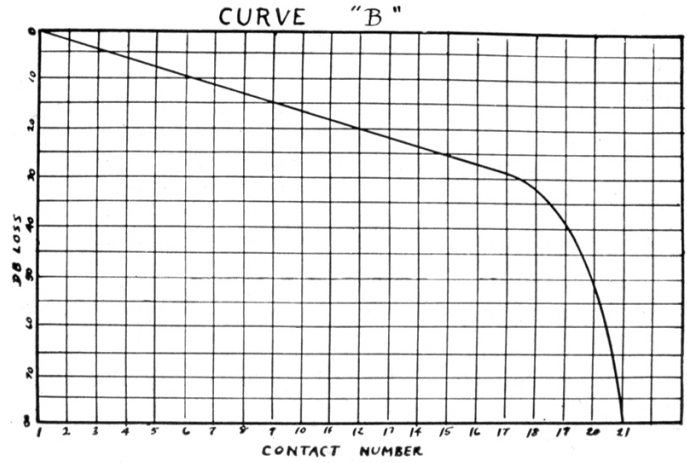
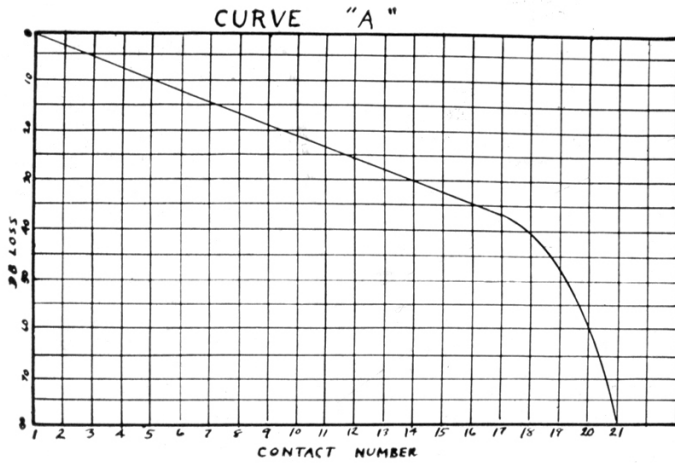
Due to the great number of different types and impedances of attenuators, we are only listing the type numbers so it will be necessary to specify the impedance. The following prices are for impedances from 30 to 600 ohms. For impedances above 600 ohms, prices on request. No detents are supplied on mixer controls. The wattage rating shown is for a sustained tone continuously.

TYPE NO.	NO. OF STEPS	INS. LOSS	DB PER STEP	TOTAL LOSS DB	TYPE CIRCUIT	SIZE FRAME	TYPE FRAME	MAX. WATTS	NET PRICE
1384	20	6 DB	2 1/3	See Curve A	Ladder	1 3/4	A	4	
1156	32	6 DB	1 1/2	See Curve C	Ladder	2	B	4	
1886	32	6 DB	1 1/2	See Curve C	Bal. Ladder	2 1/2	C	5	
1218	32	0 DB	1 1/2	See Curve C	Bridged "T"	2 1/2	C	5	
1036	40	6 DB	1	See Curve G	Ladder	3	D	6	
1047	Slide Wire	6 DB	1/25	See Curve C	Ladder	2 1/2	C	3	
3182	Slide Wire	6 DB	1/25		Ladder	2 1/2	C	3	

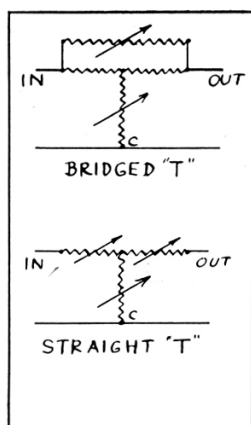
Any special Curve may be had on order at a \$3.00 setup charge.

Any impedance from 30 ohms to 600 ohms—in or out—may be had at the above price.

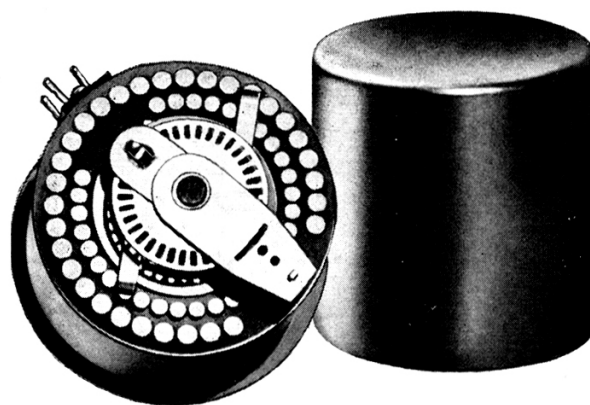
CURVES



FOR FRAME DIMENSIONS OF ALL STANDARD ATTENUATOR FRAMES SEE PAGE 14



PRECISION BRIDGED "T" STRAIGHT "T" ATTENUATORS



The Precision attenuators may be used successfully at frequencies above **100 kilocycles**; For instance there is practically no error up to 80 KC loss and at 200,000 cycles there is approximately 2 DB leakage at 40 DB attenuation. In other words when an attenuator is set at 40 DB, the actual loss at 200 kilocycles would be approximately 38 DB.

Precision 30 to 600 ohms. All resistors held to within $\pm 1\%$ accuracy, suitable for gain sets, equalizers and measuring Instruments. They may be had with odd number of steps at the same price as the nearest number of contacts shown above the number desired. They may also be had as straight "T" attenuators if desired.

TYPE NO.	NO. OF STEPS	DB PER STEP	TOTAL DB LOSS	CONTACT SPACE	SIZE FRAME	TYPE FRAME	MAX WATTS	NET PRICE
1011-A	5	.2	1.0	10°	2	B	3	
1011-B	5	.25	1.25	10°	2	B	3	
1011-C	5	.5	2.5	10°	2	B	3	
1010-A	5	1	5	10°	2	B	3	
1010-B	5	2	10	10°	2	B	3	
1010-C	5	3	15	10°	2	B	3	
1010-D	5	4	20	10°	2	B	3	
1010-E	5	5	25	10°	2	B	3	
1010-F	5	6	30	10°	2	B	3	
1010-G	5	10	50	10°	2	B	5	
1009-A	10	.1	1.0	10°	2½	C	4	
1009-B	10	.2	2.0	10°	2½	C	4	
1009-C	10	.25	2.5	10°	2½	C	4	
1009-D	10	.3	3.0	10°	2½	C	4	
1009-E	10	.5	5.0	10°	2½	C	4	
1253-A	10	1	10	10°	2½	C	4	
1253-B	10	2	20	10°	2½	C	4	
1253-C	10	3	30	10°	2½	C	4	
1253-D	10	4	40	10°	2½	C	4	
1253-E	10	5	50	10°	2½	C-Ganged	5	
1253-F	10	6	60	10°	2½	C-Ganged	5	
1007-A	15	.1	1.5	10°	2½	C	6	
1007-B	15	.2	3.0	10°	2½	C	6	
1007-C	15	.25	3.75	10°	2½	C	6	
1007-D	15	.3	4.5	10°	2½	C	6	
1007-E	15	.5	7.5	10°	2½	C	6	
1259-A	15	1	15	10°	2½	C	6	
1259-B	15	2	30	10°	2½	C	6	
1259-C	15	3	45	10°	2½	C	6	
1259-D	15	4	60	10°	2½	C	6	
1259-E	15	5	75	10°	2½	C-Ganged	6	
1006-A	20	.1	2.0	10°	2½	C	6	
1006-B	20	.2	4.0	10°	2½	C	6	
1006-C	20	.25	5.0	10°	2½	C	6	
1006-D	20	.3	6.0	10°	2½	C	6	
1006-E	20	.5	10.0	10°	2½	C	6	

FOR FRAME DIMENSIONS OF ALL STANDARD ATTENUATOR FRAMES SEE PAGE 14

VARIABLE ATTENUATORS

PRECISION (Continued)

TYPE NO.	NO. OF STEPS	DB PER STEP	TOTAL DB LOSS	CONTACT SPACE	SIZE FRAME	TYPE FRAME	MAX WATTS	NET PRICE
1327-A	20	1	20	10°	2½	C	6	
1327-B	20	2	40	10°	2½	C	6	
1327-C	20	3	60	10°	2½	C	6	
1327-D	20	4	80	10°	2½	C-Ganged	6	
1005-A	25	.1	2.5	10°	2½	C	6	
1005-B	25	.2	5.0	10°	2½	C	6	
1005-C	25	2.5	6.25	10°	2½	C	6	
1005-D	25	3	7.5	10°	2½	C	6	
1005-E	25	5	12.5	10°	2½	C	6	
1328-A	25	1	25	10°	2½	C	6	
1328-B	25	2	50	10°	2½	C	6	
1328-C	25	3	75	10°	2½	C-Ganged	6	
1004-A	30	.1	3.0	10°	2½	C	6	
1004-B	30	.2	6.0	10°	2½	C	6	
1004-C	30	.25	7.5	10°	2½	C	6	
1004-D	30	.3	9.0	10°	2½	C	6	
1004-E	30	.5	15.0	10°	2½	C	6	
1191-A	30	1	30	10°	2½	C	6	
1191-B	30	2	60	10°	2½	C-Ganged	6	
1778-A	55	.1	5.5	6°	4	E	8	
1778-B	55	.2	11.0	6°	4	E	8	
1778-C	55	.25	13.75	6°	4	E	8	
1778-D	55	1.	55.0	6°	4	E	8	

Any precision "T" or bridged "T" may be had with special attenuation curves at the price of the unit with the nearest number of steps above the one required—or if the number of steps required is the same as a unit listed, the price will be the same.

The in and out impedances on any attenuator up to and including 600 ohms may be specified by the customer. (Example: 325 ohms in, and 578 ohms out). No extra charge will be asked.

BRIDGED "T" ATTENUATORS

GENERAL PURPOSE

General purpose 15 to 600 ohm impedance—with or without detents—All resistors wire wound—±5% accuracy.

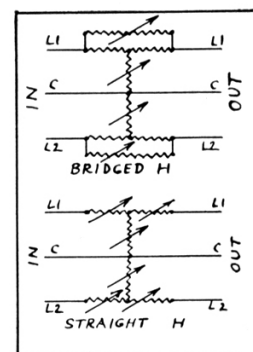
Attenuators may be had with odd number of steps for the same price as the nearest number of contacts shown above the number desired.

TYPE NO.	NO. OF STEPS	DB PER STEP	TOTAL DB LOSS	CONTACT SPACE	SIZE FRAME	TYPE FRAME	MAX WATTS	NET PRICE
1017-A	5	1	5	15°	1¾	A	2	
1017-B	5	2	10	15°	1¾	A	2	
1017-C	5	3	15	15°	1¾	A	2	
1017-D	5	5	25	15°	1¾	A	2	
1015-A	10	1	10	10°	2	B	4	
1015-B	10	2	20	10°	2	B	4	
1015-C	10	3	30	10°	2	B	4	
1015-D	10	4	40	10°	2	B	4	
1014-A	15	1	15	10°	2½	C	4	
1014-B	15	2	30	10°	2½	C	4	
1014-C	15	3	45	10°	2½	C	4	
1013-A	20	1	20	10°	2½	C	4	
1013-B	20	2	40	10°	2½	C	4	
1012-A	30	1	30	10°	2½	C	6	

FOR FRAME DIMENSIONS OF ALL STANDARD ATTENUATOR FRAMES SEE PAGE 14



PRECISION BAL. H Attenuators



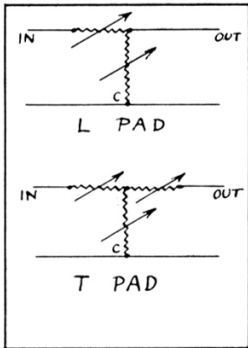
The Precision attenuators may be used successfully at frequencies above **100 kilocycles**; For instance there is practically no error up to 80 KC loss and at 200,000 cycles there is approximately 2 DB leakage at 40 DB attenuation. In other words when an attenuator is set at 40 DB, the actual loss at 200 kilocycles would be approximately 38 DB.

30 to 600 ohms. All resistors $\pm 1/2\%$. Suitable for gain sets and measuring equipment. Odd steps may be had if specified.

TYPE NO.	NO. OF STEPS	DB PER STEP	TOTAL DB LOSS	CONTACT SPACE	SIZE FRAME	TYPE FRAME	MAX WATTS	NET PRICE
1405-A	10	.1	1.0	10°	2½	C	6	
1405-B	10	.2	2.0	10°	2½	C	6	
1405-C	10	.25	2.5	10°	2½	C	6	
1405-D	10	.3	3.0	10°	2½	C	6	
1405-E	10	.4	4.0	10°	2½	C	6	
1405-F	10	.5	5.0	10°	2½	C	6	
1331-A	10	1	10	10°	2½	C	6	
1331-B	10	2	20	10°	2½	C	6	
1331-C	10	3	30	10°	2½	C	6	
1331-D	10	4	40	10°	2½	C	6	
1331-E	10	5	50	10°	2½	C	6	
1408-A	15	.1	1.5	10°	2½	C	6	
1408-B	15	.2	3.0	10°	2½	C	6	
1408-C	15	.25	3.75	10°	2½	C	6	
1408-D	15	.3	4.5	10°	2½	C	6	
1408-E	15	.4	6.0	10°	2½	C	6	
1408-F	15	.5	7.5	10°	2½	C	6	
1256-A	15	1	15	10°	2½	C	6	
1256-B	15	2	30	10°	2½	C	6	
1256-C	15	3	45	10°	2½	C	6	
1256-D	15	4	60	10°	2½	C-Ganged	6	
1229-A	19	1	19	8°	3	D	6	
1229-B	19	2	38	8°	3	D	6	
1229-C	19	3	57	8°	3	D-Ganged	6	
1406-A	20	.1	2.0	8°	3	D	6	
1406-B	20	.2	4.0	8°	3	D	6	
1406-C	20	.25	5.0	8°	3	D	6	
1406-D	20	.3	6.0	8°	3	D	6	
1406-E	20	.4	8.0	8°	3	D	6	
1406-F	20	.5	10.0	8°	3	D	6	
1409-A	20	1	20	8°	3	D	6	
1409-B	20	2	40	8°	3	D	6	
1409-C	20	3	60	8°	3	D-Ganged	6	
1410-A	25	1	25	10°	4	E	8	
1410-B	25	2	50	10°	4	E	8	
1410-C	25	3	75	10°	4	E-Ganged	8	
1332-A	30	1	30	10°	2½	C	6	
1332-B	30	2	60	10°	2½	C-Ganged	6	

Special Note: Balanced H attenuators may be assembled of any 2 bridged "T" units ganged back to back. Be sure to specify that they will be used as balanced H pads.

VARIABLE ATTENUATORS



D. B. METER

RANGE EXTENDING Attenuators



These Attenuators can be had in 1500 or 5000 ohm impedance for use with volume indicator units. The dials are so calibrated that the dial reading may be added to the meter reading and the level read direct. All resistors adjusted to within $\pm 1\%$. Volume indicator attenuators are normally supplied as L network. T circuit may be had at the same price if requested at time of order.

TYPE	NO. OF STEPS	DB PER STEP	RANGE	SPACING CONTACT	FRAME SIZE	FRAME TYPE	PRICE NET
994	10	.1	0 to +1	15°	2½	C	
1337-A	10	1	0 to +10	15°	2	B	
1337-B	10	2	0 to +20	15°	2	B	
1338-A	15	1	0 to +15	10°	2½	C	
1338-B	15	2	0 to +30	10°	2½	C	
1340-A	20	1	0 to +20	10°	2½	C	
1340-B	20	2	0 to +40	10°	2½	C	
993	25	1	0 to +25	10°	2½	C	
1414	30	1	0 to +30	10°	2½	C	
1344-A	10	1	-10 to 0	15°	2	B	
1344-B	10	2	-10 to +10	15°	2	B	
1344-C	10	5	-10 to +35	15°	2	B	
1339-A	15	1	-10 to +.5	10°	2½	C	
1339-B	15	1	-10 to +20	10°	2½	C	
1339-C	15	3	-10 to +35	10°	2½	C	
1341-A	20	1	-10 to +10	10°	2½	C	
1341-B	20	2	-10 to +30	10°	2½	C	
1343-A	25	1	-10 to +15	10°	2½	C	
1343-B	25	2	-10 to +40	10°	2½	C	

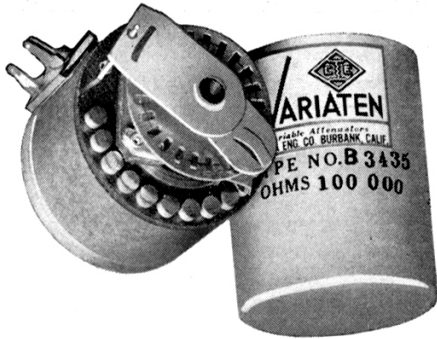
Special units may be had on short notice at the same price as the unit with the nearest greater number of steps of the above units.

V. U. METER RANGE EXTENDING ATTENUATORS

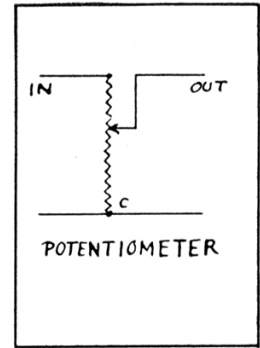
Dials calibrated in volume units for use with Weston Type 30 or General Electric Type DO 61 or similar instruments. 3900 ohm T network represents a load of 7500 ohms across a loaded 600 ohm line, when a 3600 ohm series resistor is connected in the input of the attenuator. All resistors adjusted to within $\pm 1\%$.

TYPE	NO. OF STEPS	DB PER STEP	RANGE	CONTACT SPACING	SIZE FRAME	TYPE FRAME	NET PRICE
1621-A	10	1	+4 to +14	15°	2½	C	
1621-B	10	2	+4 to +24	15°	2½	C	
1621-C	10	3	+4 to +34	15°	2½	C	
992-A	16	1	+4 to +20	10°	2½	C	
992-B	16	2	+4 to +34	10°	2½	C	
2044-A	20	1	+4 to +24	10°	2½	C	
2044-B	20	2	+4 to +44	10°	2½	C	
1528-A	21	1	+4 to +26	10°	2½	C	
1528-B	21	2	+4 to +46	10°	2½	C	
991	26	1	+4 to +32	10°	2½	C	
990	30	1	+4 to +34	10°	3	D	

FOR FRAME DIMENSIONS OF ALL STANDARD ATTENUATOR FRAMES SEE PAGE 14



PRECISION GRID CONTROL Potentiometers



These units are calibrated to work into infinite impedance loads; such as the grid of a tube. All resistors are wire wound non-inductive. May be had with or without detents.

TYPE NO.	NO. OF STEPS	DB PER STEP	TOTAL DB LOSS	CONTACT SPACING	SIZE FRAME	FRAME TYPE	Net prices up to the following impedance					
							10M	25M	50M	100M	250M	500M
1333-A	10	1	0-10	20°	2	B						
1333-B	10	2	0-20	20°	2	B						
1333-C	10	3	0-30	20°	2	B						
1333-D	10	4	0-40	20°	2	B						
1333-E	10	5	0-50	20°	2	B						
1333-F	10	6	0-60	20°	2	B						
1335-A	15	1	0-15	15°	2	B						
1335-B	15	2	0-30	15°	2	B						
1335-C	15	3	0-45	15°	2	B						
1335-D	15	4	0-60	15°	2	B						
1335-E	15	5	0-75	15°	2	B						
1335-F	15	6	0-90	15°	2	B						
1149-A	20	1	0-20	10°	2	B						
1149-B	20	2	0-40	10°	2	B						
1149-C	20	3	0-60	10°	2	B						
1149-D	20	4	0-80	10°	2	B						
1411-A	25	1	0-25	10°	2	B						
1411-B	25	2	0-50	10°	2	B						
1411-C	25	3	0-75	10°	2	B						
1272-A	30	1	0-30	10°	2	B						
1272-B	30	2	0-60	10°	2	B						
1272-C	30	3	0-90	10°	2	B						

NOTE: Any odd number of steps may be had on any attenuator at the same price as the unit with the nearest number of steps listed above the number desired.

General Purpose GRID CONTROL POTENTIOMETER

The units listed below have the same general characteristics as the Precision Grid Control Potentiometers except that resistance tolerances are held to only 5%. All resistors are non-inductive, wirewound. The units may be had with or without detents.

TYPE NO.	NO. OF STEPS	DB PER STEP	TOTAL DB LOSS	CONTACT SPACING	SIZE FRAME	FRAME TYPE	Net prices up to the following impedance					
							10M	25M	50M	100M	250M	500M
1029-A	10	1	0-10	15°	1 3/4	A						
1029-B	10	2	0-20	15°	1 3/4	A						
1029-C	10	3	0-30	15°	1 3/4	A						
1029-D	10	4	0-40	15°	1 3/4	A						
1029-E	10	5	0-50	15°	1 3/4	A						
1029-F	10	6	0-60	15°	1 3/4	A						
1028-A	15	1	0-15	10°	2	B						
1028-B	15	2	0-30	10°	2	B						
1028-C	15	3	0-45	10°	2	B						
1028-D	15	4	0-60	10°	2	B						
1028-E	15	5	0-75	10°	2	B						
1028-F	15	6	0-90	10°	2	B						

VARIABLE ATTENUATORS

General Purpose Grid Control Potentiometers, Cont.

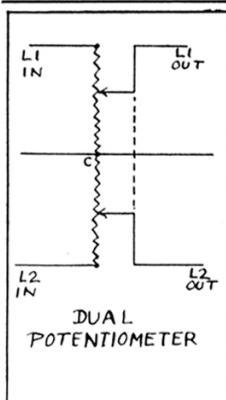
TYPE NO.	NO. OF STEPS	DB PER STEP	TOTAL DBLOSS	CONTACT SPACING	FRAME SIZE	FRAME TYPE	Net prices up to the following impedance					
							10M	25M	50M	100M	250M	500M
1027-A	20	1	0-20	10°	2	B						
1027-B	20	2	0-40	10°	2	B						
1027-C	20	3	0-60	10°	2	B						
1027-D	20	4	0-80	10°	2	B						
1026-A	30	1	0-30	10°	2	B						
1026-B	30	2	0-60	10°	2	B						
1026-C	30	3	0-90	10°	2	B						
1025-A	40	1	0-40	8°	3	D						
1025-B	40	2	0-80	8°	3	D						

GENERAL PURPOSE CARBON POTENTIOMETERS

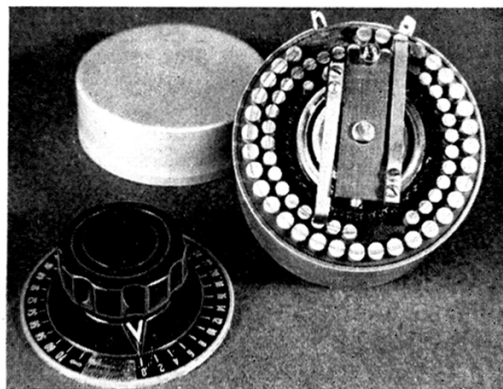
Grid control potentiometers are available with carbon resistors in all stock types as listed above or with special resistance values according to customers specifications.

Resistance values of Carbon potentiometers are selected and checked and guaranteed within the tolerances specified by the resistor manufacturer.

All Carbon Potentiometers, regardless of impedance, are priced the same as a corresponding type General Purpose Wire-wound Potentiometer of 10,000 ohm impedance.



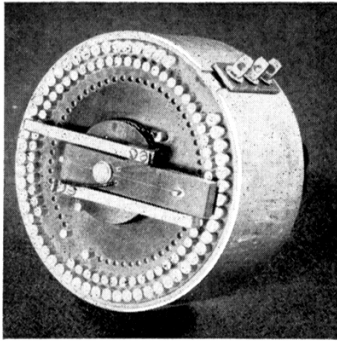
DUAL PRECISION WIRE WOUND GRID Potentiometers



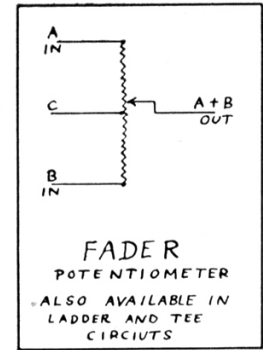
The impedance is the resistance between one line terminal and the center tap. These units are designed to work into an infinite impedance but may be supplied to work into loaded grids, if data is given with order.

TYPE NO.	NO. OF STEPS	DB PER STEP	TOTAL DBLOSS	CONTACT SPACING	FRAME SIZE	FRAME TYPE	Net Prices up to the following impedances					
							10M	25M	50M	100M	250M	500M
1023-A	10	1	0-10	20°	2	B						
1023-B	10	2	0-20	20°	2	B						
1023-C	10	3	0-30	20°	2	B						
1023-D	10	4	0-40	20°	2	B						
1023-E	10	5	0-50	20°	2	B						
1023-F	10	6	0-60	20°	2	B						
1022-A	15	1	0-15	10°	2	B						
1022-B	15	2	0-30	10°	2	B						
1022-C	15	3	0-45	10°	2	B						
1022-D	15	4	0-60	10°	2	B						
1022-E	15	5	0-75	10°	2	B						
1021-A	20	1	0-20	10°	2½	C						
1021-B	20	2	0-40	10°	2½	C						
1021-C	20	3	0-60	10°	2½	C						
1021-D	20	4	0-80	10°	2½	C						
1020-A	25	1	0-25	10°	2½	C						
1020-B	25	2	0-50	10°	2½	C						
1020-C	25	3	0-75	10°	2½	C						
1019-A	30	1	0-30	10°	2½	C						
1019-B	30	2	0-60	10°	2½	C						
1019-C	30	3	0-90	10°	2½	C						

WITH WIRE WOUND RESISTORS. Any attenuator can be had with odd DB steps other than that shown for a small set-up charge extra.



TURNTABLE FADERS



For fading one turntable or projection machine to the other. 26 steps to infinity then 26 steps back to 0 with infinity in the center. Calibrated dial marked with red on one side and white on the other. May be had either as a matched Ladder or bridged T in any impedance up to 600 ohms or as a grid control up to 500,000 ohms. May be had with or without detent.

FADERS WITH 26 STEPS EACH SIDE OF INFINITY

TYPE	RANGE DB	CONTACT SPACING	CKT	SIZE FRAME	TYPE FRAME	NET PRICE
988	0—∞—0	6°	Bridge-T	4"	E	
987	0—∞—0	6°	Ladder	4"	E	
986	0—∞—0	6°	Potentiometer	4"	E	

FADERS WITH 20 STEPS EACH SIDE OF INFINITY

TYPE	RANGE DB	CONTACT SPACING	CKT	SIZE FRAME	TYPE FRAME	NET PRICE
985	0—∞—0	8°	Potentiometer	3"	D	
984	0—∞—0	8°	Ladder	3"	D	

FADERS WITH 16 STEPS EACH SIDE OF INFINITY

TYPE	RANGE DB	CONTACT SPACING	CKT	SIZE FRAME	TYPE FRAME	NET PRICE
983	0—∞—0	10°	Potentiometer	2	B	
982	0—∞—0	10°	Ladder	2	B	
981	0—∞—0	10°	Bridged T	2½	C	

FADERS WITH 10 STEPS EACH SIDE OF INFINITY

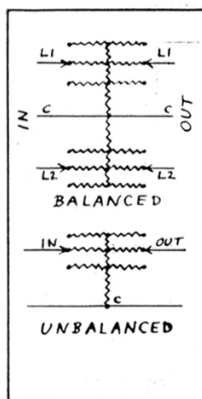
TYPE	RANGE DB	CONTACT SPACING	CKT	SIZE FRAME	TYPE FRAME	NET PRICE
3132	0—∞—0	15°	Ladder	1¾"	A	

LOUD SPEAKER CONTROLS

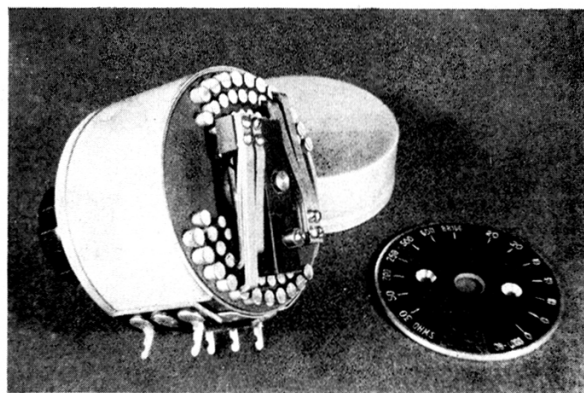
The following attenuators are suitable for service for speaker volume controls, with or without detent (INDEXING DEVICE). All wire wound resistors ± 5%. The output of 40 Watt amplifiers operating on speech and music will not damage these controls.

TYPE NO.	NO. OF STEPS	INS LOSS	CONT. SPACE	DB PER STEP	TOTAL LOSS DB	TYPE CIRCUIT	SIZE FRAME	TYPE FRAME	MAX WATTS	NET PRICE
1521-A	20	6	10°	1	20	Ladder	1¾	A	4	
1521-B	20	6	10°	2	40	Ladder	1¾	A	4	
1521-C	20	6	10°	3	60	Ladder	1¾	A	4	
1521-D	20	6	10°	4	80	Ladder	1¾	A	4	
1034-A	20	0	10°	1	20	Bridg-T	2½	C	5	
1034-B	20	0	10°	2	40	Bridg-T	2½	C	5	
1033-A	15	0	10°	1	15	Bridg-T	2½	F	5	
1033-B	15	0	10°	2	30	Bridg-T	2½	F	5	
1033-C	15	0	10°	3	45	Bridg-T	2½	F	5	
1032-A	10	0	15°	1	10	Bridg-T	2	F	4	
1032-B	10	0	15°	2	20	Bridg-T	2	F	4	
1032-C	10	0	15°	3	30	Bridg-T	2	F	4	
1032-D	10	0	15°	4	40	Bridg-T	2	F	4	

Any of the above controls are available in impedance from 8 to 600 ohms. The last step can be made Infinity if so specified at time of order.



PRECISION IMPEDANCE MATCHING Attenuators



TYPE	OHMS INPUT	OHMS OUTPUT	LOSS DB	NO. OF STEPS	SIZE FRAME	TYPE FRAME	NET PRICE BAL-H	NET PRICE T
2066-A	500	30	20	8 Steps 20° Apart	2½"	C		
		50	20					
		125	20					
		150	20					
		200	10					
		250	10					
		500	0					
600	10							
2066-B	600	30	20	8 Steps 20° Apart	2½"	C		
		50	20					
		125	20					
		150	20					
		200	10					
		250	10					
		500	10					
600	0							
2066-C	500	30	20	8 Steps 20° Apart	2½"	C		
		50	20					
		125	20					
		150	20					
		200	20					
		250	20					
		500	20					
600	20							
2066-D	600	30	20	8 Steps 20° Apart	2½"	C		
		50	20					
		125	20					
		150	20					
		200	20					
		250	20					
		500	20					
600	20							

Other impedances in and out may be had at 10% extra cost.

LOAD NETWORKS

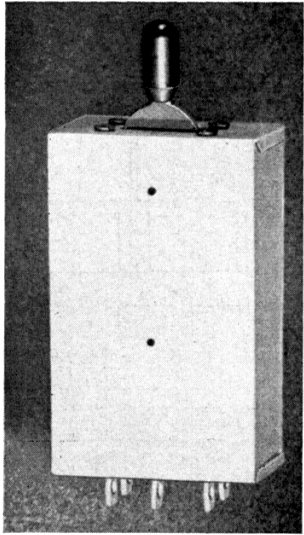
The TYPE 2084 Load Network together with its associated Type 2083 Potential Coil combine to supply an accurate loading network for use in transmission measuring sets and power level meters. Voltage correction is automatically applied at any position to attain accurate power levels at the indicated impedance. Maximum power handling capacity, 6 watts.

TYPE NO.	LOADS AVAILABLE	CONTACT SPACING	SIZE FRAME	TYPE FRAME	NET PRICE
2084-A	15, 50, 150, 200, 250, 500, 600 ohms	10°	2½"	C	
2084-B	30, 50, 150, 200, 250, 500, 600 ohms	10°	2½"	C	
2084-C	15, 30, 50, 200, 250, 500, 600 ohms	10°	2½"	C	

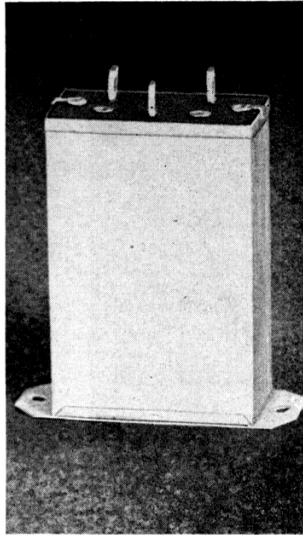
TYPE 2083 POTENTIAL TRANSFORMER for use with the Type 2084 load networks. Transformer matches any of the above load networks. Net Price

FOR FRAME DIMENSIONS OF ALL STANDARD ATTENUATOR FRAMES SEE PAGE 14

FIXED ATTENUATORS and MATCHING PADS 12



TYPE 1383 PAD



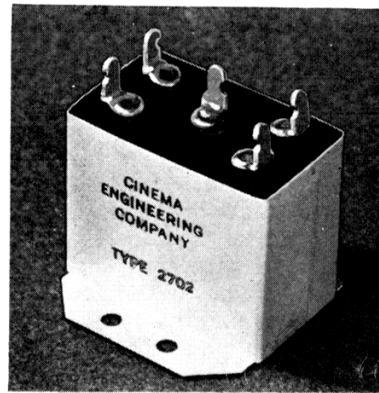
TYPE 1008 PAD

TYPE 2702. This is a small general purpose pad that can be supplied in any of the standard circuits or as a resistive network requiring not more than six terminal lugs. All resistors are held to an accuracy of 5% and are non-inductively wound on spools. The general characteristics, size and price of this pad have made it extremely popular for all general requirements in audio channels of broadcast stations, motion picture studios and recording studios.

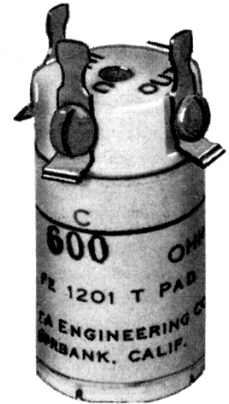
TYPE 1201. This pad is available in "L" and "T" circuits only. It is wound on a standard resistor form and mounts with a single 6-32 machine screw. This is a general purpose pad recommended where space limitations are a factor.

Our line of fixed pads have most of the design features of our variable attenuators. They are non inductively wound on cards. They may be obtained in all types: L, T, H, balanced H, π , matching L, T, U, H, balanced U, balanced H,— bridging L, U,— mixer matching net works.

TYPE 1008. This pad is available in any of the above circuits or in any network requiring a maximum of eight terminal lugs. The TYPE 1008 is a precision pad originally designed for use in transmission measurements and offers the utmost in accuracy of calibration and dependability. All resistances are non-inductively wound on a card and resistance accuracy is maintained within 1%. WE CAN POSITIVELY GUARANTEE LESS THAN .2 db LEAKAGE AT 20,000 CYCLES IN ANY OF THESE PADS. TYPE 1003 Pads are available in any loss up to 40 db.



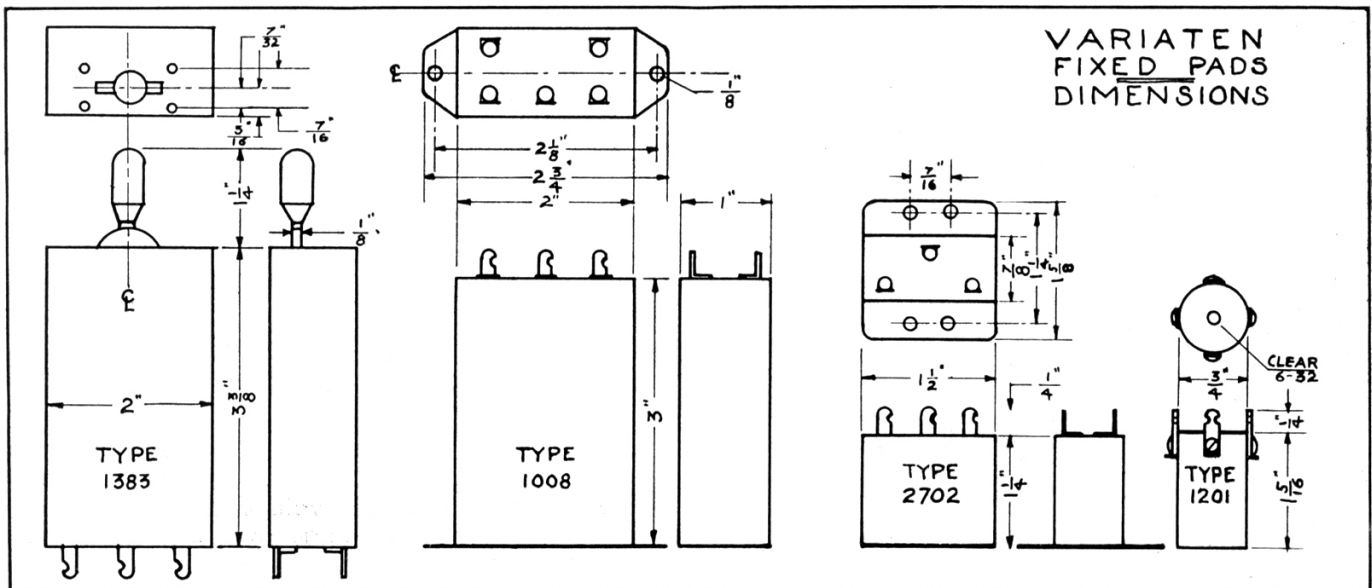
TYPE 2702



TYPE 1201

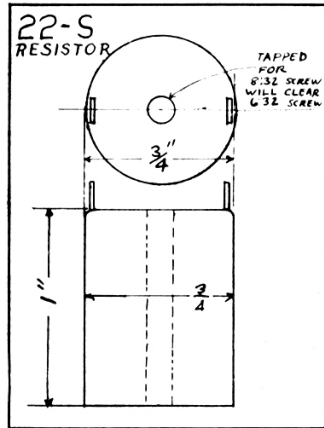
TYPE 3046. This is a larger size case having a body dimension of 2" x 4" x 2" and a mounting base dimension of 2 3/4" x 4".

TYPE	Net Price
1008 ANY VALUE LOSS UP TO 40 DB L-T-U-H-O- π AND MATCHING NETWORKS.....
1201 ANY VALUE LOSS UP TO 40 DB L-T AND UNBALANCED MATCHING NETWORKS
2702 ANY VALUE LOSS UP TO 40 DB L-T-U-H-O- π AND MATCHING NETWORKS.....
1383 KEY PAD UP TO 40 DB L-U-T-H AND MATCHING NETWORKS.....
1008 SPECIAL RESISTOR NETWORKS.....	PRICES CN REQUEST
3046 SPECIAL LARGE RESISTIVE NETWORKS.....	Prices on request



RESISTORS

22-S RESISTOR



The 22-S Resistors represent over a year and a half of constant research and development. They are non-inductively pie wound on a specially designed Isolantite form and encased in a moulded bakelite shell.

The spool of the 22-S resistor is of a new and unique design having the lugs screwed to the spool head. It has a shoulder to brace the top of the shell as well as to isolate the lugs from the mounting screw. One end of the wire connects to one of the lugs directly from the top pie, while the other end of the wire is carried from the lug in a small hole drilled through the hub of the spool and opening into the bottom pie. This isolates the wire from both the coil and the mounting screw with Isolantite.

This spool is designed for and will withstand 1,000 volts, working voltage.

The completed windings are thoroughly impregnated with a special compound of high melting point. Finished resistors show exceptional resistance to moisture penetration.

The ratings of these resistors are given below:

Temperature rise at rated wattage:

25°C at center of spool;

10° C on outer surface of spool.

1 Watt in free air; 1½ Watt when mounted on a metal panel by means of 6-32 screw through the resistor.

2 Watt when mounted on a metal panel by means of ½" 8-32 screw into the bottom of the resistor.

NET PRICES ON 22-S RESISTORS

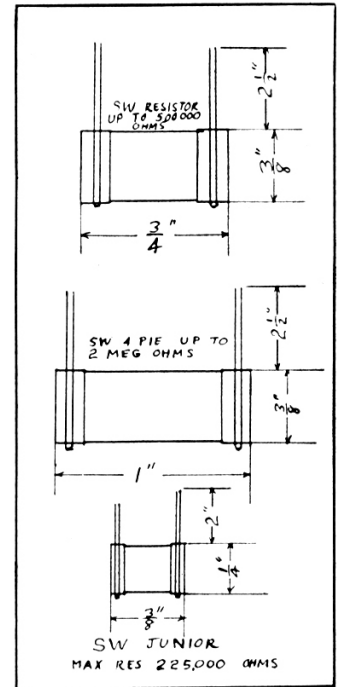
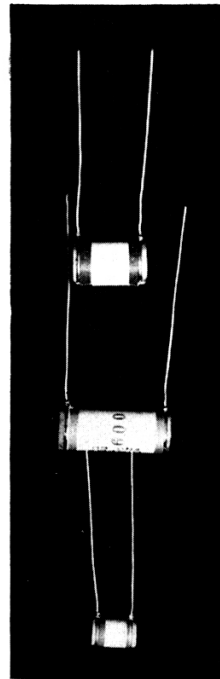
0 to	99 ohms.....	\$
1 to	500 ohms.....	
501 to	1,000 ohms.....	
1,001 to	2,500 ohms.....	
2,501 to	10,000 ohms.....	
10,001 to	20,000 ohms.....	
20,001 to	30,000 ohms.....	
30,001 to	50,000 ohms.....	
50,001 to	100,000 ohms.....	
100,001 to	250,000 ohms.....	
250,001 to	500,000 ohms.....	
500,001 to	1 meg ohms.....	
1 meg.	to 2.25 meg ohms.....	

NORMAL ACCURACY: 1%

ADD 10% FOR ½% ACCURACY

20% FOR ¼%	"
100% FOR .1%	" Values 1 to 500 ohms
50% FOR .1%	" Values above 500 ohms

181 RESISTOR



The 181 Resistors are a non inductive winding, wound on a spool with pigtail wires on the spool head.

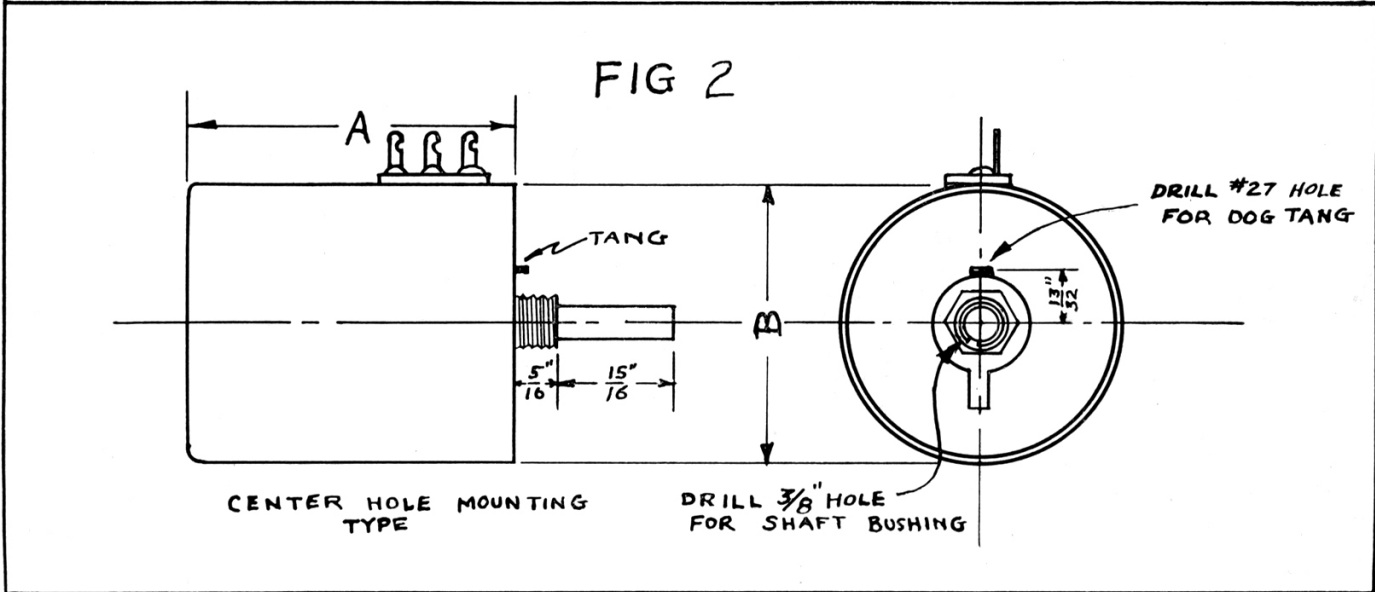
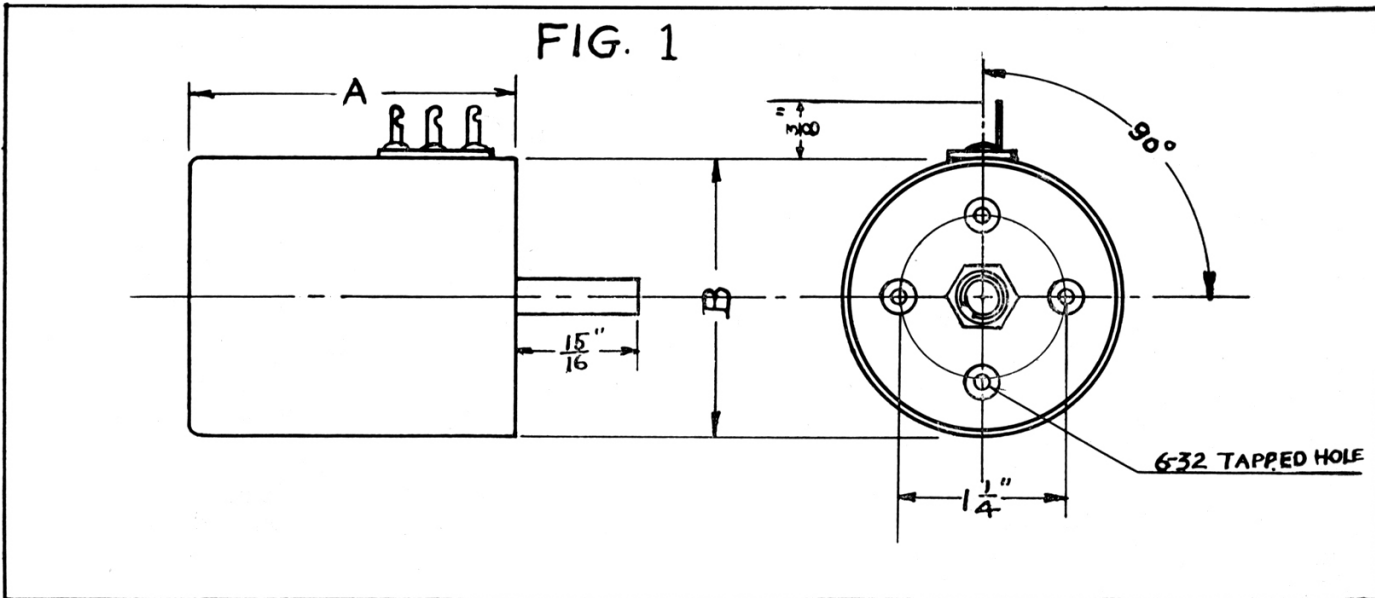
NET PRICES ON 181 RESISTORS

Up to	0.99 ohms.....	\$
Up to	1,000 ohms.....	
Up to	2,000 ohms.....	
Up to	5,000 ohms.....	
Up to	10,000 ohms.....	
Up to	15,000 ohms.....	
Up to	30,000 ohms.....	
Up to	50,000 ohms.....	
Up to	75,000 ohms.....	
Up to	100,000 ohms.....	
Up to	125,000 ohms.....	
Up to	150,000 ohms.....	
Up to	200,000 ohms.....	
Up to	250,000 ohms.....	
Up to	300,000 ohms.....	
Up to	400,000 ohms.....	
Up to	500,000 ohms.....	
Up to	600,000 ohms.....	
Up to	700,000 ohms.....	
Up to	750,000 ohms.....	
Up to	900,000 ohms.....	
Up to	1 Megohm.....	

NORMAL ACCURACY: 1%

SPECIAL TOLERANCES:	½%	ADD	5%
"	"	"	10%
"	"	"	15%
"	"	"	25%
"	"	"	50%

Special and fractional values can be supplied promptly at no extra charge over the brackets in which they fall.

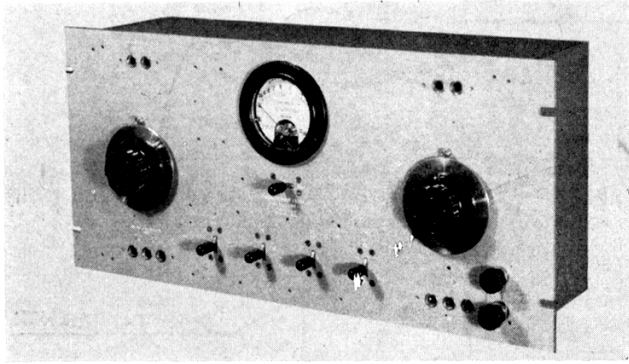


DIMENSIONS OF STANDARD VARIATEN FRAMES									
TYPE FRAME	A DIMENSION	B DIMENSION	FIG	REMARKS	TYPE FRAME	A DIMENSION	B DIMENSION	FIG	REMARKS
A	2 1/8"	1 3/4"	2		L	2 5/8"	3 1/2"	1	
A SHORT	1 5/8"	1 3/4"	2	SPECIAL	M	2 5/8"	4 1/2"	1	
B SHORT	2 1/8"	2 1/8"	1	SPECIAL	N	2 5/8"	7"	1	
B LONG	2 5/8"	2 1/8"	1		O	2 5/8"	8"	1	
C SHORT	2 1/8"	2 1/2"	1	SPECIAL					
C LONG	2 5/8"	2 1/2"	1						
D	2 5/8"	3"	1						
E	2 5/8"	4"	1						
F	2 1/8"	2 1/8"	2						
G	2 1/8"	2 1/2"	2						

DOUBLE GANGED ATTENUATORS

Any of the Attenuators may be ganged together if specified with the order. The direction of attenuation in each unit must be specified when ordered. When 2 of a type are ganged, it is possible to have one unit increase as the other decreases. NET PRICE OF GANGING 2 UNITS\$2.00

TRANSMISSION MEASURING SETS (GAIN SETS)



1435 GAIN SET

Our engineers have spent many months on the designing of this piece of equipment. The result is a unit as near perfect as possible, for the measurement of amplifiers and associated apparatus.

Precision and simplicity of operation have been our aim in building this unit.

This unit consists of balanced H send attenuators, one in steps of 1 DB, and 4 fixed pads switched by keys 10 DB, 20DB, 30DB and 40DB.

There are two jacks marked oscillator input that feed the "send" or input attenuators through a suitable network. This feeds half of the signal to the send VI meter circuit and the other half to the attenuators. A set of jacks are also provided so that by plugging into these jacks the send attenuators may be used as a straight loss network, independent of the rest of the circuit. This makes the gain set serve more than one purpose. For example, gain set, output meter, precision attenuator panel.

There is also an output attenuator calibrated in 2 DB steps from -10 to plus 30 DB. A Vernier can also be supplied on the output attenuator, calibrated in 1/10 DB steps to cover a 2 DB range. This makes the output attenuator variable in 1/10 DB steps from -10 to plus 30 DB.

One Weston Type 301 DB meter is used, connected to the input side of the input attenuators by means of special resistance network, which is so designed as to provide an exact impedance match in all directions. When this VI is switched in to read the output, by the VI transfer key, an artificial load is switched in to preserve the impedance match. In this manner a performance equal to a vacuum tube VI is attained.

Special load resistors for the output of the unit under test can be supplied. These resistors are compensated for the loading effect of the output VI meter in order not to mismatch the line. They are marked with output impedance with which they are intended to be used, such as 500ohm, 250ohm, etc.

These load resistors are supplied separately because of the possibility of an excessive amount of heat being generated and the great number of line impedance values usually encountered in use. We feel that these corrected resistors should be used because in the design and construction of this unit extreme care has been exercised to preserve exact impedance matches throughout, to better than .5%.

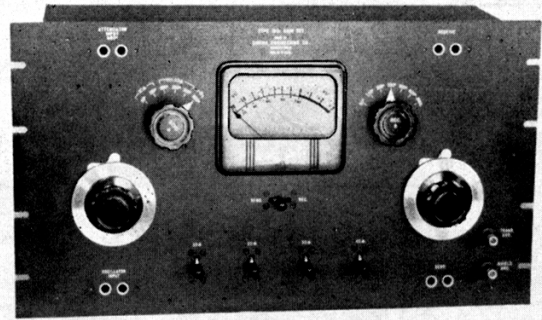
The panel is a standard 19" panel 8³/₄" high mounts either in cabinet or standard rack.

The type 1434 Gain Set is essentially the same as the 1435 except that the send attenuators are a total of 85 DB and the output or receive circuit is equipped with meter and attenuator for a range of from 0 to +30; while the 1435 has a range of 115 DB on the send attenuators and the receive circuit -10 to +30. The panel on the 1434 is a 7"x19" panel.

Both of these units may be used either as a balanced H circuit or unbalanced T circuit.

We guarantee the leakage to be less than 1/2 DB at 20 Kilocycles at full attenuation of the send attenuators. (This is something not accomplished in any other gain set now on the market.)

These units are also available in kit form. The kits are supplied less panel, VI meter and output attenuator.



1901 GAIN SET

The 1901 Gain Set is similar to the 1435 except that it is on a 10¹/₂" panel, and has a send impedance matching pot, with the customer's choice of 8 different impedances, and receive impedance in 8 different impedances, in addition to bridging impedance of 5,000 ohms. There is no compensation necessary when using different impedances as this is done by a direct reading dial in the send matching pot, and in the receive circuit a matching coil is used, matching the meter impedance to the impedance to which the dial is set. Load resistors are incorporated in the receive matching pot.

Any of the above units can be supplied with a basic impedance of 600 ohms and equipped with a VU meter instead of DB meter as is normally supplied.

GAIN SETS AND KITS

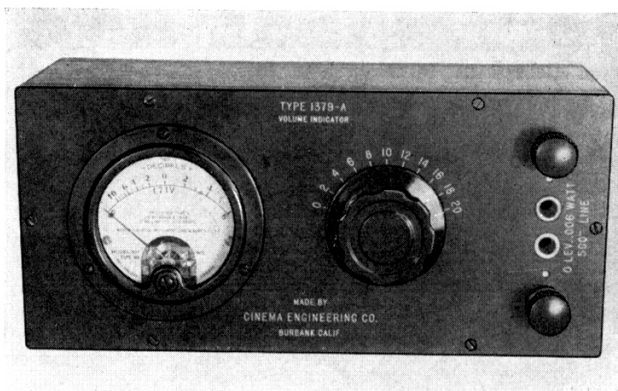
TYPE	FORM	SEND-ATT.	Receive Ckt.	PRICE
1434	Set	85 DB	0 to 30	
1435	Set	115 DB	-10 to 30	
1901A	Set	115 DB	-10 to 30	
1901B	Set	115 DB	-10 to 30	

ANY SPECIAL FEATURES MAY BE INCORPORATED IN THE ABOVE EQUIPMENT TO CUSTOMERS' SPECIFICATIONS.

LOAD RESISTORS ARE WIREWOUND, ACCURATE TO WITHIN .1% ANY SPECIFIED VALUE FROM 1 TO 2,000 ohms.

2 WATT LOAD RESISTORS.....	
20 WATT LOAD RESISTORS.....	
60 WATT LOAD RESISTORS.....	

VOLUME INDICATOR UNITS



1379 VI Panels are a combination of a VI Meter and variable L attenuator mounted on a panel. They can be had in either relay rack or cabinet models. They are essential for measuring output levels or monitoring.

L attenuators are used for extending the range of the meter instead of series resistance multipliers, because they always maintain the same bridging load across the line regardless of the attenuator setting.

We are listing several different types which cover different ranges.

The relay rack models are built on a 3½"x19" dural

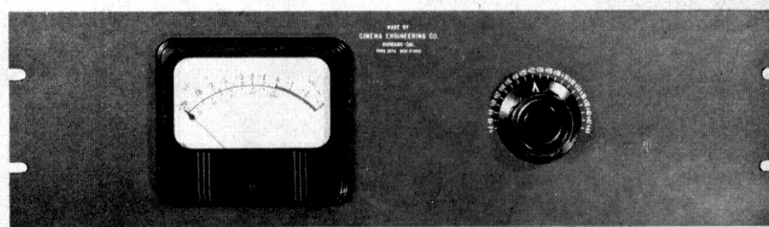
panel 3/16" thick and finished in any of the following finishes: dull black alomalite, light grey enamel, fine grey wrinkle, or fine black wrinkle. The cabinet models have a panel 10x4½" mounted on a mahogany box 3" deep. In order that a standard 1367 plug may be patched in, as well as using cords with clips, the panel has two large binding posts in parallel with two jacks.

TYPE No.	TYPE METER	TYPE ATTENUATOR	DB RANGE	INT. RESISTANCE	CABINET MOUNTING	RACK MOUNTING
1379-A	1465	1337-B	-10 to +26	5000		
1379-B	1465	1338-B	-10 to +36	5000		
1379-C	1465	1340-B	-10 to +40	5000		
1379-D	1372	1339-B	-20 to +26	5000		
1379-E	1372	1341-B	-20 to +36	5000		
1379-F	1372	1343-A	-20 to +40	5000		

Any other combination of meter and attenuator can be assembled in panels as above. The price can be determined by combining the price of the attenuator

and meter desired and adding \$14.00 for the rack type or \$20.00 for the cabinet type.

VOLUME UNIT INDICATORS



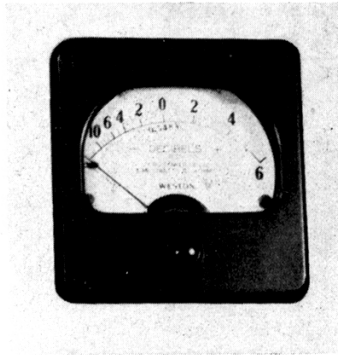
The Cinema Engineering Company's VU Meters are essentially the same as the VI units except that they are equipped with a standard VU meter (made to Bell Laboratories VU meter specifications) mounted on a panel or in a cabinet with a 3900 ohm T attenuator and a 3600 ohm resistor in series so that the input impedance of the circuit is a 7500 Bridging load. The panel is a standard 19"x5¼" panel.

Please specify meter and type of meter scale. The A scale has the VU scale on the upper side of the line and the percent calibration on the lower side. The B scale is just reverse. The above picture shows the "A" scale. VU Panels are normally Rack type, but may be had in the cabinet type at \$6.00 additional cost.

TYPE NO.	RANGE	PRICE WITH 1049 METER	
		Non-Illuminated	PRICE WITH 1048 METER Illuminated
1974-A	+4 to +14 2VU Steps		
1974-B	+4 to +24 2VU Steps		
1974-C	+4 to +34 2VU Steps		
1974-D	+4 to +44 2VU Steps		
1974-E	+4 to +14 1VU Steps		
1974-F	+4 to +24 1VU Steps		
1974-G	+4 to +34 1VU Steps		

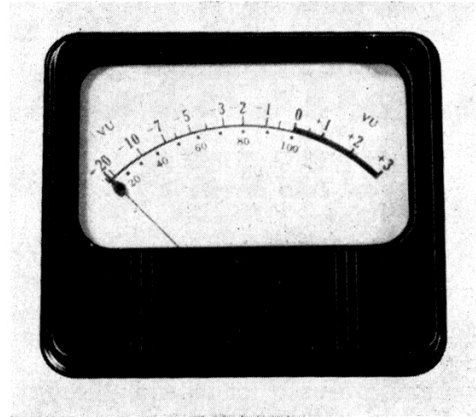
MEASURING EQUIPMENT

DECIBEL AND V. U. METERS



**TYPE 1465 & 1372
VI METER**

The 1465 and 1372 meters are both high speed DB meters, copper oxide type. Both have an internal resistance of 5000 ohms insuring very low bridging loss when bridged across a 500 ohm line. There is practically no distortion introduced by the meter. They have high speed pointer action with practically no overshoot. The frequency error is imperceptible up to 10,000 cycles. The calibration is from -10 to +6 with 0 at the center of the scale. They are calibrated

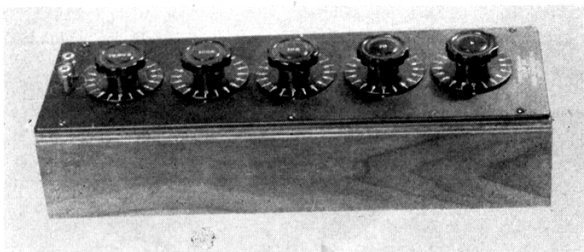


TYPE 1049 VU METER

so that 0 on the 1465 meter is 1.73 Volts at 0 and the 1372 is .548 Volts at 0. (0 is based on a power reference level of .006 watts in a 500 ohm line.) This makes the 1372 meter read -10DB at center scale.

Both instruments are standard Weston 301 type meters in either square or round cases. A chart is supplied with each meter to show the correction that should be applied when the meter is used on any impedance other than 500 ohms.

TYPE	SCALE	VOLTS at 0	INT. RES.	POINTER ACTION	NET PRICE
1465	-10-0+6	1.73	5000	High Speed	
1372	-10-0+6	.548	5000	High Speed	
1049	-20-0+3	VOLUME UNITS	3900	Bell Lab. Spec. Non-Ill.	
1048	-20-0+3	VOLUME UNITS	3900	Bell Lab. Spec. Illuminated	



DECADE RESISTANCE BOXES

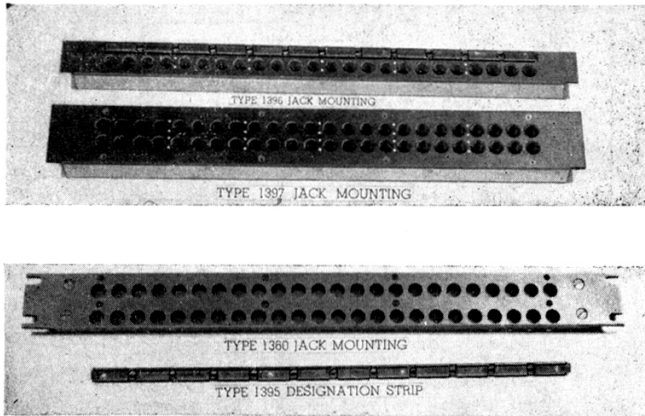
The type 2003 decade boxes are made up of the type 1046 decade units mounted on a metal panel with a walnut cabinet. The accuracy of all resistors are adjusted to better than 1/4% from 1 ohm to 100,000 ohms. Above 100,000 ohms they are better than 1/2%, below 1 ohm 1%.

The frequency characteristic has no appreciable error below 25,000 cycles.

The switch is built the same as the Cinema Attenuators with contact resistance of less than .003 ohms and a variation of less than .01%. Each switch unit is completely shielded. The temperature coefficient is less than ± .002% per degree centigrade at room temperature.

Maximum dissipation: 3 watts continuous, 6 watts for 15 minutes, not over 40 watts for 30 seconds.

TYPE NO.	NO OF DIALS	RESISTANCE PER STEP	RES. TOTAL	NET PRICE
2003-A	2	.1 OHM	9.9	
2003-B	3	.1 OHM	99.9	
2003-C	4	.1 OHM	999.9	
2003-D	5	.1 OHM	9999.9	
2003-E	2	1 OHM	99	
2003-F	3	1 OHM	999	
2003-G	4	1 OHM	9999	
2003-H	5	1 OHM	99999	
2003-J	2	10 OHMS	990	
2003-K	3	10 OHMS	9990	
2003-L	4	10 OHMS	99990	
2003-M	5	10 OHMS	999990	



JACK MOUNTINGS

(JACK STRIPS)

DESIGNATION STRIPS

Patch Panels are used in Broadcast Stations and Recording Channels to facilitate the switching of lines, amplifiers, and other equipment. Our Type 1360 JACK MOUNTING PANELS can be mounted in a rack one above the other to make up any size PATCH PANEL required.

A Designation Strip is above each row of holes. If several of these Jacks Mountings are mounted one above the other each row of Jacks will be equally spaced.

Both mountings are made up of 2 pieces. The front panel is a standard 19"x1 3/4", 3/16" thick with 3/8" panel screwed to the back. The holes are spaced 5/8" apart. The holes mount either our type 1398 or 1399 JACKS or the Western Electric 218A JACKS. The Panel is also drilled for our 1395 Designation strip or W.E.90-A.

Jack Mountings are made from Dural and finished in dull black alomalite finish (other finishes can be had at slight additional charge.)

The 1396 and 1397 Mountings are for use where additions to existing Patch Panels are necessary and will match perfectly W. E. Panels. They are precision

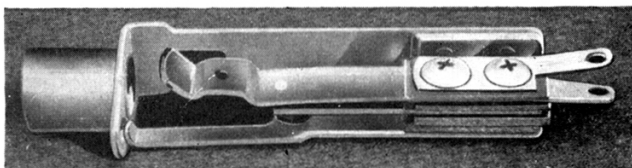
jig drilled for either our 1398 and 1399 Jacks or Western Electric 218 Jacks. Twenty four Jacks mount on the 1396 mounting and 48 Jacks mount on the 1397 mounting. These are made 5/8" thick x 1 1/4" or 2 1/8" wide of bakelite with a cadmium plated frame around all sides. Heavy steel mounting angles are fitted to each end of the strip. Both of the above mountings are drilled for our No. 1395 or the Western Electric 90A Designation strip.

All of the above mountings will accommodate our type 1367 Patch Cord Plug or the Western Electric 241-A Plug.

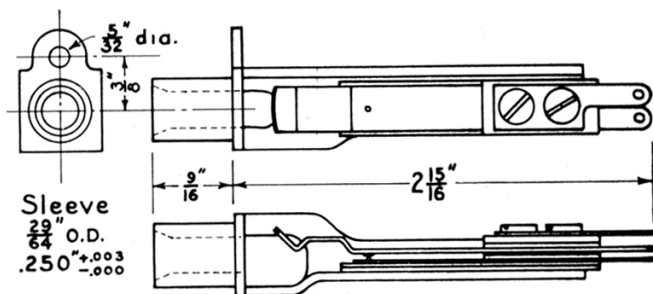
The 1395 Designation strip has 12 card holders in 1 common strip. Each card holder will accommodate a card 1-1/16" long 11/32" wide, to designate each Jack circuit. Four screws mount the strip to the Jack Mounting.

1360 JACK MOUNTING	unequipped.....
1396 JACK MOUNTING	unequipped.....
1397 JACK MOUNTING	unequipped.....
1395 Designation Strips.....	

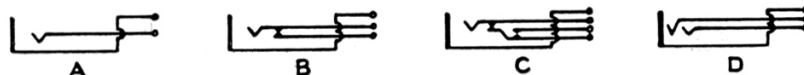
INDIVIDUAL JACKS



- 1399-A INDIVIDUAL JACKS
- 1399-B INDIVIDUAL JACKS
- 1399-C INDIVIDUAL JACKS
- 1399-D INDIVIDUAL JACKS

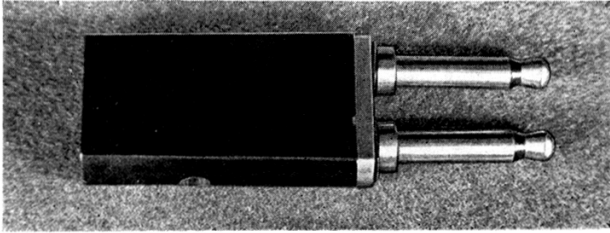


1399 JACK



Jack Spring Combinations

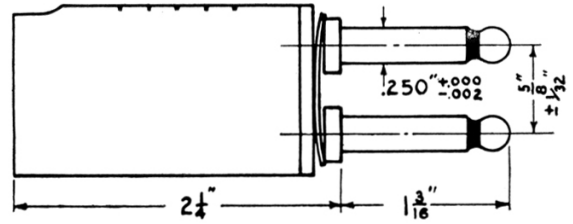
CORDS AND PLUGS



1367 PLUG

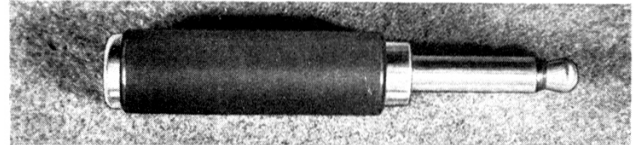
The No. 1367 Plug is a twin Plug using both tips as the two conductors and sleeves to carry through the shield. It has a one piece moulded bakelite shell with ample room inside for connecting the wires, and is notched on one side for ease of polarization. Due to the care taken in design and manufacturing details we have produced a plug that is unfailing in its operation and which may be inserted into the Jacks of the patch panel with gratifying ease.

Type 1367 Plug.....



1367 PLUG

In addition to the No. 1367 Plug the Cinema line also includes the type No. 1390 Plug.



1390 PLUG

Type 1390 Plug.....

1368 PATCH CORD

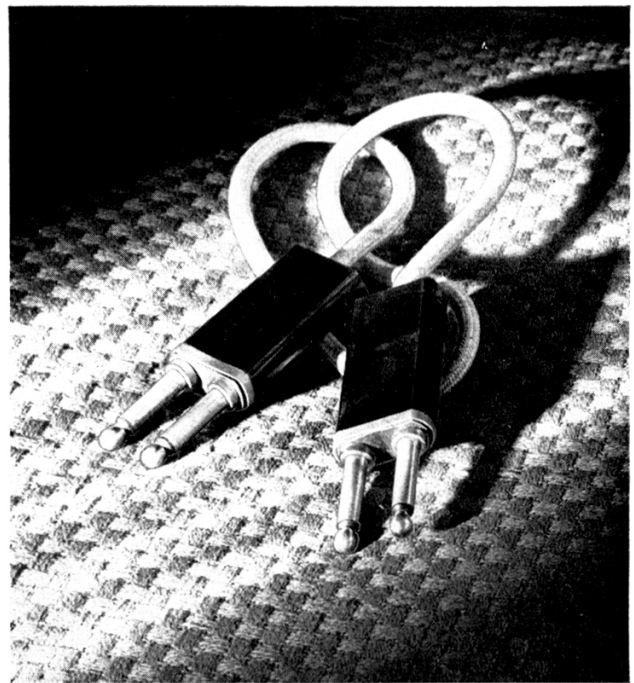
The Cinema No. 1368 Patch Cord is the type that has been the standard cord for patching sound circuits in broadcast stations and motion picture studios for many years. We have developed a few features which make this cord outstanding in its field. Namely a shielded cord insuring a crosstalk pick up of at least 40DB less than any other cord. All screws used in its assembly are standard sizes. Also a bakelite washer for insulation between the tip and sleeve is used in place of the usual hard rubber. This eliminates the softening of this important structural member and its consequent misalignment when polishing the plug.

The No. 1368 Patch Cord is the combination of our No. 1389 cord equipped with two of our type No. 1367 Plugs with the shield of the cord connected to the sleeves of the plug at one end only.

PRICES ON 1368 PATCH CORDS

TYPE	LENGTH	NET PRICE
1368-A	1 ft.	
1368-B	2 ft.	
1368-C	3 ft.	
1368-D	4 ft.	
1368-E	5 ft.	
1368-F	6 ft.	

1368 Patch Cords can be had with either black, white, red, green or brown cords.



CORDS ONLY

Shielded Cords Made Up With Lugs at Ends. For Use With 1367 Plugs.

TYPE	NO. OF COND.	LENGTH	NET PRICE
1389-A	2	1 ft.	
1389-B	2	2 ft.	
1389-C	2	3 ft.	
1389-D	2	4 ft.	
1389-E	2	5 ft.	
1389-F	2	6 ft.	

Unshielded Cords made up with Lugs. Served at Ends. For Use With 1390 Plugs.

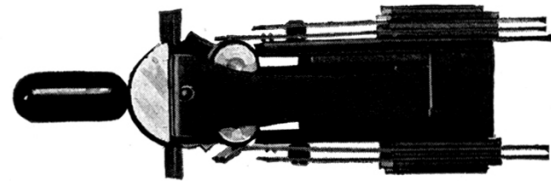
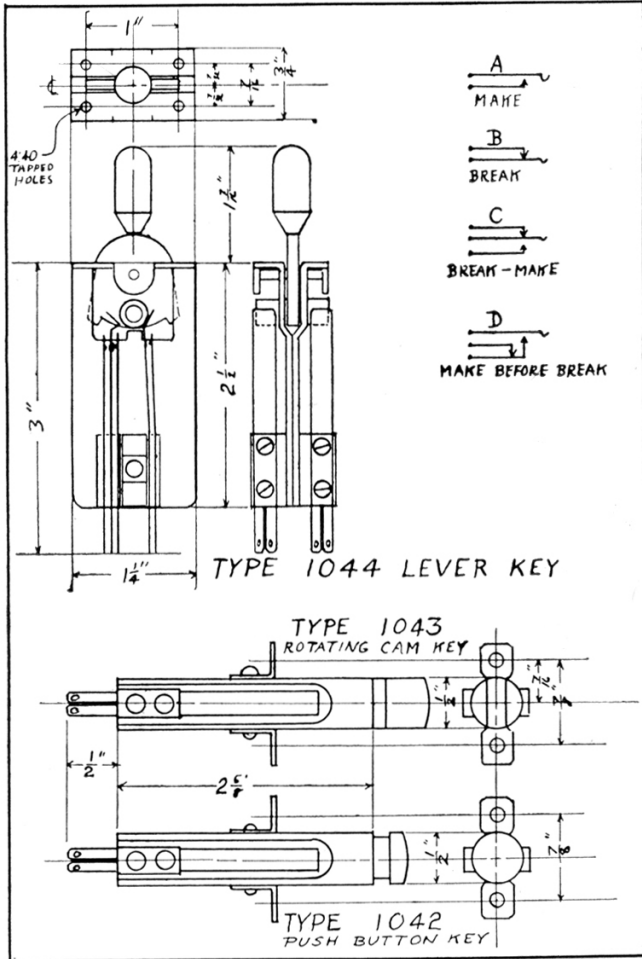
TYPE	NO. OF COND.	LENGTH	NET PRICE
1393-A	2	1 ft.	
1393-B	2	2 ft.	
1393-C	2	3 ft.	
1393-D	2	4 ft.	
1393-E	2	5 ft.	
1393-F	2	6 ft.	

Cords of any number of conductors or length can be made up with lugs or clips to fit any type of plug. Price on request. Please supply complete information.

The above Cords are available in either black, white, red, green or brown.

TELEPHONE SWITCHBOARD TYPE KEYS (LEVER TYPE)

The type 1044 key is a lever operated telephone switchboard key. They are available in a large variety of spring assemblies. The springs are



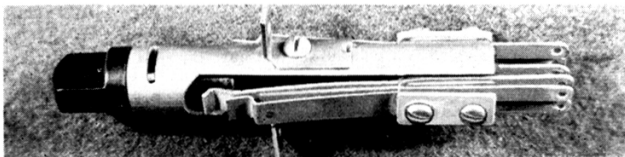
TYPE 1044 KEY

operated by a lever which has 3 positions—the center position being the normal unoperated position. By operating the lever in position 1, it operates only the springs on the side of the key associated with that position, and by operating lever in position 2 operates springs associated with position 2. Any other combinations of springs can be had by indicating with the order the number of A-B-C-D spring in position 1 or 2 that is desired.

Normally, keys are made locking in both position A and B, but may be had non-locking in either or both positions.

NO. TYPE	SPRINGS IN POS. 1	SPRINGS IN POS. 2	PRICE
1044-A	2-A	None	
1044-B	2-A	2-A	
1044-C	2-B	None	
1044-D	2-B	2-B	
1044-E	2-C	None	
1044-F	2-C	2-C	
1044-G	4-C	None	
1044-H	4-C	4-C	
1044-J	8-A	None	
1044-K	8-A	8-A	
1044-L	10-A	10-A	
1044-M	4-D	4-D	

Any combination not shown here may be had on short notice. Prices on request, or a rough approximation of the price may be had by allowing \$1.50 for the frame and .25 for each spring.

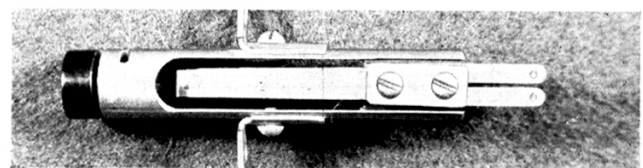


TYPE 1043 KEY

The type 1043 Key is of the rotating cam style, having only 2 positions, normal and operated. It is supplied with 2 of either the A-B-C or D spring combinations.

Recommended for microphone input circuits.

TYPE	SPRING-COMBINATION	PRICE
1043-A	2-A	
1043-B	2-B	
1043-C	2-C	
1043-D	2-D	



TYPE 1042 KEY

1042 Keys are essentially the same as the 1043, except that it is operated by a push button and has no locking position.

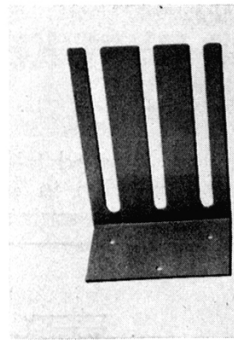
TYPE	SPRING COMBINATION	PRICE
1042-A	2-A	
1042-B	2-B	
1042-C	2-C	
1042-D	2-D	

RACKS

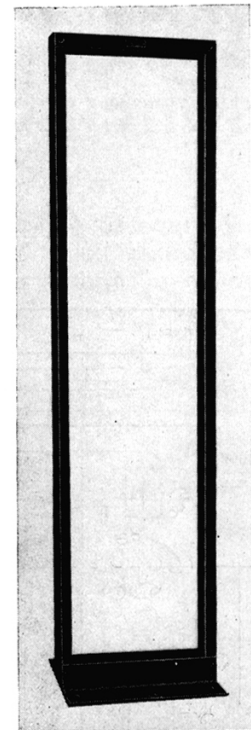
CORD RACKS

A convenient cord rack is made up in 4 standard sizes to mount near the patch panel. They are made with 1-2-3 and 4 slots. Twelve cords will fit in each slot. The cords, when not in use, hang in the slot by one of its plugs. This keeps them straight and in good condition so they never get tangled or snarled. They are finished in dull black enamel. Other finishes are 25 cents extra.

- | | | | |
|---------------|--------|---------------|--------|
| 1475-A | 1 slot | 1475-C | 3 slot |
| 1475-B | 2 slot | 1475-D | 4 slot |



**TYPE 1475-C
CORD RACK**

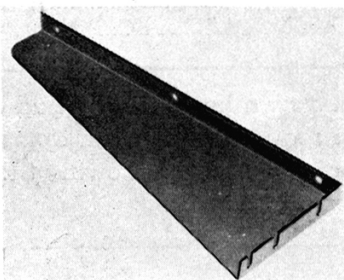


**RELAY RACK
TYPE 1261-A**

RELAY RACKS

Standard Relay Racks, precision jig drilled to take the standard 19" panels with multiples of 1 3/4" in height. They are drilled for cable details and terminal blocks on the rear. Sides are of 3 in 4.1 lb. steel channels. The Terminal Blocks mount on the bottom rear of the rack. Four blocks may be mounted with 8 3/4" blank panel mounted on the front of each rack.

TYPE	HEIGHT	PANEL SPACE	PANEL MULTIPLES	WEIGHT	PRICE NET
1261-A	84"	77"	44	115 lb.	
1261-B	71 3/4"	64 3/4"	37	106 lb.	
1261-C	59 1/2"	52"	30	98 lb.	
1261-D	47 1/4"	40 1/4"	23	90 lb.	
1261-E	35"	28"	16	81 lb.	
1261-F	22 3/4"	15 3/4"	9	73 lb.	



TYPE 1325 LEFT

SHELF BRACKETS

The 1325 Shelf brackets which occupy a 5 1/4" multiple on front of a standard relay rack to mount a 16" shelf. These are made of heavy gauge steel, and are drilled to fit standard panel drilling. The shelf may be mounted any height from the floor. They are supplied singly or in pairs right and left hand.

- 1325-R** (right)
- 1325-L** (left)
- Per Pair, L & R**

Relay Rack Shelf

Complete shelves for any standard relay rack installation are available. These shelves are made of selected heavy plywood covered with battleship linoleum and the edges trimmed with a chrome binder. Shelves come complete with shelf brackets and are easily installed. Shelves can be supplied to cover any length of relay rack installation.

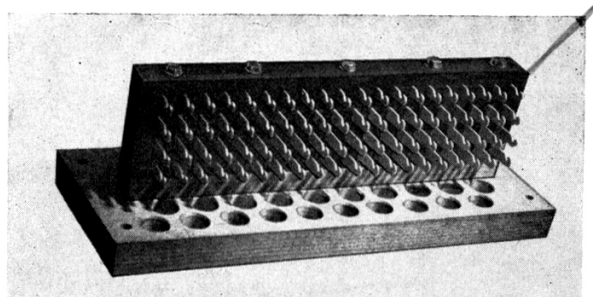
- SHELF for one Relay Rack**
- Additional for each additional rack**

Standard Rack Panels

These panels are unfinished or natural dural, 3/16 inch thick by 19 inch width. Panels are available in standard multiples and notched to install on any rack with standard Western Electric drilling.

TYPE	HEIGHT	PRICE
3332A	1 3/4"	
3332B	3 1/2"	
3332C	5 1/4"	
3332D	7"	
3332E	8 3/4"	
3332F	10 1/2"	
3332G	12 1/4"	

No. 1351 TERMINAL BLOCKS



Another member of the line of Cinema's products is our 1351 Terminal block. We make a complete series of these terminals. They are a soldering lug type of terminal block, such as are used throughout telephone offices. These terminal strips are used in many other places as well, such as recording and broadcasting equipment and motion picture recording systems.

The lugs used in these blocks are punched from .040" thick brass and then cadmium plated. This makes the connections very easily soldered as well as giving corrosion protection and a pleasing appearance. The fanning strips are made of select hard maple. The holes in the fanning strips are all carefully chamfered to eliminate the possibility of chaffing wire insulation. Then the fanning strips are lacquered. The lugs are clamped in slotted bakelite strips which are mounted on the fanning strip.

Our terminal block may be made to match any standard American made block. Any number of lugs up to and including 50 per row, up to 10 rows of lugs, may be assembled on a single fanning strip.

The standard block 1351 has 20 lugs per row, and the number of lugs high is designated by a letter suffix (example "A"-1 row "B"-2 rows "C"-3 rows, etc.) These carry a fanning strip 2 7/8" wide by 8 3/8" long and 5/8" thick. There are 4 mounting holes on 2"x7 3/4" centers.

PRICES ON 1351 TERMINAL BLOCKS 20 TERMINALS PER ROW

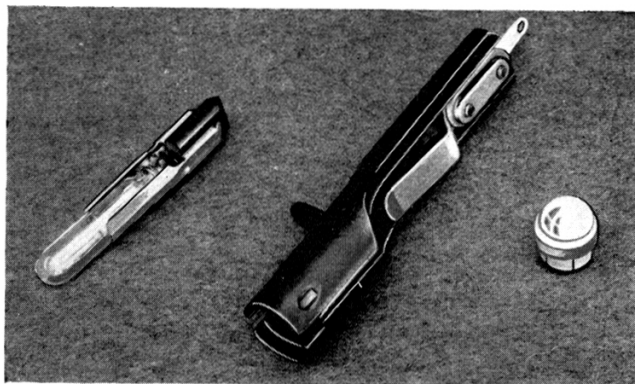
1351-A	1351-E
1351-B	1351-F
1351-C	1351-G
1351-D	1351-H

50 TERMINAL PER ROW

1352-B	1352-F
1352-D	1352-H

TERMINAL STRIP PARTS

Fanning Block	
Wood Strip	
Bakelite Top Clamp Strip.....	
Slotted Bakelite Strip	
Lugs, Any Size	
Screws, Ea.	
Labor of Assembly Per Strip of Lugs	



LAMPS AND LAMP CAPS

Switchboard type lamp sockets accommodate standard telephone switchboard lamps and lamp caps. The lamps can be supplied for the following Voltages: 6, 8, 12, 16, 18, 24, 30, 44, 48, 50, 60 Volts.

SOCKETS	
LAMP CAPS	
LAMPS	

TRANSMISSION LINE

TRANSMISSION LINE TYPE 222SB for wiring all types of high quality audio sound circuits. This superior transmission line is made up of 2 No. 22 enameled copper conductors, cotton served, waxed, tinned copper shield and overall black cotton braid.

TYPE 222SB TRANSMISSION LINE.....per 1M ft.
(quantity discounts on application)

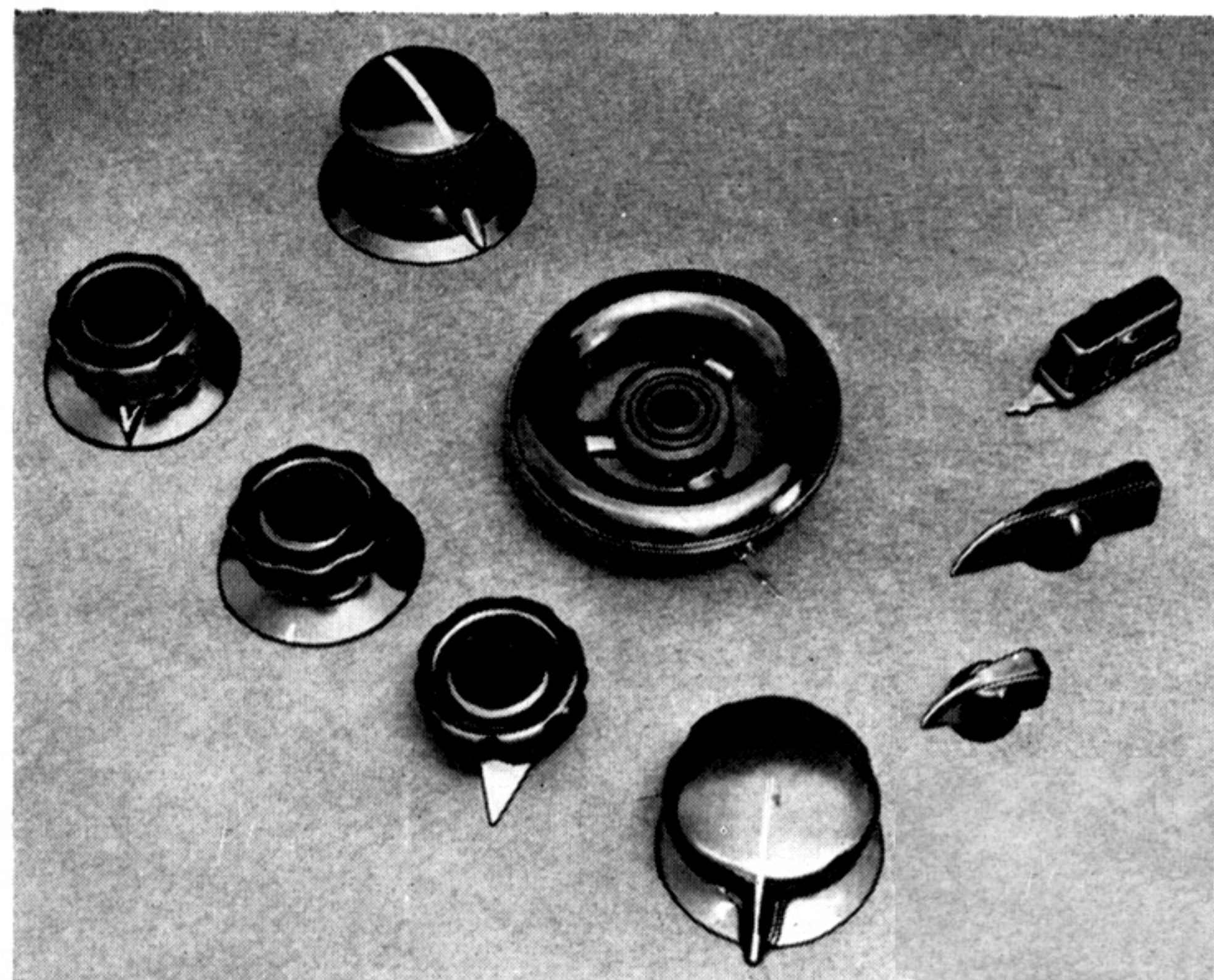
Switchboard Hookup Wire

SWITCHBOARD HOOKUP WIRE This wire is available either single (TYPE 122CW) or in twisted pairs (TYPE 222CW) No. 22 copper enamel wire cotton served and wax braid.

TYPE 122CW (single conductor).....per 1M ft.
TYPE 222CW (two conductor).....per 1M ft.

Control Knobs and Dials

Cinema Engineering Company maintains a stock of etched mixer dials graduated $\infty - 45 - 0$, 330 deg. rotation. Blank dials are also available and can be supplied with a wide variety of calibrations to fit nearly any dial requirement. Standard dials are $2\frac{3}{4}$ inch diameter and are marked to work in conjunction with $2\frac{1}{16}$ inch skirted knobs. Special dials of any diameter or calibration are available on order.



Standard Mixer Dial, $\infty - 45 - 0$

Standard Dial calibrated and machine engraved (using any standard master)

Special Dials Prices on Request

TYPE KK KNOB, $\frac{1}{4}$ inch bore, two set screws, engraved line indicator, $1\frac{1}{16}$ inch skirt (indicator not raised)

TYPE GR KNOBS, same as above except with brass insert bore and raised arrow head type indicator

TYPE WE MIXER KNOBS These are a special large knob with a raised arrow head type indicator and a rib between the knob and skirt to facilitate judging position of mixer controls by touch. Skirt Diameter: $2\frac{3}{8}$ inch.

SOLDER. High quality resin core solder, 60-40 alloy

1lb. Spools per spool

5lb. Spools per spool

LACING TWINE. waxed linen, high quality for use in lacing cables and wire in switchboard or equipment installations.

No. 6 Lacing Twine (light) per pound

No. 12 Lacing Twine (heavy) per pound

BEE'S WAX. High quality beeswax for use in all types of electronic work.

BEE'S WAX per pound

CERISE WAX. Select quality potting wax. This is the same material that is used in potting Variaten Attenuators and filter net works. An effective potting medium.

CERISE WAX per pound

SPAGHETTI. (insulating tubing), high quality impregnated fabric and plastic. Available for various wire sizes. Specify wire size when ordering.

SPAGHETTI (insulating tubing) per length (approx. 3 ft.)

ENGRAVING SERVICE

Cinema Engineering Company maintains a complete engraving department to handle all types of machine engraving work on panels, consoles, instruments, etc. A wide variety of masters are available for nearly any dial face encountered in normal electronic work as well as a great many masters covering special requirements. Facilities of the Engraving De-

partment as available as a service regardless of whether the component parts of the project are procured from Cinema Engineering Company or not.

To facilitate choosing type sizes consult the chart at the right. Specify letter size by number when ordering.

ENGINEERING AND TEST SERVICE

Cinema Engineering Company maintains complete engineering and laboratory facilities for the development of all types of audio equipment. Cinema's services do not cease with the equipment listed in this catalog. If you have a problem in the audio field, if you require special equalizers or attenuators, if you have a special switching problem or unusual equipment requirement, Cinema will be happy to consult and work with you.

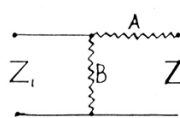
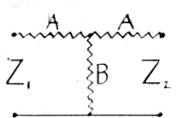
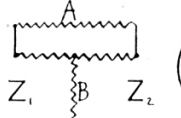
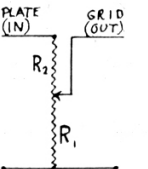
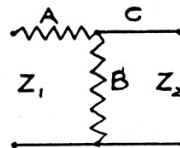
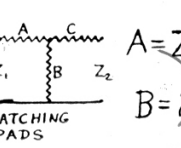
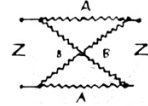
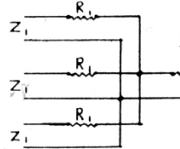
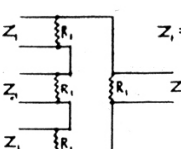
Do you have a special problem in procurement? If you do not find what you need in our catalog please feel free to consult with us as our wide experience in the electronic field and especially the audio frequency division of that field is at your service to help you find and procure what you require.

ENGINEERING, LAYOUT AND SPECIFICATION SERVICE. Cinema Engineering Company will be glad to consult with you on your problems concerning specifications, layout and engineering of broadcast speech input systems, recording channels, both

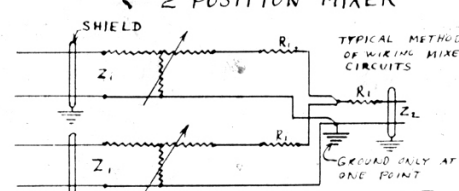
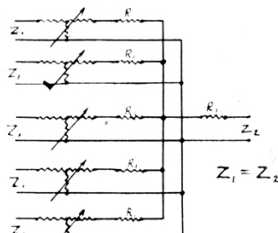
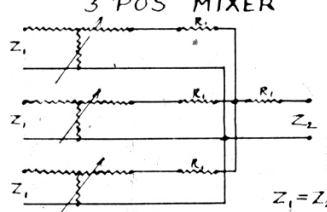
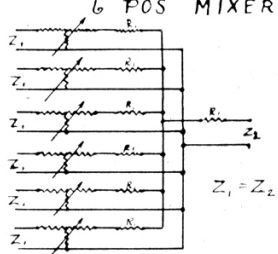
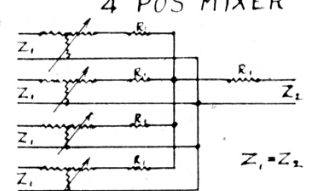
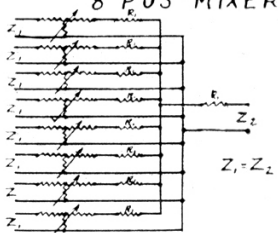
motion picture and disc, high quality public address and other audio frequency applications. Cinema Engineering Company is in a position to engineer and draw up layouts, diagrams and complete specifications for all types of sound systems and to work in cooperation with your architects or designers in preparing broadcast and recording studio designs embodying the most advanced and reliable engineering principals and practices.

TEST ENGINEERING. Complete service for making quantitative and qualitative tests and checks of all types of audio sound equipment are available in our modern laboratories. Transmission testing, gain runs, power runs, frequency runs, etc. can be made in our laboratories conducted by competent audio engineers and are available as a service on any make of equipment whether supplied by Cinema Engineering Company or not. Cinema Engineering Company is always glad to cooperate on any audio frequency problems. Feel free to call on us.

PAD FORMULAE AND MIXER CIRCUITS

 <p>L PAD</p> $\left(\frac{K-1}{K}\right)Z = A$ $\left(\frac{1}{K-1}\right)Z = B$	 <p>SYMMETRICAL T PADS</p> $\left(\frac{K-1}{K+1}\right)Z = A$ $\left(\frac{K}{K^2-1}\right)Z = B$	 <p>BRIDGED T</p> $(K-1)Z = A$ $\left(\frac{1}{K-1}\right)Z = B$
 <p>GAIN CONTROL POTENTIOMETERS</p> $\left(\frac{1}{K}\right)Z = R_1$ $Z - R_1 = R_2$	 <p>MIN. LOSS MATCHING PADS $Z_1 > Z_2$</p> $A = \sqrt{Z_1(Z_1 - Z_2)}$ $B = \frac{Z_1 Z_2}{A}$ $C = 0$ <p>db LOSS = $20 \log_{10} (R + \sqrt{R^2 - 1})$ WHERE $R^2 = \frac{Z_1}{Z_2}$</p>	 <p>MATCHING PADS $Z_1 > Z_2$</p> $A = Z_1 \left[\frac{K^2 + 1}{K^2 - 1} - \left(\frac{2}{r} \frac{K}{K^2 - 1} \right) \right]$ $B = 2 \frac{Z_1}{r} \left[\frac{K}{K^2 - 1} \right]$ $C = Z_2 \left[\frac{K^2 + 1}{K^2 - 1} - \left(2r \frac{K}{K^2 - 1} \right) \right]$ $r = \sqrt{\frac{Z_1}{Z_2}}$
 <p>LATTICE NETWORK</p> $\left(\frac{K-1}{K+1}\right)Z = A$ $\left(\frac{K+1}{K-1}\right)Z = B$	 <p>PARALLEL MIXER OR BRANCHING NETWORK</p> $\frac{N-1}{N+1}Z = R_1$ <p>N = NUMBER OF INPUTS Z_1</p>	 <p>SERIES MIXER OR BRANCHING NETWORK</p> $\frac{N+1}{N-1}Z = R_1$ <p>N = NUMBER OF INPUTS Z_1</p>

BALANCED NETWORKS of all of the above forms may be derived by merely dividing all of the series resistors by 2 and inserting half of the series resistor in each side of the line.

<p>2 POSITION MIXER</p>  <p>TOTAL LOSS WITH LADDERS 12 DB TOTAL LOSS WITH BRIDGED T 6 DB</p>	<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th>Z</th> <th>R₁, OHMS</th> </tr> </thead> <tbody> <tr><td>30</td><td>10</td></tr> <tr><td>50</td><td>16.6</td></tr> <tr><td>150</td><td>50</td></tr> <tr><td>200</td><td>86.6</td></tr> <tr><td>250</td><td>83.3</td></tr> <tr><td>500</td><td>166</td></tr> <tr><td>600</td><td>200</td></tr> </tbody> </table> <p>$\frac{N-1}{N+1}Z = R_1$ N = NO OF INPUTS</p>	Z	R ₁ , OHMS	30	10	50	16.6	150	50	200	86.6	250	83.3	500	166	600	200	<p>5 POS MIXER</p>  <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th>Z</th> <th>R₁, OHMS</th> </tr> </thead> <tbody> <tr><td>30</td><td>20</td></tr> <tr><td>50</td><td>33.3</td></tr> <tr><td>150</td><td>100</td></tr> <tr><td>200</td><td>133</td></tr> <tr><td>250</td><td>166</td></tr> <tr><td>500</td><td>333</td></tr> <tr><td>600</td><td>400</td></tr> </tbody> </table> <p>LOSS WITH LAD 20 DB LOSS WITH T 14 DB</p>	Z	R ₁ , OHMS	30	20	50	33.3	150	100	200	133	250	166	500	333	600	400
Z	R ₁ , OHMS																																	
30	10																																	
50	16.6																																	
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600	400																																	
<p>3 POS MIXER</p>  <p>LOSS WITH LAD 15.5 LOSS WITH T 9.5</p>	<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th>Z</th> <th>R₁, OHMS</th> </tr> </thead> <tbody> <tr><td>30</td><td>15</td></tr> <tr><td>50</td><td>25</td></tr> <tr><td>150</td><td>75</td></tr> <tr><td>200</td><td>100</td></tr> <tr><td>250</td><td>125</td></tr> <tr><td>500</td><td>250</td></tr> <tr><td>600</td><td>300</td></tr> </tbody> </table>	Z	R ₁ , OHMS	30	15	50	25	150	75	200	100	250	125	500	250	600	300	<p>6 POS MIXER</p>  <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th>Z</th> <th>R₁, OHMS</th> </tr> </thead> <tbody> <tr><td>30</td><td>21.42</td></tr> <tr><td>50</td><td>35.7</td></tr> <tr><td>150</td><td>107</td></tr> <tr><td>200</td><td>142.8</td></tr> <tr><td>250</td><td>178.5</td></tr> <tr><td>500</td><td>357</td></tr> <tr><td>600</td><td>428.4</td></tr> </tbody> </table> <p>LOSS WITH LAD 21.6 DB LOSS WITH T 15.6 DB</p>	Z	R ₁ , OHMS	30	21.42	50	35.7	150	107	200	142.8	250	178.5	500	357	600	428.4
Z	R ₁ , OHMS																																	
30	15																																	
50	25																																	
150	75																																	
200	100																																	
250	125																																	
500	250																																	
600	300																																	
Z	R ₁ , OHMS																																	
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<p>4 POS MIXER</p>  <p>LOSS WITH LAD 18 DB LOSS WITH T 12 DB</p>	<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th>Z</th> <th>R₁, OHMS</th> </tr> </thead> <tbody> <tr><td>30</td><td>18</td></tr> <tr><td>50</td><td>30</td></tr> <tr><td>150</td><td>90</td></tr> <tr><td>200</td><td>120</td></tr> <tr><td>250</td><td>150</td></tr> <tr><td>500</td><td>300</td></tr> <tr><td>600</td><td>360</td></tr> </tbody> </table>	Z	R ₁ , OHMS	30	18	50	30	150	90	200	120	250	150	500	300	600	360	<p>8 POS MIXER</p>  <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th>Z</th> <th>R₁, OHMS</th> </tr> </thead> <tbody> <tr><td>30</td><td>23.3</td></tr> <tr><td>50</td><td>38.8</td></tr> <tr><td>150</td><td>116.6</td></tr> <tr><td>200</td><td>155.5</td></tr> <tr><td>250</td><td>194</td></tr> <tr><td>500</td><td>388</td></tr> <tr><td>600</td><td>466</td></tr> </tbody> </table> <p>LOSS WITH LAD 24.1 DB LOSS WITH T 18.1 DB</p>	Z	R ₁ , OHMS	30	23.3	50	38.8	150	116.6	200	155.5	250	194	500	388	600	466
Z	R ₁ , OHMS																																	
30	18																																	
50	30																																	
150	90																																	
200	120																																	
250	150																																	
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500	388																																	
600	466																																	

All of the circuits in these tables are shown as unbalanced circuits.

We particularly recommend a Parallel type Mixer because—

1. It is always best to keep one side of the line at ground potential. This is not always easy in series, or series parallel mixers.
2. Phasing becomes a problem sometimes in series and series parallel mixers.
3. There is no case where a parallel mixer will not work, and no lower loss can be achieved in any other type of circuit.

We have not shown any balanced circuits, but

they may be used the same as the unbalanced circuits. However, there is nothing to be gained by the use of them, and they become very expensive.

To calculate the loss of a mixer circuit, multiply the log of the number of mixer inputs by 20. This will give the loss in DB. If the mixer attenuators have insertion loss add the loss of 1 mixer attenuator to this answer.

EXAMPLE: 3 Position Mixer, find the log of the number 3 which is .477121 multiply by 20=9.5424 DB. Add the insertion loss of one mixer pot 6 DB the total loss will be 15.542 DB. A simpler way may be used by finding the nearest number under column K in the voltage ratio table, such as for 3 the nearest is 2.985 the answer in DB will be found in the Voltage Decibel column 9.5 DB.

VOLTAGE RATIO TABLE

Decibel Voltage	$\frac{1}{K}$ Loss	K Gain	Decibel Voltage	$\frac{1}{K}$ Loss	K Gain	Decibel Voltage	$\frac{1}{K}$ Loss	K Gain	Decibel Voltage	$\frac{1}{K}$ Loss	K Gain
.0	1.0000	1.000	5.0	.5623	1.778	10.0	.3162	3.162	15.0	.1778	5.623
.1	.9886	1.012	.1	.5559	1.799	.1	.3126	3.199	.1	.1758	5.689
.2	.9772	1.023	.2	.5495	1.820	.2	.3090	3.236	.2	.1738	5.754
.3	.9661	1.035	.3	.5433	1.841	.3	.3055	3.273	.3	.1718	5.821
.4	.9550	1.047	.4	.5370	1.862	.4	.3020	3.311	.4	.1698	5.888
.5	.9441	1.059	.5	.5309	1.884	.5	.2985	3.350	.5	.1679	5.957
.6	.9333	1.072	.6	.5248	1.905	.6	.2951	3.388	.6	.1660	6.026
.7	.9226	1.084	.7	.5188	1.928	.7	.2917	3.428	.7	.1641	6.095
.8	.9120	1.096	.8	.5129	1.950	.8	.2884	3.467	.8	.1622	6.166
.9	.9061	1.109	.9	.5070	1.972	.9	.2851	3.508	.9	.1603	6.237
1.0	.8913	1.122	6.0	.5012	1.995	11.0	.2818	3.548	16.0	.1585	6.310
.1	.8810	1.135	.1	.4955	2.018	.1	.2786	3.589	.1	.1567	6.383
.2	.8710	1.148	.2	.4898	2.042	.2	.2754	3.631	.2	.1549	6.457
.3	.8610	1.161	.3	.4842	2.065	.3	.2723	3.673	.3	.1531	6.531
.4	.8511	1.175	.4	.4786	2.089	.4	.2692	3.715	.4	.1514	6.607
.5	.8414	1.189	.5	.4732	2.113	.5	.2661	3.758	.5	.1496	6.683
.6	.8318	1.202	.6	.4677	2.138	.6	.2630	3.802	.6	.1479	6.761
.7	.8222	1.216	.7	.4624	2.163	.7	.2600	3.846	.7	.1462	6.839
.8	.8128	1.230	.8	.4571	2.188	.8	.2570	3.890	.8	.1445	6.918
.9	.8035	1.245	.9	.4519	2.213	.9	.2541	3.936	.9	.1429	6.998
2.0	.7943	1.259	7.0	.4467	2.239	12.0	.2512	3.981	17.0	.1413	7.079
.1	.7852	1.274	.1	.4416	2.265	.1	.2483	4.027	.1	.1396	7.161
.2	.7762	1.288	.2	.4365	2.291	.2	.2455	4.074	.2	.1380	7.244
.3	.7674	1.303	.3	.4315	2.317	.3	.2427	4.121	.3	.1365	7.328
.4	.7586	1.318	.4	.4266	2.344	.4	.2399	4.169	.4	.1349	7.413
.5	.7499	1.334	.5	.4217	2.371	.5	.2371	4.217	.5	.1334	7.499
.6	.7413	1.349	.6	.4169	2.399	.6	.2344	4.266	.6	.1318	7.586
.7	.7328	1.365	.7	.4121	2.427	.7	.2317	4.315	.7	.1303	7.674
.8	.7244	1.380	.8	.4074	2.455	.8	.2291	4.365	.8	.1288	7.762
.9	.7161	1.396	.9	.4027	2.483	.9	.2265	4.416	.9	.1274	7.852
3.0	.7079	1.413	8.0	.3981	2.512	13.0	.2239	4.467	18.0	.1259	7.943
.1	.6998	1.429	.1	.3936	2.541	.1	.2213	4.519	.1	.1245	8.035
.2	.6918	1.445	.2	.3890	2.570	.2	.2188	4.571	.2	.1230	8.128
.3	.6839	1.462	.3	.3846	2.600	.3	.2163	4.624	.3	.1216	8.222
.4	.6761	1.479	.4	.3802	2.630	.4	.2138	4.677	.4	.1202	8.318
.5	.6683	1.496	.5	.3758	2.661	.5	.2113	4.732	.5	.1189	8.414
.6	.6607	1.514	.6	.3715	2.692	.6	.2089	4.786	.6	.1175	8.511
.7	.6531	1.531	.7	.3673	2.723	.7	.2065	4.842	.7	.1161	8.610
.8	.6457	1.549	.8	.3631	2.754	.8	.2042	4.898	.8	.1148	8.710
.9	.6383	1.567	.9	.3589	2.786	.9	.2018	4.955	.9	.1135	8.811
4.0	.6310	1.585	9.0	.3548	2.818	14.0	.1995	5.012	19.0	.1122	8.913
.1	.6237	1.603	.1	.3508	2.851	.1	.1972	5.070	.1	.1109	9.016
.2	.6166	1.622	.2	.3467	2.884	.2	.1950	5.129	.2	.1096	9.120
.3	.6095	1.641	.3	.3428	2.917	.3	.1928	5.188	.3	.1084	9.226
.4	.6026	1.660	.4	.3388	2.951	.4	.1905	5.248	.4	.1072	9.333
.5	.5957	1.679	.5	.3350	2.985	.5	.1884	5.309	.5	.1059	9.441
.6	.5888	1.698	.6	.3311	3.020	.6	.1862	5.370	.6	.1047	9.550
.7	.5821	1.718	.7	.3273	3.055	.7	.1841	5.433	.7	.1035	9.661
.8	.5754	1.738	.8	.3236	3.090	.8	.1820	5.495	.8	.1023	9.772
.9	.5689	1.758	.9	.3199	3.126	.9	.1799	5.559	.9	.1012	9.886
									20.0	.1000	10.000

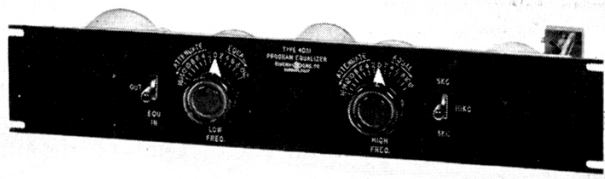
WHEN USING VOLTAGE RATIO TABLE

To read beyond 20 DB, start back at the beginning and move the decimal to the right one place for the K column and to the left one place for the 1/K column and add 20 to the DB voltage values.

For example, if we wish to know the value of K

at 23.2 voltage DB, we take the 3.2 DB value of K which is 1.445 and move the decimal to the right one point. The value of 23.2 is then K=14.45.

(The above table will numerically repeat every 20 DB for Decibel Voltage.)



SPECIFICATIONS

CIRCUIT: Constant "K"

INSERTION LOSS: 14db

MOUNTING: Standard 3½-inch rack mounting panel. (W.E. Standard)

CONTROLS: Graduated in 2 db steps.

Low frequency control knob; 12 db equalization and 16 db attenuation, peaked at 100 cycles.

High frequency control knob; 12 db equalization, and 16 db attenuation.

Key; three-position, to place high frequency equalization peak at 3 kc, 5 kc, or 10 kc.

Key; equalizer in-out, two-position with pad to compensate for insertion loss in the "out" position.

IMPEDANCE: 500 or 600 ohms.

One of the newest and most flexible instruments of the Cinema Variaten line of special apparatus for the broadcasting, recording and motion picture industries, this panel was designed as a program equalizer. Its principal value in the studio equipment line-up is to adjust for equipment, pick-up and transmission line deficiencies.

Designed with a constant "K" circuit, there is no change of impedance, signal level or wave distortion over the entire range of equalization or attenuation.

It is easy to use. The operating engineer has instantaneous control, through only two knobs of a wide range over 1456 available curve combinations, selective for both high and low frequencies over the entire audio spectrum. The unit can be preset and cut into the line at any desired time. A fixed pad on the in-out key compensates in the "out" position for insertion loss and allows switching at will without affecting the overall level.

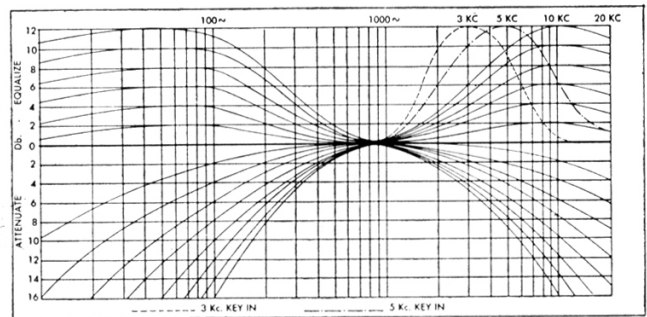
TYPE 4031-B PROGRAM EQUALIZER

Control consists of two knobs, adjustable to give 36 high frequency equalization and 16 high frequency attenuation positions, plus 12 low frequency equalization and 16 low frequency attenuation positions. These adjustments can be made in 2 db steps. Equalization is peaked at 100 cycles on the low end, and at either 3, 5, or 10 kilocycles on the high end. This equalizer is normally supplied on a 3½-inch panel to fit a standard relay rack. It is available in multiple-channel arrangements and can be fitted into any special mounting, to customer specifications.

Users have installed this instrument in the mixing console in recording and broadcasting control booths.

When so used, the operating engineer can greatly increase his efficiency by reducing the need for leaving the control console to equalize the program signal. Order this flexible unit today from our representatives or direct from your sound engineering headquarters—Cinema—in California.

TYPE NO. 4031—Program equalizer, complete and mounted on standard 3½-inch panel.



TYPE NO. 4031 COMPONENT PARTS

These components are available for those wishing to incorporate the units into special equipment.

TYPE NO.	DESCRIPTION
4031-LF	Low Frequency Filter
4031-HF-A	High Frequency Filter, A Section
4031-HF-B	High Frequency Filter, B Section
4031-A	Equalizer-Attenuator and switch
1044-F	Key
1044-SP	Key, shielded
1201	14 db Fixed Attenuator

Net Price.....

DIAMETER EQUALIZER

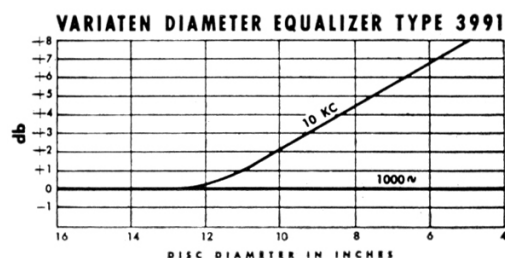


Type No. 3991

Automatic Equalization at ANY Cutting Head Position

A universal type of diameter equalizer, this new Cinema unit can be mounted on any style of recording lathe without mechanical alteration. Action is positive and automatic, assuring designed equalization characteristics as groove speed decreases or increases, according to the direction of the cut.

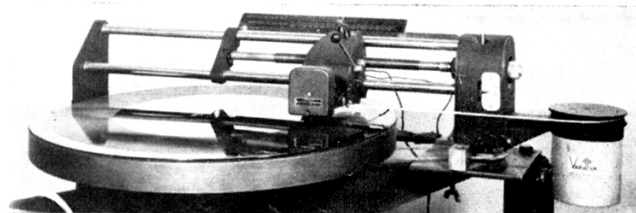
This Variaten unit gives an 8 db rise at 5 inches diameter, decreasing to zero db at 12 inches diameter at 10,000 cycles. Insertion loss is 10 db. A spring return regulates the equalizer setting, and is cord-connected to the moving bed or cutting head carriage of the recording lathe.



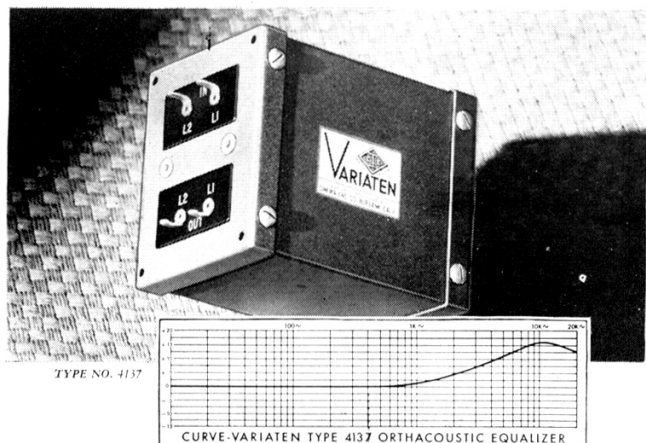
SPECIFICATIONS

EQUALIZATION:	From 8 db at 5" diameter to 0 db at 12" diameter — 10,000 cycles.
IMPEDANCE:	500 ohms.
INSERTION LOSS:	10 db.
MOUNTING:	Bracket adaptable to any flat surface. Flexible cord connection to cutter carriage.
DIMENSIONS:	3 $\frac{3}{8}$ " diameter 3 $\frac{3}{4}$ " high 2-13/16" bracket extension

Another type of cutting lathe is shown below, indicating the simple installation requirement of this new unit.



ORTHACOUSTIC EQUALIZER



TYPE NO. 4137

TYPE NO. 4137

Assuring inflexible adherence to the approved orthacoustic curve determined by the National Association of Broadcasters, this new equalizer is assembled of carefully manufactured components. Resistors, capacitors and inductances are all individually bridged and adjusted.

Ready for immediate installation into any type of recording channel, this small, compact orthacoustic equalizer is available for 500- and 600-ohm circuits. It is shielded against extraneous inductive pick-up, and has an insertion loss of approximately 16 db. Equalization is designed to peak at 10,000 cycles.

This unit can be base mounted in a space 2 $\frac{3}{4}$ x 3 $\frac{1}{4}$ x 2 $\frac{1}{2}$ inches overall. Four terminals opposite the mounting simplify wiring.

SPECIFICATIONS

EQUALIZATION:	16 db at 10,000 cycles.
IMPEDANCE:	500 or 600 ohms.
INSERTION LOSS:	16 db (approximate).
MOUNTING:	Standard transformer type. 2" x 2 $\frac{3}{4}$ " hole centers.
DIMENSIONS:	2 $\frac{1}{2}$ " x 2 $\frac{3}{4}$ " x 3 $\frac{1}{4}$ "

