

# MALLORY SWITCHES, JACKS AND PLUGS • LIST PRICES

★ Complete descriptions of these parts will be found on the following pages.

Mallory Cat. No. List Price

## Mallory Page 2

### Multi-Section Rotary Switches

1211L	\$1.55
1215L	1.65
1213L	1.80
1212L	1.90
1221L	2.30
1225L	2.60
1223L	2.80
1222L	2.95
1236L	2.90
1231L	3.10
1235L	3.30
1246L	3.60
1241L	3.95
1245L	4.60
1251L	4.90
1256L	6.05
1261L	5.80
1266L	7.40
1311L	1.55
1315L	1.65
1313L	1.80
1312L	1.90
1321L	2.30
1325L	2.60
1323L	2.80
1322L	2.95
1331L	3.10
1335L	3.30
1341L	3.95
1345L	4.60
1351L	4.90
1356L	6.05
1361L	5.80
1366L	7.40

### Single Section Rotary Switches

3115J	\$1.15
31112J	1.15
3122J	1.15
3123J	1.15
3126J	1.15
3134J	1.20
3142J	1.20
3143J	1.20
31117J	1.80
3129J	1.80
3136J	1.95
3163J	1.95
3215J	1.15
32112J	1.15
3222J	1.15
3223J	1.15
3226J	1.15
3234J	1.20
3242J	1.20
3243J	1.20
32117J	1.80
3229J	1.80
3236J	1.95
3263J	1.95

### Universal Mounting Brackets

RB254	\$0.25
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Mallory Cat. No. List Price

## Mallory Page 3

### Ceramic Section Selector Switches

172C	\$2.25
173C	2.25
174C	2.25
176C	3.50
177C	3.50
178C	3.50
179C	5.00
180C	5.00
181C	5.00

### Lever Action Switches

5124	\$1.50
6142	1.25
6143	1.25
7122-L	1.25
7123-C	1.25
7142-L	1.25
7143-C	1.25
7162-L	1.25
5224	1.50
6242	1.25
6243	1.25
7222-L	1.25
7223-C	1.25
7242-L	1.25
7243-C	1.25
7262-L	1.25

### 24-Point Non-Shorting Tap Switch

13124-L	\$3.50
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## Mallory Page 4

### Circuit-Opening Switch

1400L	\$5.90
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### Two-Section • Five-Position "Hamswitch"

151L	\$2.75
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### Two-Section • Two-Circuit • Six-Position "Hamswitch"

152L	\$3.25
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Mallory Cat. No. List Price

## Mallory Page 4

### Multiple Push-Button Switches

2164	\$5.25
2166	6.55
2168	7.90
2184	5.25
2186	6.55
2188	7.90
2194	5.25
2196	6.55
2198	7.90

### Ceramic Section • "Hamband" Switches

161C	\$2.25
162C	3.50
163C	5.00
164C	6.00
165C	7.50

## Mallory Page 5

### Single Push-Button Switches

2001	\$1.30
2001-L	1.30
2002	1.30
2002-L	1.30
2003	1.40
2003-L	1.40
2004	1.60
2004-L	1.60
2005	1.60
2005-L	1.60
2006	1.95
2006-L	1.95
2007	1.75
2007-L	1.75
2008	2.20
2008-L	2.20

### Jack Switches

20	\$1.15
30	1.40
40	1.55
45	1.85
60	1.95
73	1.95
74	2.55
720	1.10
730	1.35
740	1.50
745	1.75
760	1.95
733	1.95
744	2.55
32	1.40
62	1.95
63	2.55
64	3.15
732	1.35
762	1.90
763	2.50
764	3.10

Mallory Cat. No. List Price

## Mallory Page 6

### Jacks

1	\$0.65
2	.80
2A	.80
2B	.80
3	.95
3A	.95
3B	.95
3C	.95
4	1.10
4A	1.10
4B	1.10
5	1.20
6	1.30
701	.55
702	.75
702A	.75
702B	.75
703	.85
703A	.85
703B	.85
703C	.85
704	1.00
704A	1.00
704B	1.00
705	1.15
706	1.25
A-1	.30
A-2	.50
A-2A	.55
A-3A	.80
GJ-1	.45

## Mallory Page 7

### Jacks

XP1	\$0.90
XP2B	1.00
XP3B	1.30

### SC Jacks

SC-1A	\$0.55
SCA-2B	.65

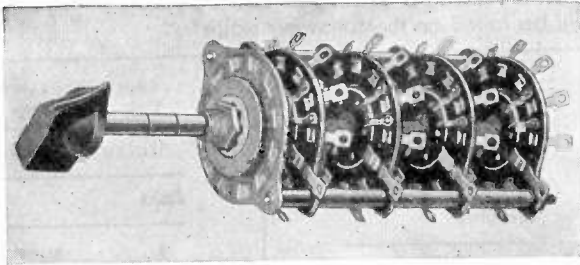
### Extension Jacks

100	\$1.30
100N	1.65
100A	2.30

### Plugs

75	\$0.65
75N	1.00
75A	1.65
76	1.00
76A	1.95

# MALLORY ROTARY SWITCHES



## Multi-Section Rotary Switches

**APPLICATION**—Ideally suited for test equipment, meter switching, and low current switching in industrial applications, including machine tool equipment. Also miscellaneous electronic devices, such as medical equipment, navigation instruments, and radar.

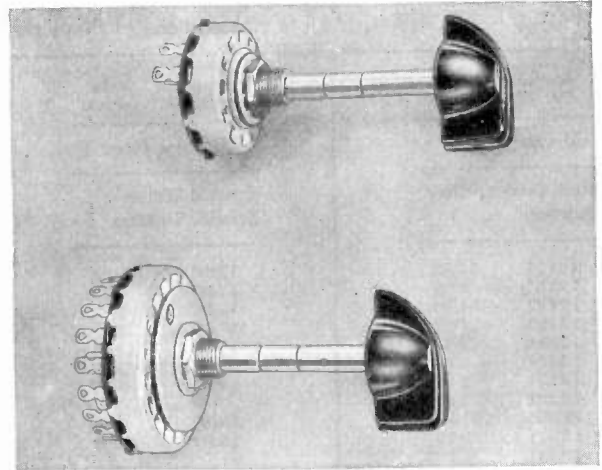
**DESCRIPTION**—All contacting members are silver plated, except rotor contact slugs, which are solid silver. This insures low contact resistance. The high lift of the contact springs provides a wiping and self-cleaning action to insure good electrical contact. The index spring, made of durable phosphor-bronze reinforced with web, prevents fracture failure and insures long-life operation.

An adjustable stop feature permits selection of the desired number of positions for extremely flexible use. The insulation used in all sections is high-grade phenolic resin. All switches supplied with  $\frac{3}{8}$ " diameter,  $\frac{3}{8}$ " long brass bushing, and 2" long shaft, grooved for easy cutting at popular lengths.

All switches have  $\frac{1}{2}$ " spacing between sections, excepting the three and four-section, which have 1" spacing. If closer spacing is required between sections, the switch can be dis-assembled and spacers cut to proper length.

**ACCESSORIES**—One Mallory No. 366 knob, one No. 232 nut, and one No. 227 lock washer furnished with each switch. See Miscellaneous Items section for Dial Plates.

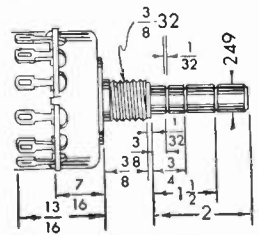
**PACKAGING**—One switch and accessories per display carton.



## Single Section Rotary Switches

**APPLICATION**—For use in small receivers as tone controls, band selector and antennae switching; also ideal for meter switching in test equipment and many other electronic devices where space is at a premium.

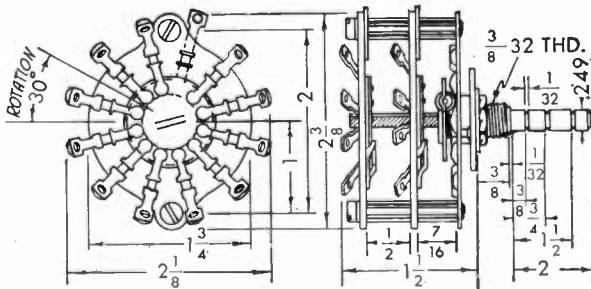
**DESCRIPTION**—Available in single section only, and in two sizes:  $1\frac{1}{4}$ " diameter, 30° indexing, and  $1\frac{1}{16}$ " diameter, 20° indexing. All combinations made in both shorting and positive non-shortening action. The  $1\frac{1}{16}$ " base switch is available with the adjustable stop feature. High quality XXX grade of phenolic resin insulation conforming to JAN specifications P-13. All switches supplied with  $\frac{3}{8}$ " diameter,  $\frac{3}{8}$ " long brass bushing and 2" long shaft grooved for easy cutting at popular lengths.



3100J-3200J SERIES

**ACCESSORIES**—One Mallory No. 366 knob, one No. 232 nut, and one No. 227 lock washer furnished with each switch. See Miscellaneous Items section for Dial Plates.

**PACKAGING**—One switch and accessories per display carton.



Shorting Type Catalog No.	Non-Shorting Type Cat. No.	No. of Circuits per Section or Gang	Total No. of Circuits per Switch	No. of Positions	No. of Sections or Gangs per Switch
1211L	1311L	1	1	2 to 11	1
1215L*	1315L*	2	2	2 to 5	1
1213L*	1313L*	3	3	2 to 3	1
1212L*	1312L*	4	4	2 to 2	1
1221L	1321L	1	2	2 to 11	2
1225L*	1325L*	2	4	2 to 5	2
1223L*	1323L*	3	6	2 to 3	2
1222L*	1322L*	4	8	2 to 2	2
1236L*†		1	3	2 to 6	3
1231L	1331L	1	3	2 to 11	3
1235L*	1335L*	2	6	2 to 5	3
1246L*†		1	4	2 to 6	4
1241L	1341L	1	4	2 to 11	4
1245L*	1345L*	2	8	2 to 5	4
1251L	1351L	1	5	2 to 11	5
1256L	1356L	2	10	2 to 6	5
1261L	1361L	1	6	2 to 11	6
1266L	1366L	2	12	2 to 6	6

\*These switches are provided with an "off" position which is in addition to the number of positions listed in the fifth column.

†Will be discontinued when present stocks are exhausted.

Shorting Type Catalog No.	Non-Shorting Type Cat. No.	Number of Circuits	Number of Positions	Diameter of Base	Adjustable Stop
3115J	3215J	1	5	1 1/4"	No
31112J	32112J	1	12	1 1/4"	No
3122J	3222J	2	2	1 1/4"	No
3123J	3223J	2	3	1 1/4"	No
3126J	3226J	2	6	1 1/4"	No
3134J	3234J	3	4	1 1/4"	No
3142J	*3242J	4	2	1 1/4"	No
3143J	3243J	4	3	1 1/4"	No
31117J	32117J	1	2 to 17	1 1/16"	Yes
3129J	3229J	2	2 to 9	1 1/16"	Yes
3136J	3236J	3	2 to 6	1 1/16"	Yes
3163J	3263J	6	2 to 3	1 1/16"	Yes

\*Replaces No. 2742.

†Replaces No. 2762 by using adjustable stop.

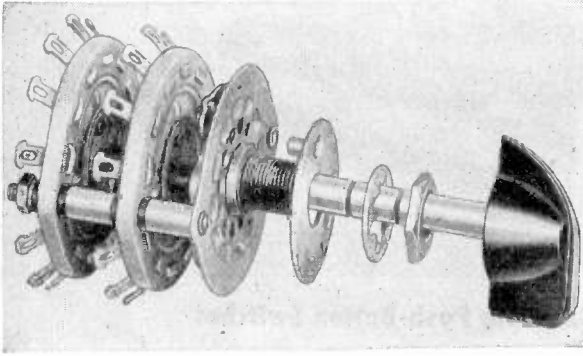
‡Replaces No. 150J by using adjustable stop.



## UNIVERSAL MOUNTING BRACKET-RB254

Mallory Page 2 (See Mallory Page 1 for List Prices)

# MALLORY SELECTOR, TAP AND LEVER ACTION SWITCHES



## Ceramic Section Selector Switches

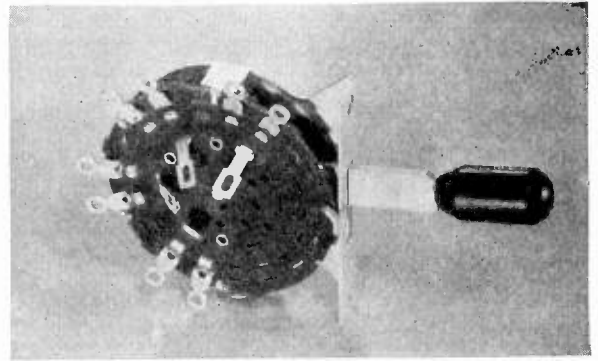
**APPLICATION**—These switches are ideal for highly efficient critical radio frequency circuit applications. Suitable for radio receivers and low-power transmitter circuits. They find widespread use in laboratories, by manufacturers of transmitters, receivers, test equipment and other electronic apparatus, and by experimenters and amateurs.

**DESCRIPTION**—Ceramic insulation minimizes RF losses and retards moisture absorption. Indexing mechanism is the "hill-and-valley" type providing a definite "snap" indexing action. An adjustable stop feature is designed into the index assembly to permit a choice of 2 to 11 positions. All current-carrying parts are heavily silver-plated. The contacts are of the double-wiping, self-cleaning type, which insures low contact resistance over an extended temperature range. All switches supplied with  $\frac{3}{8}$ " diameter,  $\frac{3}{8}$ " long brass bushing and 2" long shaft grooved for easy cutting at popular lengths. All types non-shorting.

The two-section switch has  $\frac{1}{2}$ " spacing between sections. The three-section switch has 1" spacing.

**ACCESSORIES**—One Mallory No. 366 knob, one No. 232 nut, and one No. 227 lock washer furnished with each switch.

**PACKAGING**—One switch and accessories per display carton.



## Lever Action Switches

**APPLICATION**—These switches are particularly adapted to centralized radio, sound distribution, public address equipment, and intercommunication equipment for school installations of loud-speaker systems and office communication systems.

**DESCRIPTION**—The housing and mounting bracket of these switches are one integral part, which assures rigidity, and the design lends itself to the support of the section, thus preventing warping of the section or distortion in alignment of contacts. A smooth contact surface is guaranteed by the use of the exclusive Mallory "wrap-around" method of securing the terminal through the holes in the phenolic resin section. The phenolic resin is high grade for maximum insulation. The 5000 series have elongated mounting holes in the bracket, spaced from  $2\frac{5}{16}$ " to  $2\frac{3}{8}$ " apart. The 6000 and 7000 series have mounting brackets with round holes spaced  $1\frac{1}{8}$ " apart. Switches may be mounted singly or grouped in multiple mounting with  $\frac{3}{8}$ " between lever arm centers to facilitate conventional rack and panel installations.

**ACCESSORIES**—One knob, two 6-32 bolts and nuts are furnished with each switch.

**PACKAGING**—One switch and accessories per display carton.

### Positive Indexing

Cat. No. Shorting Type	Cat. No. Non-shorting Type	Number of Poles or Circuits	Number of Positions or Contacts
5124	5224	2	4
6142	6242	4	2
6143	6243	4	3

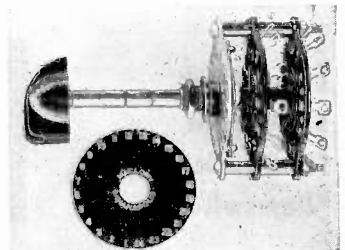
### Spring Return

7122-L	7222-L	2	2
7123-C	7223-C	2	3
7142-L	7242-L	4	2
7143-C	7243-C	4	3
7162-L	7262-L	6	2

**DON'T MISS THE  
MALLORY CONTROL  
DEALS**

**Turn to Page 3,  
Mallory Controls,  
for  
Full Information**

## 24-Point Non-Shorting Tap Switch



**APPLICATION**—This switch is particularly useful in test equipment applications where more than the conventional 12-point switch is required.

**DESCRIPTION**—The single circuit 24-point is accomplished through the use of two sections similar in design to the 1300L series switch.

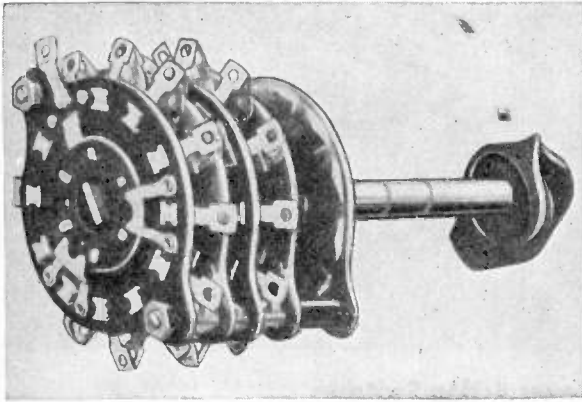
The indexing mechanism has no stops and is capable of continuous rotation with a 15° indexing action between positions. Furnished with  $\frac{3}{8}$ " diameter,  $\frac{3}{8}$ " long brass bushing and 2" long notched shaft.

**ACCESSORIES**—One Mallory No. 366 knob, one No. 232 nut, one No. 227 lock washer, and one No. 394 Mallory Dial Plate furnished with each switch.

**PACKAGING**—One switch and accessories per display carton. Catalog No. 13124L

Mallory Page 3 (See Mallory Page 1 for List Prices)

# MALLORY CIRCUIT-OPENING, "HAM", AND PUSHBUTTON SWITCHES



## Circuit-Opening Switch

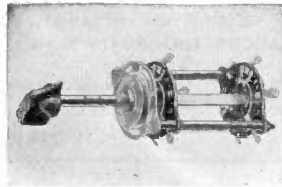
**APPLICATION**—This switch has found wide application in the construction of test sets, tube checkers, analyzers, and other apparatus where it is desirable to use only one meter.

**DESCRIPTION**—This is a special design of the series 1200L switch to provide for wiring of multiplying resistors to the switch, so that the switch not only opens the line but also automatically cuts in the proper multiplying resistor. The switch employs the standard 30° index, and is supplied with 3/8" diameter, 3/8" long brass bushing and a 2" long shaft grooved for easy cutting to proper lengths.

**ACCESSORIES**—One Mallory No. 366 knob, one No. 232 nut, one No. 227 lock washer, and one No. 382 Mallory etched Dial Plate.

**PACKAGING**—One switch and accessories per display carton.

Catalog No. 1400L



## Two-Section Five-Position "Hamswitch"\*

**APPLICATION**—This switch provides a method of using a single meter to measure current or voltages up to and including 5 circuits of an amateur transmitter.

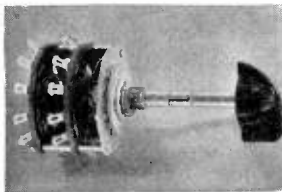
**DESCRIPTION**—This switch has the basic design of the 1200L series switch. It is of two-section construction with 2 1/4" spacing between sections to permit multiplying resistors to be soldered directly to the switch terminals. High insulating qualities and low loss construction permit a conservative rating of 1000 volts RMS AC or 1500 volts DC. 60° indexing between positions and provided with the adjustable stop feature, giving a maximum of 5 positions. Supplied with 3/8" diameter, 3/8" long brass bushing and 2" long shaft grooved for easy cutting at popular lengths.

**ACCESSORIES**—One Mallory No. 366 knob, one No. 237 nut and one No. 227 lock washer, furnished with each switch.

Refer to Misc. Items Section for special dial plate No. 487.

**PACKAGING**—One switch and accessories per display carton.

Catalog No. 151L



## Two-Section Two-Circuit Six-Position "Hamswitch"

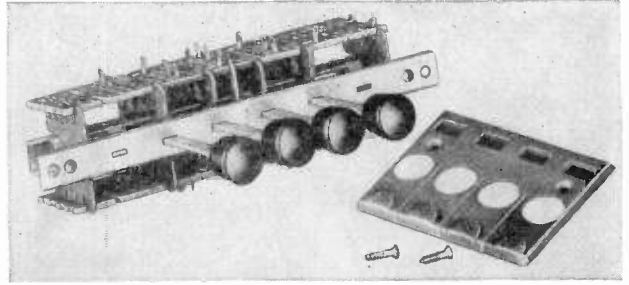
**APPLICATION**—Where all unused terminals are to be connected together and automatically shorted out.

**DESCRIPTION**—This switch is of the basic design of series 170C, excepting a phenolic resin insulation is used in the two-section assembly. Through the use of the 330° shorting shoes, all unused terminals are automatically connected. The spacing between sections is 1/2". Switch is supplied with adjustable stop feature for 2 to 6 positions. Supplied with 3/8" diameter, 3/8" long brass bushing and 2" long shaft grooved for easy cutting at popular lengths.

**ACCESSORIES**—One Mallory No. 366 knob, one No. 232 nut, and one No. 227 lock washer furnished with each switch.

**PACKAGING**—One switch and accessories per display carton.

Catalog No. 152L



## Multiple Push-Button Switches

**APPLICATION**—This switch is ideal for applications requiring a device for making, breaking, or transferring multiple circuits in automatic station selector tuning, inter-office communication systems, telephone and annunciator systems, set analyzers, tube checkers, and multimeters.

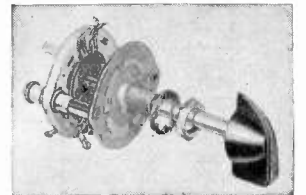
**DESCRIPTION**—Available from four to eight buttons with 5/8" spacing between center lines of plungers. Each plunger actuates a phenolic resin slider supporting the various combinations of shoes which engage the stationary contacts. Arrangement of the plunger and latch bar mechanism provides an inter-locking action whereby one or more plungers may be pressed simultaneously, and will remain latched until released by depressing another plunger. Available in both shorting and non-shorting types, and with contact arrangement for both circuit closing and circuit transfer.

**ACCESSORIES**—Each switch furnished with brown phenolic resin knobs, one attractive statuary bronze escutcheon plate with blank designation inserts, and transparent strip for windows.

**PACKAGING**—One switch and accessories per display carton.

Catalog Number	Number of Buttons	Type
2164	4	Circuit Closing
2166	6	Circuit Closing
2168	8	Circuit Closing
2184	4	Circuit Transfer
2186	6	Circuit Transfer
2188	8	Circuit Transfer
2194	4	†Circuit Transfer
2196	6	†Circuit Transfer
2198	8	†Circuit Transfer

†Non-shorting.



## Ceramic Section "Hamband" Switches

**APPLICATION**—For transmitter band switching of low power transmitter circuits.

**DESCRIPTION**—A special ceramic switch designed for transmitter plate circuits using up to 1000 volts DC with power up to 100 watts inclusive. Ceramic insulation is employed in both the section and spacers between sections to obtain highest insulation qualities, and to provide low losses at high frequencies. Available in one to five sections, with each section having one circuit. 90° indexing between positions, and capable of continuous rotation. Supplied with 3/8" diameter, 3/8" long brass bushing and 2" long shaft grooved for easy cutting at popular lengths. All types non-shorting.

**ACCESSORIES**—One Mallory No. 366 knob, one No. 232 nut, and one No. 227 lock washer furnished with each switch.

Refer to Misc. Items Section for special dial plate No. 488.

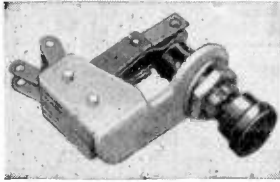
**PACKAGING**—One switch and accessories per display carton.

Catalog Number	No. of Sections or Gangs	Circuits per Switch	Spacing between Sections	Points or Contacts per Circuit
161C	1	1		4
162C	2	2	2"	4
163C	3	3	1"	4
164C	4	4	1"	4
165C	5	5	1"	4

\*Reg. U.S.Pat. Off.

Mallory Page 4 (See Mallory Page 1 for List Prices)

# MALLORY PUSH-BUTTON AND JACK SWITCHES



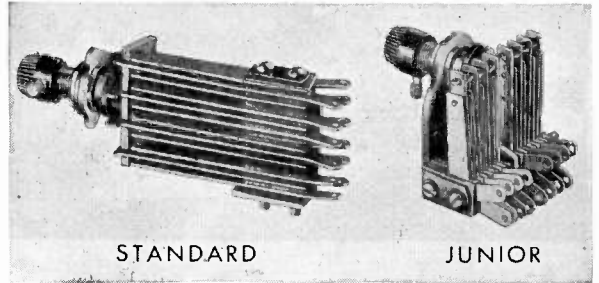
## Single Push-Button Switches

**APPLICATION**—These switches are ideal for a wide variety of applications requiring momentary or permanent contact. Especially adapted for use in laboratories, on test panels, in meter circuits, etc.

**DESCRIPTION**—Eight different circuit combinations available in either the locking or non-locking types. The locking types keep the circuit closed until the button is pulled out. The non-locking types maintain contact only while the button is held in the depressed position. Excellent electrical characteristics are achieved through the use of the phosphor bronze contact springs and the low resistance silver-plated contacts. The switch frame is steel cadmium plated, and the mounting bushing is nickel plated brass. Will mount in single hole  $\frac{7}{16}$ " diameter on panels up to  $\frac{1}{4}$ " thick.

**ACCESSORIES**—One polished phenolic resin knob, one Mallory 232 nut and one No. 225 washer furnished with each switch.

**PACKAGING**—One switch and accessories per display carton.



STANDARD

JUNIOR

## Jack Switches

**APPLICATION**—Ideally suited for use in laboratories, test panels, meter circuits, and other equipment where variable circuit combinations are accomplished through the leaf spring type assembly.

**DESCRIPTION**—The Standard Jack (or long frame type) may be used where space is no factor, as the frame extends straight back from panel mounting. The spring stack is assembled on a horizontal line with the frame. Constructed with knob and shaft that rotates through the bushing, operating a cam to actuate the spring which accomplishes the circuit switching.

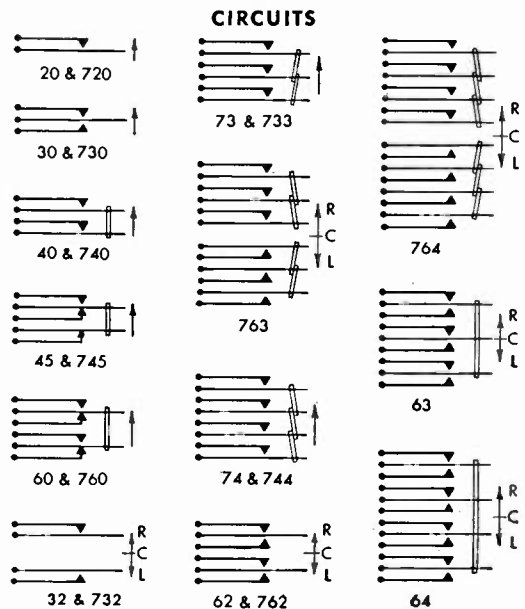
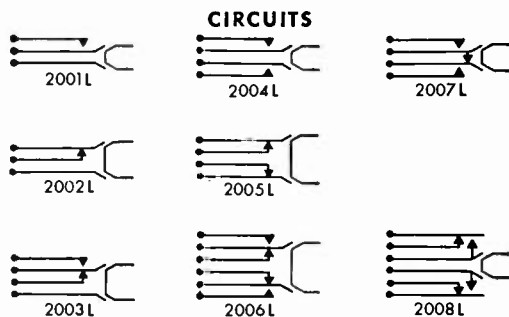
The Junior Jack (or short frame type) is made with the frame supporting the spring stack at right angles. Because of the short springs used, it requires a minimum of space for mounting. The actuation of the springs is the same as for the Standard Switch. Frames on both Standard and Junior types are cadmium plated. Brass bushings and phosphor bronze springs are nickel plated. The fine silver contacts insure good electrical and low resistance contact. Both switch types are suitable for mounting in a single hole  $\frac{7}{16}$ " diameter on panels up to  $\frac{1}{4}$ " thick.

**ACCESSORIES**—One Mallory black phenolic resin knob, one No. 232 nut, and one No. 225 washer furnished with each switch.

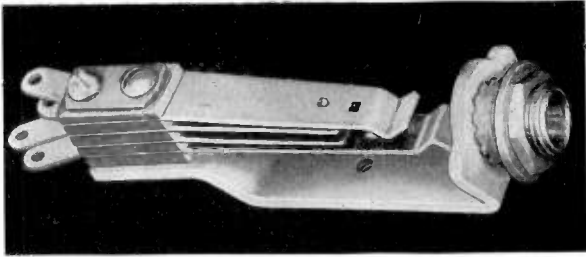
**PACKAGING**—One switch and accessories per display carton.

Two Position		Circuit Arrangement
Standard	Junior	
No.	No.	
20	720	Single-Pole, Single-Throw Single-Pole, Double-Throw Double-Pole, Single-Throw Five Springs, two break and one make Double-Pole, Double-Throw Three-Pole, Single-Throw Four-Pole, Single-Throw
30	730	
40	740	
45	745	
60	760	
73	733	
74	744	
Three Position		
32	732	Double-Pole, Single-Throw Center off Position Double-Pole, Double-Throw Center off Position Three-Pole, Double-Throw Center off Position Four-Pole, Double-Throw Center off Position
62	762	
63	763	
64	764	

Cat. No.	Circuit Arrangement
2001	S. P. Make contact—Non-locking type
2001-L	S. P. Make contact—Locking type
2002	S. P. Break contact—Non-locking type
2002-L	S. P. Break contact—Locking type
2003	S. P. Double-Throw—Non-locking type
2003-L	S. P. Double-Throw—Locking type
2004	2-Pole—Make two contacts—Non-locking type
2004-L	2-Pole—Make two contacts—Locking type
2005	2-Pole—Break two contacts—Non-locking type
2005-L	2-Pole—Break two contacts—Locking type
2006	2-Pole—Double-Throw—Non-locking type
2006-L	2-Pole—Double-Throw—Locking type
2007	2-Pole—Make two—Break one—Non-locking type
2007-L	2-Pole—Make two—Break one—Locking type
2008	Double-Throw—Make before break—Non-locking type
2008-L	2-Pole—Double-Throw—Make before break—Locking type



# MALLORY JACKS



## Jacks

**APPLICATION**—These jacks provide a conventional receptacle where it is desirable to open or close auxiliary circuits by use of a combination of spring assemblies actuated by insertion of connection plugs. Excellent for head sets, hand sets, or microphone cord and plug connections, for meter testing cord and plug connections, or as a receptacle for any device where desirable to connect or disconnect by cord and plug. Fit all Mallory #75 and 76 plugs.

**DESCRIPTION**—The long frame jacks are provided with a variety of spring combinations. The spring stackups are mounted horizontally to the frame. The jack is designed to mount in a single  $\frac{7}{16}$ " hole in panels up to  $\frac{5}{16}$ " thick. Fits all standard Mallory plugs of two and three conductor types.

The Junior Jack (sometimes called "short frame" jack) is made with the frame supporting the spring stack at a right angle with the short springs requiring only  $1\frac{5}{16}$ " space back of panel for mounting. Bushings are made to mount in single  $\frac{7}{16}$ " diameter holes in panels up to  $\frac{5}{16}$ " thick. Fits all standard Mallory plugs.

The Midget Jack is very compact (with shorter frame and springs than the Junior types), being extremely useful where bare minimums of space exist. Will mount in a single  $\frac{3}{8}$ " diameter hole in panels up to  $\frac{1}{4}$ " thick.

The Infant Jack (sometimes referred to as a "pup" jack) is the smallest single circuit jack manufactured to accommodate the conventional 2-way phone plug tip and sleeve connection.

All jacks are made with cadmium-plated frames. Brass bushings and phosphor bronze springs are nickel plated. Fine silver contacts provide a jack with excellent electrical contact and low-contact resistance.

**ACCESSORIES**—One Mallory No. 232 nut and one No. 225 washer furnished with each long frame Junior and A-1 (Infant) Jack. Two nuts and one washer furnished with all Midget Jacks.

**PACKAGING**—One switch and accessories per display carton.

## MALLORY VIBRATOR DATA BOOK

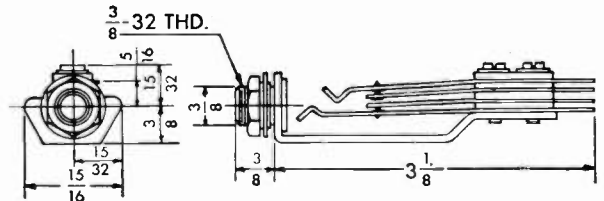
Complete . . . original . . . easy to read. Answers all your questions about vibrator power supplies. It's packed with information that cannot be duplicated anywhere else; information gained by Mallory in sixteen years of specialized power supply experience. The demand for this book is large—so order your copy now through your Mallory Distributor.

	Long Frame Cat. No.	Junior Jacks Cat. No.	Infant and Midget Cat. No.
	1	701	*A-1
	2	702	A-2
	2A	702A	A-2A
	2B	702B	
	3	703	
	3A	703A	A-3A
	3B	703B	
	3C	703C	
	4	704	
	4A	704A	
	4B	704B	
	5	705	
	6	706	

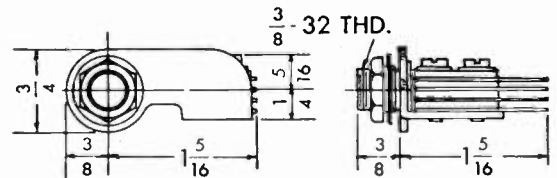
\*Commonly referred to as "Infant" Jack.

**"GROUNDING" JACK**—(Type GJ-1), for "grounding" airplanes while refueling. Similar in construction to A1 Jack except for insulation.

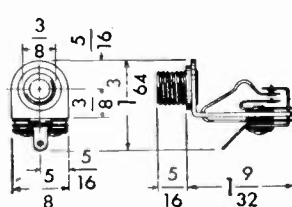
## JACK DIMENSIONS



LONG FRAME

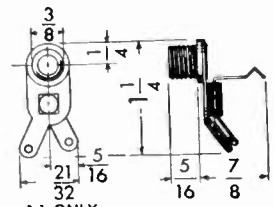


JUNIOR



A2, A2a & A3a ONLY

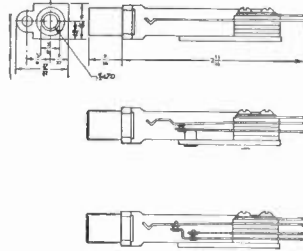
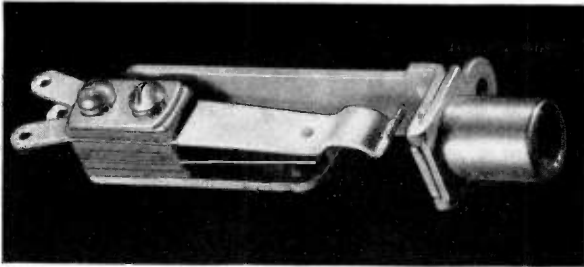
MIDGET JACK



A1 ONLY

INFANT JACK

# MALLORY JACKS AND PLUGS



Cat. No.	Type
XP1	(Open Circuit)
XP2B	(Three-Circuit Microphone)
XP3B	(Single Circuit, Make before Break)

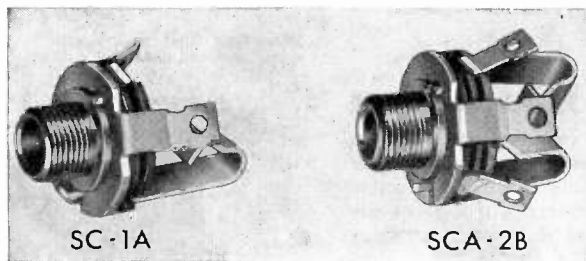
## Jacks

**APPLICATION**—Ideal for telephone switchboard types of applications, as well as industrial applications where a more compact jack is required for close strip panel mounting.

**DESCRIPTION**—Although limited to three circuit combinations, these jacks serve the same purpose as the Mallory Standard Long Frame Jacks, but employ a special frame angle to provide greater support. The bushing is plain, unthreaded, and the jack is mounted by means of a screw through the panel mounting plate at the base of the bushing. Bushing fits all standard Mallory plugs of two and three conductor types. The springs are assembled horizontally to the frame. The frames are steel cadmium plated. Brass bushings and phosphor bronze springs are nickel plated. The fine silver contacts provide an excellent electrical contact and low contact resistance.

**ACCESSORIES**—None furnished.

**PACKAGING**—One jack per display carton.

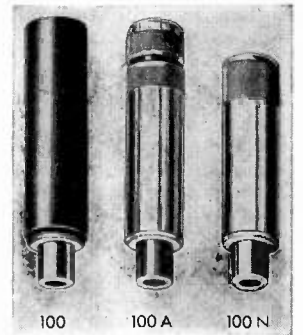


## SC Jacks

**No. SC-1A Phone Jack**—Equivalent of Signal Corps Jack No. JK-34A. Same spring arrangement as No. 1 Long Frame Jack. Designed to receive following plugs: Mallory No. 75, Western Electric Nos. 47A and 47B; Signal Corps Nos. PL-47, PL-48, PL-55, PL-148, PL-155.

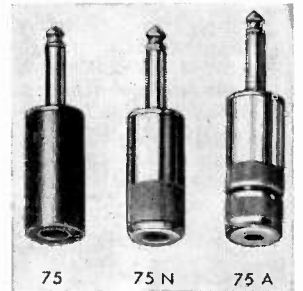
**No. SCA-2B Microphone Jack**—Equivalent of Signal Corps Jack No. JK-33A. Same spring arrangement as No. 2B Long Frame Jack. Designed to receive following plugs: Western Electric No. 109 and Signal Corps Nos. PL-46, PL-68 and PL-168.

## Extension Jacks



Cat. No.	Description
100	Two-Way Extension Jack (Fiber Shell) for No. 75 Phone Plug
100N	Two-Way Extension Jack (Shielded One-Piece Nickel Shell) for No. 75N Phone Plug
100A	Two-Way Extension Jack (Shielded Two-Piece Nickel Shell) for No. 75A Phone Plug (with Built-in Cable Clamp)

## Plugs



Cat. No.	Description
75	Two-Way Phone Plug with Tie-Cord Anchor (Phenolic Resin Shell)
75N	Two-Way Phone Plug with Tie-Cord Anchor (Shielded One-Piece Nickel Shell)
75A	Two-Way Phone Plug with Tie-Cord Anchor (Shielded Two-Piece Nickel Shell) (with Built-in Cable Clamp)
76	Three-Way Microphone Plug (Phenolic Resin Shell)
76A	Three-Way Microphone Plug (Shielded Two-Piece Nickel Shell) (with Built-in Cable Clamp)

**MALLORY**

**RADIO SERVICE ENCYCLOPEDIA**

Page after page of replacement information  
for all pre-war and post-war receivers.





# SMALL SWITCHES, LIMIT SWITCHES, AND MAGNETIC RELAYS

## SMALL SNAP-ACTION SWITCH, G-E SWITCHETTE CR1070-C103

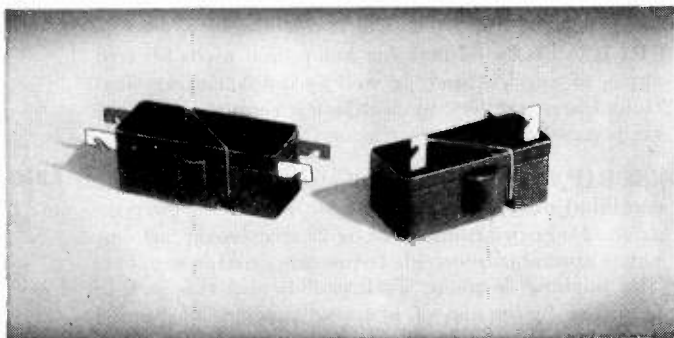
This new, lightweight switch mechanism lends itself especially to applications where space is limited and long life is required.

The Switchette is operated by movement of the spring-return button located in the housing. This button can be actuated by a lever, bellows, or other means. Snap-action, double-break-contact construction gives the G-E Switchette a high current rating and makes it suitable for applications where the vibration is severe.

### FEATURES AND ADVANTAGES

1. Small (approximately  $1\frac{1}{4}$  in. by  $\frac{1}{2}$  in. by  $\frac{1}{2}$  in.) and weighs only 9 grams (0.02 lb).
2. Resists vibration and corrosion.
3. Phenolic-resin operating button provides safety from live parts during operation.
4. Contact tips are 99.95 per cent pure silver.
5. Particularly suited to electronic applications because of negligible amount of contact bounce.
6. Five terminal arrangements are available, including the two shown above.
7. Wide variety of forms available, for example, three basic contact arrangements: single-circuit, normally open; single-circuit, normally closed; and two-circuit, normally open and normally closed. Also many special forms.

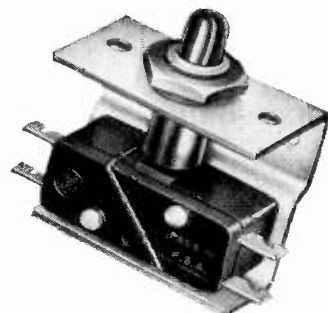
Switchettes are available in ratings up to 10 amperes at 115 or 230 volts a-c. Write for Bulletin GEA-3818.



Switchettes showing two terminal arrangements

## LIMIT SWITCH, CR1070-D101

This sturdy, open-type limit switch is operated by a plunger which provides  $\frac{7}{32}$ -inch overtravel. The contact mechanism of this device is the G-E Switchette, which can be wired to control one normally open circuit and one normally closed circuit. Rated 10 amperes at 230 volts a-c. Write for Bulletin GEA—3821.



Open-type limit switch with push-rod operation

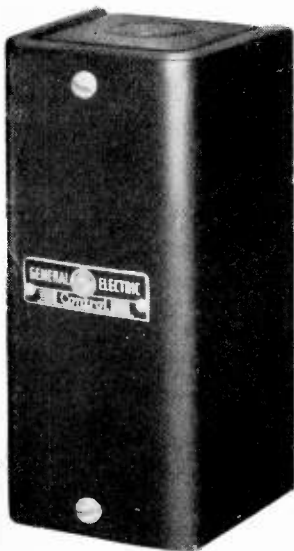
## GENERAL PURPOSE RELAY, CR2790-E

The CR2790 relay is a compact, attractively finished device for use either as a motor starter or a relaying unit. Available in either an open form or enclosed in a general-purpose or explosion-proof housing. Three contact arrangements available: single-pole, single-throw; double-pole, single-throw; and double-pole, double-throw. In the open form, all three contact arrangements use the same base, which facilitates mounting. In the enclosed form, the U-shaped cover makes wiring and servicing convenient. Rated 10 amp. continuous, 110/120 volts a-c.

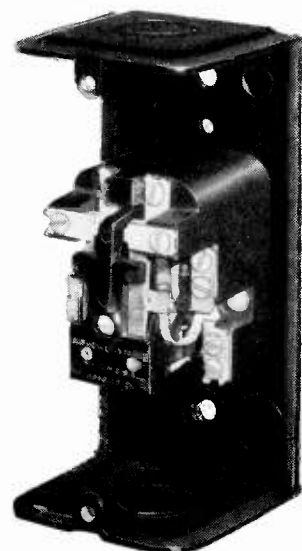
### Applications

Control of pilot circuits in response to remote control switch or thermostat, or for direct control of small motors.

As a fractional-horsepower motor starter, or in conjunction with a magnetic switch controlling larger motors, heating or lighting circuits, and signal systems. Bulletin GEC—257.



Enclosed magnetic relay



Enclosed relay with cover removed



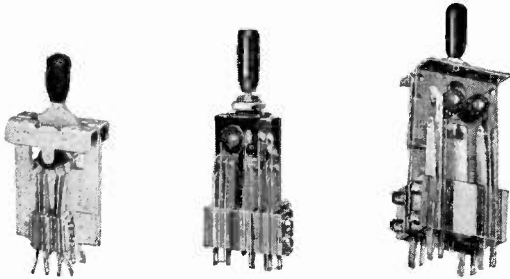
# SWITCHES

LEVER • FOOT  
and  
PUSH-BUTTON

TOUCH  
•  
TIMING

# CONTROLS

## CAM-LEVER SWITCHES



**Model MCT    Model MCM    Model MCL**

Compact lightweight switches designed for long life and trouble-free service under heavy-duty requirements. Added features include shielding between contact sections, mounting provisions for single hole and standard mounting centers plus availability of all popular as well as special build-up variations.

Quotations will be given promptly on your switch problems. Common types are in stock for immediate shipment.

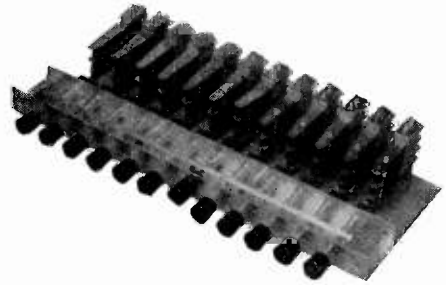
Type	Amps.*	High	Wide	Long†
MCT	1	1½"	¾"	2¾"
MCM	5	1¼"	1¼"	2¾"
MCL	10	1¾"	1¾"	3½"

\*At 125 volts, 60 cycles, non-inductive load.  
†Distance from back panel to end of terminals.

COMPLETE SWITCH WITH FOUR SPDT SECTIONS:

Type	Net Price, 1-9
<b>MCM</b>	<b>\$5.08</b>
<b>MCL</b>	<b>7.03</b>

## MASTER PUSH-BUTTON SWITCH Model MPB



A single unit type push-button switch with high power handling ability to give direct push-button control. Furnished in from two to a maximum of twelve positions. Standard frames are: (1) locking, (2) non-locking, (3) release-lock, and (4) accumulative locking with single-button release. Pure silver contacts, phosphor bronze springs. Rating: 5 amps., 125 volts a-c (non-ind.).

## HEAVY DUTY ELECTRONIC TIMERS

Convenient and compact units for either full or semi-automatic control of industrial processes. Two or more timers control a number of individually timed operations in a predetermined sequence with either self-recycling or manual recycling. Handle 10 amps. at 125 volts, 60 cycles, on DPDT power control contacts. Five ranges: 0.06-1.2, 1/2-8, 3/4-15, 1.5-30, and 3-60 seconds. Plug-in capacitors give ready selection of timing range. Adaptable to use as photo-electric or sensitive relay in non-timing use. \$32.00 List



## FOOTSWITCHES

Models to meet every need. Type MI has large, inclined foot treadle; type MC operates by pressure of finger, elbow,

knee, or foot anywhere on its top plate. Each switch will handle 10 amperes at 125 volts a-c.

Type	Type	Action
Price	Price	
MC-11	MI-21	Normally open, spring return.
\$5.50	\$8.80	
MC-12	MI-22	Normally closed, spring return.
\$5.50	\$8.80	
MC-13	MI-23	Double throw, spring return.
\$6.00	\$9.35	
MC-14	MI-24	First press closes switch contacts; second press opens switch contacts.
\$8.25	\$11.35	
MC-15	MI-25	First press transfers switch contacts; second press restores switch contacts.
\$8.75	\$11.85	
	MI-26	First half-throw closes 1st switch; second half-throw closes 2nd switch; spring return.
	\$13.00	

Contact Operation



**Model MI**  
Cast Iron Case  
4" w. x 6¾" l. x 3" h.



**Model MC**  
Cast Iron Case  
4" diam. x 2½" high



**GENERAL CONTROL COMPANY**  
1203 SOLDIERS FIELD ROAD BOSTON 34, MASSACHUSETTS



# SWITCHCRAFT INC.

CHICAGO 22, ILLINOIS

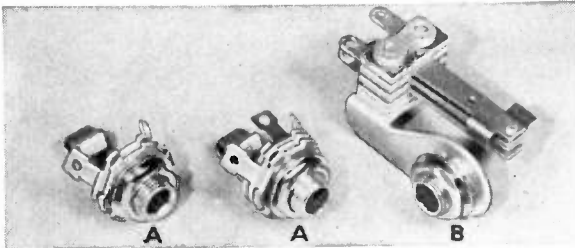
## PHONE JACKS • PHONE PLUGS

SWITCHES: Push-Button . . .

Rotary and Lever Action . . .

"SWITCHCRAFT" produces many custom made products for the industry. Inquiries invited.

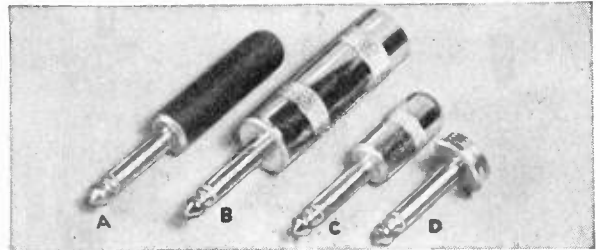
### SWITCHCRAFT PHONE JACKS



The "Littel-Jax" (A), features notched insulating washers mechanically interlocking springs and lugs; "V-bend" in tip spring firmly "holds" mating Plug; minimum space requirements, economical. Mounts in single  $\frac{3}{8}$ " dia. hole, panels up to  $\frac{3}{8}$ " thick. The short frame type Jack known as "SF-JAX" (B), requires minimum panel depth, mounts in single  $\frac{3}{8}$ " dia. hole, panels up to  $\frac{3}{8}$ " thick.

"LITTEL-JAX"		"SF-JAX"		Description	Schematic.
Part No.	U.S.A. List Price	Part No.	U.S.A. List Price		
11	\$0.35	21	\$0.50	Open Ckt. 2-cond.	
		22	\$0.65	Closed Ckt. 2-cond.	
12A	\$0.40	22A	\$0.65	Closed Ckt. 2-cond.	
12B	\$0.50	22B	\$0.65	Open Ckt. 3-cond.	
		23	\$0.75	Separate "make" ckt.	
		23A	\$0.75	"Break-make" ckt.	
13B	\$0.70	23B	\$0.75	"Break" ckt. 3-cond.	
		23C	\$0.75	"Break" ckt. 3-cond.	
		23E	\$0.75	Separate "Break" ckt.	
		24	\$0.85	Two "Break" ckts.	
		24A	\$0.85	Two-conductor — spl. ckt.	
		24B	\$0.85	Two "Break" ckts.	
		25	\$1.05	Special Circuit — 2-cond.	
		26	\$1.15	Special Circuit — 3-cond.	

### SWITCHCRAFT PHONE PLUGS



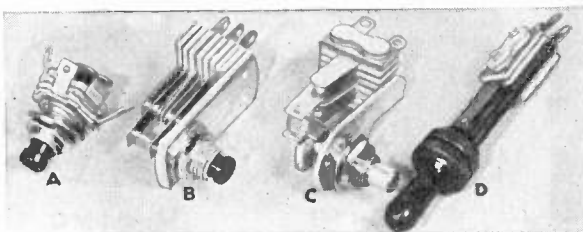
The "Littel-Plug" (A), radically new, fitting standard Jacks; solder lug type features clamp terminal serving as a cable clamp and terminal—perfect for metal braid cable. Screw type terminals—no clamp. Tenite or Metal handles are  $1\frac{1}{8}$ " L.,  $\frac{1}{2}$ " dia. Exterior metal parts bright nickel Pl.

The Standard Plugs (B), conventional design, available both black Bakelite or metal handles  $2\frac{1}{4}$ " L.,  $\frac{1}{4}$ " O.D., except No. 90 and No. 160 have metal handles 1" long. Exterior metal parts bright Nickel Pl.

The "Lug-Plug" (C), low-cost two conductor, solder lug term. Exterior metal parts bright Nickel Pl. Red or Black Tenite Handles are  $1\frac{1}{8}$ " L.,  $\frac{1}{2}$ " O.D. No. 330 has metal handle 1" L., bright Nickel Pl. Plug Adapter (D) used with MC1F or MC1FA Connectors for use with standard Phone Jacks.

Part No.	U.S.A. List Price	Plug Type	Color or Type of Handle	Description
240	\$0.70	"Littel-Plug"	Black	2-conductor. Screw Term.
245	\$0.70	" "	Red	" " " " " "
270	\$0.95	" "	Metal	" " " " " "
250	\$0.65	"Littel-Plug"	Black	2-conduct. Clamp-lug Term.
255	\$0.65	" "	Red	" " " " " "
280	\$0.90	" "	Metal	" " " " " "
260	\$1.10	"Littel-Plug"	Black	3-conductor. Screw Term.
290	\$1.30	" "	Metal	" " " " " "
267	\$0.95	"Littel-Plug"	Black	3-conduct. Clamp-lug Term.
269	\$0.95	" "	Red	" " " " " "
297	\$1.20	" "	Metal	" " " " " "
40	\$0.65	Standard	Black	2-conductor. Screw Term.
70	\$1.10	" "	Metal	" " " " " "
160	\$0.85	" "	Metal	" " " " " "
44	\$0.45	Adapter	—	" " " " " "
60	\$0.95	Standard	Black	3-conductor. Lug Terminals
90	\$1.20	" "	Metal	" " " " " "
350	\$0.50	"Lug-Plug"	Black	2-conductor. Lug Terminals
355	\$0.50	" "	Red	" " " " " "
380	\$0.60	" "	Metal	" " " " " "

## SWITCHCRAFT SWITCHES



The "Littel-Switch" (A), available 3 circuits, either red or black one-piece Plastic Push-Buttons, non-locking only. Mounts in single  $\frac{3}{8}$ " dia. hole, panels up to  $\frac{1}{4}$ " thick.

The "FF-Switch" (B), all common circuits, one-piece black Plastic Push-Button, non-locking only. Mounts in single  $\frac{3}{8}$ " dia. hole, panels up to  $\frac{1}{4}$ " thick.

The "RS-Switch" (C), non-locking, two-position rotary, all common circuits. Mounts in single  $\frac{3}{8}$ " dia. hole, panels up to  $\frac{1}{4}$ " thick. Ideal for "Talk-Listen" switches in Inter-Comm. Systems.

The "LS-Switch" (D), unusually small Lever Action Switch, made to special order only, two or three positions, non or locking. Mounts in single  $\frac{1}{2}$ " dia. hole, panels up to  $\frac{3}{8}$ " thick.

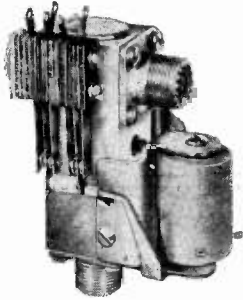
AVAILABLE AT ALL LEADING RADIO JOBBERS.

"LITTEL-SWITCH"			"FF-SWITCH"		"RS-SWITCH"		Schematic Circuit
Part No. Red. Push-button	Part No. Black Push-button	U.S.A. List Price	Part No.	U.S.A. List Price	Part No.	U.S.A. List Price	
101	201	\$0.80	1001	\$0.90	2001	\$0.90	
102	202	\$0.80	1002	\$0.90	2002	\$0.90	
103	203	\$0.85	1003	\$1.00	2003	\$1.00	
			1004	\$1.10	2004	\$1.15	
			1005	\$1.10	2005	\$1.15	
			1006	\$1.35	2006	\$1.50	

PRICES SUBJECT TO CHANGE WITHOUT NOTICE.

# Advance RELAYS

## COAXIAL RELAY



Type 7204

This relay, for use with 52 ohm RG coaxial cable, has SPDT internal contacts, rated at 880 watts maximum. If desired, DPDT auxiliary contacts (as illustrated) may be had. Tests on a 52 ohm line show VSWR of 1.02:1.0 at 100 meg.

\*List Prices: (Up to 115 V A.C. or 40 V D.C.)

A.C.	D.C.		
7200	8200		\$13.75
7204	8204	With auxiliary contacts.....	17.05

\*For higher voltages up to 440 V A.C. or 240 V D.C., or for other Advance Coaxial Relays, see your nearest jobber.

Size (without auxiliary contacts): 1 $\frac{3}{8}$ " x 2 $\frac{7}{8}$ " x 3 $\frac{1}{2}$ "

## MIDGET TELEPHONE RELAY



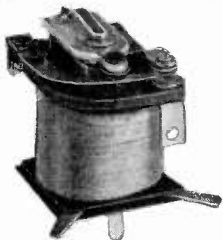
Type 5203A  
"A" denotes  
5-amp. contacts

This small, yet sturdy relay is offered in any contact combination from SPST to 4PDT; with  $\frac{1}{8}$ ", 1.5 amp. contacts, or with  $\frac{3}{16}$ ", 5 amp. contacts. Coils draw from .1 to 2 watts D.C. or 1 to 1 $\frac{1}{2}$  watts A.C. List prices below are for coils up to 115 V A.C. or 1000 ohms D.C.

A.C.	D.C.				
5201	6201	SPST	N. O.	\$3.85	For higher voltage coils, up to 220 V A.C. or 16,000 ohms D.C., see your nearest jobber. He can also show you other Advance Telephone Relays.
5201A	6201A	SPST	N. O.	4.07	
5203	6203	SPDT		4.12	
5203A	6203A	SPDT		4.56	
5204	6204	DPDT		4.95	
5204A	6204A	DPDT		5.83	

## TINY MITE RELAYS

(FOR D.C. ONLY)

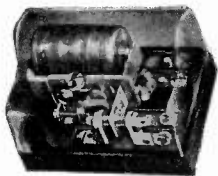


Type 003

In these tiny relays, which require less than  $\frac{1}{2}$  cubic inch mounting space, all switching is above ground. Contacts are rated at .35 amperes at 115 V A.C. (non-inductive). Power required is .2 to .5 watt. Coils are available for any D.C. voltage 1 to 80; resistances up to 5000 ohms. Weight: 10 grams. (45 relays per lb.). List prices below are for any coil up to 800 ohms (24 V D.C.). For higher resistances see your nearest jobber.

Type		List	Size: $\frac{1}{8}$ " x $\frac{1}{8}$ " x $\frac{9}{16}$ "
003	SPST N. O.	\$2.91	(Overall dimensions with lugs as illustrated).
005	DPST N. O.	3.19	If desired, can be supplied with leads.

## ULTRA-SENSITIVE D.C. RELAYS



Type 1200

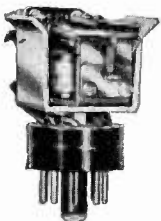
This relay combines many superior features — transparent plastic cover-molded Bakelite base — counter-balanced armature — high overall sensitivity . . . 5 milliwatts for positive operation — 2 $\frac{1}{2}$  milliwatts with careful adjustment, and light contact load . . . Three adjustments with vernier screws: spring, and each contact. Contacts are SPDT, pure silver rated at 1.5 amperes at 115 V A.C. (non-inductive).

Supplied in coil resistances up to 40,000 ohms. Be sure to specify resistance desired! List Prices:

Up to 2200 ohms.....	\$9.07	8700 ohms.....	\$ 9.90	30000 ohms.....	\$12.65
3500 ohms.....	9.35	14000 ohms.....	10.45	40000 ohms.....	15.40
5500 ohms.....	9.62	20000 ohms.....	11.00		

Base Dimensions: 2" x 2 $\frac{9}{16}$ ". Height: 1 $\frac{1}{2}$ ". Weight: 6 $\frac{1}{4}$  ounces.

## PLUG-IN RELAYS



Type K1604P

Any Advance Relay can be Supplied with Standard Speaker Plugs!

To designate that plug-in is desired, add the letter "P" to the type number when ordering. For example type K1604 (illustrated) becomes type K1604P.

To compute list prices, add to the prices shown elsewhere as follows:

4-5-6-7-8 prong.....	\$2.20	11 prong.....	\$3.63
9 prong.....	2.80	12 prong.....	4.07
10 prong.....	3.19		

• Ask your jobber about Advance Hermetically Sealed or Dustite Relays! •

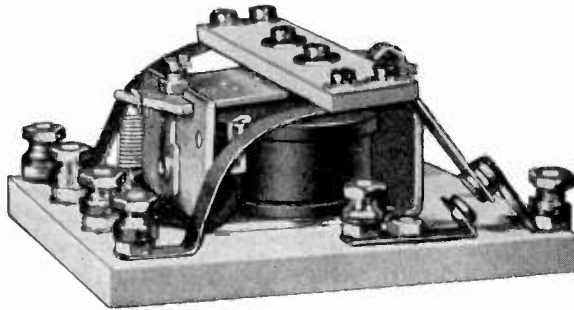
# Advance RELAYS

Isolantite model Antenna Change-Over. Designed for use in Amateur Transmitters.

The contact system is Double Pole-Double Throw, using  $\frac{1}{4}$ " Pure Silver contacts, with exceptional wiping action. Three and four pole arrangements are available on special order.

For high radio frequency control. Entirely hum-

## TRANSMITTER RELAYS



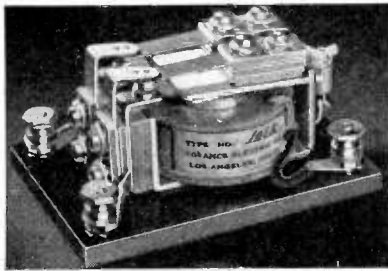
Type 400

free where intended for A.C. operation, and highly efficient on D.C. supplies. All metallic parts are cadmium and chromium plated.

Standard coils are for 110V A.C. and may also be used for 24V D.C. However, they will also be supplied for lower A.C. or D.C. voltages at no increase in price.

List Price .....\$10.89

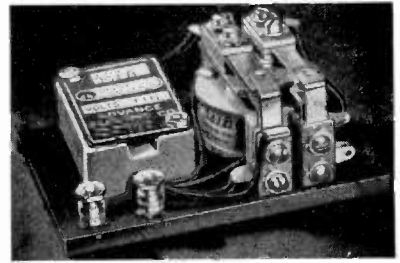
## KEYING RELAYS



Type 300—N.O.  
Type 350—N.C.

Type 101K—A.C.  
Type 201K—D.C.

## TIME DELAY RELAYS



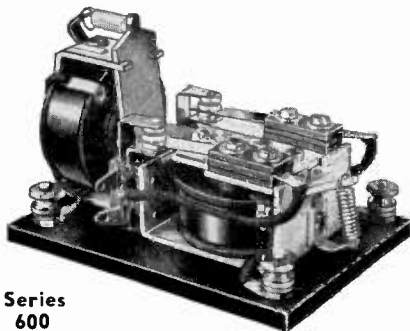
Designed expressly for use in Keying Circuits where it is desired to use low voltage across the key to control high voltage transmission through the Relay contacts. The heavy duty coil and strong return spring makes possible an exceptional keying speed. Two sets of  $\frac{1}{4}$ " Pure Silver contacts in series allow a carrying capacity of 2500 volts. The complete unit, mounted on a  $\frac{3}{16}$ " Bakelite base with binding posts for coil connections, has over-all dimensions of 3" x 2" x  $1\frac{3}{8}$ " and is obtainable for A.C. operation to 115 volts or D.C. operation to 60 volts.

List Price .....\$6.05

Particularly suited for use where short time delays (10 sec. to 1 min.) are required, these Relays are available with both normally open and normally closed thermostats. Types 300 and 350 respectively, the former being widely used for pre-heating tube filaments, etc. The contact combination on both models is Double Pole Single Throw with  $\frac{1}{4}$ " Pure Silver contacts. Mounted on  $\frac{3}{16}$ " Bakelite bases measuring  $3\frac{3}{4}$ " x  $2\frac{3}{8}$ " x  $1\frac{1}{2}$ " with binding posts for coil connections. Standard operating voltage is 110 A.C. List Price \$9.07

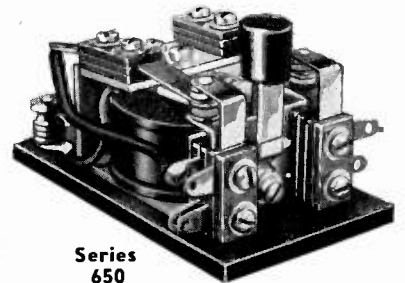
Low voltage units are available on special order.

## LATCHING RELAYS



Series 600

These Relays are highly desirable for applications where it is impractical to have the holding coil in constant service. When the coil actuating the contact arrangement is momentarily energized, the armature is locked in the closed position, and may be released electrically (Type 600) or manually (Type 650).

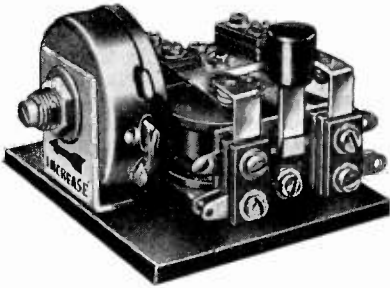


Series 650

	List		List
Type 604B	\$10.56	Double Pole-Double Throw	Type 654B \$7.86
Type 605B	10.28	Double Pole-Single Throw (N. O.)	Type 655B 7.53
Type 606B	10.28	Double Pole-Single Throw (N. C.)	Type 656B 7.53

The above list prices are for  $\frac{1}{4}$ " contacts. For  $\frac{3}{16}$ " points deduct 25c—for  $\frac{1}{8}$ " points deduct 50c. When ordering these types SPECIFY THE VOLTAGE.

# Advance RELAYS

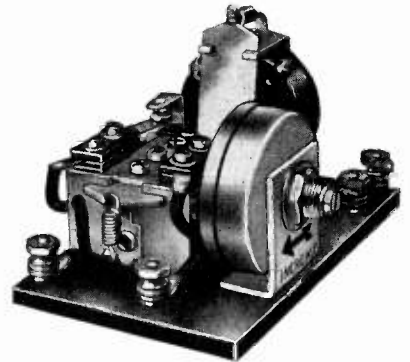


Type 700

## OVERLOAD RELAYS

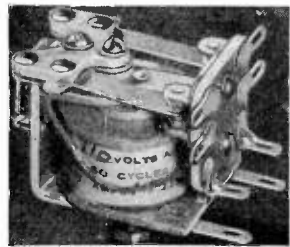
These Relays are designed to provide accurate and positive protection against current surges and continuous overloads, and both the Manual Reset (Type 700) and Electrical Reset (Type 750) are divided into two classifications: Type "A" allows the Relay to attract on any current value between 250 and 500 mills, and Type "B" for any setting between 500 mills and 1 ampere.

When the current flow passes the safety setting, the Double Pole-Single Throw  $\frac{1}{4}$ " Pure Silver contacts are opened, breaking the power supply circuit until reset.



Type 750

Type 700—Base dimensions 3" x 2 $\frac{1}{2}$ "	List Price	\$11.16
Type 750—Base dimensions 4" x 2 $\frac{1}{2}$ "		14.52



Series K1500 and K1600

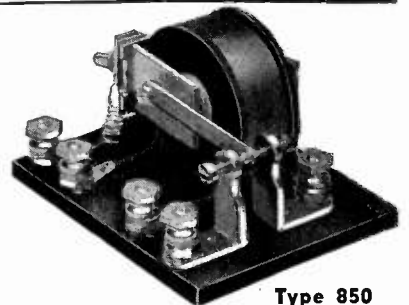
## MIDGET RELAY

Of particular interest where size and cost are factors, this new series of Midget Relays, of improved design, incorporates all of the fine construction features typical of the ADVANCE line. This unit measures only  $1\frac{1}{2}$ " x  $\frac{3}{4}$ " x  $1\frac{1}{8}$ " high. Pure Silver contacts are used,  $\frac{1}{8}$ " in diameter. Standard coils are obtainable from 2 to 32 V D.C. and 1 to 115 V A.C. The following switch combinations can be supplied:

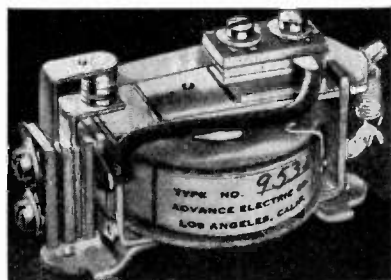
TYPE		CONTACT COMBINATION	LIST PRICES
A.C.	D.C.		
K1505	K1605	DP-ST NOR. OPEN	\$3.57
K1506	K1606	DP-ST NOR. CLOSED	3.57
K1504	K1604	DP-1T	3.85

## ELECTRONIC RELAY

An ultra-sensitive unit for use in electronic tube circuits, providing positive, dependable control on as little as 12 milliwatts. Adjustment screws to change the air-gap between the armature and the pole face, allow operation on a voltage differential of 30%, a condition ideal for electronic applications. The contact combination is Single Pole-Double Throw, employing  $\frac{1}{8}$ " Pure Silver points to safely handle 100 watt non-inductive loads. Obtainable in resistances of 2500, 3000, 5000 and 10,000 ohms at no increase in price.....List Price \$7.86



Type 850



## GENERAL PURPOSE RELAYS

Types 951B — 952B — 953B

These Relays afford maximum power and efficiency at very low cost.  $\frac{1}{4}$ " Pure Silver contacts are standard on the Single Pole-Single Throw (N. O.) Type 951B—Single Pole-Single Throw (N. C.)—952B—and Single Pole-Double Throw—953B—switch combinations. Adequately insulated and entirely above "ground," these Relays may be mounted on any type of panel, quickly and easily, by means of the metal mounting bracket. Coils are obtainable to 115V A. C. or 60V D. C.

List Price .....\$4.23

## GEN-E-MOTOR STARTING RELAY

Type 951C

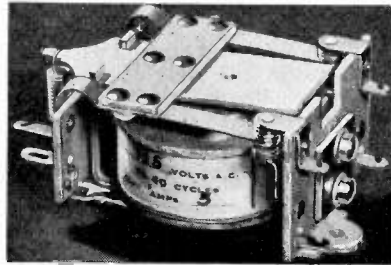
An exceptionally sturdy power transfer Relay, easily capable of handling the heavy current surge encountered on "cold" starts in motor-generator systems. The contacts are  $\frac{3}{8}$ " Pure Silver and have ample carrying capacity for the usual 200-500V converters. Heavy-duty in every phase of construction, this unit is not to be compared with the common five and ten ampere circuit controls. Base dimensions are 3" x 2" and each unit is complete with a braided generator-cable pig-tail and binding posts for all connections. Coils for 5 $\frac{1}{2}$  to 32V D. C. or 1 to 115 A.C. ....List Price...\$7.26



# Advance RELAYS

## MIDGET TYPE CIRCUIT CONTROLS

These Relays are designed for general circuit control applications where the space for mounting is limited, and measure only 2½" in length, 1½" in width, and 1¼" in height. A.C. operated Relays in this series require but 4 watts on 50/60 cycle current, and the D. C. models from 1.5 to 2 watts, affording maximum effi-



ciency without sacrifice of power and dependability. Metal brackets (not shown in the illustration) are supplied with all Relays of this type, and except on special order, these models are limited to the following contact arrangements and the usual standard operating voltages:

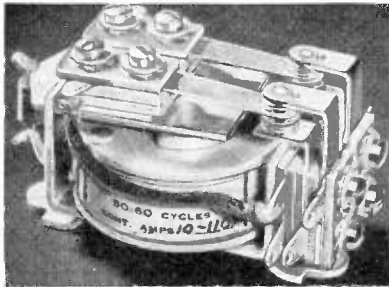
Type Numbers		Contact Sizes and List Prices	
3/16"	List	¼"	List
104AM	\$6.05	104BM	\$6.65
105AM	5.72	105BM	6.32
106AM	5.72	106BM	6.32

### Contact Combinations

Double Pole-Double Throw	3/16"
Double Pole-Single Throw (N. O.)	104AM
Double Pole-Single Throw (N. C.)	105AM
	106AM

The above chart lists type numbers for A.C. operated Relays. D. C. coils may be obtained by changing the series number from 100 to 200. Prices apply to both.

## INDUSTRIAL CONTROL RELAYS



Series 960

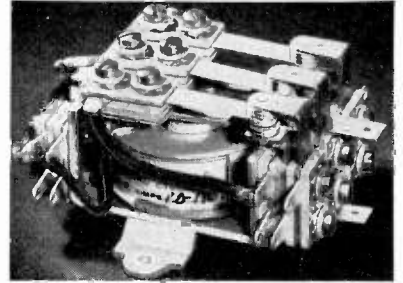
Designed mainly for industrial applications — air conditioning, lighting, and power transfer systems, the Series 960 Relays embody all of the rugged construction features demanded in units of this

type without sacrificing the desirable qualities of the midget style. Available in the following contact combinations, and to operate on standard A. C. and D. C. voltages.

	List
Type 964B—Double Pole-Double Throw	\$6.05
Type 965B—Double Pole-Single Throw (N. O.)	5.72
Type 966B—Double Pole-Single Throw (N. C.)	5.72

For smaller contacts, deduct 25c for 3/16" or 50c for ¼" points, from the above list prices.

Having the same characteristics as the Series 960 Relays, these Three Pole units, Series 970, may be used for fractional h/p 3-phase motor controls, etc. The area required for mounting 2½" x 1⅞" for Type



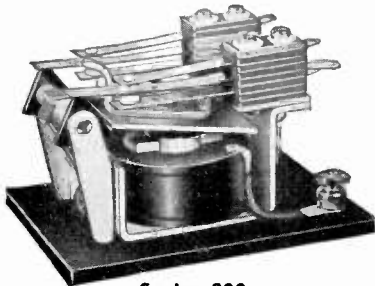
Series 970

970 Relays, as against 2½" x 1¼" for the Type 960's, is due to the slightly larger frame. The metal brackets are the same in both instances—2-5/16" long, and 2" between centers of the 6/32 mounting holes. Available in the voltages indicated in the preceding series, and in the following contact combinations:

	List
Type 977B—Three Pole-Single Throw (N. O.)	\$6.32
Type 978B—Three Pole-Single Throw (N. C.)	6.32
Type 979B—Three Pole-Double Throw	7.26

For smaller contacts, deduct 50c for 3/16" or 75c for ¼" points from the above list prices.

## IMPULSE RELAYS



Series 900

This is another type of Relay for use where it is not feasible to have the holding coil in constant service, but differs from the latching types in that it may be controlled with a single push-button. Coils to operate this type of unit are

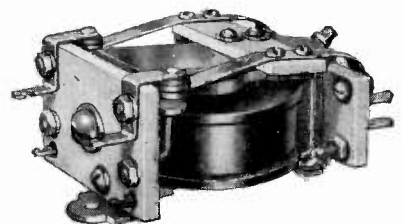
extremely heavy-duty, and are for intermittent (impulse) use only. Available for standard A. C. and D. C. voltages in the following combinations:

	D.P.S.T. List	D.P.D.T. List
With ¼" Pure Silver contacts	\$10.28	\$10.89
With 3/16" Pure Silver contacts	10.89	11.49
With ¼" Pure Silver contacts	11.49	12.70

When ordering these type, be sure to specify the input voltage, contact combination, and size of points.

## MIDGET TYPE R.F. RELAYS

These models are sturdy, compact Double Pole - Double Throw Transmitter Relays, designed expressly for use in all types of mobile-portable communications equipment where space is



Series 1000—A.C. Series 2000—D.C.

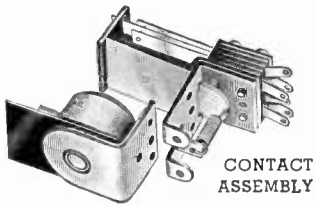
at a premium. The insulation on this, as on the Type 400's, is Isolantite for both the cross-arm and end pieces, with all holes adequately well spaced to prevent structural weakness and possible "creepage." Coils are obtainable for all A. C. and D. C. voltages, and will operate in any position, the former consuming approximately four watts—the latter, two watts of power. Dimensions are 2¾" x 1½" x 1¼".

List Price.....\$9.07



# RELAYS BY GUARDIAN

A COMPLETE LINE OF AMATEUR AND INDUSTRIAL RELAYS



CONTACT ASSEMBLY

COIL ASSEMBLY

**CONTACT SWITCH ASSEMBLIES**

	List Price ea.
Type 200-1—Standard, with SPDT Contact Assembly.....	\$1.83
Type 200-2—Standard, with DPDT Contact Assembly.....	2.50
Type 200-4—Standard, DPDT, 12.5 Amps.....	2.90
Type 200-M1—Midget, with SPDT Contact Assembly.....	1.70
Type 200-M2—Midget, with DPDT Contact Assembly.....	2.25

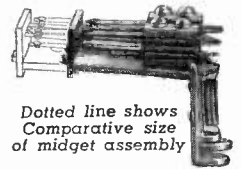
**AC COILS\***

	List Price ea.
6 Volt.....	\$2.25
12 Volt.....	2.25
24 Volt.....	2.25
115 Volt.....	2.80

\*All AC coils available in 25 and 60 cycles.

## SERIES 200—INTERCHANGEABLE

Two basic parts—a coil assembly and a contact assembly—comprise this simple, yet versatile, relay. Coil assembly consists of coil and field piece. Contact assembly consists of switch blades, armature, return spring and mounting bracket. The new midget contact assembly, which is interchangeable with the standard assembly, is also available in either single pole double throw, or double pole, double throw. The standard contact assembly is 2 7/8" long, 1 3/4" high, 1" wide. The midget assembly is 1 3/8" long, 1 1/2" high, 1" wide. The four contact assemblies can be used with any one of 13 coils to make a required relay. Contact points are rated at 8 amps., 115 volts, 60 cycles AC, non-inductive load.



Dotted line shows Comparative size of midget assembly

MIDGET CONTACT ASSEMBLY

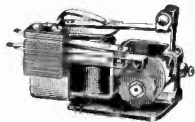
**DC COILS**

	List Price ea.
6 Volt.....	\$2.25
12 Volt.....	2.25
24 Volt.....	2.25
32 Volt.....	2.25
110 Volt.....	2.80
5000-D—For Current Type Operation.....	2.90

**CONTACT PARTS KIT 200-3.** Assortment of contact parts to make other switch combinations. May be used with SPDT or DPDT contact assemblies to make 3PST, 4PST, 4PDT combinations, etc. Either contact assembly takes any combination up to four pole double throw. Includes complete assembly and wiring information for all possible combinations. Complete with all necessary hardware. Shipping weight 4 oz.

List Price .....\$1.85 ea.

## RC-100 REMOTE LOCKING CONTROL RELAY



A Guardian development of the momentary impulse locking control relay. The circuit to the coil needs to be energized only long enough to close armature; contacts lock automatically. Each impulse reverses position of contacts.

Standard coils operate on 115 volts, 50-60 cycles AC. Coils

for other voltage and currents on specification.

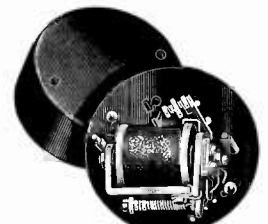
Contacts, 1/4" fine silver metal rated at 1500 watts at 115 volts, 60 cycle, non-inductive. Can also be used in AC primary circuits of any power supply delivering up to 1 KW. 3" long, 2 1/2" wide, 1 1/2" high.

**Applications**—break-in control and phone to CW switching. Any circuit control where locking circuits are used.

	Shp. Wt.	List Price
RC-100-AR—(4PST).....	8 oz.	\$7.15 ea.
RC-100-BR—(3PDT) (SPDT) (DPST).....	8 oz.	7.85 ea.

## U-100 AND U-200 ADJUSTABLE UNDERLOAD RELAYS

Sensitive, precise, designed and constructed for long, trouble-free service. Relays are encased in attractive black finished metal containers, protecting them from dirt, dust and maladjustment. Normal current through the coil on the U-100 is 300 milliamperes with an adjustable range of 100 to 200 milliamperes DC. Normal current through the coil on the U-200 is 600 milliamperes with an adjustable range of 200 to 400 milliamperes. Oversize contacts of fine silver, rated for the AC primary of any power supply delivering up to 500 watts.



**Radio Application**—protection of class "B" audio equipment in case of class "C" load failure, also class "C" amplifier in case of excitation failure.

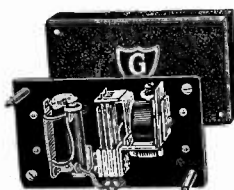
**Industrial Application**—Any DC circuit where it is desirable to maintain currents above a set value.

U-100 and U-200 are 3 1/8" in diameter, 2 1/4" high. Shipping weight 14 oz. List Price \$10.75 ea.

## T-100 AND T-110 TIME DELAY RELAYS

Standard coils operate on 115 volts, 50-60 cycles non-inductive AC. Coils available on other voltages on specification. Oversize contacts rated at 1500 watts on 115 volts, 50-60 cycles non-inductive. Can also be used in the AC primary of any power supply delivering up to 1 KW. Adjustable time delay for any period between 10 and 60 seconds.

**Applications**—Radio. In transmitter circuits to prevent damage of rectifiers and tube filaments by application of plate current before filaments are sufficiently heated. Industrial. Any control problem requiring the changing of circuits after a predetermined interval.



GUARDIAN SERIES T-110 TIME DELAY RELAY

T-100—5 1/4" long, 3" wide, 2 1/4" high. Shipping weight 1 1/4 lbs. Laminated construction. List Price.....\$17.15 ea.

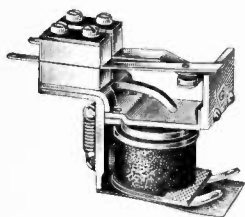
The T-110 is a compact, sturdy, economical time delay relay for use in applications not requiring the capacities of the T-100. Contact capacity — 1250 watts on 115 volt, 60 cycle non-inductive AC. Can also be used in the AC primary circuit of any power supply delivering up to, and including, 1 KW. Adjustable time delay between 10 and 60 seconds.

T-110—5 3/8" long, 3 1/8" wide, 2 7/16" high. Shipping Weight 8 oz. List Price.....\$10.75 ea.



# RELAYS BY GUARDIAN

A COMPLETE LINE OF AMATEUR AND INDUSTRIAL RELAYS



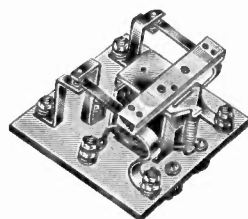
SERIES R-100  
H.F. RELAY

## HIGH FREQUENCY RELAYS

The Series R-100, R-100B, and A-300 Guardian Relays are primarily designed for high frequency applications. They are low-loss insulated, compact, economical and sturdily constructed. The R-100 and R-100B are AISiMag insulated, while the A-300 is mounted on a mycalex base with polystyrene contact mounting bar.

**Radio Applications** — Antenna changeover, break-in, high voltage keying, grid controlled rectifier keying, remote control of receiver and transmitter, and other high frequency applications.

**Industrial Applications** — Oven control, remote motor control, short wave therapy and diathermy, heating equipment.



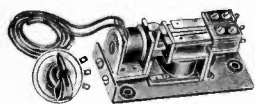
SERIES A-300  
H.F. RELAY

	Length	Width	Height	Shpg. Wght. (oz.)	List Price ea.
R-100 — SPST (normally open).....	2¾"	1"	2"	6	\$3.95
R-100-B — SPST (normally closed).....	2¾"	1"	2¾"	6	3.95
R-100-C — SPDT .....	2¾"	1½"	2¾"	6	4.75
R-100-G — DPDT .....	2¾"	1¾"	2¾"	6	8.55
A-300 — DPDT .....	3"	3"	2-1/16"	7	9.10

## X-300-ER

### ADJUSTABLE OVERLOAD RELAY

with Electrical Reset



This relay offers positive, precise protection against current surges and continuous overloads — remote panel installation of the control potentiometer simplifying adjustment of relay to operate on

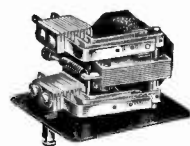
any current value from 250 to 750 milliamperes — auxiliary contacts for pilot light indication of "overload" or "clear" position — reset relay can be operated from any convenient point. Voltage drop across overload coil is less than 10 volts at any current value. Insulation between coil and ground rated at 3000 volts.

**X-300-ER**—4¾" long, 1-15/16" wide, 2" high. Shipping weight 12 oz.

List Price.....\$9.25 ea.

## B-100 BREAK-IN RELAY

Specially designed for break-in operation on amateur transmitters. Low current drain and compact construction, plus the use of a laminated field piece and armature insuring efficient operation, make the B-100 an ideal relay for this application. Standard coil operates on 115 V., 50-60 cycle AC. Silver contacts rated at 1500 watts, 60 cycles AC non-inductive, and in AC primary circuits of any power supply delivering up to 1 KW.

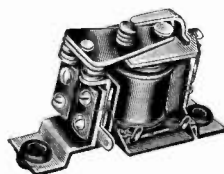


**B-100**—2¾" long, 2½" high, 2¼" wide. Shipping weight 11 oz.

List Price.....\$10.75 ea.

## K-320 KEYING RELAY

A standard coil operates on 6 volts AC. Coils for other voltages on specification at 10% additional to list price. Contacts — special over-size silver. Can handle 5,000 watts on 60 cycle non-inductive 115 volts AC and in AC primary circuit of any power supply delivering up to and including 1 KW. Control capacity — up to 2,000 volts with clean make and break.



**Applications**—Control of filament center tap keying of any stage having up to 2,000 volts on plate; primary keying or control of power supplies up to and including 1,000 watts; and grid-controlled rectifier keying of 3,000 volt power supplies.

**K-320**—3" long, 1½" wide, 1-15/16" high. Shipping weight 4 oz.

List Price.....\$4.50 ea.

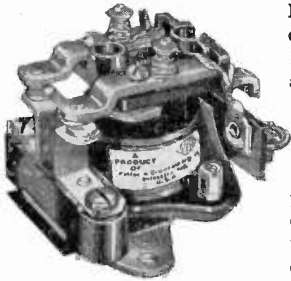


# Potter & Brumfield

## PR Series HEAVY DUTY POWER RELAYS

On these pages we list a few of the relay types we class as standard. Stocks of either completed relays or component parts are kept on hand for quick assembly, resulting in unusually prompt delivery and lower prices. From these relays a type can be selected for almost any application where the contact load does not exceed 20 amperes.

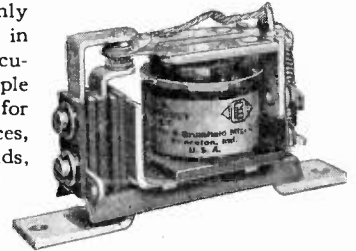
## MR Series MEDIUM DUTY POWER RELAYS



Designed for such power circuits as motor starting up to 1 HP., heater loads up to 20 amperes, remote break-in control of transmitters, electro plating devices, elevator controls, or any control circuit requiring fast positive switching. AC types operate on approximately 10 volt amperes. DC types require approximately 2 watts.

Relay contacts on PR3A, PR3D, PR4A and PR4D rated at 20 A, non-inductive load 115V AC or 1 HP, AC. All other relay contacts rated at 15 A, non-inductive at 115V AC. Size approximately 2 5/8" x 2 9/16" x 2 1/4" high. Specify coil voltage and frequency.

Sturdy, compact, highly efficient, for mounting in confined spaces. Particularly adapted to multiple panel mounting. Ideal for safety and signal devices, call systems, heater loads, radio protective circuits, transmitter keying circuits, burglar alarms, photographic

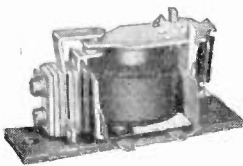


applications, electric sign controls, etc. Available in all contact arrangements up to and including double pole double throw. AC types operate on approximately 4 volt amperes and DC types operate on approximately 2 watts. Contacts rated at 8 A, 115V, 60 cycles non-inductive load. Approximate size single pole units 2 15/16" x 1 1/2" x 1 5/8" high. Double pole units 2 3/4" x 2 1/8" x 1 7/8" high.

Description	A.C. RELAYS 6-12-24-115-230 Volts				D.C. RELAYS 6-12-24-115 Volts						
	Normally Open	Net	Normally Closed	Net	Normally Open	Net	Normally Closed	Net			
SPST	PR1A	\$2.85	PR2A	\$2.85	PR1D	\$2.85	PR2D	\$2.85			
Heavy Duty SPST	PR3A	3.10	PR4A	3.15	PR3D	3.10	PR4D	3.15			
DPST	PR7A	3.65	PR8A	3.85	PR7D	3.65	PR8D	3.85			
SPDT	PR5A		3.20		PR5D		3.20				
DPDT	PR11A		4.90		PR11D		4.90				
Add 60c to prices above for coils over 150 volts.				Add 60c to prices above for coils over 50 volts.							

Description	A.C. RELAYS 6-12-24-115-230 Volts				D.C. RELAYS 6-12-24-115 Volts						
	Normally Open	Net	Normally Closed	Net	Normally Open	Net	Normally Closed	Net			
SPST	MR1A	\$2.00	MR2A	\$1.95	MR1D	\$2.00	MR2D	\$1.95			
DPST	MR7A	2.60	MR8A	2.50	MR7D	2.60	MR8D	2.50			
SPDT	MR5A		2.15		MR5D		2.15				
DPDT	MR11A		2.80		MR11D		2.80				
Add 40c to prices above for coils over 150 volts.				Add 40c to prices above for coils over 55 volts.							

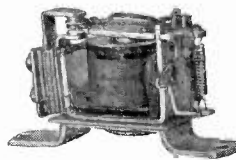
## LS Series PLATE CIRCUIT RELAYS



Designed for application where size and cost are important. Often used in photoelectric circuits, temperature control circuits and electronic timing devices. Similar to the LM Series but less sensitive. Available in all resistances up to and including 10000 ohms. Requires .09 watt minimum actuating power.

Single pole double throw, 2500 ohm coil, net \$1.90.  
Single pole double throw, 5000 ohm coil, net \$2.20.  
Single pole double throw, 10000 ohm coil, net \$2.45.  
Size 2 5/8" x 1 3/8" x 1 3/8" high.  
When ordering, specify coil voltage or resistance.

## FR Series PHOTO FLASH RELAYS



The newly developed electronic photo flash units using a high voltage discharge through a xenon gas filled bulb require a relay of extraordinary characteristics. When the bulb is flashed the contacts must carry an extremely high surge of current without sticking, burning or pitting. The repetitive accuracy must be as uniform as a precision built shutter on a fine camera. Unfailing positive contact is vital to synchronization of the shutter with the 2500 volt capacitor discharge.

The Potter and Brumfield FR relay has been tried and proven under the most severe conditions of temperature, humidity and shock. Special contact material and the finest quality of baked varnish impregnation of coil and other insulating parts combine to give a reliable relay at economy prices. The FR is available in all the contact combinations listed under the MR Series shown on this page up to and including Double Pole Double Throw. Coils are available in all AC voltages up to 230 volts and DC voltages up to 115. Power requirements for coil operation is 1.5 to 2 watts DC and 3 to 4 volt amperes AC. Overall dimensions for single pole types are 2 15/16" x 1 1/2" x 1 5/8" high. Double pole types 2 3/4" x 2 1/8" x 1 7/8" high.

FR1A	\$3.00	FR5A	\$3.25
FR1D		FR5D	
FR2A	2.95	FR7A	3.95
FR2D		FR7D	
FR3A	3.65	FR8A	3.85
FR3D		FR8D	
FR11A	\$4.25		
FR11D			

## POTTER & BRUMFIELD

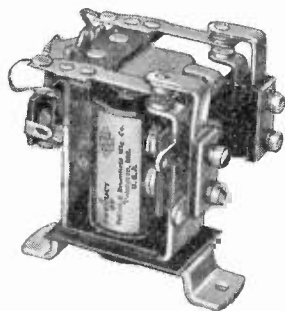
Department 250

549 WEST WASHINGTON BOULEVARD • CHICAGO 6, ILLINOIS

EXPORT SALES AT 2020 ENGINEERING BLDG., CHICAGO 6, U.S.A. • FACTORY AT PRINCETON, INDIANA

# POTTER & BRUMFIELD

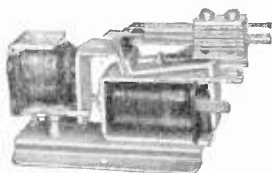
## LM Series PLATE CIRCUIT RELAYS



Designed to meet demand for high grade medium cost plate circuit relays in both single and double pole contact arrangements. Large coils are particularly sensitive. The single pole LM operates on as low as .015 watts, the double pole types on .070 watts. Applicable to smoke control, packaging, counting and other electronic control circuits. Contacts supplied are 3/16" fine silver. Approximate size of single pole units 2 1/4" x 1 3/8" x 2 3/8" high. Double pole units 2 1/4" x 2 3/8" x 2 3/8" high. When ordering, specify coil resistance.

DESCRIPTION	Coil Resistance Ohms	SINGLE THROW			
		Normally Open	Net	Normally Closed	Net
SPST	2500	LM-1	\$2.10	LM-2	\$2.15
	5000		2.40		2.45
	10000		2.75		2.85
DPST	2500	LM-7	3.00	LM-8	3.05
	5000		3.25		3.30
	10000		3.65		3.70
DOUBLE THROW					
SPDT	2500	LM-5			2.30
	5000				2.55
	10000				2.95
DPDT	2500	LM-11			3.40
	5000				3.65
	10000				4.05

## EL Series MULTIPLE CONTACT LATCHING RELAYS



Available in all contact combinations up to and including four pole double throw as shown under SU series. Actuating and latching coils are available for DC voltages up to 115 or AC voltages up to 230. Actuating coils require 1.5 to 2.5 watts.

EL1A	NET	EL7A	NET	EL12A	NET	EL15A	NET
EL1D	\$3.60	EL7D	\$3.95	EL12D	\$4.40	EL15D	\$4.75
EL2A		EL8A		EL13A		EL16A	
EL2D		EL8D		EL13D		EL16D	
EL5A	\$3.75	EL11A	\$4.30	EL14A	\$4.95	EL17A	\$5.40
EL5D		EL11D		EL14D		EL17D	

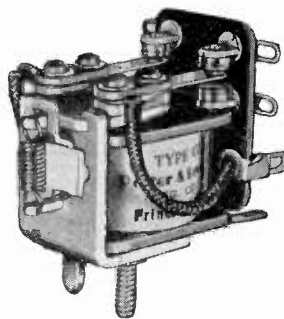
## SM Series Super Midget



This miniature relay weighs less than 1/2 oz. and is less than 1/4 cubic inch in volume. Contacts are SPDT pure coined silver rated at .25 amp. 115 V 60 cy. load. The "D" or voltage operating types can be wound for any specified DC voltage up to 115 and draw approximately .5 watt. The "L" or current operating types can be wound to maximum of 8000 ohms which gives minimum pull-in of 3 ma at 75 milliwatts. "G" version hermetically sealed in miniature tube glass envelope with standard 7 pin base.

List Price	Nominal Coil		List Price	List Price	Coil Resistance Ohms	List Price
SM5D	Voltage	Amps	SM5DG	SM5L		SM5LG
\$1.25	0.3 - 34	2.1 - .016	\$2.15	\$1.50	0.155 to 1800	\$2.40
1.35	35 - 48	.017 - .0116	2.25	1.60	1801 to 3400	2.50
1.65	49 - 60	.0117 - .0093	2.55	1.90	3401 to 5200	2.80
1.90	61 - 75	.0092 - .0075	2.80	2.15	5201 to 8000	3.05

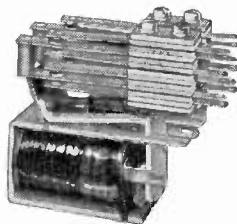
## KR Series Small Light Duty



A relay designed for application where size and weight are important. Sturdy and efficient. In applications where operating current is not too limited, the DC types can be adjusted to withstand the vibration encountered in most aircraft applications. Ideal for sub-chassis mounting and switching of RF or AF circuits. Contacts are rated at 3 amperes 110 volts, 60 cycle non-inductive. Approximate size of KR11D 1 3/16" x 1 11/16" x 1 1/4" high. When ordering, specify coil voltage and frequency.

Description	A.C. RELAYS 6-12-24-115 Volts				D.C. RELAYS 6-12-24-60 Volts			
	Normally Open	Net	Normally Closed	Net	Normally Open	Net	Normally Closed	Net
SPST	KR1A	\$2.00	KR2A	\$1.95	KR1D	\$1.90	KR2D	\$1.85
Heavy Duty SPST	KR3A	2.40	KR4A	2.35	KR3D	2.30	KR4D	2.25
	KR7A	2.40	KR8A	2.35	KR7D	2.30	KR8D	2.25
SPDT	KR5A		2.00		KR5D		1.90	
DPDT	KR11A		2.50		KR11D		2.40	
A.C. coils up to 117 volts at above prices.					Add 25c to above prices for coils of 3500 to 5000 ohms from 50c to 6000 ohms add 35c.			

## SU Series MULTIPLE LEAF RELAYS



Unique construction provides many valuable features at low cost. Larger coil space permits most efficient winding for higher voltages and lower consumption. May be mounted either vertically or horizontally, terminals easily accessible in either mounting. Suitable for applications such as signal or alarm controls, remote indicators, temperature controls, overload or underload protective devices, etc. Contacts rated at 4 amperes 115 volts AC non-inductive load. Contact combinations up to and including 4-pole double throw. DC types require 1.5 watts actuating power. Dimensions of SU17A (illustrated) are 2 1/2" x 1 7/16" x 2 1/2" high. When ordering, specify coil voltage and frequency.

Description	A.C. RELAYS 6-12-24-115-230 Volts				D.C. RELAYS 6-12-24-115 Volts			
	Normally Open	Net	Normally Closed	Net	Normally Open	Net	Normally Closed	Net
SPST	SU1A	\$1.95	SU2A	\$1.95	SU1D	\$1.95	SU2D	\$1.95
DPST	SU7A	2.45	SU8A	2.45	SU7D	2.35	SU8D	2.35
3PST	SU12A	2.90	SU13A	2.90	SU12D	2.80	SU13D	2.80
4PST	SU15A	3.30	SU16A	3.30	SU15D	3.20	SU16D	3.20
SPDT	SU5A		2.15		SU5D		2.15	
DPDT	SU11A		2.70		SU11D		2.70	
3PDT	SU14A		3.15		SU14D		3.15	
4PDT	SU17A		3.65		SU17D		3.65	
Add 63c to above prices for coils above 117 volts.					Add 63c to above prices for coils over 60 volts.			

# POTTER & BRUMFIELD

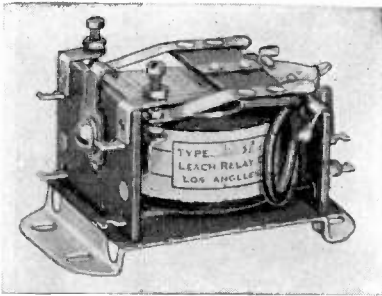
PRINCETON, INDIANA

EXPORT SALES AT 2020 ENGINEERING BLDG., CHICAGO 6, U. S. A.



These Leach Relays are considered standard items within the trade. These relays are maintained in shelf-stock supply in order to expedite shipment to jobbers throughout the United States.

For more than thirty years Leach has manufactured quality relays. This vast experience in engineering design and manufacturing ability is incorporated in these standard relay designs.



**BASE DIMENSIONS:** 1½" x 2-9/16", overall height 1-11/32"

**WEIGHT:** 4½ ounces.

**RESISTANCES:** 5,000 Ohms or 10,000 Ohms.  
Type  
No.

1037 Double Pole, Double Throw, 5,000 Ohms.

1037 Double Pole, Double Throw, 10,000 Ohms.

Be sure to specify coil resistance when ordering.

## SENSITIVE METAL BASE RELAY

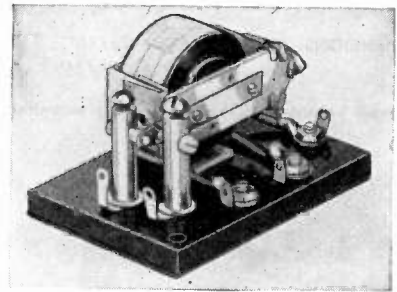
### TYPE 1037 SERIES

This Relay is constructed for sensitive operation, and has ⅛" pure silver contacts mounted on screws to provide adjustments on top contacts which are capable of carrying 1 Ampere at 115 Volts, AC, Non-inductive. With these adjustment screws, the air gap can readily be adjusted so that the Relay can be set to pull in at some predetermined coil current. It is supplied at DPDT only. Nothing is grounded to the metal base. The minimum reliable coil consumption is .040 watts. It will operate on a good deal less, but the adjustment becomes fairly critical on these low values.

## SENSITIVE DIRECT CURRENT RELAYS

### TYPE 1032 SERIES

This Relay is used extensively in closed circuit burglar alarm systems, in the plate circuit of electron tubes, as secondary Relays for micro-ampere Relays, etc. It is a very fine all-around low current, high resistance Relay, capable of withstanding considerable vibration without affecting its operation. It is equipped with an adjustable spring and adjustable stationary contacts, fitted with set screws. All contacts are pure silver and capable of carrying 1 Ampere, 115 Volts, AC, Non-inductive. This Relay is pigtailed to prevent current passing through the hinge part. The contact system is SPDT, and minimum practical coil wattage is .015 watts.



**BASE DIMENSIONS:** 2" x 2¾", overall height, 1-11/16"

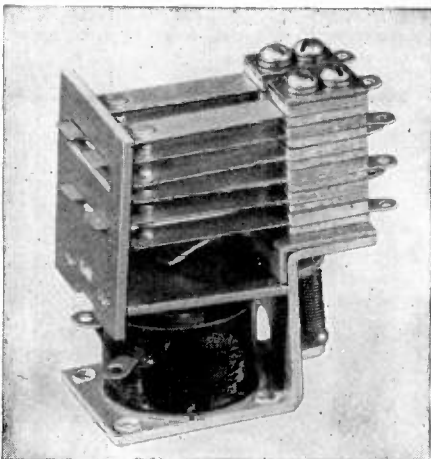
**WEIGHT:** 6 ounces.

**RESISTANCES:** 5,000 Ohms or 10,000 Ohms.  
Type  
No.

1032 Single Pole, Double Throw, 5,000 Ohms.

1032 Single Pole, Double Throw, 10,000 Ohms.

Be sure to specify coil resistance when ordering.



## MULTIPOLE RELAYS

### TYPE 6 & 7 SERIES

This Relay is the most versatile Relay for its size in the Leach line, and is ideal for industrial and radio applications where currents to be handled by the contact systems do not exceed 8 Amperes at 115 VAC, Non-inductive. By using the desired stationary contacts, many combinations are available. For example, on the 7-4C Relay one could have various combinations of double-pole, single-pole open, single-pole closed, etc., as required. All contacts are pure silver and are mounted on heavy-plated phosphor-bronze pole pieces, which are designed to give a wiping action and positive contact, pressure. Relay provides solder lugs for connecting coil and contact systems.

**COILS:** 6 Volt Direct Current Coils consume approximately 3 watts, 6 or 115 VAC Alternating Current Coils consume 6V/A approximately.

**CONTACTS:** Heavy fine silver contacts ⅛" diameter. Will carry loads up to 8 Amperes at 115 VAC, Non-inductive.

#### Type Number

6-C 7-C Single Pole, Double Throw.  
6-2C 7-2C Double Pole, Double Throw.  
6-4C 7-4C 4-Pole Double Throw.

# LEACH RELAY CO.



## MIDGET RELAYS

### TYPE 223-227 & 323-327 SERIES

ENGINEERED in miniature to weigh less than 2 ounces and measures from one to 1 3/4 inches in length, Leach Midget Relays dependably handle contact loads of up to 2 Amperes at 115 Volts AC, Non-inductive. Because of their space and weight saving factors, Midgets expand the range of control by Relays in many products where previous methods are considered unprofitable.

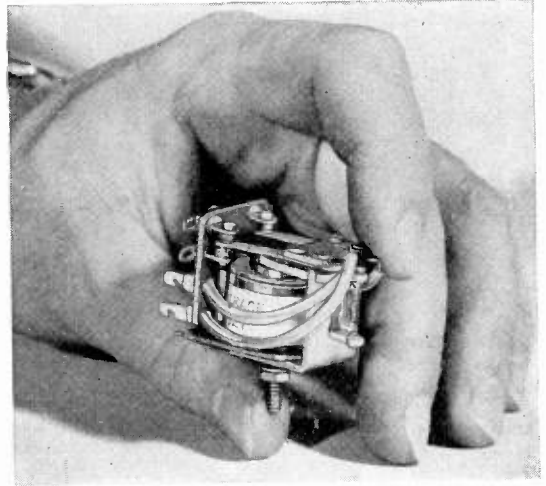
Supplied in a variety of contact arrangements, with moving contact poles insulated from the armature and frame, and with coils for operation on either AC or DC. The high quality, well-known in our standard and larger size Relays, is used throughout.

**STANDARD COILS:** 6 Volt Direct Current Coils consume approximately .750 watts of Alternating Current 6 or 115 Volts, approximately 4 V/A.

**CONTACTS:** 1/8" diameter Fine Silver, rated 2 Amperes at 115 VAC, Non-inductive.

**DIMENSIONS:** SP — 15/16" x 1-13/16".  
DP — 1-3/16" x 1-13/16"

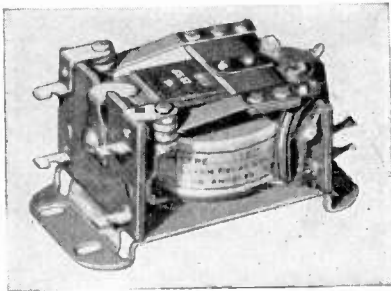
Overall height—1 1/4" not including mounting stud.



**MOUNTING:** Single No. 6-32 stud, 7/16" long.

**WEIGHT:** 1.5 ounces approximately.

Type Number		
DC	AC	
223	323	SPDT
227	327	DPDT



## METAL BASE STYLE

### TYPE 1057 & 1157 SERIES

THESE RELAYS are ruggedly built for industrial uses and are fitted with 1/4" fine silver contacts for handling heavier currents. Phosphor-bronze, nickel-plated, is used for the pole pieces. Nothing is grounded to the frame. All parts and pieces are so constructed that nothing can twist or turn out of alignment.

**DIRECT CURRENT:** Coil consumption 1.5 watts, 6 Volts.

**ALTERNATING CURRENT:** Coil consumption 50-60 cycles, 6 or 115 Volts, approximately 4 V/A.

**CONTACTS:** 1/4" diameter Pure Silver. 12.5 Amperes at 115 Volts AC, Non-inductive.

**BASE DIMENSIONS:** 1 5/8" x 2 3/4"; overall height 1 3/8".

**WEIGHT:** 5 ounces.

Type Number		
DC	AC	
1057	1157	DPDT

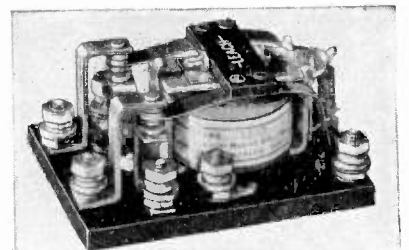
## STANDARD SIZE CIRCUIT CONTROL RELAYS

### TYPE 1257 & 1357 SERIES

This excellent Relay has many applications where it is not desirable to use solder terminal connections. They are highly insulated and made of the best materials obtainable. The magnetic circuit is exceptionally high grade of magnetic iron, heavily cadmium-plated. The contacts are 1/4-inch pure silver, slightly crowned, and are rated at 12.5 Amperes, 115 Volts AC, Non-Inductive.

AC coils consume 6 V/A, 6 or 115 Volts AC.

DC coils consume 1.5 watts, 6 Volts DC.



**BASE DIMENSIONS:** 1/4" black Bakelite, 2-3/16" x 3"; overall height, 1-7/16"

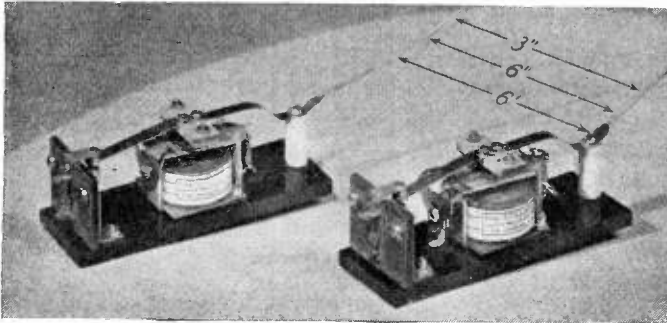
**WEIGHT:** 7 ounces.

Type Number		
DC	AC	
1257	1357	DPDT

# LEACH RELAY CO.



## RADIO AND HIGH FREQUENCY RELAYS—ANTENNA TRANSFER



### TYPE 1623-S9 & 1723-S9

These Relays are exactly the same as above, except that a  $\frac{1}{8}$ -inch fine silver SPST Normally Open auxiliary contact has been added. Usually one these relays is paired with one of the above types\*, in order to provide the auxiliary contact for the power supply. This may also be used to close a power Relay, for grounding, or for controlling light power circuits.

AC coils consume approximately 6 V/A, 6 or 115 Volts, 50-60 cycles.

DC coils consume approximately 3.5 watts, 6 Volts DC.

**DIMENSIONS:**  $1\frac{1}{2}$ " x  $4\frac{5}{8}$ "; overall height,  $1\frac{3}{4}$ ".

**WEIGHT:**  $6\frac{1}{4}$  ounces, approximately (each relay).

Type Number		
DC	AC	SPDT
1623	1723	SPDT
1623-S9	1723-S9	SPDT, with $\frac{1}{8}$ " Aux. Cont.

\*Usually one No. 1723 and one No. 1723-S9 are paired for AC use or one No. 1623 and one No. 1623-S9 are paired for DC use.

## MYCALEX AND ISOLANTITE

### TYPE 1623 & 1723

This new idea for antenna change-over eliminates the major drawback of most Relays now used for this purpose. The spacing between leads, heretofore has been limited to the spacing between the Relay contact strips. A pair of the above matched Relays permits any desired spacing between antenna lead-out wires whether 6 inches, or 6 feet.

Maximum high frequency insulation is provided through the use of heavy Mycalex panels, and Isolantite insulators. The Relays are designed with a wide air gap,  $\frac{1}{4}$  inch pure silver contacts with a SPST arrangement.

They will withstand over 4000 volts RMS, 60-cycle hi-spot test between contacts and between contacts and frame on ground.

## RADIO AND HIGH VOLTAGE RELAYS CERAMICS

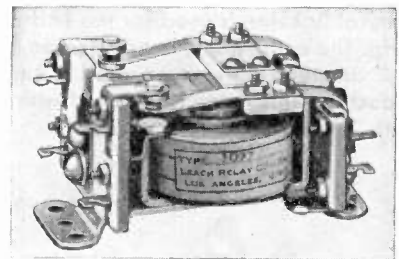
### TYPE 1077 & 1177 SERIES

This is an ALSiMag insulated RF Relay designed for more or less universal service, such as police mobile radio, aircraft and amateur installations. Nothing has been left undone to make this Relay the best of its kind. The pole pieces are nickel-plated, phosphor-bronze. The main contacts are  $\frac{1}{4}$ " pure silver. All iron parts cadmium plated. The tension spring is stainless steel.

No. 1077C and 1177C have Auxiliary  $\frac{1}{8}$ " contacts which provide a third center pole on Relay. They are grounded to the frame, but not to the base of the Relay.

**WEIGHT:** 5 to  $5\frac{1}{2}$  ounces.

Type Number		
DC	AC	DPDT
1077	1177	DPDT
1077-C	1177-C	DPDT, with Aux. SPDT.



**CONTACTS:**  $\frac{1}{4}$ " Pure Silver—Double Pole, Double Throw.

**COIL DATA:** 6 Volts DC,  $2\frac{1}{2}$  watts, 6 or 115 Volts AC, 50-60 cycles, 6 V/A.

**DIMENSIONS:**  $1\frac{1}{2}$ " wide by  $2\frac{3}{4}$ " long by  $1\frac{1}{2}$ " high.

Mounting hole centers,  $2\frac{3}{8}$ ".

Center holes tapped 6-32.

Outer holes clear 6-32.

# LEACH RELAY CO.



## RADIO AND HIGH VOLTAGE RELAYS

### MYCALEX

#### TYPE 1601-MX & 1701-MX

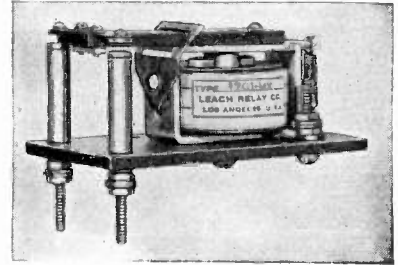
This Relay was designed to control a high voltage radio frequency circuit. Contacts are  $\frac{1}{4}$ " pure silver, SPST normally open, double break. Metal spacers are supplied for mounting.

AC coils consume 6 V/A, or 115 Volts, 50-60 cycles AC.

DC coils consume approximately 3.5 watts, 6 Volts DC.

**DIMENSIONS:**  $1\frac{3}{4}$ " x 3" overall height, not including studs or mounting spacers,  $1\frac{1}{2}$ ".

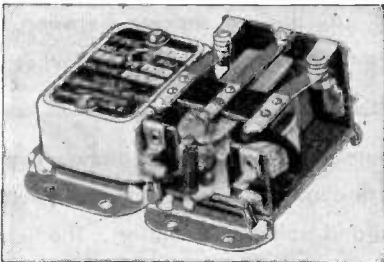
**WEIGHT:** 8 ounces.



Type Number

DC AC

1601-MX 1701-MX SPST-DB Normally open.



**BASE DIMENSIONS:**  $3\frac{1}{4}$ " x  $2\frac{3}{4}$ ", overall height, 1-7/16".

Type Number

DC AC

1057-T 1157-T DPDT.

## TIME DELAY RELAY

### TYPE 1057 & 1157 T SERIES

This Thermo Element Time Delay Relay is primarily for use on vacuum tube transmitters, but may also be used for a wide variety of other applications. They are all made DP, which may be used as normally open, normally closed or DT. The contacts are  $\frac{1}{4}$ " pure silver, rated  $12\frac{1}{2}$  Amperes, 115 Volts AC, non-inductive. The center pole, as shown, always is used for controlling the thermo element, which provides a variable delay of from 20 seconds to 1 minute. After the coil is energized, the Thermo element drops out of the circuit, cooling for the next cycle.

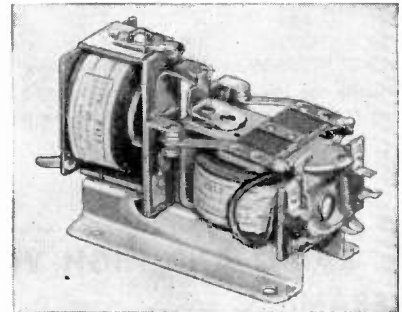
**STANDARD COILS:** AC—6 and 115 Volts (6 V/A)

DC—6 Volts—(1.5 Watts)

## LATCH TYPE ELECTRICALLY RESET

### TYPE 2417

This type Relay fits many applications where it is not desirable to have current continuously on the coil. The mechanical arrangement is such that after the pull-in coil is energized the armature closes and locks, closed by a mechanical latch on the armature of the Relay coil. The pole pieces are phosphor-bronze, and canvas-base natural Bakelite is used for the end panels and the pole mounting strip. The entire Relay is mounted on a metal base. The contacts are  $\frac{3}{16}$ " diameter pure silver rated 8 Amperes at 115 Volts AC. Non-inductive. This Relay is supplied with 2—6 or 115 Volt AC coils or with 2—6 Volt DC coils.

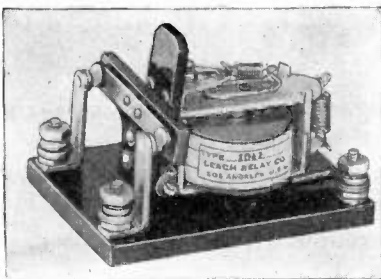


**DIMENSIONS:**  $1\frac{5}{8}$ " x  $3\frac{3}{8}$ "; height 2-1/16".  
**WEIGHT:** 8 ounces.

Type Number

2417 DPDT.

Specify voltage and whether for AC or DC.



Type  
Number

1042 SPST Normally closed—double break.  
Contact rating 10 Amp., 115 Volts AC.

## LIGHT DUTY OVERLOAD TRIP RELAYS

### TYPE 1042 SERIES

The Relays shown are used as safety devices on electronic apparatus for the protection of the equipment against excessive currents. When current reaches a predetermined value the Relay is pulled in allowing the contacts to snap open and at the same time locking the armature closed. To reset the contacts, the coil circuit must be opened before pressing the Bakelite first finger. These Relays are supplied with the coil circuit highly insulated from the contacts; however, to use them as circuit breakers the coils and contacts may be connected in series.

Commonly used for the protection of power tubes. In this service the coil is put in series with the negative side of the plate supply and the contacts are in series with the transformer primary or the coil of the power contactor.

These Relays are all adjustable for the trip-out setting to approximately 20% plus or minus of their designated rating. In ordering it is necessary that you specify the approximate current on which they are to operate. Supplied in 2 standard coils: 250 MA or 500 MA.





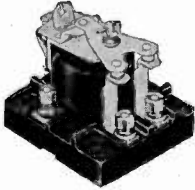
# WARD LEONARD • RADIO AMATEUR and INDUSTRIAL RELAYS

## RELAYS FOR AUTOMATIC CONTROL

Representative samples of the comprehensive line of relays made by Ward Leonard. The ones illustrated are those particularly adaptable to electronic and the more common industrial applications.

### MIDGET MAGNETIC RELAY — TYPE No. 106. —

For remote control of A.C. or D.C. circuits. Has wide application for use on power circuits or electronic circuits in which the currents to be controlled do not exceed the ratings of the contacts. May be energized from main line or from an independent circuit. Built on a molded Bakelite base. Front or back connected terminals.



#### Coil Voltages —

D.C. — 6, 8, 12, 24, 32, 115 volts.  
A.C. (60 cycles) — 6, 8, 12, 24, 32, 115 volts.  
115 volts.

#### Contact Arrangement —

Single Pole, Double Break, Normally Open, Normally Closed and Double Throw.  
Double Pole, Single Break, Normally Open, Normally Closed and Double Throw.  
Double Pole (Common Feed), Single Break, Normally Open, Normally Closed and Double Throw.

#### Contact Ratings, in Amperes —

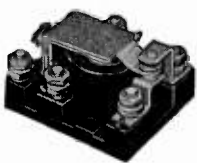
Volts	D. C.		60-Cycle A.C.	
	Single Break	Double Break	Single Break	Double Break
0-24	4	6	4	6
25-115	1*	2	4	6

\*0.7 Amperes if Double Throw.

Dimensions — 2" wide; 2¼" high; 2½" deep.

Type No. 106 Relays for 3-wire control are also available. Details will be furnished on request.

### HEAVY DUTY MIDGET RELAY — TYPE No. 105. —



A general purpose relay designed for remote control of the ordinary type of electrical appliances, such as electric heaters, electric signals, electric lights, electrically operated pumps, and most types of electronic equipments. The Heavy Duty Midget Relay is sturdily built on a molded Bakelite base. Heavy, front connected terminals are provided. The Heavy Duty Midget Relay, as a standard unit, is of the open type, but it can be furnished with a steel knock-out box enclosure.

#### Coil Voltages —

D.C. — 6, 10, 12, 24, 32, 115 volts.  
A.C. (60 cycles) — 6, 10, 12, 24, 32, 115, 230 volts.

#### Contact Arrangement —

Single Pole, Single Break, Normally Open, Normally Closed and Double Throw.  
Double Pole, Single Break, Normally Open, Normally Closed and Double Throw.

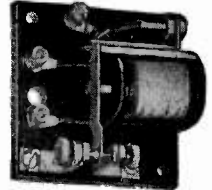
#### Contact Ratings, in Amperes —

Volts	D. C.		60-Cycle A.C.	
	Normally Open	Normally Closed	Normally Open	Normally Closed
0-24	20	15	20	15
25-115	1	1	20	15
230	0.5	0.5	15	10

Dimensions — Single Pole: 1⅞" wide; 2⅜" high; 1½" deep. Double Pole: 2½" wide; 2¾" high; 1¾" deep.

### SENSITIVE RELAY — TYPE No. 250. —

For use in applications where a high degree of sensitivity is required such as in electronic circuits. Built on a Bakelite base with large knurled heads and nuts to facilitate adjustment of the contacts and the spring tension on the armature. The use of nickel alloy in the magnetic circuits insures good contact torque at pull-up and crisp drop-out.



#### Contact Arrangement —

Single Pole, Double Throw.

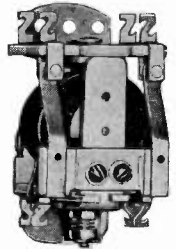
#### Contact Rating, in Amperes —

Volts	D.C.	60-Cycle A.C.
115	0.75	2.0
230	0.5	1.5

Dimensions — 2½" wide; 2½" high; 1½" deep.

### MIDGET METAL BASE RELAY — TYPE No. 104. —

For use in small radio transmitters, sound equipment, aircraft control circuits, and other similar applications. Available with Bakelite insulation or ceramic insulation. Small size permits installation in limited spaces. Built on a metal base. Vibration resistant up to 10 times gravity when energized. Front connected, solder type terminals.



#### Coil Voltages —

D.C. — 6, 10, 12, 24, 32, 115 volts.  
A.C. (60 cycles) — 6, 10, 12, 24, 32, 115 volts.

#### Contact Arrangement —

Single Pole and Double Pole. Various combinations with or without auxiliary contacts.

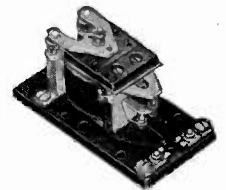
#### Contact Ratings, in Amperes —

Volts	D.C.	60-Cycle A.C.
0-24	4	4
25-115	0.5	4

Dimensions — 1⅞" wide; 2½" high. 1⅞" deep.

### HEAVY DUTY RELAY — TYPE No. 130. —

A relay that has heavy current carrying and rupturing capacities for use in A.C. or D.C. circuits. Contact fingers are heavy stiff metal blades with large stainless steel springs for pressure. Large gap contacts with adequate surfaces. As high as four separate circuits may be opened simultaneously with the closing of up to four other circuits.



#### Coil Voltages —

D.C. — 24, 32, 115, 230 volts.  
A.C. (60 cycles) — 24, 32, 115, 230, 440 volts.

Other voltages and frequencies available on special order.

#### Contact Arrangement —

Various combinations of contacts from one to four poles.

#### Contact Ratings, in Amperes —

Volts	Direct Current	D.C. with Blowout	A.C. 25 Cycles	A.C. 60 Cycles
0-24	25	25	25	25
25-125	3	20	25	25
125-250	1	10	25	25
251-440	.....	.....	10	15

Note: Blowouts required for relays that control Direct Current circuits in excess of 23 volts or a current of 1 ampere.

Dimensions — Base dimensions vary according to size of relay. Maximum depth, 3¼".



# WARD LEONARD • RADIO AMATEUR and INDUSTRIAL RELAYS

## RELAYS FOR THE RADIO AMATEUR

A few examples of Ward Leonard's popular line of relays for use in radio circuits are illustrated here. Information on specifications and prices are detailed in Catalog D-11 which will be furnished on request made to Ward Leonard directly or through one of its agents or distributors.

### R. F. BREAK-IN RELAYS. —

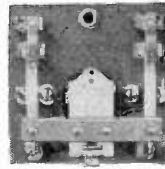
Otherwise known as "Push-to-Talk" Relay for phone transmitters. Pushing button in control circuit connects proper transmitter circuits and disconnects proper receiving circuits to transmit. Releasing button switches all circuits back to normal position for receiving. Furnished in two sizes, Midget Type for light duty and the Heavy Duty Type.



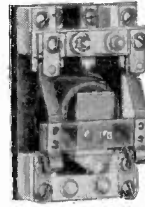
Midget Type



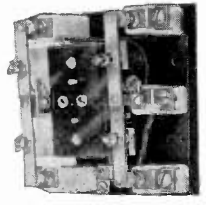
Heavy Duty Type



Midget Type



Intermediate Type

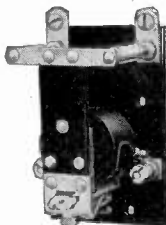


Heavy Duty Type

**ANTENNA CHANGE-OVER RELAYS.** — Switches antenna to transmit or receive. May also be used to switch transmitter or receiver to either of two antennas. Available in three sizes — Midget Type, Intermediate Type, and Heavy Duty Type. Midget Type built on Mycalex base. Contacts and terminals on Intermediate and Heavy Duty Types (except coil terminals) supported by ceramic blocks. Lucite crossarm used on all types.



Low Voltage Type



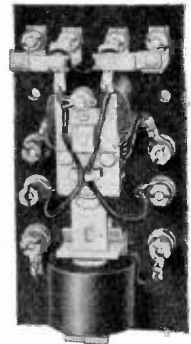
High Voltage Type

**KEYING RELAYS.**—Low voltage type for center-tap or grid-bias keying. High voltage type for use with grid controlled high voltage rectifier tubes. Use of Keying Relays reduces length of circuit wiring and permits control of keying with key located in convenient position for operating. Capable of keying up to 40 words per minute.



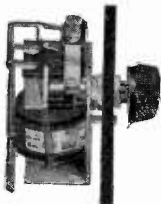
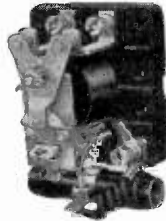
### ANTENNA GROUNDING RELAY. —

For grounding transmitting or receiving antenna when not in use. Contact arms supported on Lucite crossarm. Circuit contacts and terminals supported on ceramic insulation block. Coil terminals and grounding terminals mounted on Bakelite base. Double pole, double throw contacts, with fixed or adjustable normally closed contacts.

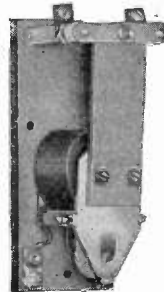


**MIDGET LATCH-IN RELAY.**—A multi-purpose relay especially useful in circuits where interference might be caused if relay coils were continually energized. Momentary energizing coil "pulls in" armature which is locked in position by mechanical latch. Momentary energizing reset coil releases latch allowing armature to drop to normal position.

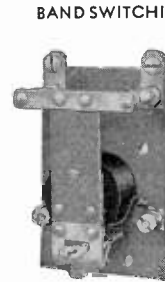
**UNDERLOAD RELAY.** — Protects against damage to tubes and other components of amplifiers when load failures occur, due, for example, to inability of one or more vacuum tubes to hold the load because of loss of excitation. De-energizing of relay coil when load drops opens contacts and prevents damage to transformers or tubes. Available from stock with coil adjusted to pick up at 100 m.a. to 200 m.a. DC or with coil adjusted to pick up at 200 m.a. to 400 m.a. DC.



**ROTARY RESET OVERLOAD RELAY.** — For protection against overloading vacuum tubes of power amplifiers or transmitters. Current surge causes armature to be pulled in, breaking the rectifier primary circuit. A mechanical latch holds the contacts open until the operator closes them by turning the reset knob. Designed for panel mounting. Available from stock with 250 m.a. DC coil and 500 m.a. DC coil.

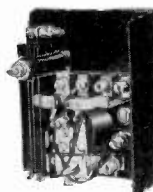


Heavy Duty Type



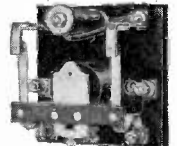
Midget Type

**BAND SWITCHING RELAYS.**—Automatically changes frequency bands through two-wire control circuit. Installation on the relay in the set near the coils eliminates the need for long R. F. leads, such as are required when a panel-mounted switch is used. Mycalex insulation used for base and contact arms. Contacts and terminals spaced to insure against leakage or creepage of high frequency and high voltage in the circuit.



**THERMAL TIME DELAY RELAY.** — Delays the application of voltage to the plates of vacuum tubes until the filaments have heated. The relay illustrated is adjustable over a range of from 15 seconds to 45 seconds. Other time delay relays — thermal type and motor driven type — are also available. Furnished with 110 volt, 60-cycle AC coil.

**SAFETY RELAY.** — A relay that should be installed in every amateur rig. It gives automatic protection against the hazards of high voltages in filter condensers when power supply unit is turned off. Furnished with resistor through which condensers are discharged. Furnished with normally closed contacts which open when transformer primary circuit is closed, energizing relay coil.



The use of Ward Leonard Relays in an Amateur Rig not only modernizes it, but also improves its efficiency and stability. Short r.f. leads prevent stray currents. Convenient control is provided.



**EXCLUSIVE  
FEATURES  
of  
AMPERITE  
THERMOSTATIC  
DELAY  
RELAYS**

- Actuated by a heater.
- Operates on A.C., D.C., or Pulsating Current.
- Hermetically sealed, Amperite Relays are not affected by altitude, moisture or other atmospheric conditions.
- Compact, lightweight and inexpensive.

**TECHNICAL CHARACTERISTICS**

**CIRCUITS:** SPST only — Normally open or normally closed.

**HEATER WATTAGE:** 2 W prox. — Heaters can be operated continuously.

**CONTACT RATING:** 115 V - 3A A.C. (or 440 V - 1.5A A.C.); maximum voltage across contacts — 1000 V. Maximum voltage between contacts and heater — 1500 V.

**AMBIENT TEMPERATURES:** Relays are compensated for temperatures of  $-55^{\circ}$  to  $+70^{\circ}$  C.

**LIFE:** With 115 V - 3A A.C., non-inductive, at least 25,000 operations.

**BASE WIRING:** Heater — Prongs 2-3; Contacts — 5-7.

**LIST PRICE:** Standard types of relays — \$4.00 each.

**DELIVERY:** The types shown in bold type are most popular, and usually available from stock. Other types delivered in approximately 3 weeks.

Delay-Seconds	Tolerance-Seconds	NORMALLY OPEN CONTACTS						NORMALLY CLOSED CONTACTS					
		HEATER VOLTAGES						HEATER VOLTAGES					
		2.5 V.	5.0 V.	6.3 V.	12 V.	26 V. (22-30)	115 V.	2.5 V.	5.0 V.	6.3 V.	12 V.	26 V. (22-30)	115 V.
2	± 1	2N02	5N02	<b>6N02</b>	12N02	26N02	115N02	2C2	5C2	<b>6C2</b>	12C2	26C2	115C2
5	± 2	2N05	5N05	<b>6N05</b>	12N05	<b>26N05</b>	<b>115N05</b>	2C5	5C5	<b>6C5</b>	12C5	<b>26C5</b>	<b>115C5</b>
10	± 3	<b>2N010</b>	5N010	<b>6N010</b>	12N010	<b>26N010</b>	<b>115N010</b>	2C10	5C10	<b>6C10</b>	12C10	<b>26C10</b>	<b>115C10</b>
15	± 3	2N015	5N015	<b>6N015</b>	12N015	<b>26N015</b>	<b>115N015</b>	2C15	5C15	<b>6C15</b>	12C15	<b>26C15</b>	<b>115C15</b>
20	± 4	2N020	5N020	<b>6N020</b>	12N020	<b>26N020</b>	<b>115N020</b>	2C20	5C20	<b>6C20</b>	12C20	<b>26C20</b>	<b>115C20</b>
30	± 7	<b>2N030</b>	<b>5N030</b>	<b>6N030</b>	<b>12N030</b>	<b>26N030</b>	<b>115N030</b>	<b>2C30</b>	<b>5C30</b>	<b>6C30</b>	<b>12C30</b>	<b>26C30</b>	<b>115C30</b>
45	± 9	2N045	5N045	<b>6N045</b>	12N045	<b>26N045</b>	<b>115N045</b>	2C45	5C45	<b>6C45</b>	12C45	<b>26C45</b>	<b>115C45</b>
60	± 10	<b>2N060</b>	<b>5N060</b>	<b>6N060</b>	12N060	<b>26N060</b>	<b>115N060</b>	<b>2C60</b>	5C60	<b>6C60</b>	12C60	<b>26C60</b>	<b>115C60</b>
75	± 12	2N075	5N075	<b>6N075</b>	12N075	<b>26N075</b>	<b>115N075</b>	2C75	5C75	<b>6C75</b>	12C75	<b>26C75</b>	<b>115C75</b>
90	± 12	<b>2N090</b>	5N090	<b>6N090</b>	12N090	<b>26N090</b>	<b>115N090</b>	2C90	5C90	<b>6C90</b>	12C90	<b>26C90</b>	<b>115C90</b>
120	± 20	2N0120	5N0120	<b>6N0120</b>	12N0120	<b>26N0120</b>	<b>115N0120</b>	2C120	5C120	<b>6C120</b>	12C120	<b>26C120</b>	<b>115C120</b>

Flashers available only in low voltage heaters . . . . . 2.5, 5.0, 6.3 — 26 V.

Flash Rate available — pre-set at factory — 15 to 100 fpm. . . . . List — \$4.00 each



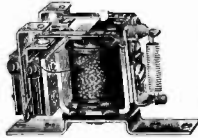
# RELAYS

## FOR AMATEUR AND INDUSTRIAL USES



### MINIATURE RELAYS

These units are very compact and are especially designed for plate circuit and general purpose control application. Overall dimensions: MR 1 1/8" x 1 1/8" x 7/8"—MRD 1 1/8" x 1 1/8" x 1 1/4". Contacts are fine silver rated 5 amps at 115 V. All AC relays are free from hum and AC chatter. The MR-2 and MRD-2 have 2500 ohm coil, will pick up at 6 ma. and 12 ma. respectively. The MR-5 and MRD-5 have 5000 ohm coils, will pick up at 3 ma. and 7.5 ma. respectively. The drop out value of these relays is approximately 50% of the pick up value.

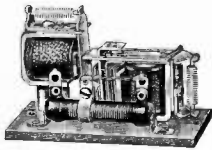


MRD

Type	A.C.	D.C.	Contacts	Net Prices
MR-2		Plate Circuit	SPDT	\$1.50
MR-5		Plate Circuit	SPDT	2.10
MR-6		6 V.	SPDT	1.50
MR-7			SPDT	1.59
MR-11	6 V.		SPDT	1.59
MRD-2	110 V.	Plate Circuit	DPDT	2.70
MRD-5		Plate Circuit	DPDT	3.60
MRD-6		6 V.	DPDT	2.70
MRD-7	6 V.		DPDT	3.00
MRD-11	110 V.		DPDT	3.00

### OVERLOAD RELAYS

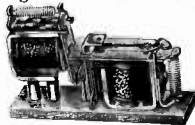
Adjustable overload relays provide accurate and positive protection against current surges and continuous overloads. Contact arrangements SPDT using 3/16" fine silver contacts. This allows the use of either audible or visual signal to advise of overload. All models are of the electrical reset type which allows remote control resetting of the relay. Size—3 3/4" x 2" x 1 1/2".



Type	Current Range	Reset Coil	Net Prices
OA-2	250-500 ma.	110 V. A.C.	\$4.50
OA-5	500-1000 ma.	110 V. A.C.	4.50
OC-2	250-500 ma.	6 V. A.C.	4.50
OC-5	500-1000 ma.	6 V. A.C.	4.50
OD-2	250-500 ma.	6 V. D.C.	4.50
OD-5	500-1000 ma.	6 V. D.C.	4.50

### LATCHING RELAYS

These relays are employed where it is not desirable to have current continuously on the coil. The latching arrangement is such that when the relay coil is energized the armature closes and locks in a closed position by mechanical latching. An electrical impulse on the reset coil releases the armature from the latch and allows the relay to assume its initial position. 3/16" fine silver contacts. Bakelite Base. Size—3 3/4" x 2" x 3/4".



Type	Reset Coil	Pull-in Coil	Net Prices
LEA	110 Volts A.C.	110 Volts A.C.	\$3.75
LEA-6	6 Volts A.C.	6 Volts A.C.	3.75
LED	6 Volts D.C.	6 Volts D.C.	3.75

### COMMUNICATION RELAYS

Ideally suited for use in telephone, remote control, signaling, communications circuits etc. High speed operation plus high sensitivity with high contact pressure. Contacts will handle 4 amps at 115 V. non-inductive load. Each relay has one make and one break contact sets. Size—3 3/4" x 1 3/16" x 1 1/8".

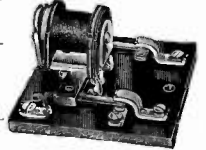


Type	Res. of Coil Ohms	Volts Pick-up	M.A. Pick-up	Net Prices
T10G	10,000	31	3.2	\$3.30
T63F	6,300	24	4.0	3.30
T40F	4,000	19	5.0	3.15
T10F	1,000	10	10.0	2.85
T25E	250	5	20.0	2.55

### ANTENNA CHANGE-OVER

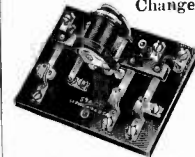
Mycalex Insulation is satisfactory for operation up to 60 MC. Triple-X insulation for operation up to 15 MC. All models use 3/16" fine silver wiping action contacts rated at 4 amps. These relays are designed with ball-bearing armature pivot and have large contact spacing to assure minimum capacity between contact arms. The armature is designed so as to eliminate AC chatter. Size—3 3/8" x 3 3/8" x 2 3/16".

Type	Insulation	Coil Voltage	Net Prices
ABA	TRIPLE-X	110 V. A.C.	\$3.00
ABD	TRIPLE-X	6 V. D.C.	3.00
AMA	MYCALEX	110 V. A.C.	4.00
AMD	MYCALEX	6 V. D.C.	4.00



### BREAK-IN RELAYS

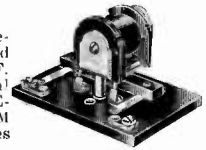
Same type of relay as above only two additional poles are added, one normally open, one normally closed. This arrangement is perfect for PUSH-TO-TALK relays. Contacts etc. identical with Antenna-Change-Over Relay. Size—4 1/2" x 3 3/8" x 2 3/16".



Type	Insulation	Coil Voltage	Net Prices
BBA	TRIPLE-X	110 V. A.C.	\$4.20
BRD	TRIPLE-X	6 V. D.C.	4.20
BMA	MYCALEX	110 V. A.C.	6.00
BMD	MYCALEX	6 V. D.C.	6.00

### R.F. AND GENERAL PURPOSE RELAY

An excellent relay for R.F. or high voltage remote control. Contacts are 3/16" fine silver rated 4 amps. Designed with extremely short R.F. path, Ball-bearing armature pivot. All metal parts cadmium plated. RB Series are TRIPLE-X insulated for frequencies up to 15 MC. RM series are MYCALEX insulated for frequencies up to 60 MC. Size—2 1/4" x 3 3/8" x 2 3/16".



Type	Insulation	Contact Combination	Coil Voltage	Net Prices
RBA-1	TRIPLE-X	SPST (double-break)	110 V. A.C.	\$2.10
RBD-1	TRIPLE-X	SPST (double-break)	6 V. D.C.	2.10
RMA-1	MYCALEX	SPST (double-break)	110 V. A.C.	2.55
RMD-1	MYCALEX	SPST (double-break)	6 V. D.C.	2.55
RBA-2	TRIPLE-X	DPST (single-break)	110 V. A.C.	2.25
RBD-2	TRIPLE-X	DPST (single-break)	6 V. D.C.	2.25
RMA-2	MYCALEX	DPST (single-break)	110 V. A.C.	3.00
RMD-2	MYCALEX	DPST (single-break)	6 V. D.C.	3.00

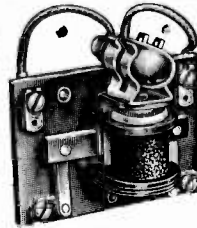
### KEYING RELAY

Same specifications as RB Series except that the coil and return spring are faster acting. Follows a "Bug" with ease.

Type	Coil Voltage	Contacts	Net Prices
KBA	110 V. A.C.	SPST (double-break)	\$2.10
KBD	6 V. D.C.	SPST (double-break)	2.10
KBA-6	6 V. A.C.	SPST (double-break)	2.10

### MERCURY-SWITCH RELAY

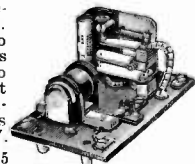
This type relay is used for controlling inductive loads and may be safely used in the presence of explosive dust, gas and vapor. This unit will safely handle a 1/4 H.P. motor or its equivalent. This single pole single throw mercury relay can easily be changed from normally open to normally closed by reversing the mercury tube in the clip. In addition this relay is equipped with SPST double break 3/16" fine silver contact sets which can be used to electrically lock this relay, or other applications. Mounts vertically with adjusting screws. Size—3 3/8" x 2 7/8" x 3 1/2".



Type	Coil Voltage	Net Prices
MSA	110 V. A.C.	\$3.75
MSA-6	6 V. A.C.	3.75
MSD-6	6 V. D.C.	3.75

### TIME-DELAY RELAY

Low cost Thermostatic Time delay relays designed for transmitting and industrial use. Prevents damage to tube filaments due to application of plate current before filaments are thoroughly heated. TD-11 is equipped so that it automatically compensates for ambient temperature changes. Time delay can be adjusted by means of screwdriver. Stock models are 110 V. A.C. Size—3 3/8" x 3 3/8" x 2 3/16". TD-11 (10-60 Sec.)—With compensator ..... Net \$4.75





## SPEED-X

SPEED-X keys, formerly made by Les Logan Co. of San Francisco, Calif., have attained a pre-eminent position as the leading complete line. Now manufactured by JOHNSON, their reputation will be maintained, and improved wherever possible.

### HIGH SPEED SEMI-AUTOMATIC KEYS

SPEED-X Semi-Automatic Keys are designed and constructed to rigid specifications and are approved by the experienced professional and amateur C. W. operators. They are fully adjustable from lowest to highest speeds. Manufactured in four distinctive and attractive models. Fully guaranteed against any defect in material or workmanship. Bases of all models drilled for stationary mounting.

**STANDARD MODEL 114-500.** New-Improved Standard Model Semi-Automatic Key mounted on extra heavy steel base  $3\frac{1}{2}'' \times 6\frac{1}{4}'' \times \frac{1}{2}''$  finished in attractive wrinkle baked enamel. Mounted on four rubber feet to insure stationary position at all times. The finish will not scratch or chip and will last indefinitely. The frame is finished same as base and has five adjustments with lock nuts, assuring dependable operations at all speeds. Vibrator arm, posts, switch and all machine parts heavily plated in beautiful satin chromium. Complete with adjustable weight,  $\frac{1}{8}''$  pure silver contacts, circuit-closing switch and two paddles adjustable to any desired height. Net weight  $4\frac{1}{2}$  lbs.

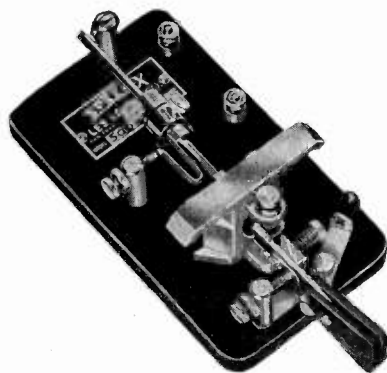
114-500..... List Price \$17.50

114-500-L (Left-handed model)..... List Price 19.50

**MODEL 114-501.** Beautiful Chrome finish. Heavy steel base  $6\frac{1}{4}'' \times 3\frac{1}{2}'' \times \frac{1}{2}''$  with four non-slip rubber feet. Heavy brass connector strips mounted under base. Heavy die cast frame with same finish as base and with five screws for sensitive adjustments. Vibrator is designed to obtain slowest and fastest speeds required by high speed operators. Pure silver  $\frac{1}{4}''$  contacts. Pigtail connections to vibrating arm. Perfectly aligned free acting vibrator bearings. Lock nuts on all adjustments. Paddles adjustable to any required height. All machine parts heavily chrome plated, which makes this the most outstanding semi-automatic key on the market. Furnished with circuit closing switch. Net weight  $4\frac{1}{2}$  lbs.

114-501..... List Price \$25.00

114-501-L (Left-handed model)..... List Price 27.50



Nos. 500, 501



114-515

**AMATEUR MODEL 114-515.** Baked Black Wrinkle Enamel Finished Steel Base  $6\frac{1}{4}'' \times 3'' \times \frac{3}{8}''$  with four rubber feet to prevent slipping or tilting. Heavy Brass connector strips. Die Cast Frame finished same as base with adjustable trunion screws. Chromium brass Vibrator has main spring and U-spring made of clock spring for smooth snappy action. Adjustable weight. Two adjustable black fibre paddles. Two sets  $\frac{1}{8}''$  pure silver contacts. Lock nuts for every adjustment. Damping wheel, post screws, springs and terminals chrome plated. Packed in attractive carton. Net weight  $3\frac{1}{4}$  lbs.

114-515..... List Price \$12.50

114-515-L (Left-handed model)..... List Price 15.00

**JUNIOR MODEL 115-510.** Die Cast Base  $2\frac{3}{4}'' \times 6'' \times \frac{3}{4}''$  finished in black wrinkle baked enamel concealing heavy brass connector strips. Frame is same finish as base and all other parts are chromium plated. Vibrator Arm same as Standard model with lots of pep. Adjustable from eight words per minute to as high a rate as desired. Pure silver  $\frac{1}{8}''$  contacts, adjustable weight and two adjustable paddles. Circuit closing switch mounted on base. Being small, compact and streamlined, this semi-automatic key is an outstanding value. A light-weight but sturdily built machine for clean-cut sending. Net weight  $2\frac{1}{2}$  lbs.

114-510..... List Price \$13.50

### REPLACEMENT PARTS

Cat. No.	Description	List Price	Cat. No.	Description	List Price
114-330	Adjustable Weight.....	\$0.25	114-352	Switch Knob.....	\$0.15
114-333	Self-locking Adj. Weight.....	.50	114-360	Black Navy Knob.....	.30
114-335	Key Spring.....	.10	114-361	$\frac{1}{2}''$ Chrome Screw.....	.10
114-336	Dash Spring.....	.10	114-362	$\frac{3}{4}''$ Chrome Screw.....	.13
114-337	Dot Spring.....	.10	114-363	1" Chrome Screw.....	.15
114-340	Set $\frac{1}{8}''$ Mounted Contacts.....	1.00	114-364	$\frac{1}{2}''$ Chrome Knurled Nut.....	.10
114-341	Set $\frac{1}{4}''$ Mounted Contacts.....	2.00	114-365	Chrome Terminal Nuts.....	.10
114-342	Key Mounds— $\frac{1}{8}''$ Contact.....	.40	114-370	Fibre Paddle.....	.25
114-345	(2) $\frac{1}{8}''$ Contacts.....	.20	114-375	Vibrator Arm Complete.....	3.00
114-346	(2) $\frac{1}{4}''$ Contacts.....	.50	114-376	Vibrator Arm Only.....	1.75
114-347	(4) .080 Contacts.....	.20	114-380	Plug for Hi-Speed Key.....	1.50
114-350	Black Key Knob.....	.20	114-390	$\frac{1}{8}''$ U Spring Contact.....	.60
114-351	Brown Key Knob.....	.20	114-391	$\frac{1}{4}''$ U Spring Contact.....	.75

#### 114-444 KIT

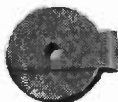
An assortment of the best selling parts for all makes of keys, selected from the above list, and packed in a beautiful display box..... List Price \$20.00



114-370



114-330



114-333



114-360



114-350



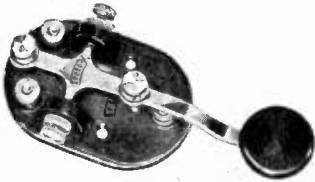
114-390



## SPEED-X

### MOULDED BAKELITE KEYS, BUZZERS, PRACTICE SETS

SPEED-X Moulded Bakelite and Metal Hand Keys, Practice Sets and Buzzers are used throughout the world as standard equipment in amateur and commercial work. Each unit is built according to rigid specifications and is fully guaranteed. All models have holes for stationary mounting. Code card supplied with each individually packed unit.



114-301

**AMATEUR KEY 114-301**—A general purpose key with moulded black bakelite base. Perfect insulation—adjustable smooth acting bearings—improved spring—nickel key arm—pigtail connections—no current on bearings— $\frac{1}{8}$ " pure silver contacts. Net Wt. 6 oz.

- 114-301 ..... List Price \$3.00
- 114-301-S—Same as Model 301 with circuit closing switch mounted on base..... List Price 3.50
- 114-301-SL with  $\frac{1}{4}$ " Contacts..... List Price 3.75

**PRACTICE KEY 114-300**—A well-built and inexpensive practice key for the beginner. Moulded Brown Bakelite base and knob. Spring bearings, perfect action, simple adjustments,  $\frac{1}{8}$ " pure silver contacts. All machine parts nickel plated. Standard Code card furnished. Net Wt. 5 oz.

- 114-300..... List Price \$1.75
- 114-300-L with  $\frac{1}{4}$ " Contacts..... List Price 2.00

**PRACTICE KEY 114-312**—Heavy die cast base finished in Gray Wrinkled Enamel. Smooth adjustable contacts.  $\frac{1}{8}$ " pure silver contacts. Has provision for plugging in our semi-automatic keys when desired. Net Wt. 9 oz.

- 114-312..... List Price \$3.25
- 114-312-S—Same as Model 114-312 with circuit closing switch mounted on base..... List Price 3.75
- 114-312-SL with  $\frac{1}{4}$ " Contacts..... List Price 4.00

**PRACTICE SET 114-450**—Consists of one constant frequency adjustable buzzer and a standard hand key with  $\frac{1}{8}$ " pure silver contacts mounted on a moulded brown bakelite light-weight base 6" x 4". Adjusting screws, key arm and all machine parts nickel plated. Light Spring for perfect keying. A complete sending and receiving set. Three hook-up diagrams on carton show how this Practice Set may be used singly for code practice and in pairs for point to point communications. Standard Code Card included. Net Wt. 12 oz.

- 114-450..... List Price \$4.50

**CONSTANT FREQUENCY BUZZER 114-400**—Moulded Black Bakelite Base and Cap eliminates insulation problems. Large pure silver contacts—precision parts hold adjustments. Additional adjustment on vibrator. Resistance 2 ohms. Operates on two dry cells or one "C" battery. A high quality buzzer for all purposes. Net Wt. 3 oz.

- 114-400..... List Price \$2.00

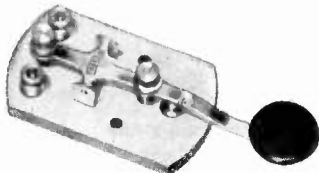


114-450



114-400

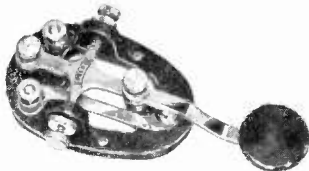
### HEAVY DUTY METAL HAND KEYS



114-300, 114-305, 114-306

**METAL HAND KEY 114-305**—An inexpensive metal base key with black wrinkled enamel finish. Smooth acting spring bearings and adjustable key arm spring. Key arm and all machine parts bright nickel finish.  $\frac{1}{8}$ " pure silver contacts. Net Wt. 10 oz.

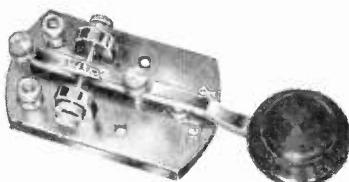
- 114-305 ..... List Price \$1.90
- 114-306—Same as Model 114-305 with Baked Wrinkle Brass finished base..... List Price 1.90



114-310, 114-311, 114-316

**STANDARD KEY 114-310**—Heavy die cast base finished in black wrinkled enamel. Smooth adjustable bearings.  $\frac{1}{8}$ " pure silver contacts. Has provisions for plugging in our semi-automatic keys when desired. Net Wt. 9 oz.

- 114-310 ..... List Price \$3.25
- 114-311—Same as 114-310 with Chromium finish base and parts..... List Price 4.00
- 114-316—Same as 114-310 with Baked Wrinkle Enamel Brass finish base..... List Price 3.25
- 114-316-L with  $\frac{1}{4}$ " Contacts..... List Price 3.50



114-320, 114-321, 114-326

**STANDARD KEY 114-310-S**—Same specifications as Standard model key 114-310 with circuit closing switch mounted on base.  $\frac{1}{8}$ " pure silver contacts. An attractive high-quality key. Net Wt. 10 oz.

- 114-310-S ..... List Price \$3.75
- 114-311-S—Same as 114-311 with circuit closing switch mounted on base..... List Price 4.50
- 114-316-S—Same as 114-316 with circuit closing switch mounted on base..... List Price 3.75

**HEAVY DUTY KEY 114-320**—Black wrinkle enameled extra heavy Die Cast Base. Large sturdy chromium plated key arm with adjustable steel bearings. Heavy brass connector strip concealed under base. Well insulated for heavy duty work. Improved Navy Type Knob and  $\frac{1}{4}$ " pure silver contacts. Net Weight 12 oz.

- 114-320..... List Price \$4.25
- 114-321—Chromium Base..... List Price 5.00

**HEAVY DUTY KEY 114-326**—Same specifications as Heavy Duty Model 114-320 but base finished in a beautiful Lacquered BRASS finish. Arm and machine parts chromium plated. Well designed spring gives this model a light keying touch. Navy Type Knob and  $\frac{1}{4}$ " pure silver contacts. Net Wt. 12 oz.

- 114-326..... List Price \$4.25



# The Vibroplex

**A SEMI-AUTOMATIC TELEGRAPH AND WIRELESS TRANSMITTING MACHINE**

**Embodying the latest exclusive features**



Prominent features which have been contributed to the success of the Vibroplex are:

- Simplicity • Durability
- Perfect control • Easy adjustment
- Strong carrier • Ease of manipulation
- Adaptability to changing wire conditions
- Ability to transmit perfect Morse and Continental signals at high speed

These features, which are found only in the genuine Vibroplex models illustrated on these pages, make for clear, rapid, easy transmission; relieve the arm of strain caused by sending on the ordinary key; rest

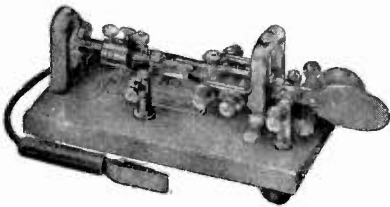
and strengthen the overworked muscles, and prevent telegrapher's paralysis.

### CLEAR, RAPID SENDING MADE EASY

The Vibroplex transmits the same grade of Morse and Continental code as the strongest clearest hand sender, faster than is possible on the ordinary key, and with less than half the labor.

There is no tensing of the muscles, no nerve strain, no pounding on the key in order to make clear, rapid signals. You simply press the lever—the machine does the rest.

## New SUPER DE LUXE "PRESENTATION" VIBROPLEX



Your name engraved on base, \$1.50  
Additional engraving, 15c per letter

The Finest Bug Ever Built! 24K Gold-Plated Base Top, Patented Jewel Movement and Super-Speed Control! New patented adjustable main spring affords wider range of speed than ever obtained before in semi-automatic transmitting key. Beautifully-designed with polished chromium machine parts mounted on a 24K gold-plated base top, colorful red switch knob, finger and thumb piece and precision-machined. This new Super-DeLuxe "Presentation" Vibroplex key at \$27.50 affords a life-time of sending enjoyment. Harder than metal, the jewels in this key reduce friction, maintain smoother, easier operation and prolong life.

Amateur Net Price ..... **\$27.50**

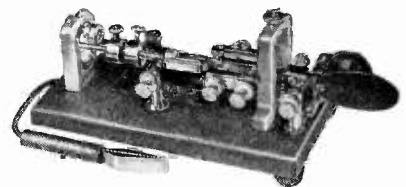
## THE Improved "ORIGINAL" VIBROPLEX

Suitable for All Classes of Transmitting work Where Speed and Perfect Morse Are Prime Essentials

This great new Vibroplex is a smooth and easy working BUG. It has won fame on land and sea for its clarity, precision and ease of manipulation. Can be slowed down to 10 words per minute or less or geared to as high rate of speed as desired. Maintains the same high quality signal at whatever speed, insuring easy reception under all conditions.

### SPECIFICATIONS

The improved model, single lever. Two pairs of contact points: one for dots, the other for dashes. Weight, 3 lbs. 8 oz. A handsome and efficient transmitting machine, with unlimited sending possibilities. Complete with cord and wedge.



Standard—Polished Chromium top parts, black base. Amateur Net Price..... **\$15.95**

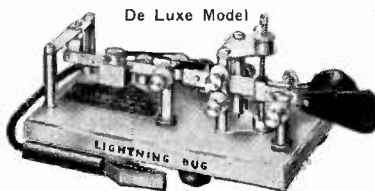
DeLuxe—Polished Chromium base and top parts, with jeweled movement. Amateur Net Price ..... **19.50**

## THE "LIGHTNING BUG" VIBROPLEX

**High Quality Signals at All Speeds**

### SPECIFICATIONS

Single lever, with improved flat pendulum, instantly adjustable dot contact spring, circuit breaker parallel with pendulum. Two pairs of contact points, one for dots, the other for dashes. Complete with cord and wedge. Weight 3 lbs. 8 oz.



Standard—Polished Chromium top parts, black base. Amateur Net Price ..... **\$13.95**

DeLuxe—Polished Chromium base and top parts, with jeweled movement. Amateur Net Price ..... **17.50**



The

# Vibroplex



Telegraph & Wireless  
Transmitting Machines

## THE "ZEPHYR" VIBROPLEX

A Genuine Vibroplex. Slightly Lighter in Weight.  
Having Plenty of "Pep" and "Power"

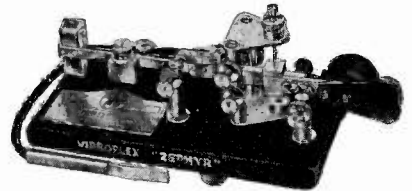
Smaller and more compact but designed in most details the same as the "Lightning Bug" model. Planned to meet the demand for a low priced, efficient and high speed transmitter for telegraph use.

### SPECIFICATIONS

Single lever with standard size contact points. Mounted on slightly smaller base. Weight 3 lbs. 2 oz. Equipped with circuit closer, cord and wedge. Standard finish only. Chromium finished top parts, with black crystal base.

Amateur Net Price .....

**\$12.50**



## THE "CHAMPION" VIBROPLEX

*For Radio Use Only*

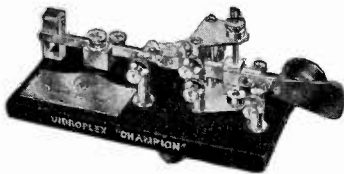
The new "Champion" is an inexpensive transmitter having exceptional sending qualities . . . clarity . . . speed . . . sending ease, which will appeal alike to amateur and professional radio operators. Designed to meet the demand for a low priced Vibroplex in the radio field.

### SPECIFICATIONS

Single lever with two pairs of contact points. Mounted on large standard size base. Weight 3 lbs. 8 oz. Without circuit closer, cord and wedge. Standard finish only. Chromium finished top parts, with black crystal base.

Amateur Net Price .....

**\$9.95**



Designed to Fulfill the Demand for  
a Low Priced Radio Transmitter

## THE "BLUE RACER" VIBROPLEX

Small and compact, the "Blue Racer" Vibroplex can be carried around and never be in the way. Embodies the same sending possibilities, the same carrying qualities, the same strength and durability as the larger models. Built especially to meet the demand of telegraphers requiring a small, lightweight and efficient sending machine.

### SPECIFICATIONS

Single Lever. Two pairs of contact points—one for dots, the other for dashes. Weight, 2 lbs. 8 ozs. Complete with cord and wedge.

Standard—Polished Chromium top parts, black base . . .

Amateur Net Price .....

**\$15.95**

DeLuxe—Polished Chromium base and top parts, with jeweled movement. Amateur Net Price .....

**19.50**



Very similar to the Original Vibroplex except that it is only half the size. Suitable for all classes of telegraph work and in high favor with wireless men.

## VIBROPLEX CARRYING CASE

Keeps the Machine Free from Dust, Dirt and Moisture  
Insures Safe-keeping When Not in Use



A cloth-lined case, finished in handsome simulated black morocco. Corners are reinforced, adding to its durability and attractiveness. A flexible leather handle makes it more convenient to carry. Has lock and key.

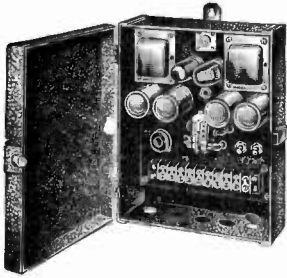
PRICE .....

**\$5.50**

The JEWELS used in the DeLuxe Model Vibroplexes are the same as placed in the world's finest precision made watches and instruments.

A JEWEL bearing main lever insures a "LIFETIME" of service and an ease of operation that can only be referred to as "FEATHER-TOUCH" sending.

**MODEL 63 MASTER AMPLIFIER**



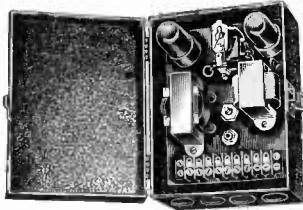
Model 63 Amplifier is especially designed for use with a correct combination of standardized Worner Photo-Cell and Light Source units. However, this Amplifier will operate also from Light Source units, such as daylight, artificial lights, radiant energy from metallic processing, etc.

Model 63 Amplifier is a specially engineered, highest quality unit. It enjoys wide preference as it efficiently meets 95 per cent of industrial requirements and replaces the need of costly individually engineered equipment. Technical details on request.

Model 63 Master Amplifier.....each \$85.00

**MODEL 64 ECONOMY AMPLIFIER**

This Amplifier is an economical unit for practically any industrial application where economy is a factor or requires a light beam distance of not more than 50 feet or where the Relay is not required to operate in excess of 250 times a minute. Can be furnished for greater distances or speed, technical details furnished on request.



Model 64 Economy Amplifier.....each \$56.00

**MODEL 62 R & L  
AMPLIFIER AND LIGHT SOURCE SET**



Model 62-R Amplifier



Model 62-L Light Source

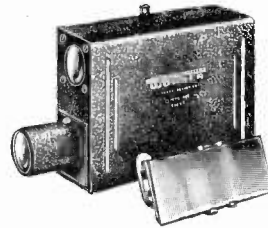
This "two-unit" set has specially designed Light Source unit and an Amplifier unit that includes the Photo-Cell Receiver, Relay and other electrical controls. This combination has proved efficient for countless simple applications for distances from a few inches to 75 feet or where Relay is not required to operate in excess of 300 times a minute.

The "two-unit" set will supervise efficiently on a simple application, such as: Counting or sorting large objects; limit switches; start and stop operations; light density; fire protection; flame control; opening doors, etc.

Model 62 R & L "Two-Unit Set".....per set \$70.00  
Model 62-R Amplifier only.....each 58.00  
Model 62-L Light Source only.....each 18.00

**FOTOLECTRIC ANNOUNCER**

Automatically Announces the Entrance or Passing of Any Object



Model 61-A

The Fotoelectric Announcer unit is designed to project a "beam of light" across any entrance to any room, building or premises. The breaking of this light beam by any person entering will activate a chime or other sound to automatically announce the entrant.

Can serve countless purposes and solve most entrance problems efficiently.

Model 61 Fotoelectric Announcer includes Light Source and sensitive Photo-Cell units in one compact metal case, finished in black crackle lacquer. Size, 10 3/4 x 7 1/2 x 2 3/4 inches.

Model 61 Announcer with Chime.....each \$31.25

Model 61-A Fotoelectric Announcer, the same unit as described above except that it is equipped with an optical system to arrest unwanted light.

Model 61-A Announcer with Chime.....each \$34.25

**LIGHT SOURCE UNITS AND  
PHOTO-CELL RECEIVER UNITS**



Model 33



Model 23



Model 31



Model 21

The Light Source unit is designed to project the light beam and the Photo-Cell Receiver is designed to pick up the beam and convert its light into electrical energy through the Amplifier unit.

Model 33 Light Source is "standard" for general applications and is most generally recommended. Its light beam covers a distance from a few inches to 50 feet from Light Source to Receiver. Heavy duty, cast iron unit with 1/2-inch conduit fittings. Gray finish.

Model 23 Photo-Cell Receiver is engineered for use with Model 33 Light Source and has the same case specifications.

For use in damp surroundings, Models 33 and 23 can be made water-proof at slight additional cost.

Model 31 Light Source is "standard" where a lighter weight case is practical. Its light beam covers a distance from a few inches to 25 feet from Light Source to Photo-Cell Receiver. Case is 18 gauge steel, gray crackle finish. Has 1/2-inch knockout.

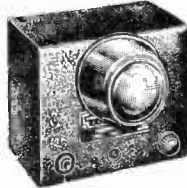
Model 21 Photo-Cell Receiver is engineered for use with Model 31 Light Source and has the same case specifications.

Model No.	Description	Size, Inches	Price, Each
33	Light Source Housing	4 1/4 x 2 3/4 x 2 3/4	\$11.00
23	Photo-Cell Receiver	4 1/4 x 2 3/4 x 2 3/4	16.00
31	Light Source Housing	6 5/8 x 2 x 1 1/4	9.00
21	Photo-Cell Receiver	6 5/8 x 2 x 1 1/4	14.00

**MODEL 9000 SERIES**  
**FOTOLECTRIC BURGLAR ALARM SYSTEM**



Amplifier Model 9100-R



Amplifier Model 9150-R

This series consists of One Master Control Panel operating with one or more (up to 4) Fotoelectric Light Source and Amplifier sets. The combination may be used with traps, foil systems and other equipment as used by professional burglar alarm companies, to operate audible or visible alarms.

Any interruption of the light beam operates whatever alarms the user wishes to install. The complete alarm circuit is supervised by the Master Control Panel which is remotely located for operator's convenience.

All Model 9000 series Amplifiers contain the following: Heavy duty transformers 110-120-volt, 50 to 60 cycle, A.C. with dual secondary. Potentiometer type sensitivity control. Meter Jack to determine correct cut-off and plate current in Relay circuit. Electrolytic condensers. Double pole, double throw 5-amp. relay.

Constructed of 18-gauge steel, welded, gray wrinkle finish. Size: 7 x 6 1/4 x 4 1/4 inches. (Not weatherproof.)

Model No.	Description	Range per Set	Price, Each
9100	Master Trespass Trap.....	100 ft.	\$70.00
9150	Master Trespass Trap.....	150 ft.	90.00
9250	Master Trespass Trap.....	250 ft.	130.00
9500	Master Trespass Trap.....	500 ft.	225.00



Model 9000 Control Panel, \$45.00 list, supplied with plate relays equal to the 9000 series Amplifiers ordered. If 9000 series Amplifiers are ordered without Control Panel, plate relay is supplied with Amplifiers to be mounted in Control Panel.

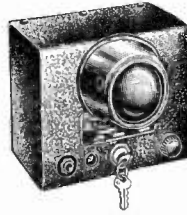
**MODEL 7000 SERIES**  
**FOTOLECTRIC BURGLAR ALARM SYSTEM**

The Model 7000 series operates in conjunction with professional independent burglar alarm company's central office or local equipment.

The 7000 series Amplifiers are complete with the following scientifically engineered equipment: Tubes. Lenses. Heavy duty shielded Amplifier transformer 110-120 volt, 50-60 cycle, A.C. with dual secondary. Potentiometer sensitivity control. Meter Jack to determine correct cut-off and plate current in relay circuit. Electrolytic condensers. Single-pole, double-throw relay, self-wiping contacts rated at 5 amp. non-inductive at 110-120 volts, 50 to 60 cycle.

Model No.	Description	Range per Set	Price, Each
7100	Remote Cont. Trespass Trap	100 ft.	\$70.00
7150	Remote Cont. Trespass Trap	150 ft.	90.00
7250	Remote Cont. Trespass Trap	250 ft.	130.00
7500	Remote Cont. Trespass Trap	500 ft.	225.00

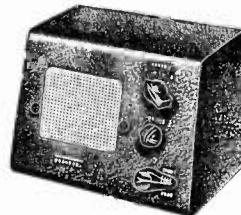
**MODEL 5000 SERIES**  
**FOTOLECTRIC BURGLAR ALARM SYSTEM**



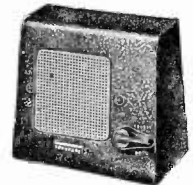
Model 5000 series consists of a Light Source unit and an Amplifier unit. This combination is designed for interior use where a single beam is considered ample protection; it is not intended for use with protective devices such as foil systems, etc. Furnished for 110 volts. Amplifier Model 5150-R (illustrated) is equipped with a scientifically engineered "unwanted light rejector," which materially increases the day-light range of the unit and makes it equal to the night-time range, if equipment is installed so that 90 per cent of the light reaching the Photo-Cell is that guaranteed by the Light Source.

Model No.	Description	Range	Price, Each
5100	Single Beam Trespass Trap	100 ft.	\$75.00
5150	Single Beam Trespass Trap	150 ft.	95.00

**WORNER**  
**COMMUNICATING SYSTEMS**



Models P-359, P-353



Model P-360

All WORNER units operate efficiently as far as 2000 feet unit. Persons at or near Sub-stations when called may answer without leaving their work, from as far away as 25 feet. "Silent feature" shuts out noise in vicinity at Station. 110 volt to 120 volt, A.C. or D.C. Units are shipped complete with wiring diagrams and instructions for easy installation.

Model P-359 Selective Master Station. Handles 1 to 5 Sub-stations. Has 3-tube amplifier. 1 watt output. Contains 5-inch speaker for maximum input without talking directly into unit. In substantial all-metal cabinet; size: 9 x 6 1/4 x 6 inches. Finished in hammered walnut lacquer finish. Complete with tubes and instructions..... each \$34.75

Model P-353 Combination Master Station. 2 to 5 units may be used, in any combination of Masters to Masters, or Masters to Sub-stations. Contains 3-tube amplifier. Complete with tubes and instructions..... each \$47.50

Model P-360 Sub-station. Has 5-inch speaker. Talk-listen switch used by Sub to originate call; not used after Master answers. In substantial all-metal cabinet as illustrated; size: 7 1/4 x 4 x 6 inches; finished in attractive hammered walnut lacquer finish.  
each \$11.50