

GENERAL CATALOG no. 11

KELLOGG

SWITCHBOARDS

TELEPHONES

SUPPLIES

C H I C A G O , U . S . A .

NO.
11

Kellogg

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SUPPLIES PAGES 135 TO 264

PARTS PAGES 265 TO 294

KELLOGG SWITCHBOARD AND SUPPLY COMPANY
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General Catalog No. 11
KELLOGG SWITCHBOARD AND SUPPLY COMPANY
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FOREWORD

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FOREWORD

This catalog has been prepared in three sections consisting of Kellogg apparatus, supplies, and piece parts for Kellogg apparatus.

All products of Kellogg manufacture and all supplies are presented in alphabetical order. Products are alphabetized by the name of the product. For example, desk set boxes will be found under Boxes, Desk Set, etc.

THE APPARATUS SECTION contains all coded items of Kellogg manufacture. Also included in this section are storage batteries and other power equipment and protection and cross-connecting equipment not manufactured by Kellogg. The coded components of major coded items are listed in this section under the description of the major item.

THE SUPPLY SECTION includes all supplies except storage batteries, other power equipment, and protection and cross-connecting equipment. This equipment is shown under "Power" in the Apparatus Section.

THE PIECE PART SECTION includes piece parts which are regularly supplied and which can be replaced by operating companies.

HOW TO ORDER

All orders should include *both the code number and the name* of the article or product ordered. In general, both the code number and the name are necessary to properly identify the apparatus.

Piece parts should be ordered by piece part number. Where itemized drawings are shown in the Piece Part Section the associated code number should be determined from the accompanying listing of piece part numbers.

CUSTOMER INFORMATION

Guarantee

Goods properly used are fully guaranteed for one year against any defect in material or workmanship and are subject to replacement.

Always notify a Kellogg office before making any return shipments. This will help to make the proper adjustment without delay.

Terms

All invoices to companies whose credit has been approved are payable net, within 30 days from date thereof, except those covering some items of construction material which carry a discount for cash within 10 days from date of invoice or those whose terms were specified in quotations, proposals or contracts.

We invite the opening of charge accounts. New customers who ordinarily are not rated by commercial agencies can help assure prompt service by sending in credit information such as their latest balance sheet and profit and loss statement, bank or other references, with initial orders.

Sight draft or C.O.D. orders receive the same attention as those covered by established charge accounts.

Orders

To avoid errors or delays, catalog numbers as well as the name of each article should appear on the order. Possibilities of delay are decreased when complete information is given in the order.

Telephone or telegraph orders should be confirmed by mail immediately so that if a mistake is made in transmission of the order it can be checked and corrected. However, confirming orders should be marked "Confirming" to avoid the possibility of duplication.

Changes and Cancellations

A reasonable charge is made for changes or cancellation of orders when engineering, special assembly or adjustment is involved. These charges are only sufficient to compensate for the actual loss in time or material.

Shipments

Always specify whether goods are to be shipped via freight, express or parcel post. When shipment is desired by freight specify the routing. In the absence of instructions Kellogg will select routes which will assure the best service.

Claims for Shortage, Breakage or Non-Delivery

All claims for breakage, damages and non-delivery should be made at once to the transportation company handling the shipment. Kellogg will gladly assist in presenting these claims.

Receipts from the transportation company specify that shipments are received in good condition, therefore shipments must be checked as they are received. Always have the agent of the transportation company make a notation on the bill of lading specifying any damage or shortage.

If packages or cases are in apparent good order, but contents are found to be damaged upon opening, call the freight agent or adjuster and have him mark the freight bill to show the concealed damage.

Claims for damage or non-delivery of parcel post shipments should be made to Kellogg as Kellogg insures this material and makes all adjustments.

Returning Goods

Please notify Kellogg before making any return shipments. This will help to make the proper adjustment without delay.

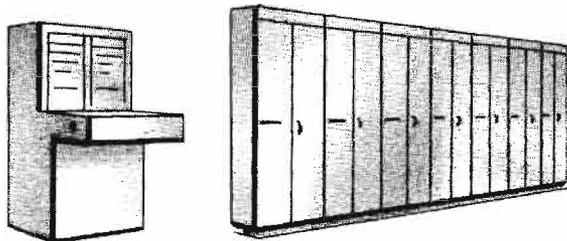
The liability of the Kellogg Company is limited in all cases to the value of the goods claimed to be defective.

Marine or Parcel Post Insurance

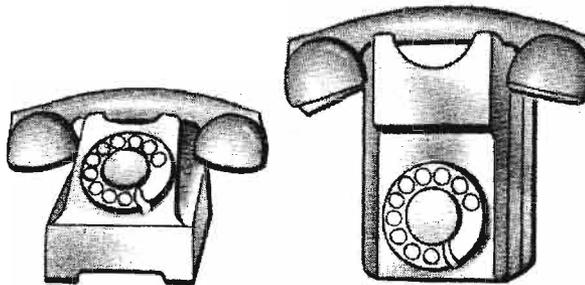
Unless otherwise directed, Kellogg will insure against non-delivery all shipments made by steamer or parcel post. A charge will be made to cover this cost.

Kellogg

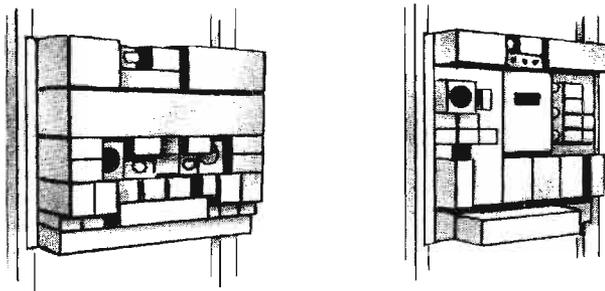
APPARATUS



SWITCHBOARDS



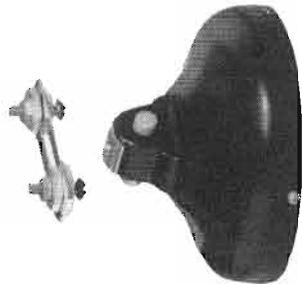
TELEPHONES



CARRIER & REPEATER



ARMS, TELEPHONE TRANSMITTER
No. 39 Transmitter Arm, Wall Type
Steel Telephone



This arm is used on Kellogg No. 817 type steel telephones. The transmitter back is made of punched brass and the remainder of punched steel, finished in black enamel. The arm is 1½ inches long from the back of the mounting to the end of the transmitter back. Can be adjusted from 15° above to

15° below horizontal. Has concealed cord design.

No. 41 Transmitter Arm, Wall Type
Wood Telephones

The No. 41 Transmitter Arm is designed for use with Kellogg No. F-2731 and F-2870 wood telephones. The transmitter back of this arm is of punched brass and the remainder of pressed steel. The arm is finished in black enamel. The arm is 1½ inches long from the back of the mounting to the end of the transmitter back and requires a 2-inch opening in the telephone woodwork to mount. Adjustable 15° above and below the horizontal. Has concealed cord design.

No. 50 Transmitter Arm



The No. 50 Transmitter Arm is standard for magneto telephones. Has concealed cord design and is adjustable 15° above and below the horizontal. The arm is 2¾ inches long from the back of the mounting to the end of the transmitter back. Finished in black enamel.

ARMS, SWITCHBOARD TRANSMITTER
No. 48 Switchboard Transmitter Arm



This arm is of the suspended adjustable type for use with all types of small switchboards. The construction of this arm completely eliminates the use of a cord weight and provides a wide range of positions.

The No. 48 arm is especially adaptable to installations where the operator must perform duties other than straight operating, requiring freedom of position at the board. The arm is equipped with both horizontal and vertical swivel joints, making it easy to place the transmitter in any convenient position.

Heavy brass, with a durable nickel finish, is used in the construction of this arm. The length of the arm is adjustable from 16¼ inches to 25⅞ inches and the height is 2-5/16 inches. Rollers are provided for the transmitter cord to prevent wear on the conductor insulation. The arm is arranged for use with the No. 157 type transmitter.

ARMS, SWITCHBOARD TRANSMITTER
No. 28 Switchboard Transmitter Arm,
Hinged Lug Type

The arm is designed for use on desk type or small, floor type switchboards. It is made of brass tubing with durable nickel plating. The transmitter cords are concealed in the tubing, protected from wear and damage.

The length of the arm is adjustable from 16¼ inches to 22¾ inches and the height from 4-11/16 inches to 11½ inches. The transmitter arm is arranged for use with the No. 121 type transmitter.

No. 54 Switchboard Transmitter Arm,
Suspended Type

The No. 54 arm is the same as the No. 48 except the arm length is adjustable from 14-5/16 inches to 20¾ inches. It is arranged for use with the No. 157 type transmitter.

BARS, DISTRIBUTING

These distributing bars are for use on switchboards for battery commons, ground strips, and fuse terminals. They are made of brass and are furnished with round head brass machine screws and washers. Kellogg distributing bars are available in four types: the No. 52 has tapped mounting holes for mounting with machine screws; the No. 3, No. 5, and No. 44 types have countersunk mounting holes for mounting with wood screws.



LEFT: TYPE 52



RIGHT: TYPE 3

Tapped Mounting Hole Type Bars

TYPE NO. 52

Code No.	No. Term Screws	Centers Spaced	DIMENSIONS OF BAR (INCHES)		
			Length	Width	Thickness
52	2	13/32 in.	1-3/16	¼	¼

Countersunk Mounting Hole Type Bars

TYPE NO. 3

Code No.	No. Term Screws	Centers Spaced	DIMENSIONS OF BAR (INCHES)		
			Length	Width	Thickness
3	2		1-3/16	¼	¼
4	4	½ in.	2½	¼	¼

TYPE NO. 5

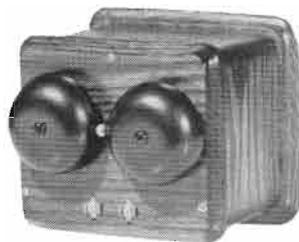
5	5	½ in.	2-9/16	⅜	¼
10	6	½ in.	3-1/16	⅜	¼
12	7	½ in.	3-9/16	⅜	¼
15	9	½ in.	4-9/16	⅜	¼
16	10	½ in.	5-1/16	⅜	¼
18	11	½ in.	5-9/16	⅜	¼
19	13	½ in.	6-9/16	⅜	¼
23	16	½ in.	8-1/16	⅜	¼
39	28	½ in.	14-1/16	⅜	¼
43	25	½ in.	12-9/16	⅜	¼

TYPE NO. 44

40	7	1 in.	6-9/16	½	¼
44	2	11/16 in.	1-3/16	½	¼
62	5	1 in.	4-9/16	½	¼

BELLS

MAGNETO EXTENSION TYPE



The No. 37 type magneto extension bells consist of a ringer mounted in a small oak cabinet with the gongs and two binding posts mounted on the outside. The cabinet for the No. 37 type bell is 6½ inches long, 5½ inches wide, and 4½ inches high. The cabinet of the No.

115-BA bell is 6 inches long, 6 inches wide, and 3¼ inches high, mounted on a base 9 inches long, 6½ inches wide, and 5⁄8 inch thick. The gongs for these bells are finished in black enamel.

These bells are furnished less condensers unless specified when ordering. Order by code number.

STRAIGHT LINE TYPE

Code No.	Ringer	Frequency (Cycles)	Binding Amt.	Posts Code	Type of Ringer
37-SA	78-A	---	2	77	1000 ohm Str. Line
37-SD	78-D	---	2	77	1600 ohm Str. Line
37-SG	78-G	---	2	77	2500 ohm Str. Line

BIASED TYPE

37-BA	79-A	---	2	77	1000 ohm Str. Line
115-BA	79-A	---	2	11	1000 ohm Biased & No. 146 Condenser

HARMONIC TYPE

37-HA-1	72-A-1	33⅓	2	77	Harmonic
37-HA-2	72-A-2	50	2	77	Harmonic
37-HA-3	72-A-3	66⅔	2	77	Harmonic
37-HA-4	72-A-4	16⅔	2	77	Harmonic
37-HB-1	73-A-1	30	2	77	Harmonic
37-HB-2	73-A-2	42	2	77	Harmonic
37-HB-3	73-A-3	54	2	77	Harmonic
37-HB-4	73-A-4	66	2	77	Harmonic

BELLS AND BUZZERS, NIGHT ALARM

These bells are for night alarm use in small exchanges. The bells and buzzers shown below are the same in construction except the bells are provided with a gong. The buzzers are approximately 3 inches in diameter and 1¼ inches in height. The bells have the same dimensions except that a 1¾-inch gong is mounted on top making an over-all length of 4¾ inches.

These bells and buzzers must be ordered by code number. Both bells and buzzers will operate on either A.C. or D.C. Separate connections on the terminal strips are marked for either connection.

DRY CELL TYPE

Code No.	Description	Coil Resis. (Ohms)	Voltage
1-A	Bell	4	3-V., A.C. or D.C.
10-A	Buzzer	4	3-V., A.C. or D.C.

STORAGE BATTERY TYPE

1-B	Bell	300	24-V., A.C. or D.C.
1-C	Bell	500	48-V., A.C. or D.C.
10-B	Buzzer	300	24-V., A.C. or D.C.
10-C	Buzzer	500	48-V., A.C. or D.C.
10-D	Buzzer	50	12-V., A.C. or D.C.

(The No. 10-D Buzzer is for use with intercommunication sets.)

WEATHERPROOF LOUDRINGING TYPE



The Kellogg weatherproof loudringing bell is for indoor or outdoor use with either common battery or magneto service. These bells are completely weatherproof and operate under all climatic conditions. They are especially adapted for taxi stands, coal yards, lumber yards, and all other installations where a loud-ringing bell which will stand up under all service conditions is needed.

The housing for these bells consists of a heavy cast iron base with a removable cast iron cover, all finished with an asphalt base followed by an aluminum paint to insure against corrosion. The gongs are 6 inches in diameter. Either straight line or harmonic ringers can be furnished. Over-all dimensions: width 13 inches; height 12½ inches, and depth 4½ inches. These bells must be ordered by code number.

STRAIGHT LINE TYPE

Code No.	Ringer	Ringer Freq. (Cycles)	Condenser	Type Ringer
65-SA	107-A	---	See Note	---
65-SD	107-D	---	See Note	---
65-SG	107-G	---	See Note	---

BIASED TYPE

65-BA	107-A	---	No. 214	1000 ohm coil resistance. Biasing spring attachment.
-------	-------	-----	---------	--

Note: The straight line type bells are equipped with straight line ringers with coil resistances as follows: 65-SA, 1000 ohms; 65-SD, 1600 ohms, and 65-SG, 2500 ohms. A condenser is furnished only if specified. For 1 mfd. specify No. 12 condenser. For 2 mfd. specify No. 214 condenser. For other extension bells see Boxes, Desk Set.

HARMONIC TYPE

65-HA-1	105-A-1	33⅓	No. 12	Harmonic
65-HA-2	105-A-2	50	No. 12	Harmonic
65-HA-3	105-A-3	66⅔	No. 12	Harmonic
65-HA-4	105-A-4	16⅔	No. 12	Harmonic
65-HB-1	106-A-1	30	No. 12	Harmonic
65-HB-2	106-A-2	42	No. 12	Harmonic
65-HB-3	106-A-3	54	No. 12	Harmonic
65-HB-4	106-A-4	66	No. 12	Harmonic
65-HC-1	119-A	20	No. 12	Harmonic
65-HC-2	119-A	60	No. 12	Harmonic
165-HA	121-A	25	No. 12	Harmonic

BINDING POSTS

**Extension Bell Type
NO. 77**

The No. 77 binding post is made of soft steel with cadmium plating. Terminal end tinned for soldering purposes. Over-all dimensions 1¼ by 7-1/16 inches. Used for No. 37 extension bells. Has No. 6-32 round head machine screws.

BINDING POSTS (Cont'd)

Telephone Type



NO. 11

The No. 11 binding post is made of nickel plated brass with end tinned for soldering. Has No. 6 screw for spade tip terminals. Base dimensions 5/16 by

1 inch. Wood mounting screw is No. 5 by 1/2 inch.



NO. 59

The No. 59 binding post is similar to the No. 11 except the connection is made at right angle to the base. Made of nickel plated brass with end tinned for soldering. Size 5/16 by 3/4 inch. Wood mounting screw No. 6 by 1/2 inch.



NO. 63

The No. 63 binding post is the same as the No. 59 except it has a clip to take either spike or spade tips.

Connecting Rack Type



NO. 76

This post is the same as the No. 11 except it has a clip to take either spike or pin tips as well as spade tips. Used on Nos. 12, 13, and 14 connecting racks.

BLANKS, JACK

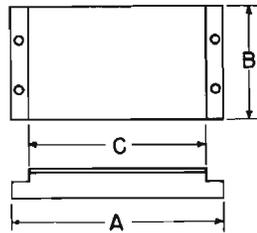


FIGURE "A"

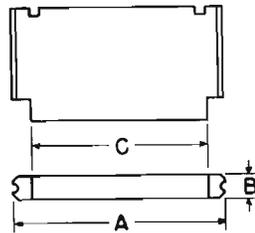


FIGURE "B"

These jack blanks are used to fill out the face of the switchboard in unequipped spaces. A few of the most commonly used blanks are listed below. For information concerning other available types, contact the Kellogg Sales Department. With the exception of the No. 9-E, all blanks listed below are made of wood with a bakelite face, dull rubbed to match the face of the switchboard. No. 9-E is made of wood with an ebonized face.

Code No.	Dimensions (Inches)			Figure
	A	B	C	
4-B	8 1/4	3/8	7-21/32	A
4-F	8 1/4	1/2	7-21/32	A
7-B	10 3/4	15/16	10 1/4	B
7-H	10 5/8	1 1/2	10 1/4	B
7-P	10 3/4	2-3/16	10 1/4	B
7-R	10 3/4	4-11/16	10 1/4	B
7-W	10 3/4	1-7/16	10 1/4	B
7-X	10 3/4	2	10 1/4	B
9-D	7-29/32	1 3/4	7-21/32	B
9-E	7-29/32	4-1/16	7-21/32	B
9-F	7-29/32	4-1/16	7-21/32	B

BOXES, DESK SET

Kellogg Desk Set Boxes have a heavy drawn steel cover with a durable black enamel finish for the common battery type and a wood cover with black finish for local battery and special types. All parts for these boxes are easily accessible and quickly replaceable with an ordinary screw driver. Connecting racks are clearly marked for convenience. Universal type terminals used.

Common Battery Two-Conductor Type



For use as an extension bell or with 2-conductor telephones. Supplied less induction coil, but space is provided for addition of a No. 99-A coil.

Code No.	Ringer	Frequency (Cycles)	Condenser	Type Ringer
F-605-BA	79-A	--	177	Biased
F-605-HA-1	72-A-1	33 1/3	177	Harmonic
F-605-HA-2	72-A-2	50	177	Harmonic
F-605-HA-3	72-A-3	66 2/3	177	Harmonic
F-605-HA-4	72-A-4	16 2/3	177	Harmonic
F-605-HB-1	73-A-1	30	177	Harmonic
F-605-HB-2	73-A-2	42	177	Harmonic
F-605-HB-3	73-A-3	54	177	Harmonic
F-605-HB-4	73-A-4	66	177	Harmonic
F-605-HC-1	74-A-1	20	177	Harmonic
F-605-HC-2	74-A-2	60	177	Harmonic
F-605-LR	---	--	177	No Ringer

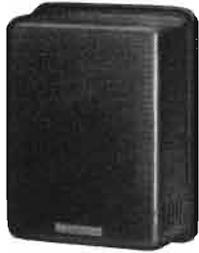
Common Battery Three-Conductor Type

For common battery telephones. With steel cover. For use with 3-conductor telephones Nos. 700-A, 900-A, 9735, 925A, 9741, 1062, 1063, 1162, 1163.

Code No.	Ringer	Frequency (Cycles)	Induction Coil	Condenser	Type Ringer
F-602-BA	79-A	--	99-A	177	Biased
F-602-HA-1	72-A-1	33 1/3	99-A	177	Harmonic
F-602-HA-2	72-A-2	50	99-A	177	Harmonic
F-602-HA-3	72-A-3	66 2/3	99-A	177	Harmonic
F-602-HA-4	72-A-4	16 2/3	99-A	177	Harmonic
F-602-HB-1	73-A-1	30	99-A	177	Harmonic
F-602-HB-2	73-A-2	42	99-A	177	Harmonic
F-602-HB-3	73-A-3	54	99-A	177	Harmonic
F-602-HB-4	73-A-4	66	99-A	177	Harmonic
F-602-HC-1	74-A-1	20	99-A	177	Harmonic
F-602-HC-2	74-A-2	60	99-A	177	Harmonic
F-602-LR	---	--	99-A	177	No Ringer

BOXES, DESK SET (Cont'd)

Common Battery Four-Conductor Type



A steel cover box for use with 4-conductor telephones Nos. 900, 925, 710, 305, 9735, 9741, 1060, 1061, 1160, and 1161. Has anti-side tone induction coil.

Code No.	Ringer	Frequency (Cycles)	Induction Coil	Condenser	Type Ringer
610-BA	79-A	--	103-A	185	Biased
610-HA-1	72-A-1	33 $\frac{1}{3}$	103-A	185	Harmonic
610-HA-2	72-A-2	50	103-A	185	Harmonic
610-HA-3	72-A-3	66 $\frac{2}{3}$	103-A	185	Harmonic
610-HA-4	72-A-4	16 $\frac{2}{3}$	103-A	185	Harmonic
610-HB-1	73-A-1	30	103-A	185	Harmonic
610-HB-2	73-A-2	42	103-A	185	Harmonic
610-HB-3	73-A-3	54	103-A	185	Harmonic
610-HB-4	73-A-4	66	103-A	185	Harmonic
610-HC-1	74-A-1	20	103-A	185	Harmonic
610-HC-2	74-A-2	60	103-A	185	Harmonic
610-LR	---	--	103-A	185	No Ringer

Three-Conductor, Special Type

Code No.	Condenser	Induction Coil	Push Button	Note
F-2413	171	97-A and 98-A	58	For F-601 Telephone
F-2414	171	97-A and 98-A	--	Requires No. 1-B Foot Switch

Local Battery Three-Conductor Type



Code No.	Ringer	Generator	Condenser	Induction Coil
3328	78-A	15	--	100-A
3361	78-D	53	--	100-A
3362	78-G	53	--	100-A
3370	78-D	53	184	100-A
3371	78-G	53	184	100-A

Local Battery Four-Conductor Type

Code No.	Ringer	Generator	Condenser	Induction Coil
3515*	78-G	75	--	--
3528*	78-A	15	--	--
3561*	78-D	53	--	--
3562*	78-G	53	--	--
4362**	78-G	53	--	105-A
4415**	78-G	75	--	111-A

*Triad circuit for 1040-LR and C-LR and similar telephones.
**Anti-side tone.

BOXES, GENERATOR



Code No.	Generator
1203*	15 (3-bar)
1205*	53 (5-bar)
1206*	75 (6-bar)
4421**	53 (5-bar)

*Made of hardwood, finished in black. Used with 1040, 1041, 1050, 1140, 1141, and 1150 Magneto Master-phones.

**Used with F-2413 or F-2414 desk set boxes and F-601 telephone.

BOXES, KEY

For Switching Telephones



The Kellogg Nos. 12 and 13 key boxes are compact, attractively designed units used for switching a telephone to one of either two or three incoming lines, respectively. These boxes are made of black molded bakelite and clip to a steel back plate which is fastened to the wall with two screws.

All equipment, consisting of a standard Kellogg No. 1000 type key, connecting racks, and all wiring, is mounted on the back plate. Extra terminals provided on connecting racks may be used to terminate bell, buzzer, or other circuits which are independent of the switching key.

Lines wires are connected to the key box through an opening in the bottom of the box. Boxes may be mounted in any position.

These key boxes are 5 $\frac{1}{2}$ inches high, 3 $\frac{5}{8}$ inches wide, and 1 $\frac{1}{2}$ inches deep. Shipping weight each is one pound.

NO. 12 KEY BOX

The No. 12 key box is equipped for switching a telephone to either of two incoming lines. The key locks in two positions.

NO. 13 KEY BOX

The No. 13 key box is similar to the No. 12 except it switches a telephone to one of three lines. The key locks in all three positions. Can be used in systems having two trunks and a separate circuit for intercommunication.

NO. 24 KEY BOX WITH HOLD KEY

The No. 24 key box is used to switch a telephone between two incoming trunk lines and to hold one of those trunk lines while using the other circuit for intercommunication.

No auxiliary equipment, other than the key box is required. The key box is the regular No. 13 Kellogg key box with the addition of a No. 2-B choke coil, used to perform the holding function.

The key on this key box is a three position unit. In the normal position the circuit is arranged to answer Line 1. Operated in one direction the key switches the telephone to Line 2 and holds Line 1. Operated in the other direction the key switches the telephone to Line 2 for answering purposes.

BOXES, KEY—FOR KEY-BX SYSTEMS



18-M KEY BOX



19-M KEY BOX

THE Kellogg Key-BX key box is the basic component of the Kellogg Key-BX system, a trunk and line switching system designed to provide a maximum number of outside trunk facilities with a small number of inside intercommunicating circuits. For detailed information on the Key-BX system and associated equipment see Intercommunications Systems in this section.

The 18-M and 19-M Key-BX key boxes consist of two four-party keys, a No. 1000 type cam key, and either 10 or 20 push button keys for signalling purposes. This equipment is mounted on a strong framework with a wood base and provided with a metal cover, finished in black wrinkle enamel. A wood cover is available upon request.

Four different Key-BX key boxes are available wired for four different combinations of trunks, intercommunicating lines, and total stations.

The two basic sizes of this key box are 10 and 20 lines. The 10 line unit is standard.

This key box is designed for long life under heavy use and utilizes proved parts in its construction. The four party keys used for circuit switching are the same keys used by Kellogg in the manufacture of switchboards and have been proved strong, durable, and dependable over many years of service.

NO. 18-M KEY BOX

This key box is for use with the 6-2-10 Key-BX system. It is wired for 6 trunks to a common battery manual or dial exchange, 2 intercommunication circuits, and 10 stations. Is housed in a metal cabinet.

NO. 19-M KEY BOX

This key box is for use with the 6-2-20 Key-BX system. It is wired for 6 trunks to a common battery manual or dial exchange, 2 intercommunication circuits, and 20 stations. Is housed in a metal cabinet.

NO. 20-M KEY BOX

This key box is for use with the 3-1-10 Key-BX system. It is wired for 3 trunks to a common battery manual or dial exchange,

1 intercommunication circuit, and 10 stations. Is housed in a metal cabinet.

NO. 22-M KEY BOX

This key box is for use with the 2-2-10 Key-BX system. It is wired for 2 trunks to a common battery manual or dial exchange, 2 intercommunication circuits, and 10 stations. Is housed in a metal cabinet.

NO. 25-M KEY BOX

This key box is for use with the 6-2-10 Key-BX system. It is wired for 6 trunks to a common battery manual or dial exchange, 2 intercommunication circuits, and 10 stations. This key box is equipped with "busy" lamps associated with each station and includes a relay and condenser for performing this function.

BOXES, KEY—FOR INTERCOMMUNICATION SYSTEMS



Code No.	Stations	Description
11	11	Without buzzer
11-B	11	With buzzer
23	23	Without buzzer
23-B	23	With buzzer

These key boxes are used as one of the components of intercommunication systems. For detailed information on these systems and associated equipment see Intercommunication Systems in this section.

Circuits of from 11 to 23 lines are possible with these key boxes. Complete flexibility is obtained with selective talking and ringing provided. The key box is compact and sturdily built of cast aluminum with a finish of black baked enamel.

A designation strip is positioned beside each button with a removable name or number card. A green button designates the ringing key, a red button indicates the home station, and all other buttons are black. Four mounting holes are provided in the base for mounting purposes. A pleasant toned buzzer is supplied with the No. 11-B and No. 23-B key boxes for signalling. The keys are all interlocked so that the operation of one key will release any other key previously depressed.

BRAID AND LEAD COVERED CABLE



Kellogg switchboard cable is manufactured from the best grades of selected raw materials by specially designed machinery and is furnished in several types and sizes. The copper conductors are either tinned or tinned and enameled, depending upon the type of cable. All conductors, except rubber covered conductors used on certain power cable, are insulated with two servings of cellulose acetate yarn followed by a cotton wrap or braid. The twisted pairs are formed into a cable, covered with several wraps of insulating paper, and impregnated with a special high grade moisture proofing wax compound. Available in round or flat types.

braided cotton, saturated with a grey flameproof paint. For all types of cable the over-all covering is listed with other descriptive matter in the charts shown below.

A standard color code is used in Kellogg cable so each pair of conductors can be identified. With the code number of each cable is listed a reference to the color code for that cable. The color coding of any cable can thus be determined by referring to the color scheme charts.

Short lengths of cable will be shipped in boxes. Longer lengths will be shipped on suitable reels. When reels are furnished they will be charged for. Full credit will be allowed for their return, in good condition, prepaid to the Kellogg factory.

On braid covered cable the standard over-all covering is

BRAID COVERED SWITCHBOARD CABLE

Round Type—No. 22 A.W.G.

Waxed core. Grey flameproof paint over outer braid.

Code No.	Conductor Finish	Number		Diameter Inches	Color Scheme
		Twisted Pairs	Number Singles		
160-AX	Tinned Enameled	6	--	5/16	E-2
56-A	Tinned	7	--	5/16	W
114-AX	Tinned Enameled	11	--	23/64	A
65-A	Tinned	11	--	23/64	A
137-AX	Tinned Enameled	11	11	25/64	E
99-A	Tinned	11	11	25/64	E
107-AX	Tinned Enameled	21	--	15/32	D
42-A	Tinned	21	--	15/32	D
22-AX	Tinned Enameled	21	21	17/32	K
41-A	Tinned	21	21	17/32	K
161-AX	Tinned Enameled	31	--	17/32	K-2
112-A	Tinned	26	--	15/32	F
109-AX	Tinned Enameled	41	--	19/32	J
125-A	Tinned	41	--	19/32	J
29-AX	Tinned Enameled	51	--	5/8	L
63-A	Tinned	51	--	5/8	L
53-AX	Tinned Enameled	102	--	15/16	V
62-A	Tinned	102	--	53/64	V

Round Type—No. 19 A.W.G.

Waxed core. Grey flameproof paint over outer braid.

Code No.	Conductor Finish	Twisted Pairs	No. Singles	Diameter Inches	Color Scheme
31-AX	Tinned Enameled	11	--	15/32	A
32-AX	Tinned Enameled	21	--	37/64	D
85-A	Tinned	21	--	35/64	D

Flat Type—No. 22 A.W.G.

Waxed core. Grey flameproof paint over outer braid.

Code No.	Conductor Finish	Twisted Pairs	No. Singles	Diameter Inches	Color Scheme
49-AX	Tinned Enameled	21	--	3/8 x 33/64	D
64-A	Tinned	21	--	3/8 x 33/64	D
138-AX	Tinned Enameled	21	21	11/32 x 3/4	K
129-A	Tinned	21	21	11/32 x 3/4	K
140-AX	Tinned Enameled	21	21	5/16 x 1	K
135-A	Tinned	21	21	5/16 x 1	K
104-AX	Tinned Enameled	41	--	7/16 x 3/4	J
119-A	Tinned	41	--	7/16 x 3/4	J

Round Type—No. 22 A.W.G. Quadded Type

Grey flameproof paint over outer braid. Waxed core, tinned enameled conductors.

Code No.	No. Quads	Total No. Conductors	Diam. Inches	Color Scheme
407-AX	7	28	7/16	D-3

LEAD COVERED SWITCHBOARD CABLE

Round Type—No. 22 A.W.G.

Round type—waxed core. Tinned copper wire conductors. The construction of this cable is the same as the braid covered switchboard cable except that a lead sheath instead of a painted cotton braid covers the paper wrapping.

Code No.	No. Twisted Pairs	No. Singles	Diam. Inches	Color Scheme
148-L	13	--	15/32	B
144-L	16	--	31/64	C
121-L	21	--	33/64	D
147-L	26	--	19/32	F
146-L	51	--	3/4	L
145-L	102	--	1-1/16	V

INTERPHONE CABLE, LEAD COVERED

No. 22 A.W.G. Pairs, No. 18 A.W.G. Singles

Tinned copper wire conductors. The construction of this cable is the same as the braid covered interphone cable except that a lead sheath instead of a painted cotton braid covers the paper wrapping.

Code No.	No. 22 A.W.G. Twisted Pairs	No. 18 A.W.G. Singles	Diam. Inches	Color Scheme	Sheath Thickness Inches
163-L	8	4	13/32	C	3/64
167-L	26	4	1/2	L	3/64
168-L	32	4	17/32	L	3/64
171-L	50	4	5/8	L	1/16
174-L	100	4	3/4	V	1/16

INTERPHONE CABLE, BRAID COVERED

Round Type

No. 22 A.W.G. Pairs, No. 18 A.W.G. Singles

Grey flameproof paint over outer braid. Tinned copper wire conductors.

Code No.	No. 22 A.W.G. Twisted Pairs	No. 18 A.W.G. Singles	Diam. Inches	Color Scheme
163-A	8	4	5/16	C
167-A	26	4	13/32	L
171-A	50	4	1/2	L
174-A	100	4	5/8	V

POWER CABLE, LEAD COVERED

Ringing Equipment to Switchboard

Round type cable for leads from ringing equipment to switchboard. Made of No. 18 A.W.G. tinned copper wire conductors. Conductor insulation is rubber covering and cotton braid. Cable made up of single conductors twisted into a cable followed by a lead sheath covering. This cable same as No. 59 and No. 105 except has lead sheath.

Code No.	No. Singles	Diam. Inches	Color Scheme
59-L	5	9/16	Y
105-L	7	19/32	M-2

POWER CABLE, NO BRAID

Ringing Circuits Through Key Cable

For carrying ringing circuits through key cable. Made of No. 22 A.W.G. tinned enameled conductors. Conductor insulation is two cellulose acetate yarn and one cotton wrap. Cable is made up of single conductors twisted into a cable. No over-all braid on cable.

Code No.	No. Twisted Pairs	No. Singles	Diam. Inches	Color Scheme
71-X	--	5	7/64	C-2
72-X	--	9	5/32	B-2
150-X	--	6	9/64	B-3

Ringing Equipment to Key Cable

For carrying power circuits from ringing equipment leads to key cable. Made of No. 20 A.W.G. tinned enameled conductors. Conductor insulation is two cellulose acetate yarn and one cotton wrap followed by a cotton braid. Cable made up of single conductors twisted into a cable. No over-all braid on cable.

Code No.	No. Twisted Pairs	No. Singles	Diam. Inches	Color Scheme
101-X	--	5	13/64	C-2
102-X	--	7	7/32	M-2
152-X	--	3	11/64	B-4

Ringing Equipment to Switchboard

For leads from ringing equipment to switchboard. Made of No. 18 A.W.G. tinned copper wire conductors. Conductor insulation is rubber covering and cotton braid. Cable made up of single conductors twisted into a cable. No over-all braid on cable.

Code No.	No. Twisted Pairs	No. Singles	Diam. Inches	Color Scheme
59	--	5	27/64	Y
66	--	9	35/64	B-2
105	--	7	15/32	M-2

Power to Ringing Equipment

For leads from power boards to ringing equipment. Cable made of one No. 14 A.W.G. and 11 No. 18 A.W.G. single conductors twisted into a cable. No over-all braid on cable. Tinned copper wire conductors. Conductor insulation is rubber covering and cotton braid.

Code No.	No. Single Conductors	Diam. Inches	Color Scheme
122	12	9/16	O-2

CABLE COLOR SCHEME CHARTS

The color scheme charts listed below are for Kellogg switchboard, power, and interphone cable and all are based upon a standard color code. Because of this a table for a "Standard

Twenty" and "Standard Singles" may be used as a reference chart for determining the color scheme of any Kellogg cable.

STANDARD TWENTY

- | | |
|----------------|------------------|
| 1. Blue | 11. Orange-White |
| 2. Orange | 12. Orange-Green |
| 3. Green | 13. Orange-Black |
| 4. Black | 14. Orange-Slate |
| 5. Slate | 15. Green-White |
| 6. Blue-White | 16. Green-Black |
| 7. Blue-Orange | 17. Green-Slate |
| 8. Blue-Green | 18. Black-White |
| 9. Blue-Black | 19. Black-Slate |
| 10. Blue-Slate | 20. Slate-White |

Spare Pairs

- | | |
|--|--------------------------|
| 21. Blue-Orange-White and (White mate) | 22. Red and (White Mate) |
|--|--------------------------|

COLOR SCHEME "A"

One to 10 of "Standard Twenty" twisted with a white mate to form 10 twisted pairs. One spare pair No. 21.

COLOR SCHEME "B"

One to 12 of "Standard Twenty" twisted with a white mate to form 12 twisted pairs. One spare pair No. 21.

STANDARD SINGLES

- | | |
|--------------------|----------------------|
| 1. Blue-Red | 11. Orange-White-Red |
| 2. Orange-Red | 12. Orange-Green-Red |
| 3. Green-Red | 13. Orange-Black-Red |
| 4. Black-Red | 14. Orange-Slate-Red |
| 5. Slate-Red | 15. Green-White-Red |
| 6. Blue-White-Red | 16. Green-Black-Red |
| 7. Blue-Orange-Red | 17. Green-Slate-Red |
| 8. Blue-Green-Red | 18. Black-White-Red |
| 9. Blue-Black-Red | 19. Black-Slate-Red |
| 10. Blue-Slate-Red | 20. Slate-White-Red |

Spare Singles

- | |
|------------------------|
| 21. Orange-Black-White |
|------------------------|

COLOR SCHEME "C"

One to 15 of "Standard Twenty" twisted with a white mate to form 15 twisted pairs. One spare pair No. 21.

COLOR SCHEME "D"

One to 20 of "Standard Twenty" twisted with a white mate to form 20 twisted pairs. One spare pair No. 21.

CABLE COLOR SCHEME CHARTS (Cont'd)

COLOR SCHEME "E"

One to 10 of "Standard Twenty" twisted with a white mate to form 10 twisted pairs. One spare pair No. 21. One to 10 "Standard Singles" and one spare single No. 21.

COLOR SCHEME "F"

One to 20 of "Standard Twenty" twisted with a white mate to form the first 20 twisted pairs. One to 5 of "Standard Single" twisted with a white mate to form the next 5 twisted pairs. Total 25 regular pairs. One spare pair No. 21.

COLOR SCHEME "J"

One to 20 of "Standard Twenty" twisted with a white mate to form the first 20 twisted pairs. One to 20 of "Standard Singles" twisted with a red mate to form the second 20 pairs. Total 40 regular pairs. One spare pair No. 21.

COLOR SCHEME "K"

One to 20 of "Standard Twenty" twisted with a white mate to form 20 twisted pairs. One spare pair No. 21. One to 20 of "Standard Singles" and one spare single No. 21.

COLOR SCHEME "L"

One to 20 of "Standard Twenty" twisted with a white mate to form the first 20 twisted pairs. One to 20 of "Standard Twenty" with a red mate to form the second 20 pairs. One to 10 of "Standard Twenty" twisted with a red-white mate to form the next 10 pairs. One spare pair No. 21.

COLOR SCHEME "V"

This scheme consists of 5 groups in each of which wires appear bearing the "Standard Twenty" colors. The five groups are distinguished by the color of the tip or mate wire. In the first, second, third, fourth, and fifth groups the mate wire is white, red, red-white, brown, and brown-white respectively forming the 100 twisted pairs. Two spare pairs Nos. 21 and 22.

COLOR SCHEME "W"

One to 7 of "Standard Twenty" twisted with a white mate to form 7 twisted pairs.

COLOR SCHEME "Y"

One to 5 of "Standard Twenty" (tracer colors).

COLOR SCHEME "B-2"

One to 9 of "Standard Twenty."

COLOR SCHEME "B-3"

One to 6 of "Standard Twenty."

COLOR SCHEME "B-4."

One to 3 of "Standard Twenty."

COLOR SCHEME "C-2"

One to 5 of "Standard Twenty."

COLOR SCHEME "D-3"

One to 7 of "Standard Twenty" with a white mate twisted with 1 to 7 of "Standard Singles" with a red mate to form 7 twisted quads.

COLOR SCHEME "E-2"

One to 5 of "Standard Twenty" twisted with a white mate to form 5 twisted pairs. One spare pair No. 21.

COLOR SCHEME "K-2"

One to 20 "Standard Twenty" twisted with a white mate to form 20 twisted pairs. One to 10 of "Standard Twenty" twisted with a red mate to form 10 twisted pairs. One spare pair No. 21.

COLOR SCHEME "M-2"

One to 7 of "Standard Twenty."

COLOR SCHEME "O-2"

One to 12 of "Standard Twenty."

CAPS, LAMP

Type No. 9



The Type 9 lamp cap fits 19/32-inch holes. The shank is 7/16-inch long and is nickel-plated. This cap generally is used for pilot and signal work.

Code No.	Color	Lens	Description
9	White Opalescent	Diamond	
9-A	Clear Red Glass	Diamond	Back of lens ground
9-B	Clear Green Glass	Diamond	Back of lens ground
9-C	Clear Glass	Diamond	
9-D	Clear Amber Glass	Diamond	Back of lens ground

Type No. 25



The No. 25 lamp cap fits 11/32-inch holes. The shanks are 5/16-inch long. These caps are used with No. 33 lamp jacks and other jacks with hard rubber face strips. The lens cap screws on and is provided with blank paper discs for numbering.

Code No.	Marking*	Color	Lens Shape	Material
25	A	White	Disc	Celluloid

*See marking diagrams on next page.

Type No. 46

The Type 46 lamp cap fits 11/32-inch holes and the shanks are 9/32-inch long. A lens protector can be screwed on the cap.

Code No.	Color	Lens Shape	Description
46	White Opalescent	Convex	Has mica disc under lens
47	Clear Red Glass	Convex	Back of lens ground

Types Nos. 74 and 75

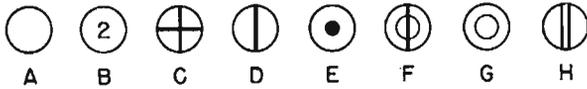


Types 74 and 75 lamp caps fit 13/16-inch holes. The shanks are 7/32-inch long and are nickel-plated. They fit Dean pilot jacks and also are used in signal work.

Code No.	Color	Lens	Description
74	White Opalescent	Diamond	
74-D	Clear Amber Glass	Diamond	Back of lens ground
75	Red Opalescent	Diamond	Back of lens ground
75-B	Clear Green Glass	Diamond	Back of lens ground

CAPS, LAMP (Cont'd)

Lamp Marking Diagrams



Type No. 79

The Type 79 lamp cap fits 5/16-inch holes and the shanks are 1/2-inch long. These caps are used with Type Nos. 35, 36, 41, and 60 lamp jacks.

Code No.	Marking	Color	Lens	Description
79	A	Wh. Opales.	Convex	
79-A	A	Cl. Red Glass	Convex	Back of lens ground
79-E	C	Wh. Opales.	Convex	
79-F	H	Wh. Opales.	Convex	
79-G	A	Cl. Grn. Glass	Convex	Back of lens ground
79-K	E	Cl. Grn. Glass	Convex	Marked with wh. enm., back of lens ground
79-L	D	Wh. Opales.	Convex	
79-M	D	Red Opales.	Convex	Marked with blk. enam.

Type No. 154



The Type 154 lamp cap fits 11/32-inch holes. The lacquered brass shanks are 9/32-inch long. This cap is used with Nos. 25, 31, 32, 33, 34, 37, 43, and 44 types lamp jacks. Numbering desired must be specified when ordering No. 154-C caps.

Code No.	Marking	Color	Lens	Description
154	A	Wh. Opales.	Convex	Groove for extractor
154-A	A	Cl. Red Glass	Convex	Back of lens ground
154-B	A	Cl. Grn. Glass	Convex	Back of lens ground
154-C	B	Clear Glass	Semi-Convex	Arranged for number'g
154-D	C	Wh. Opales.		Convex
154-G	A	Wh. Opales.	Flat	
154-H	D	Wh. Opales.	Convex	Marked with blk. enam.
154-J	E	Wh. Opales.	Convex	Marked with blk. enam.
154-K	F	Wh. Opales.	Convex	Marked with blk. enam.
154-L	G	Wh. Opales.	Convex	Marked with blk. enam.
154-M	H	Wh. Opales.	Convex	Marked with blk. enam.
154-N	A	Blue Opales.	Convex	
154-P	A	Cl. Red Glass	Convex	Back of lens ground, front sand blasted, shield over part of lens
154-Q	A	Cl. Grn. Glass	Convex	
154-U	A	Cl. Red Glass	Semi-Convex	Back of lens ground
154-V	A	Cl. Grn. Glass		Semi-Convex
154-W	A	Cl. Grn. Glass	Convex	Back of lens ground, front sand blasted

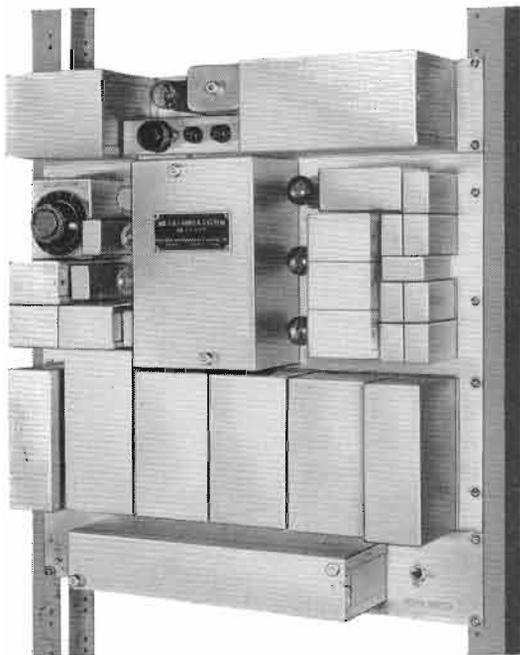
Type No. 155



Type 155 lamp caps fit 7/16-inch holes. The shank is 11/32-inch long. These caps fit Automatic Electric lamp jacks No. G-30. The shank is finished in lacquered, oxidized copper.

Code No.	Color	Lens	Description
155	White Opalescent	Convex	
155-A	Clear Red Glass	Convex	Back of lens ground
155-B	Clear Green Glass	Convex	Back of lens ground
155-C	Clear Amber Glass	Diamond	Back of lens ground

CARRIER SYSTEMS



NO. 104 POWER SUPPLY UNIT

NO. 5A-E CARRIER UNIT

NO. 5-J SIGNAL UNIT

NO. 5A-J EAST CARRIER TERMINAL

THE Kellogg type No. 5 telephone carrier systems provide additional circuits over existing voice-frequency lines without any increase in outside plant facilities. Operation over these carrier circuits can be arranged on either a ringdown or dial basis with full supervision and without interference with existing circuits.

The type No. 5 carrier systems can be superimposed on a straight physical circuit, on either or both sides of a phantom group, or on the phantom circuit itself. In certain cases the carrier can be placed on rural subscriber loops to create additional loop facilities. It can be used on either copper or iron open-wire lines or non-loaded cable circuits.

While providing an excellent means of establishing an additional circuit in permanent installations, the flexibility and portability of this carrier equipment is such that it is ideally suited for meeting heavy seasonal traffic demands and for temporary or emergency uses.

The additional telephone circuits of any carrier system are created by lifting the voice frequency currents of each new circuit by a modulation process to frequency bands above the voice range, thus "carrying" them over the circuit without conflicting with the existing voice frequency currents. At the receiving end the carrier frequency currents are separated from the voice currents by filters and are then lowered by demodulation to recover the same voice frequency currents as were originally impressed on each new circuit.

CARRIER SYSTEMS (Cont'd)

CARRIER DESIGN

The carrier and sideband frequencies employed in the Type No. 5 Carrier System are as follows:

	DIRECTION OF TRANSMISSION	
	WEST-EAST	EAST-WEST
5A SYSTEM (1st CHANNEL)		
Carrier frequency	7150 cps	10725 cps
Sideband	4450-6850 cps	8025-10425 cps
5B SYSTEM (2nd CHANNEL)		
Carrier frequency	21450 cps	14300 cps
Sideband	18750-21150 cps	14600-17000 cps

In the Kellogg type No. 5 carrier systems each carrier frequency is an integral multiple of 3575 cycles per second. The frequencies were selected in this harmonic relation to cancel out any possible interference between bands and to provide for a simple check of the frequencies by beating one against the other by means of an oscilloscope. The equivalent voice frequency band in both channels is 300 to 2700 cycles per second.

Each carrier frequency is transmitted along with the single sideband listed above. This is in the manner of conventional radio broadcasting (except that both upper and lower sidebands are transmitted in radio).

The advantages of a carrier-transmitted system in telephony are (1) greater range of operation made possible by locating the bands farther apart; (2) the elimination of carrier synchronizing procedures since each sideband is demodulated by the same carrier that modulates it, preventing misalignment; (3) the simplicity of signaling over any distance—ringdown signalling is accomplished, for instance, merely by blocking the carrier; (4) the creation of a positive circuit-failure alarm method; (5) the ease of fault tracing and of line loss measurement without the use of an auxiliary oscillator; (6) the absence of terminal loop gain limitations; and (7) signalling method does not limit maximum range of operation.

Transmission Information

Both transmitting levels and receiving gains are adjustable at each end of the type No. 5 systems, receiving gain being selected by a variable attenuation pad with calibrated dial.

The type No. 5A carrier systems transmit at the level of 0 dbm (one milliwatt) or plus 10 dbm, as measured at the line terminals. The type No. 5B systems transmit at from 0 dbm to plus 15 dbm.

The over-all gain of the No. 5A carrier system (first channel) is 23 db in each direction. Therefore, it may be superimposed on a circuit having a line loss as great as 30 db measured at the highest frequency used, 10.7 kilocycles, in which case it will provide a talking circuit of 7 db net loss. The over-all gain of the No. 5B system (second channel) is 35 db in each direction. Thus when superimposed on a circuit having a line loss as great as 42 db measured at the highest frequency used, 21.4 kilocycles, it will also provide a talking circuit of 7 db net loss. The greater gain of the No. 5B system has been provided to offset the greater line losses at the higher frequencies in order that each system will have about the same distance capability.

The table shown in the next column gives the approximate maximum length of line over which either system will provide a standard circuit of 7 db net loss. These limits are not affected by the type of carrier signalling used.

Table 1

OPEN WIRE, PHYSICAL OR SIDE CIRCUIT

	No. 5A System Miles	No. 5B System Miles
104 mil HD copper	220	206
80 mil HD copper	160	150
104 mil copper steel, 40%	125	156
80 mil copper steel, 40%	88	115
109 mil galvanized iron, No. 12 BWG	23	22
83 mil galvanized iron, No. 14 BWG	19	18
109 mil galvanized steel, No. 12 BWG	21	20

The above figures are computed on the basis of lines with 12-inch pin spacing, DP insulators, wet weather, no large impedance discontinuities, line in good condition, and with allowance for entrance cable loss of not more than 3 db for the No. 5A or 5 db for the No. 5B system.

CABLE, PHYSICAL OR SIDE CIRCUIT

	No. 5A System Miles	No. 5B System Miles
16 ga. toll, .062 mf, carrier loaded	55	52
16 ga. toll, .062 mf, non-loaded	20	24
19 ga. toll, .062 mf, carrier loaded	35	38
19 ga. toll, .062 mf, non-loaded	11	13
19 ga. exchange, .08 mf, non-loaded	9	11
22 ga. exchange, .08 mf, non-loaded	5.4	6

The maximum range of operation for either channel is not limited in any way by terminal loop gain considerations. Excessive sidetone or actual oscillations within a carrier terminal at the higher gains are eliminated in this system by blocking the transmitted carrier frequency in the receiving section filter. Also the signalling systems in no way limit the maximum range of operation. In fact, all No. 5 carrier systems are designed to transmit signals reliably over circuits which exceed the maximum talking range of the carrier system by 5 db.

TYPES OF CARRIER SYSTEMS

Kellogg carrier equipment is designed for use in three standard circuit combinations. In addition, provisions can be made for operation over special circuits in accordance with the demands of particular applications.

Standard types of carrier systems are described below:

No. 5A-J or No. 5B-J Carrier System

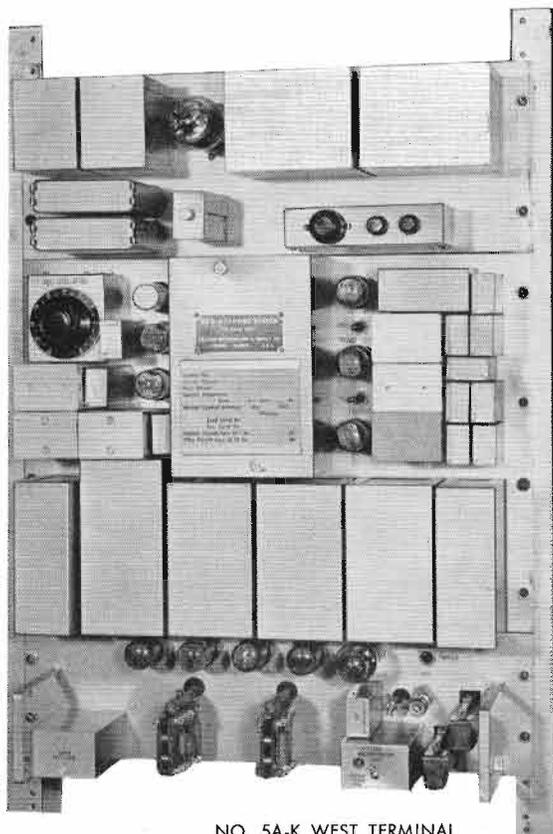
The No. 5A-J or 5B-J carrier system provides an additional ringdown trunk in which ringdown signalling is accomplished over the carrier channel. The signalling function is performed by interrupting the carrier frequency. This releases a relay in a circuit tuned to the incoming carrier frequency at the distant end and applies the local ringing supply to the carrier circuit drop. A source of ringing supply must be available at each carrier terminal. The No. 5A-J and No. 5B-J carrier systems also can be used to provide an additional circuit for magneto, code ring and multi-party rural service.

No. 5A-K or No. 5B-K Carrier System

The No. 5A-K or 5B-K carrier system provides an additional toll circuit in which composite type dial and supervisory signals are transmitted over the carrier channel. The terminals of both systems are designed for direct connection to composite dial trunks which bring out either the T, R, A, B, E, and M leads or the T, R, E, and M leads, thus eliminating the need for trunk adapter or applique circuits.

In these systems dial and supervisory signals are electronically transmitted over the carrier channel by the application of a frequency shift or FM (frequency modulation) process in much

CARRIER SYSTEMS (Cont'd)



NO. 5A-K WEST TERMINAL

System		Component	East Terminal		West Terminal	
First Channel	Second Channel		First Channel	Second Channel	First Channel	Second Channel
5A-CX	5B-CX	Carrier Unit	5A-E	5B-E	5A-W	5B-W
		Power Supply Unit	104 or 105	105	104 or 105	105
5A-J	5B-J	Carrier Unit	5A-E	5B-E	5A-W	5B-W
		Power Supply Unit	104 or 105	105	104 or 105	105
		Signal Unit	5J	5J	5J	5J
5A-K	5B-K	Carrier Unit	5A-E	5B-E	5A-W	5B-W
		Power Supply Unit	104 or 105	105	104 or 105	105
		Signal Unit	5K-E	5L-E	5K-W	5L-W

Power Supply Units. A power supply unit is required to supply the 200 v. DC plate voltage and 6.3 v. 60-cycle, AC heater voltage for the electronic circuits in the carrier and signal units. It operates from a standard 105-125 v., 50-60 cycle, AC commercial power source. Both the No. 104 and 105 units employ a full wave rectifier and choke input circuit. They are equipped with a tap switch to compensate for a wide range of line voltages and loads. Each unit is fully fused and also contains a power failure relay having a set of contacts which may be connected to operate an external alarm device in the event of line failure or defect in the power supply unit, such as a faulty rectifier tube.

The AC ripple component of the plate voltage is less than 0.1% at full rated load.

POWER UNIT CAPACITIES

NO. 104 UNIT	NO. 105 UNIT
2 5A-CX or 1 5B-CX terminals	4 5A-CX or 3 5B-CX terminals
2 5A-J or 1 5B-J terminals	4 5A-J or 3 5B-J terminals
1 5A-K terminal	2 5A-K or 2 5B-K terminals

Accessory Equipment for Carrier Systems

NO. 28-A REPEATING COIL

The No. 28-A repeating coil is a specially designed wide frequency range transformer which will pass all frequencies from 15 to 40,000 cps. The line side of the repeating coil is a center-tapped, balanced winding that can be used to derive a simplex or phantom leg from a wire circuit over which a carrier system is operating.

CARRIER BY-PASS UNIT

A carrier by-pass unit must be employed to separate voice frequency currents from carrier currents where it is necessary to transfer a carrier circuit from one wire circuit to another wire circuit. This unit consists of two low pass line filters and a high pass filter. The low pass filters have a cut-off frequency of 3,000 cps, and the high pass filter passes only those frequencies above 4,000 cps.

With the by-pass unit, voice frequency and signalling currents can be passed through the low pass filter to an intermediate switchboard while the carrier currents are by-passed around the switchboard. The use of the carrier by-pass unit makes it possible to operate carrier circuits between two locations not connected by direct wire circuits.

BRIDGED STATION FILTER

When telephone stations are bridged on the main wire line over which a carrier system is operating it is necessary to use bridged station filters to keep carrier currents out of the bridged station and to prevent attenuation of the carrier currents in the main line. These filters may be installed on the station side of the station protection or pole mounted. When pole mounted, protection is required on both sides of the filter.

BRANCH LINE FILTER

When a branch or spur line, which serves a switchboard or many subscribers, is connected to a main line over which a carrier system is operating it is necessary to install a branch line filter to keep carrier currents out of the branch line and to prevent attenuation of carrier currents by the branch line. The filter is inserted in the main line and, in most applications, is pole mounted. Protection is required on both sides of the main line as well as on the branch line side.

the same manner as intelligence is transmitted in the FM broadcast radio systems. Since the voice transmission over the carrier channel is accomplished by AM (amplitude modulation) and the signalling by FM, it is possible to talk and signal simultaneously and independently. Also, since the signalling system is a full duplex system, it is possible to signal in both directions at the same time.

Incorporated in the 5K-() and 5L-() signal units is an auxiliary control circuit in which the absence of incoming frequency causes a relay to operate. The contacts of this relay can be used to actuate a carrier failure alarm signal.

An existing 5A-J carrier system (ringdown) can be converted to a 5A-K carrier system (carrier dialing) in a matter of minutes by simply substituting a 5K-E and a 5K-W signal unit for the two 5-J signal units.

A similar conversion of a 5B-J system can be made by substituting the 5L-E and 5L-W signal units for the two 5-J signal units.

In the 5A-K system, as in the 5A-J system, all signalling information is transmitted within the carrier frequency band allocated to the first channel, thus leaving the remainder of the frequency spectrum available for other carrier channels. Like operation is found in the second channel systems. This system of carrier dialing fulfills all the requirements of the nationwide toll dialing program.

No. 5A-CX or No. 5B-CX Carrier System

This system provides only the talking circuits. Signalling is accomplished independently of the carrier over any metallic circuit, such as a composite or simplex leg.

COMPONENTS OF KELLOGG CARRIER SYSTEMS

Each Type No. 5 carrier system consists of an east terminal and a west terminal. Each terminal consists of a carrier unit, a power supply unit, and a signal unit when required.

Shown in the chart following is all the equipment required for each terminal in the standard Kellogg carrier systems listed:

CARRIER SYSTEMS (Cont'd)

EQUIPMENT RACKS

Kellogg Type No. 5 carrier equipment mounts on any standard 19-inch equipment rack with 18³/₈-inch mounting centers. Self-supporting racks are available as shown below.

Order No.	Description	Height	Width	Vertical Mtg. Space
Item 1, Drg. 42104	Standard 19" Rack with Writing Shelf	6' 6"	20 1/2"	6' 0"
Item 2, Drg. 42104	Standard 19" Rack less Writing Shelf	6' 6"	20 1/2"	6' 0"
Item 3, Drg. 42104	Writing Shelf Only	**	**	**
Drg. 42104 Special	Special 19" Rack, less Writing Shelf	*	20 1/2"	**
Drg. 46813	Small, lightweight, 19" Rack	2' 3"	19 3/4"	2' 1"

*As specified in order.
 **Mounting space (vertical) is 6 inches less than specification for height.
 NOTE: If it is desired to mount the carrier equipment in cabinets, specify the type and side of cabinet desired.

APPLICATION AND ORDERING INFORMATION

In planning a carrier system, the selection of the proper items of equipment and the determination of expected performance under a given set of circumstances can best be made by Kellogg.

In order to serve the customer most efficiently, the manufacturer of the carrier equipment must have accurate information relative to:

- A. Type of service desired.
- B. Characteristics of the wire lines over which the carrier system is to operate, including any apparatus connected to these lines.
- C. Availability of trunk equipment to connect the new carrier circuit to the switchboard.
- D. Availability of 19" racks or cabinets to mount the equipment.

To insure correctly engineered carrier systems, and prompt delivery of the proper equipment, the following information must accompany all orders or quotation inquiries.

A. TYPE OF SERVICE DESIRED

Which of the following types of service is the carrier system to render?

1. Ringdown Trunk.
2. Dial trunk with signalling accomplished over an available CX or SX leg.
3. Dial trunk with signalling accomplished over the carrier channel.
4. Rural line. State type of ringing to be used.
5. Special service such as control of remote radio transmitter, telemetering, etc.

B. CHARACTERISTICS AND DATA ON WIRE LINE FACILITIES

This information can be conveyed most easily by means of a sketch which shows the following data:

1. The names of the exchanges which terminate the circuits, and any intermediate locations of equipment or apparatus. Also indicate which is the east (or north) and west (or south) end of the circuit.
2. The number of pairs of conductors available between each location, and whether these conductors are arranged as physical circuits or as phantom groups.
3. Details of open wire in the circuits.
 - a. Length of open wire, and location in circuit.
 - b. Gauge and type of conductors.
 Examples: 104 Copper; #10 AWG Copper-steel, 40% conductivity; #12 BB iron, etc.
 - c. Pin spacing and type of insulators, if known.
 - d. Transposition scheme of open wire lead.
 - e. Indicate exposure to power lines and voltage of power line.
4. Details of cable in the circuits.
 - a. Length and location in wire circuit.
 - b. Gauge of conductors.

- c. Distributed capacitance per mile.
- d. State whether the conductors are quadded or paired.
- e. Are the cable conductors loaded or non-loaded? If loaded, give the loading scheme.

Examples of properly described cable runs:
 3,150 ft., 19 ga., Quadded, .062 mf Cable, Non-loaded;
 10,500 ft., 16 ga. Non-Quadded, .062 mf cable, loaded H-88;
 830 ft., 22 ga., Non-Quadded, .082 mf cable, Non-loaded.

5. Indicate the location, manufacturer's name, and type number of line equipment such as repeating coils, insulating transformers, and composite equipment.
6. Show the location of any telephones, switchboards or lines, bridged on the main circuit.
7. Indicate the presence of any existing carrier systems. Give manufacturer's name, type number, and carrier frequency allocations. Show the location of the east and west carrier terminals, and carrier repeaters, and the position of the system on the open wire lead by pin numbers.
8. Indicate location of any existing voice frequency telephone repeaters. Include the manufacturer's name and type number.
9. Indicate the presence of any telegraph, teletype, or facsimile equipment operating over the circuits involved.

C. TRUNK CIRCUIT REQUIREMENTS

1. In providing a new ringdown circuit for toll or rural service, the terminals of a No. 5A-J or No. 5B-J Carrier System connect directly to any ringdown type line or trunk circuit.
2. When a new dial trunk is created by the application of a No. 5A-CX or No. 5B-CX Carrier System, the carrier equipment provides only the new talking circuit. Signalling must be accomplished over an available composite or simplex leg. If no spare composite or simplex dial trunks are available, they should be ordered from the manufacturer of the switchboard.
3. In the case of a new dial trunk where it is necessary to transmit the signal impulses over the carrier channel, the No. 5A-K and No. 5B-K Systems are used. The terminals of these systems are connected directly to any composite or simplex type dial trunks which bring out either the T, R, A, B, E, and M, or the T, R, E, and M leads, without the use of trunk adapter or applique circuits. When in doubt as to whether or not a 5()-K System will work directly with an existing trunk circuit, a copy of the circuit drawing should be forwarded with the order or inquiry for carrier equipment.
4. For special carrier systems, complete information relative to the type of service desired, and the functions to be performed will be required.

D. MOUNTING RACKS FOR CARRIER EQUIPMENT

To avoid delays in delivery and installation of the carrier equipment, all orders and quotation inquiries should include a positive statement as to whether or not 19" equipment racks should be included in the order. If the customer desires non-standard height racks, it is necessary that the desired height be specified on the order.

Coils, No. 2 Heat



These coils are designed for use with the No. 16 Kellogg arrester. Coil will operate on .5 ampere in less than 210 seconds and will carry .35 ampere for 10 minutes at 68°F. Resistance varies between 3.8 and 4 ohms.

COILS, INDUCTION

Kellogg induction coils are manufactured in two major types, switchboard and telephone coils. These two groups are further divided into "anti-side tone" and "booster" types. In the listings below these groupings are indicated. In telephone coils notation is made of the application of each coil, either for local or common battery operation.

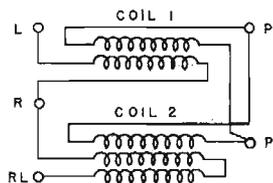
Careful craftsmanship and high-quality materials are used

throughout in the manufacture of Kellogg induction coils. Windings are of enameled wire, separated where required with an interleaving layer of paper. The coil is finished with a cotton serving and the entire coil impregnated with varnish under the vacuum method. This impregnation guards the coils against moisture and corrosion and will protect it in tropical areas against fungus and other damage.

SWITCHBOARD TYPE

Anti-Side Tone Type

NO. 72-A

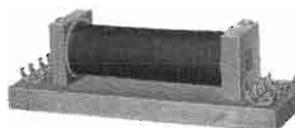


An anti-side tone coil made up of two separate coils with the primary of the two coils connected in parallel.

Code No.	Winding Resistance (ohms)		Dimensions (inches)		
	Primary	Secondary	Height	Width	Length
72-A	(1) 12.6	(1) 74.6	1 3/4	2 1/2	6
	(2) 12.6	(2) 430			

Booster Type

NO. 32-B



This coil is for use with an operator's circuit having a retardation type busy test. Booster type. It has four windings, the two secondaries wound in parallel forming a split secondary.

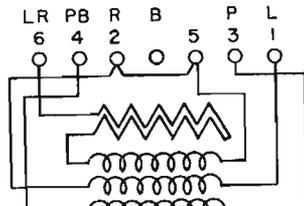
Code No.	Winding Resistance (ohms)			Dimensions (inches)		
	Primary	Secondary	Tertiary	Height	Width	Length
32-B	30	(1) 141	474	1 7/8	2	6
		(2) 141				

NO. 32-E

Same as No. 32-B except winding resistances are: primary, 4 ohms; first secondary, 35 ohms; second secondary, 35 ohms, and tertiary, 400 ohms.

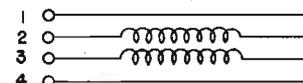
NO. 110-A

For local battery operation in magneto switchboards. Anti-side tone type. Replaces coils Nos. 28-C and 100-A. Has four windings. The third and fourth windings are connected in series; the first three windings are concentric and the fourth is non-inductive. The primary is insulated from the secondary.



Code No.	Winding Resistance (ohms)				Dimensions (inches)		
	1	2	3	4	Height	Width	Length
110-A	1.38	10.30	8.30	600	1-3/16	1-5/16	4

NO. 35-A



A booster type coil combined with an adjustable interrupter to change D.C. to high frequency pulsating D.C. for operation of the Kellogg No. 2 Howler.

Code No.	Winding Resistance (ohms)		Height	Dimensions (inches)		Length
	Primary	Secondary		Width	Length	
35-A	1.5	51.5	3 1/2	2	4 3/4	

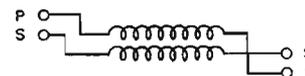
Booster Type

NO. 7-A

The No. 7-A induction coil is a booster type for use in common battery switchboards where a third or tertiary winding is designed for monitoring in connection with an operator's circuit having a relay-type busy test. It is not anti-side tone.

Code No.	Winding Resistance (ohms)			Dimensions (inches)		
	Primary	Secondary	Tertiary	Height	Width	Length
7-A	62	84	463	2-1/16	2-1/16	6

NO. 81-A



The second and third windings of this booster type coil are wound and connected in parallel. Used with battery feed coils where operators' sets on magneto boards are supplied from 24 volt battery.

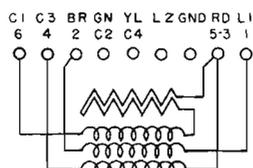
Code No.	Coil Resistance (ohms)		Height	Dimensions (inches)		Length
	Primary	Secondary		Width	Length	
81-A	4	37.5	1	1	4 1/4	

COILS, INDUCTION (Cont'd)

TELEPHONE TYPE

Anti-Side Tone Type

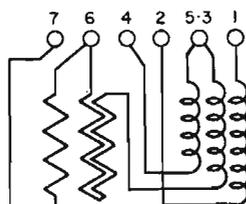
NO. 103-A



Anti-side tone type, three winding coils with 9-point connecting rack. Used in Nos. 817 and 9817 telephones and in No. 610 desk set boxes wired with the Kellogg Triad circuit.

Code No.	Winding Resistance (ohms)			Dimensions (inches)		
	1	2	3	Height	Width	Length
103-A	37.6	16.7	115	1 1/4	1 1/2	4 1/4

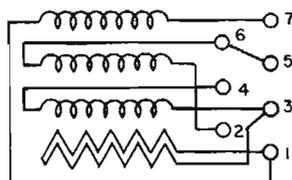
NO. 106-A



Anti-side tone type, four winding coil. Standard for Nos. 925, 9900, and 9917 common battery telephones and the No. 700 desk set boxes. For greater side tone reduction tertiary windings are connected in series.

Code No.	Winding Resistance (ohms)			Dimensions (inches)		
	1	2	3	Height	Width	Length
106-A	13	14	138 (1) 62 (2)	2 1/4	1	3

NO. 113-A



Anti-side tone type induction coil for use on the 1000 series Kellogg Masterphone. Plug-in type. Used for common battery signalling and talking. See illustration above.

Code No.	Coil Resistance (ohms)		Tertiary
	Primary	Secondary	
113-A	15	16	(1) 273 (200) 100

Booster Type

NO. 51-A

For common battery use in the base of desk stand for F-97 telephone. For booster circuit.

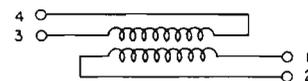


Code No.	Coil Resistance (ohms)		Dimensions (inches)		
	Primary	Secondary	Height	Width	Length
51-A	33	17.5	1 7/8	1	4 1/2

Booster Type (Cont'd)

NO. 79-A

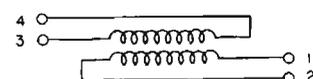
The 79-A coil is used in the booster circuit for Nos. 801 and 803 telephones and the No. 600 desk set boxes.



Code No.	Coil Resistance (ohms)		Height	Dimensions (inches)		Length
	Primary	Secondary		Width	Length	
79-A	33	17.5	1	1 3/8	4 1/2	

NO. 99-A

This coil is similar to the No. 79-A, a two winding, local battery induction coil, but is equipped with a 7-point connecting rack. It is used in Nos. 805 and 807 wall telephones and the No. 602 desk set boxes.



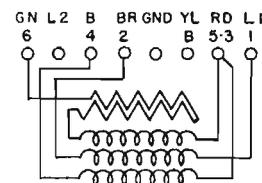
Code No.	Coil Resistance (ohms)		Height	Dimensions (inches)		Length
	Primary	Secondary		Width	Length	
99-A	25	7.8	1 1/4	1 1/2	4 1/2	

LOCAL BATTERY TELEPHONE TYPE

Anti-Side Tone Type

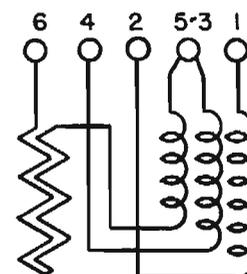
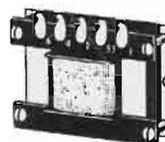
NO. 105-A

A winding local battery induction coil for use the Kellogg Triad anti-side tone circuit, equipped with 8-point connecting rack. Used in the Kellogg 4800 series wall telephones and the 5800 series magneto wall Masterphones. Similar to the No. 100-A, listed above.



Code No.	Coil Resistance (ohms)			Dimensions (inches)		
	1	2	3	Height	Width	Length
105-A	1.38	10.3	610	1 1/4	1 1/2	4 1/4

NO. 109-A



A 3-winding local battery coil with closed core. Has 5-point connecting rack. Used with Nos. 950-LR, 930-LR, and 9387 Kellogg Masterphones.

Code No.	Coil Resistance (ohms)			Dimensions (inches)		
	1	2	3	Height	Width	Length
109-A	1.5	8.7	600	2 1/4	1	3

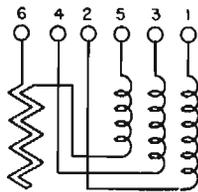
COILS, INDUCTION (Cont'd)

LOCAL BATTERY TELEPHONE TYPE

Anti-Side Tone Type (Cont'd)

NO. 111-A

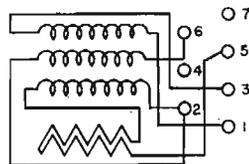
A three winding, closed core, local battery coil with separate primary and secondary circuits. For use with the Nos. 951-LR and 5844-M telephones with 4-conductor handsets. Same as No. 109-A except coils 2 and 3 are separate.



Code No.	Coil Resistance (ohms)			Dimensions (inches)		
	1	2	3	Height	Width	Length
111-A	1.5	8.7	600	2 1/4	1	3

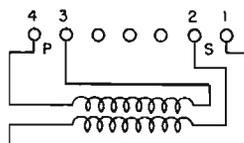
NO. 114-A

Local battery coil for use with the 1000 series Kellogg Master-phones. Used for local battery signalling—local battery talking or for common battery signalling—local battery talking. Plug-in type. Same in appearance as No. 113-A shown on page 16.



Code No.	Coil Resistance (ohms)		
	1	2	3
114-A	0.94	9.0	900

Booster Type

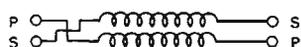


NO. 100-A

Consists of a 2-winding induction coil and 7-point connecting rack for line and cord terminals. Used as replacement for old-style Kellogg No. 3800-M series magneto wall telephones.

Code No.	Coil Resistance (ohms)		Height	Dimensions (inches)		
	Primary	Secondary		Width	Length	
100-A	1.3	11.1	1 1/8	1-3/16	4 1/4	

NO. 108-A



Used with F-2300 series desk set boxes and with F-2731, 3000, 3001, F-2870, F-1983, and F-2921 telephones.

Code No.	Coil Resistance (ohms)		Height	Dimensions (inches)		
	Primary	Secondary		Width	Length	
108-A	1.3	11.1	1 1/4	1	4 1/4	

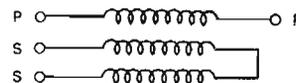
Booster Type (Cont'd)

NO. F-108-A

Same as No. 108-A except has No. 65 binding posts.

SPECIAL RAILWAY AND DISPATCHING TYPE

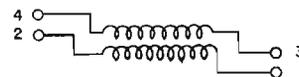
NO. 66-A



Combined interrupter and induction coil for use with railroad and telegraph telephone sets. Booster type. Used with Nos. F-2869 and 3002 telephones.

Code No.	Coil Resistance (ohms)		Height	Dimensions (inches)		
	Primary	Secondary		Width	Length	
66-A	1.6	22	2	1	3	

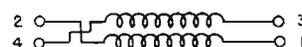
NO. 97-A



Used with the No. 98-A induction coil as a set for high impedance dispatching telephones No. F-2945 and railroad dispatching desk set boxes Nos. F-2413 and F-2414. Booster type.

Code No.	Coil Resistance (ohms)		Height	Dimensions (inches)		
	Primary	Secondary		Width	Length	
97-A	15.5	240	1 5/8	1 1/2	4 3/4	

NO. 98-A



Used with No. 97-A induction coil as a set railroad dispatching telephones and desk set boxes. Booster type. See No. 97-A above.

Code No.	Coil Resistance (ohms)		Height	Dimensions (inches)		
	Primary	Secondary		Width	Length	
98-A	0.3	12	1 5/8	1 3/8	4 1/4	

COILS, RELAY



Most Kellogg relay coils are wound on standard forms and each will fit the standard relay coil mountings. All 2000 series manual switchboard, 1700, 1800, and 3000 series Relaymatic, 71-7400 gang type Relaymatic, and 2100 pilot relays are manufactured on this standard form. Because of special applications, the A.C. relays, 2061 trip type relays, and the 2100 micrometer adjustment relays require special types of coils which do not mount on standard cores and mountings.

Relay coils in most general use are manufactured by the stick-winding process. Each coil is cellulose acetate filled and each layer

of winding is separated by a sheet of cellulose acetate. After winding each coil is coalesced and spool heads, of phenol fibre with a cellulose acetate facing, are firmly cemented to the coil. This type of manufacture makes the coil resistant to moisture and fungus damage and requires no impregnation.

In the listings below relay coils are separated in four types—single winding, code numbers for which are prefixed by the letter "S"; concentric winding, code number prefixed by letter "C"; tandem winding, code number prefixed by "T", and parallel winding, code number prefixed by "P". Unless otherwise specified nickel silver windings are non-inductively wound.

Special purpose coils with copper slugs on the armature end of the coil to provide a slow operate relay or with a copper sleeve over the core to provide a slow release relay are available and listed under separate headings with the respective type of coil. Special requirements for coils should be discussed with the sales division of the Kellogg Switchboard and Supply Company. Standard coils should be ordered by code number.

CONCENTRIC WOUND COILS

1/4-Inch Core FOR GENERAL USE

First resistance value given in listing below is that for the inside winding.

Code No.	Resistance (ohms)
C-EZ	31—750
C-EP	100—12000
C-DF	875—200 Nickel Silver
C-DR	875—450 Nickel Silver

3/8-Inch Core FOR GENERAL USE

First resistance value given in listings below is that for the inside winding.

Code No.	Resistance (ohms)	Code No.	Resistance (ohms)
C-FC	65—20 Nic. Sil.	C-BD	775—250
C-CC*	150—750 Nic. Sil.	C-FP	1000—20 Nic. Sil.
C-AM	300—300 Nic. Sil.	C-EA	775—250
C-DU	300—1200	C-BE	1000—20 Nic. Sil.
C-DG	300—1700	C-EQ	1000—100 Nic. Sil.
C-FW	400—1000 Nic. Sil.	C-AJ	1000—500 Nic. Sil.
C-AW	500—20 Nic. Sil.	C-P†	1000—1000 Nic. Sil.
C-CR	500—200 Nic. Sil.	C-DP	1000—1000 Nic. Sil.
C-FR	500—2500 Nic. Sil.	C-EY‡	850 to 1100—850 to 1000 N.S.
C-AE	500—300 Nic. Sil.	C-FQ	1300—2000 Nic. Sil.
C-AB	500—500 Nic. Sil.		
C-B	500—3000 Nic. Sil.		

*Inductive.

†First winding is 525 ohms copper in series with 475 ohms nickel silver, inductive.

‡Effective resistance is 1700-2000 ohms when connected in series.

FOR "SLOW RELEASE" RELAYS

These coils are provided with a 1/16-inch copper sleeve over the 3/8-inch magnetic iron core for use with slow release relays. First resistance value given below is that for the inside winding. Windings are of nickel silver wire.

Code No.	Resistance (ohms)
C-Z	500—500
C-DX	500—1000
C-BZ	1000—500

CONCENTRIC WOUND COILS (Cont'd)

3/8-Inch Core (Cont'd)

FOR "SLOW OPERATE" RELAYS

This coil has a 3/8-inch diameter core and a 3/4-inch copper slug on the armature end to provide a slow operate relay. First resistance given is that of the inside winding.

Code No.	Resistance (ohms)
C-CY	125—130

PARALLEL WOUND COILS

3/8-Inch Core FOR GENERAL USE

Code No.	Resistance
P-J	50—50
P-C	100—100
P-L*	2000—2000

*Each winding of this coil is made up of a 1230 ohm copper winding connected in series with 770 ohms nickel silver, inductive, winding for 2000 ohm total.

SINGLE WOUND COILS

1/4-Inch Core FOR GENERAL USE

Code No.	Resistance (ohms)	Code No.	Resistance (ohms)
S-EQ	1.5	S-ET	140
S-HG*	3.5	S-JQ*	210
S-EB	4.5	S-FA	1175
S-EA	7.47	S-GD	2000
S-JC†	11.8	S-EP	3800
S-JG	35	S-EK	7250
S-HY*	100	S-FV	14500

*Nickel Iron core.

†16 ohm copper winding in multiple with 45 ohm nickel silver wire.

3/8-Inch Core

Code No.	Resistance (ohms)	Code No.	Resistance (ohms)
S-E	20	S-L	100
S-BR	25	S-N	150
S-F	30	S-P	200
S-G	40	S-EW	*(1) 50
S-H	50		†(2) 150
S-J	65	S-FP	200

*Coils in series, eff. resis. 200 ohms.

†Nickel Silver (inductive).

COILS, RELAY (Cont'd)

SINGLE WOUND COILS (Cont'd) 3/8-Inch Core (Cont'd)

FOR GENERAL USE

Code No.	Resistance (ohms)	Code No.	Resistance (ohms)	Code No.	Resistance (ohms)
S-GO	(1) 350† (2) 500‡	S-GG	(1) 1000§ (2) 1000¶	S-GX	(1) 2000** (2) 2000
S-R*	300	S-DG	800	S-BK	1300
S-DY	(1) 550† (2) 660‡	S-FG*	800	S-X	1500
S-U	390	S-FY*	1000	S-Y	2000
S-V	500	S-W*	1000	S-Z	3000
		S-AH*	(1) 450* (2) 550	S-BG	4000

†Coils in multiple, eff. resistance 205 ohms.

‡Coils in multiple, eff. resistance 300 ohms.

§Coils in multiple, eff. resistance 500 ohms.

*Coils in series, eff. resistance 1000 ohms.

**Coils in multiple, eff. resistance 1000 ohms.

¶Nickel Silver.

||Nickel Silver, Inductive.

FOR A.C. RELAYS

Code No.	Resistance (ohms)	Description
S-BZ	500	For Nos. 2017, 2018, 2052, 2057, and 2085 A.C. Relays.
S-BX	1000	For Nos. 2017, 2018, 2052, 2057, and 2085 A.C. Relays.
S-BY	1600	For Nos. 2017, 2018, 2052, 2057, and 2085 A.C. Relays.
S-JD	2000	Laminated core for 2103—2203 type relays.

FOR "SLOW RELEASE" RELAYS

Coils listed at left have a 3/8-inch diameter iron core with 1/16-inch thick copper sleeve. Over-all diameter is 1/2 inch. Coils at right, 3/8-inch diameter core with 1/8-inch copper sleeve. Over-all diameter is 5/8-inch.

Code No.	Resistance (ohms)	Code No.	Resistance (ohms)
S-AJ	50	S-AQ	1000
S-AK	100	S-BM	500
S-AN	300	S-BU	1000
S-BE	400	S-DD	(1) 300* (2) 300**
S-AP	500		

*Coils in multiple, eff. resis. 150 ohms.

**Nickel Silver.

FOR "SLOW OPERATE" RELAYS

These coils have 3/8-in. diameter core. Each has a 3/4-in. copper slug on armature end.

Code No.	Resistance (ohms)
S-FN	43
S-GA	800
S-DS	1300

FOR TRIP RELAYS

For use with Nos. 2061, 2062, 2083, 2086, and 2098 trip relays only.

Code No.	Resistance (ohms)
S-GN	100
S-FS	500
S-FU	1000

FOR RINGING TONE RELAYS (WITH CONDENSER)

Code No.	Resistance (ohms)	Description
S-GB	100	Nickel Silver, with .20-.29 mfd. winding.
S-FC	540	With .01 mfd. condenser winding.
S-GT	10000	Nickel Silver, with .01 mfd. condenser winding.

RESISTANCE COILS

Wound on standard relay coil spools. Nickel silver wire insulated with enamel and one layer of silk. The coils are non-inductively wound and are all on 3/8-inch cores.

Code No.	Resistance (ohms)	Code No.	Resistance (ohms)
S-DJ	50	S-CP	600
S-CE	100	S-CS	750
S-GJ	150	S-FQ	800
S-CT	200	S-CD	1000
S-CQ	250	S-CJ	2000
S-CC	300	S-CG	2500
S-CV	400	S-CH	10000
S-CB	500		

TANDEM WOUND COILS

1/4-Inch Core

FOR GENERAL USE

First resistance listed below is that for the terminal winding. Second is for the armature winding.

Code No.	Resistance (ohms)	Code No.	Resistance (ohms)
T-BL	35—35	T-CY*	100—100
T-BK	46—46	T-BY	125—125
T-CW	48—641	T-BX	490—48

*Nickel Iron core.

3/8-Inch Core

FOR GENERAL USE

First resistance value listed below is that for the terminal winding. Second is that for the armature winding.

Code No.	Resistance (ohms)	Code No.	Resistance (ohms)
T-AE	25—25	T-AY	300—100
T-J	50—50	T-M	300—300
T-Z	75—75	T-E	500—100
T-C	100—100	T-H	500—250
T-AH	100—300	T-F	500—500
T-U	150—150	T-CO	750—750
T-G	200—200	T-Y	1000—1000
T-K	250—250	T-CD	1500—1500

FOR "SLOW RELEASE" RELAYS

These coils are wound on a 3/8-inch magnetic iron core with a 1/16-inch thick copper sleeve. Over-all diameter of sleeve is 1/2 inch. First resistance value given in listings below is for the terminal winding, second is that for the armature winding.

Code No.	Resistance (ohms)	Code No.	Resistance (ohms)
T-BS	50—50	T-AB	1000—500
T-B	500—500	T-CG	1000—1000

RESISTANCE COILS

These coils are wound on standard relay coil spools with nickel silver wire insulated with enamel and one layer of silk. The coils are non-inductively wound and are all on 3/8-inch cores.

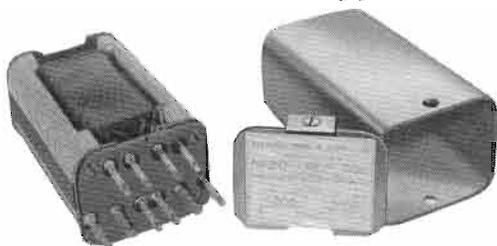
Code No.	Resistance (ohms)	Code No.	Resistance (ohms)
T-BM	20—20	T-AF	400—400
T-AV	50—50	T-CX	1000—1000
T-AS	70—70	T-BU	1500—1500
T-AT	200—200	T-CN	2000—2000
T-CZ	300—300		

COILS, REPEATING

Kellogg repeating coils are classified here in three major groups, cord circuit, line, and miscellaneous types. Each of these coils is either of the "talk and ring through" or "talk through only" types. The "talk through only" type has a low impedance and passes only

the high frequencies. The "talk and ring through" type has a high impedance and passes both low and high frequencies. All "line" type repeating coils are of the "talk and ring through" type.

Cord Circuit Type



NO. 20-A

A concentric-wound coil for "talk through only" circuits. Mounts on standard relay mountings in cross-talk proof shell.

Code No.	1	Winding Resistance (ohms)		4
		2	3	
20-A	12.1	13.7	15.2	16.6

NO. 19-A

This is a concentric-wound coil of the "ring and talk through" type. Mounts on standard 1000-type repeating coil mountings. Has cross-talk proof shell.

Code No.	1	Winding Resistance (ohms)		4
		2	3	
19-A	15.3	17.1	18.8	20.9

Line Type

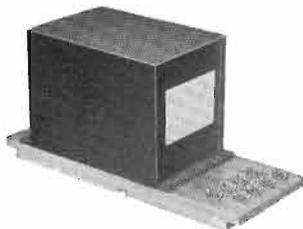
As indicated above, all line type repeating coils are of the "ring and talk through" type.

NO. 17-F

This coil is for use with phantom circuits employing ground return only. Has two parallel and two tandem windings.

Code No.	1	Winding Resistance (ohms)		4
		2	3	
17-F	21.5	21.5	29.5	29.5

NO. 18-A



Balanced coil for use with split phantom circuits. Consists of two parallel windings connected to two parallel windings.

Code No.	1	Winding Resistance (ohms)		4
		2	3	
18-A	5.7	5.7	7.5	7.5

NO. 18-B

For use with phantom circuits using a ground return. Consists of two pairs of parallel windings.

Code No.	1	Winding Resistance (ohms)		4
		2	3	
18-B	5.7	5.7	7.5	7.5

NO. 21-A

Phantom circuit type coil consisting of two pairs of parallel windings. Same as No. 24-A coil less base.

Code No.	1	Winding Resistance (ohms)		4
		2	3	
21-A	20.6	20.6	25.5	25.5

Line Type (Cont'd)

NO. 22-A

Phantom circuit type coil consisting of two coils. One coil has two parallel windings and the other two tandem windings. Has cross-talk proof shell. For mounting on coil rack.

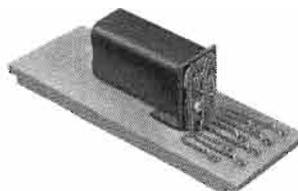
Code No.	1	Winding Resistance (ohms)		4
		2	3	
22-A	20.6	20.6	25.5	25.5

NO. 23-A

Consists of one repeating coil and one No. 3-A resistance unit each on a No. 1012 mounting. Mounted on wood base. Coil has two parallel and two tandem windings.

Code No.	1	Winding Resistance (ohms)		4
		2	3	
23-A	20.6	20.6	25.5	25.5

NO. 24-A



Phantom circuit type. Consists of four windings, two parallel and two tandem. Mounted on wood base and has cross-talk proof shell. Base size, 10³/₄ by 4 inches. Height, 3¹/₄ inches.

Code No.	1	Winding Resistance (ohms)		4
		2	3	
24-A	20.6	20.6	25.5	25.5

NO. 27-A

This coil is the same as the No. 24-A coil except for the size of the base. Base size, 6 by 4 inches. Height, 3¹/₈ inches. Has cross-talk proof shell.

Code No.	1	Winding Resistance (ohms)		4
		2	3	
27-A	20.6	20.6	25.5	25.5

NO. 121-A

Phantom circuit type. Has cross-talk proof shell. Mounts on 1³/₄-inch width base. Consists of two parallel and two tandem windings.

Code No.	1	Winding Resistance (ohms)		4
		2	3	
121-A	20.6	20.6	25.5	25.5

Miscellaneous Type

NO. 19-B

A concentric wound coil used as a monitoring coil for operator's telephone circuit. Similar in construction to No. 19-A.

Code No.	1	Winding Resistance (ohms)		4
		2	3	
19-B	23	26	115	120

NO. 28-A

Used in Kellogg carrier equipment. Has high frequency cut-off at 40,000 cycles. Mounts on 1³/₄-inch mounting.

Code No.	1	Winding Resistance (ohms)		3
		2		
28-A	55.8	28.8		28.8

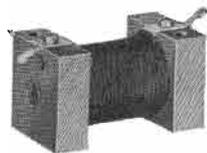
COILS, RESISTANCE

Non-Inductive Type

NO. 1-F

A non-inductively wound coil with windings of nickel silver wire No. 29. Resistance is 200 ohms. Height of coil 1 inch, length 1³/₄ inches.

NO. 5-A



Non-inductive coil wound with No. 38 nickel silver wire. Resistance is 10000 ohms. Height of coil 1 inch, length 1³/₄ inches.

Inductive Type

NO. 32-B

Inductively wound with No. 32 nichrome resistance wire. Resistance is 50 ohms. Height is 5/8 inch by 1¹/₄ inches.

COILS, RETARD

Retard coils are used to feed battery and to isolate or limit fluctuating or alternating currents to some particular circuits.

These coils are made over a soft iron wire core or on coils having laminated cores of silicon steel.

Attendant Station Type

The No. 21-C retard coil listed below is for use with the No. 21 attendant station. Over-all dimensions of both coils, 3³/₈ inches long; 1³/₈-inch diameter.

Code No.	Resistance (ohms)	Code No.	Resistance (ohms)
21-C	30	22-G	(1) 35 (2) 35

For Composite Telephone and Telegraph Ringing Circuits



The No. 55-A retard coil is used for composite telephone and telegraph ringing circuits as a balancing coil. Base size is 11 x 9³/₄ inches. Over-all height is 6 inches.

Code No.	Resistance (ohms)
55-A	39

For Radio Interference

The No. 65-A retard coil is used to eliminate radio interference caused by telephone ringing equipment. Diameter is 2³/₈ inches; height, 1-3/16 inches.



Code No.	Resistance (ohms)
65-A	2.72 to 3.01

Ringing Machine Type

These retard coils are used as noise killers for pole changer equipment. Over-all dimensions: 2³/₈ x 1-13/16 x 4¹/₈ inches.

Code No.	Resistance (ohms)	Code No.	Resistance (ohms)
67-A	60.5	67-C	29.9
67-B	48.4	67-D	18.6

COILS, RETARD (Cont'd)

For Line Units

The No. 68-A retard coil is used on Nos. 401 and 402 line units. Over-all dimensions: 4¹/₈ x 2³/₈ x 3³/₈ inches.

Code No.	Resistance (ohms)
68-A	(1) 3.6 (2) 8.5 (3) 4.9

Switchboard Type

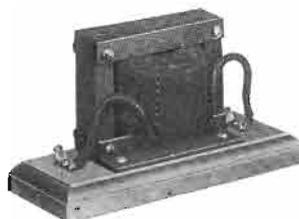
FOR C. B. OPERATOR'S TELEPHONE CIRCUIT

These coils are used for common battery operator's telephone circuit. Base size: 6 by 2 inches. Over-all height is 2 inches.



Code No.	Resistance (ohms)
8-B	200
8-C	350
8-H	165
9-D	85

For Relaymatic Ringing Circuits



The No. 41-B retard coil is used on Relaymatic ringing circuits and replaces the No. 41-A coil. Over-all dimensions: 4 x 2³/₄ x 3¹/₂ inches.

Code No.	Resistance (ohms)
41-B	0.19

For Miscellaneous Applications

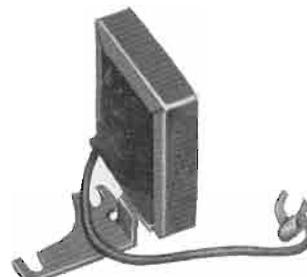
The coils listed below are used for miscellaneous switchboard applications. Over-all dimensions of the Nos. 22-A and 22-B listed below are 3³/₈ inches long and 1³/₈ inches in diameter. The Nos. 56-A, 56-B, and 56-C are mounted in a standard relay shell and will fit No. 2000 type mountings.



NO. 56-A

Code No.	Resistance (ohms)
22-A	(1) 75 (2) 75
22-B	(1) 100 (2) 100
56-A	(1) 57 (2) 57
56-B	(1) 200 (2) 200
56-C	(1) 3.4 (2) 3.4

Telephone Signalling Type



The No. 64-A retard coil listed below is used for common battery signalling, local battery talking Nos. 1020 and 1120 type Masterphones. The No. 64-B is used for simplex signal (manual or dial) local battery talking Nos. 1081 and 1181 Masterphones. No. 64-B is 1-9/32 inches square by 3/4 inch thick excluding the bracket.

Code No.	Resistance (ohms)	Code No.	Resistance (ohms)
64-A	80	64-B	(1) 40 (2) 40

CONDENSERS

Condenser Mounting Sketches

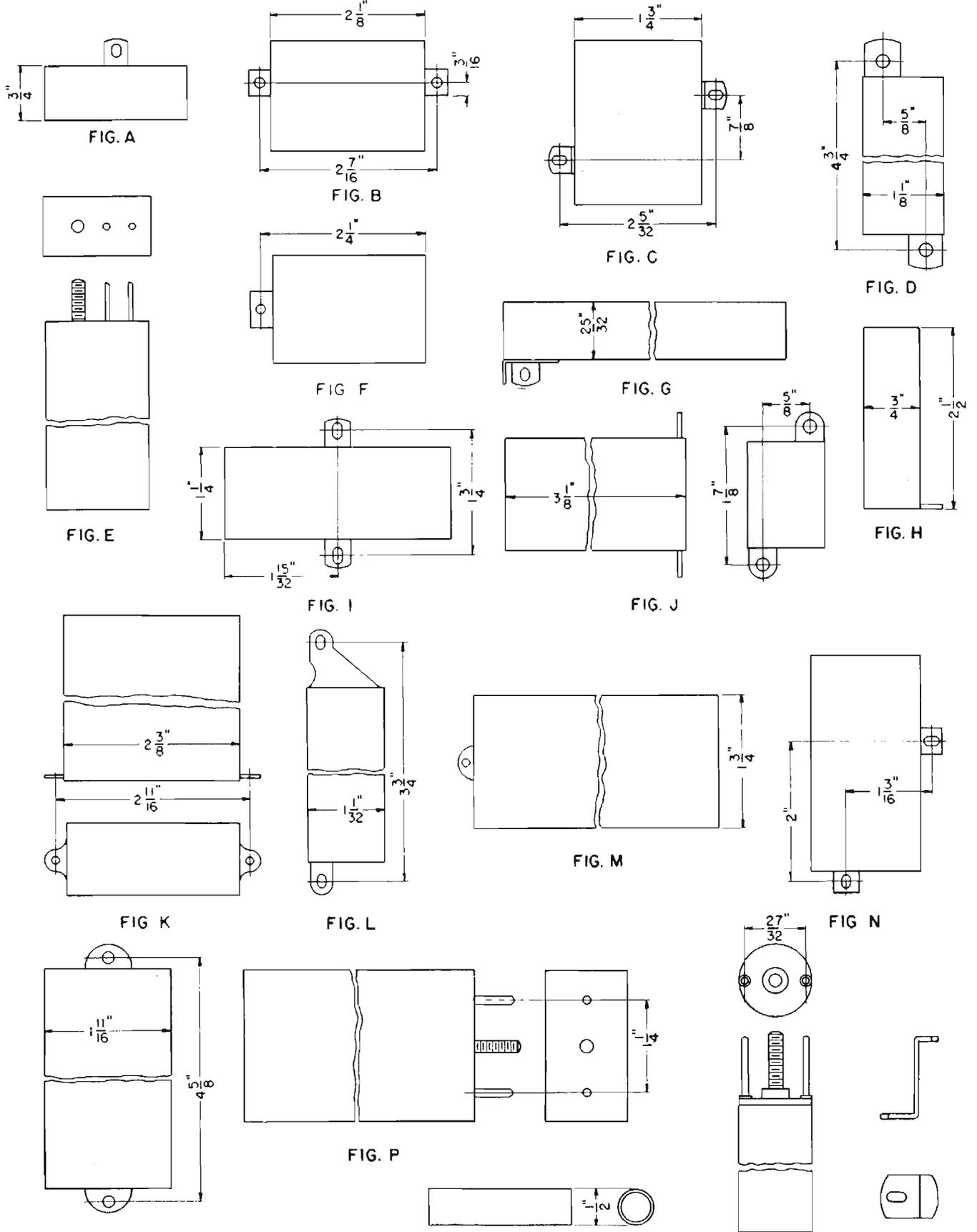


FIG. O

FIG. R

FIG. Q

FIG. S

CONDENSERS

Condenser Mounting Sketches

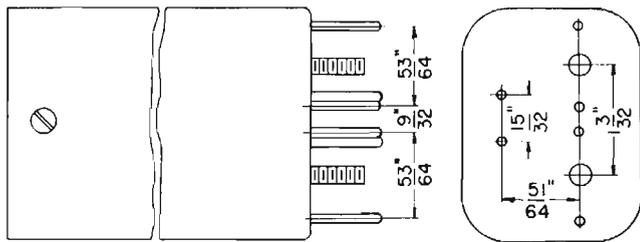


FIG. U

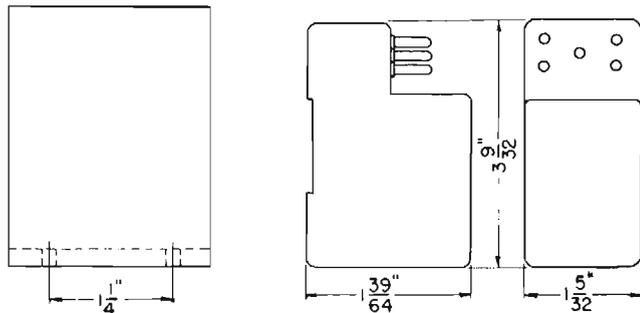


FIG. T

FIG. V

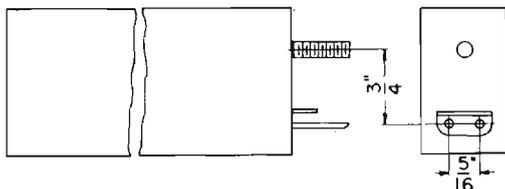


FIG. W

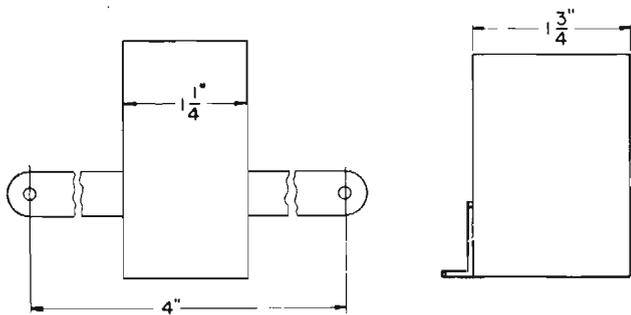


FIG. X

FIG. Z

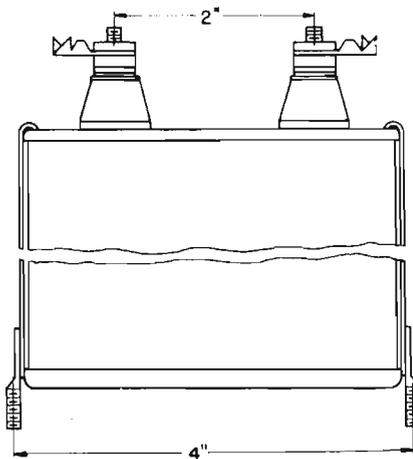


FIG. Y

Kellogg condensers are of the wax-impregnated page, aluminum foil type. The impregnating compound used is Halowax. A moisture-proofing compound is added when the condenser is assembled in the can and the can sealed to prevent the entrance of moisture.

Flash tests of twice the rated voltage for 15 seconds are made on each Kellogg condenser before it leaves the factory.

Condensers should be ordered by code number.

SWITCHBOARD CONDENSERS

Single Type

NO. 37



For magneto switchboard cord circuits. This is a 1 mfd. condenser with a working voltage of 200 volts. Size: 3 x 2 3/8 x 1 inches. See mounting sketch "K."

Triple Type

NO. 239

For Nos. 1007-CC, 1007-CCX, and 200711 cordless switchboards. This is a three-unit condenser with capacities of 0.25, 0.50, and 1.0 mfd. Working voltage is 200 volts for each section. Size: 2-15/64 x 1-13/32 x 51/64 inches. See mounting sketch "E."

TELEPHONE & DESK SET BOX CONDENSERS

Single Type

NO. 28



For Nos. 2887-G, 4883, F2731, 3000, 3001, 3002, F2869 telephones and Nos. F2370, F2371, and F2376 desk set boxes. Capacity is 0.5 mfd. and the working voltage is 200 volts. Size: 2 1/2 x 1 1/4 x 3/4 inches. See mounting sketch "H."

NO. 53

For Nos. 4883, 4888, F97, and F97-B telephones, No. F97 desk stand, and transformer sets. Capacity is 2 mfd. and the working voltage 160 volts. Size: 3 x 1 1/2 x 1-1/32 inches. See mounting sketch "N."

NO. 67



For the No. 4902 telephone. Capacity is 1 mfd. and the working voltage 200 volts. Size: 3 1/8 x 1 1/2 x 1-1/32 inches. See mounting sketch "J."

NO. 171

For Nos. F2945 and 4890 telephones and Nos. F2413 and F2414 desk set boxes. Same as Western Electric Co. No. 21-AL. Capacity is 0.25 mfd. and the working voltage is 700 volts. Size: 4 3/8 x 2-1/16 x 25/32 inches. See mounting sketch "G."

NO. 172

For Nos. 4901 and 4905 telephones. Capacity is 1 mfd. and the working voltage is 200 volts. Size: 3 x 1 1/2 x 1-1/32 inches. See mounting sketch "L." Has flexible leads.

CONDENSERS (Cont'd)

TELEPHONE & DESK SET CONDENSERS



Single Type (Cont'd) NO. 174

For magneto telephones. Capacity is 2 mfd. and the working voltage is 200 volts. Size: $2\frac{1}{4} \times 1\frac{3}{4} \times 1\frac{5}{8}$ inches. See mounting sketch "Z."

NO. 184

For No. 4886 telephones. Capacity is 0.5 mfd. and the working voltage is 200 volts. Size: $2\frac{1}{2} \times 1\frac{1}{4} \times \frac{3}{4}$ inches. See mounting sketch "H." Has flexible leads.

NO. 191

For No. 705 desk set boxes. Capacity: 1 mfd. Working voltage: 160 volts. Size: $2\frac{1}{8} \times 1\frac{1}{2} \times 1\frac{1}{8}$ inches. See mounting sketch "B." Has flexible leads.

NO. 193

For Nos. 950LR, 950CLR, and 951CLR telephones. Capacity: 1 mfd. Working voltage: 160 volts. Size: $3\frac{1}{8} \times 1\frac{1}{4} \times 1$ inches. See mounting sketch "I." Has flexible leads.

NO. 198

For receiver circuit of No. 9830 telephone. Capacity: 1 mfd. Working voltage: 160 volts. Size: $2\frac{1}{8} \times 1\frac{1}{2} \times 1\frac{1}{8}$ inches. See mounting sketch "F." Has flexible leads.

NO. 199

For No. 930CLR telephone. Capacity: 1 mfd. Working voltage: 160 volts. Size: $2\frac{1}{8} \times 1\frac{3}{4} \times 1$ inches. See mounting sketch "C." Has flexible leads.

NO. 200

For Nos. 4816, 4820, 4824, 4880, 6886, 4825, and 5800 series telephones and Nos. 3370 and 3371 desk set boxes. Capacity: 1 mfd. Working voltage: 160 volts. Size: $2\frac{1}{2} \times 1\frac{1}{4} \times \frac{3}{4}$ inches. See mounting sketch "H." Has flexible leads.

NO. 202

For No. 3025 telephone. Capacity: 1 mfd. Working voltage: 160 volts. Size: $2\frac{1}{8} \times 1\frac{3}{4} \times 1$ inches. See mounting sketch "S." Has flexible leads. Requires mounting strap Pc. No. 4854.

Double Type

NO. 185

For Nos. F817 and 9817 telephones and No. F-610 desk set boxes. Capacity: (1) 1.0 mfd. (2) 2.0 mfd. Working voltage: (both sections) 160 volts. Size: $4\frac{3}{8} \times 2\text{-}1/16 \times 25/32$ inches. See mounting sketch "M." Has flexible leads.

NO. 186

For Nos. 9710, 4900, 4901-A, 4902, and 4903 telephones. Capacity: (1) 1.0 mfd. (2) 2.0 mfd. Working voltage: (both sections) 160 volts. Size: $3 \times 1\frac{1}{2} \times 1\text{-}1/32$ inches. See mounting sketch "L." Has flexible leads.

NO. 187

For Nos. 9720, 9721, 9740, and 9745 telephones. Capacity: (1) 1.0 mfd. (2) 1.5 mfd. Working voltage: (both sections) 160 volts. Size: $2\frac{1}{8} \times 1\frac{1}{2} \times 1\frac{1}{8}$ inches. See mounting sketch "F." Has flexible leads.

NO. 189

For No. 700 desk set boxes. Capacity: (1) 1.0 mfd. (2) 1.5 mfd. Working voltage: (both sections) 160 volts. Size: $2\frac{1}{8} \times 1\frac{1}{2} \times 1\frac{1}{8}$ inches. See mounting sketch "B." Has flexible leads.

Triple Type

NO. 203

For No. 925 telephones. Capacity: (1) 1.0 mfd. (2) 1.0 mfd. (3) 1.5 mfd. Working voltage: (all sections) 160 volts. Size: $2\frac{1}{8} \times 1\frac{3}{4} \times 1$ inches. See mounting sketch "C." Has flexible leads.

NO. 204

For Nos. 9900 and 9917 telephones and No. 700 desk set boxes. Capacity: (1) 1.0 mfd. (2) 1.0 mfd. (3) 1.5 mfd. Working voltage (all sections) 160 volts. Size: $2\frac{1}{8} \times 1\frac{1}{2} \times 1\frac{1}{8}$ inches. See mounting sketch "B." Has flexible leads.

NO. 206

For general telephone use. Capacity: (1) 1.0 mfd. (2) 0.5 mfd. (3) 1.5 mfd. Working voltage: (all sections) 160 volts. Size: $2\frac{1}{8} \times 1\frac{3}{4} \times 1$ inches. See mounting sketch "C." Has flexible leads.

NO. 207

For desk set boxes. Capacity: (1) 1.0 mfd. (2) 0.5 mfd. (3) 1.5 mfd. Working voltage: (all sections) 160 volts. Size: $2\frac{1}{8} \times 1\frac{1}{2} \times 1\frac{1}{8}$ inches. See mounting sketch "B." Has flexible leads.

NO. 209

For No. 900 telephones. Capacity: (1) 1.0 mfd. (2) 1.0 mfd. (3) 1.5 mfd. Working voltage: (all sections) 160 volts. Size: $3\frac{1}{8} \times 1\frac{1}{4} \times 1$ inches. See mounting sketch "I." Has flexible leads.

NO. 210

For general telephone use. Capacity: (1) 1.0 mfd. (2) 0.5 mfd. (3) 1.5 mfd. Working voltage: (all sections) 160 volts. Size: $3\frac{1}{8} \times 1\frac{1}{4} \times 1$ inches. See mounting sketch "I." Has flexible leads.

NO. 225



For the Kellogg No. 1000 series Masterphone. Capacity: (1) 0.5 mfd. (2) 0.5 mfd. (3) 1.0 mfd. Working voltage: (all sections) 200 volts. Size: $1\text{-}39/64 \times 1\text{-}5/32 \times 3\text{-}9/32$ inches. See mounting sketch "V."

MISCELLANEOUS CONDENSERS

The condensers listed below and on next page do not have special applications but are manufactured by Kellogg for miscellaneous use in the construction of Kellogg equipment or for general use in telephone work. These condensers are listed according to their capacity, the smallest sizes listed first.

Single Type

Code No.	Capacity (mfd.)	Working Voltage	Height	Dimensions (inches) Width	Thickness	Mounting Sketch
137	.01	200		$3\frac{3}{8}$ (1 inch diameter)		Q
208*	.025	400		$1\frac{1}{8}$ ($\frac{1}{2}$ inch diameter)		R
197	.25	200	$3\text{-}15/64$	$1\text{-}13/32$	$27/32$	E
238	.25	200	$3\text{-}15/64$	$1\text{-}13/32$	$27/32$	W
20	.20 to .30	400	$2\frac{3}{8}$	$1\frac{1}{4}$	$\frac{3}{4}$	S

MISCELLANEOUS CONDENSERS

Single Type (Cont'd)

Code No.	Capacity (mfd.)	Working Voltage	Dimensions (inches)			Mounting Sketch
			Height	Width	Thickness	
240*	.50	200	2 ³ / ₈	1 ¹ / ₄	3 ³ / ₄	X
24	.50	400	2 ⁵ / ₈	(2-1/64 diameter)		T
68	.50	400	3 ¹ / ₈	1 ¹ / ₂	1-1/32	J
101	.50	400	3-15/64	1-13/32	27/32	E
237	.50	200	3-15/64	1-13/32	27/32	W
215	.65 to .80	400	4 ³ / ₈	2-1/16	25/32	S
192*	1.0	160	2	1 ¹ / ₄	3 ³ / ₄	A
25	1.0	400	2 ⁵ / ₈	(2-1/64 diameter)		T
103	1.0	200	3	1 ¹ / ₂	1-1/32	L
78	1.0	200	3	1 ¹ / ₂	1-1/32	S
132	1.0	200	3-15/64	1-13/32	27/32	E
236	1.0	200	3-15/64	1-13/32	27/32	W
12	1.0	400	4 ³ / ₈	2-1/16	25/32	S
176*	1.0	200	4 ³ / ₈	2-1/16	25/32	S
177*	1.0	200	4 ³ / ₈	2-1/16	25/32	S
146	1.0	400	4 ³ / ₈	2-1/16	25/32	S
140	1.0	700	4-7/16	1 ³ / ₄	1 ⁵ / ₈	M
140-C†	1.0	700	4-7/16	1 ³ / ₄	1 ⁵ / ₈	M
241*	2.0	160	2 ¹ / ₈	1 ¹ / ₂	1 ¹ / ₈	F
62	2.0	160	3	1 ¹ / ₂	1-1/32	S
66	2.0	160	3 ¹ / ₈	1 ¹ / ₂	1-1/32	J
235	2.0	400	3-15/64	1-13/32	27/32	W
64	2.0	160	3-15/64	1-13/32	27/32	E
102	2.0 to 2.22	700	4-19/64	2 ³ / ₈	1-11/16	O
108	2.0 to 2.22	700	4-19/64	2 ³ / ₈	1-11/16	O
16	2.0	200	4 ³ / ₈	2-1/16	1 ¹ / ₈	S
34	2.0	200	4 ³ / ₈	2-1/16	1 ¹ / ₈	D
36	2.0	200	4 ⁵ / ₈	2-1/16	1 ¹ / ₈	P
233	6.0	600	3-15/16	3 ³ / ₄	1 ¹ / ₄	Y

*These condensers have flexible leads.

†Hermetically sealed.

Double Type

188*	(1) 1.0	160	2 ¹ / ₈	1 ¹ / ₂	1 ¹ / ₈	F
	(2) 1.5	160				
128	(1) 2.0	200	4	2 ³ / ₈	1-13/16	U
	(2) 2.0	200				
213	(1) 2.0	400	4	2 ³ / ₈	1-13/16	U
	(2) 2.0	400				
234	(1) 2.0	400	4	2 ³ / ₈	1-45/64	U
	(2) 2.0	400				

*Has flexible leads.

Triple Type

229	(1) 0.5	560	4	2 ³ / ₈	1-45/64	U
	(2) 1.0	560				
	(3) 1.0	560				
212	(1) 1.0	560	4	2 ³ / ₈	1-13/16	U
	(2) 1.0					
	(3) 1.0					
231	(1) 1.0	560	4	2 ³ / ₈	1-45/64	U
	(2) 1.0	560				
	(3) 1.0	560				
230	(1) 1.0	200	4	2 ³ / ₈	1-45/64	U
	(2) 2.0	200				
	(3) 2.0	200				

CONVERSION KITS

Kellogg conversion kits are available to convert old model, outdated equipment to usable, modern instruments. Kits are available for converting both common battery and magneto telephones to modern handset units.

For Common Battery Telephones

KIT NO. 1

For converting No. 801 wall telephones to wall Masterphone handset instruments.

This kit consists of the following parts:

- 1 No. F-27-C handset.
- 1 No. 154 hookswitch assembly.
- 1 Form 1438 designation strip.
- 1 Number plate assembly including 1 No. 42081 holder, 1 No. 56445 number plate, 1 No. 42083 protector, 1 No. 56437 dial blank and 1 No. 56000 screw.
- 1 No. 56442 clamp.
- 2 No. 56462 screws.

KIT NO. 2

For converting No. 742 wall telephones to wall Masterphone handset instruments. Consists of the same parts as used in Kit No. 1 except for the designation strip which is Form No. 1439, specially marked for No. 742 instruments.

KIT NO. 11

For converting No. 817 triad circuit steel wall telephones to No. 9817 wall Masterphone handset instruments.

This kit consists of the following parts:

- 1 No. F-27-C handset.
- 1 No. 56280 switch hook lever.
- 1 No. 62116 cover plate.

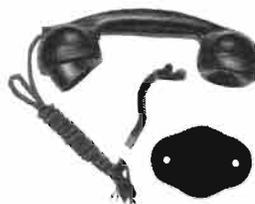
For Magneto Telephones

KIT NO. 7

For converting wall magneto telephones into wall Masterphone handset instruments. The conversion may be made without removing the telephones from the wall.

This kit consists of the following parts:

- 1 No. 40-C handset.
- 1 No. 56280 switch hook lever.
- 1 No. 71618 cover plate.

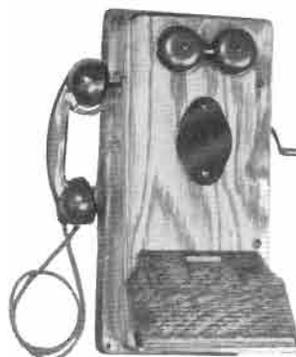


KIT NO. 8

Same as Kit No. 7 with the addition of a complete hookswitch assembly, No. 155, to replace hookswitch assembly not adapted to the Masterphone switch hook lever.

This kit consists of the following parts:

- 1 No. 40-C handset.
- 1 No. 155 hookswitch assembly.
- 1 No. 71618 cover plate.



CORDS

High quality, long lasting Kellogg switchboard and telephone cords are manufactured in two types of construction to meet all requirements of the operating company.

Braid covered conductor cords, for general use, are made under the exacting conditions of the Kellogg cord department where high precision, modern equipment turns out hundreds of cords of all types every day. Rubber covered conductor cords also are

manufactured by the Kellogg factory for installations requiring a more durable type of cord.

For extra hard usage and for installations subject to moisture and fungus damage, a special neoprene jacketed, rubber covered conductor cord can be supplied. This type cord is especially desirable in locations where heavy usage or tropical conditions demand an exceptionally durable cord.

CONSTRUCTION FEATURES OF KELLOGG CORDS

Braid Covered Conductor Type

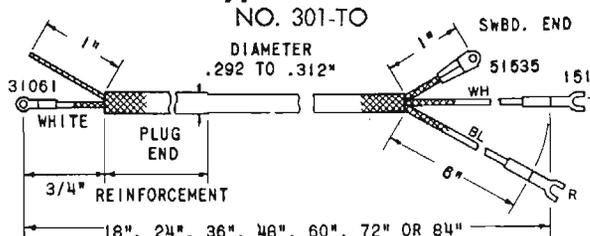
- Two tinsel ribbons are wound around a cotton thread core to form a tinsel thread.
- Six tinsel threads are twisted together over a cotton thread to form a flexible tinsel conductor.
- The tinsel conductor is covered with two reverse servings of celanese.
- Conductor assembly is then impregnated with a moisture-proofing compound.
- Cotton braid is then applied.
- Conductors twisted together to form the body of the cord. Fillers added to make cord round and smooth.
- A tight serving is applied to hold conductors in place.
- Plug end reinforced for 12 inches to fit plug and to allow for bending and handling.
- Outer braiding is then applied. (Continuation of reinforcement.)

Rubber Covered Conductor Type

- Two tinsel ribbons are wound around a cotton thread core to form a tinsel thread.
- Six tinsel threads are twisted together over a cotton thread to form a flexible tinsel conductor.
- A cotton serving is then applied over each tinsel conductor.
- Conductor then given colored rubber covering.
- Rubber covered conductors then laid parallel and cotton fillers used to make cord round.
- Cotton binder applied to hold conductors in position.
- Cord reinforced at plug end for 12 inches to fit plug and to allow for bending and handling.
- Over-all braid applied.
- Solderless terminals are then attached.

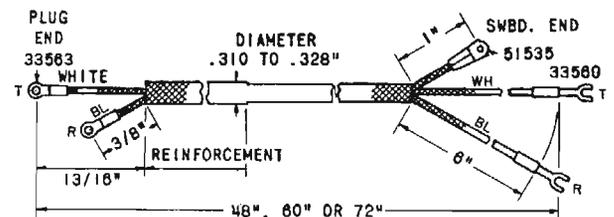
SWITCHBOARD CORDS

TWO CONDUCTOR Tinsel Type—Braid Covered



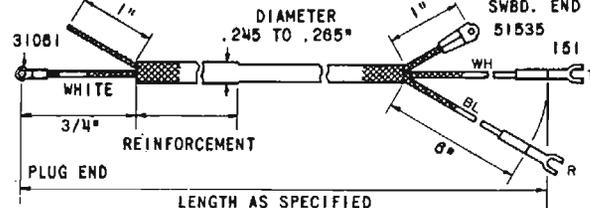
Diameter at plug end .292 to .312 inches. Fits Kellogg Nos. 3, 42, 70, 138, and 109 plugs and Leich No. 3A plug.

Tinsel Type—Braid Covered NO. 397-TO



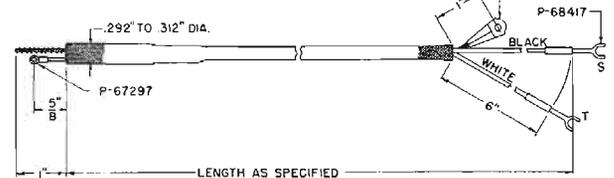
Diameter at plug end .310 to .328 inches. Fits Western Electric No. 47 and Kellogg No. 247 plug. Replaces Western Electric Nos. 493 and S-2-A cords.

NO. 324-TO



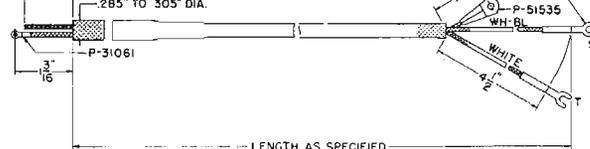
Replaces Stromberg-Carlson No. MS-22-F cord. Used with Kellogg plugs Nos. 141 and 211 and Stromberg-Carlson plugs Nos. 56 and 56-X. Also used with Garford two-conductor plugs.

Tinsel Type—Rubber Covered NO. 754



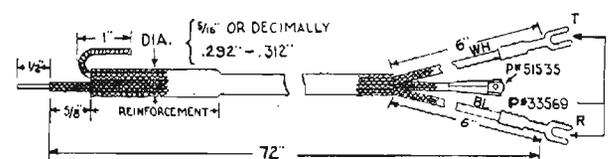
Fits Kellogg No. 42 plug. Replaces No. 301-TO for export.

NO. 753



Fits Stromberg-Carlson Nos. 15 and 42 plugs. Replacement for Kellogg No. 301-B cord and Stromberg-Carlson No. S-23-G. Over-all diameter at plug end is .285 to .305 inches.

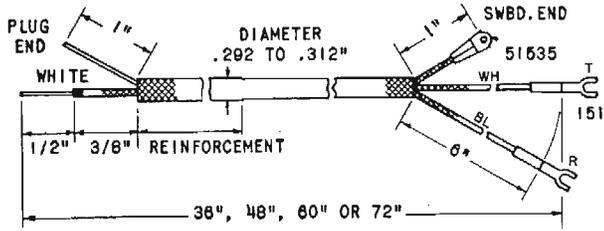
Steel and Tinsel Type—Braid Covered NO. 353-ST



Diameter at plug end is .292 to .312 inches. Fits Kellogg No. 247 and Western Electric No. 47 plugs.

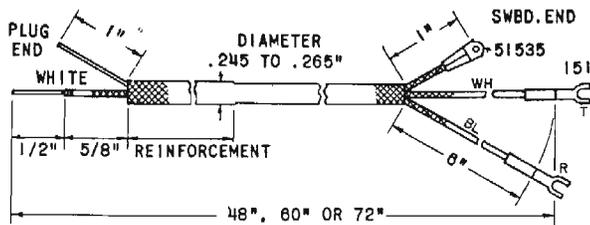
CORDS SWITCHBOARD CORDS

Steel and Tinsel Type—Braid Covered (Cont'd)
NO. 304-ST



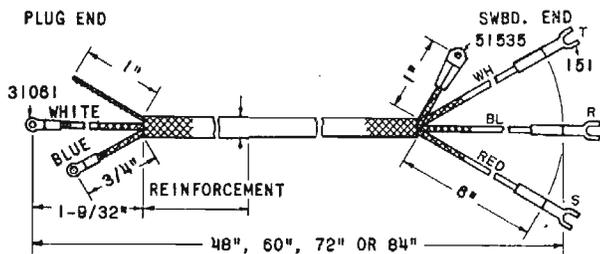
Fits Kellogg Nos. 3, 42, 70, 130, 187, and Automatic Electric No. 1188 plugs.

NO. 323-ST



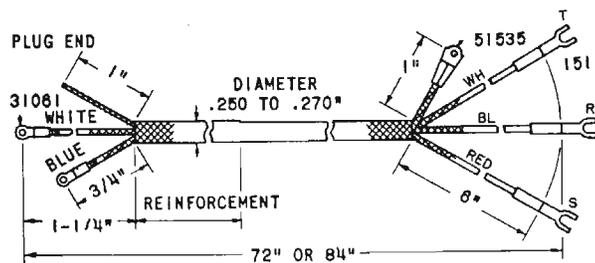
Diameter at plug end is .245 to .265 inches. Fits Kellogg No. 211 and Stromberg-Carlson Nos. 56 and 57 plugs.

**THREE CONDUCTOR
Tinsel Type—Braid Covered**
NO. 309-TO



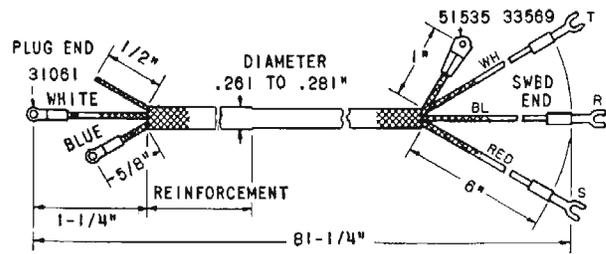
Diameter at plug end is .292 to .312 inches. Fits Kellogg Nos. 12, 13, 106, 202, 152, 137, and 233 plugs; Leich No. 202; Automatic Electric Nos. K-28, K-55, and K-56 plugs. Replaces Automatic Electric No. CD-406548-W cord.

NO. 326-TO



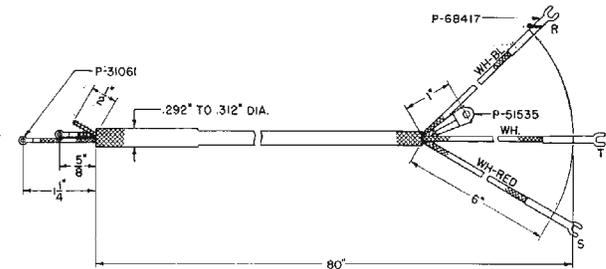
Fits Kellogg Nos. 199 and 201 plugs. Diameter at plug end is .250 to .270 inches. Replaces Automatic Electric No. CD-407572 cord.

Tinsel Type—Braid Covered (Cont'd)
NO. 390-TO



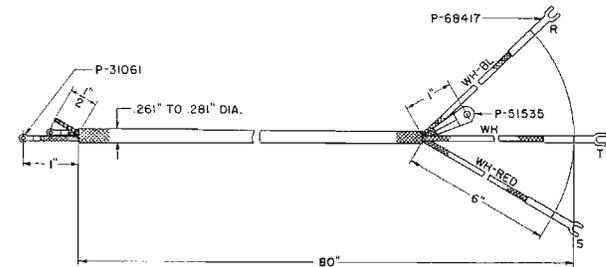
Diameter at plug end is .261 to .281 inches. Replaces Kellogg cord No. 396-TO; Stromberg-Carlson No. MS-32-K, and Western Electric No. S-2-A cords. Fits Kellogg No. 185 and Western Electric No. 109 plugs.

NO. 391-TO



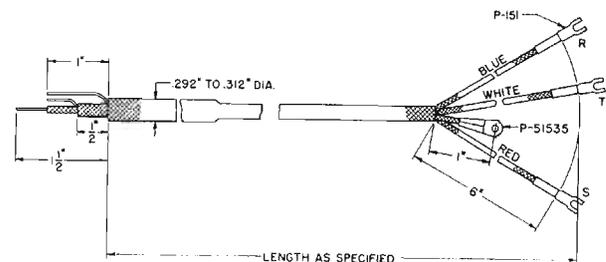
Same as No. 390-TO cord except diameter at plug end is .292 to .312 inches. Fits Kellogg Nos. 191 and 233 plugs, and Western Electric No. 110 plug. Replaces Western Electric No. S-3-B cord.

NO. 745-TO



Fits Kellogg No. 235, Western Electric No. 109, Stromberg-Carlson Nos. 53-X, 54, and 53-N plugs. Replacement for Stromberg-Carlson S-32-K cord.

Steel and Tinsel Type—Braid Covered
NO. 303-ST



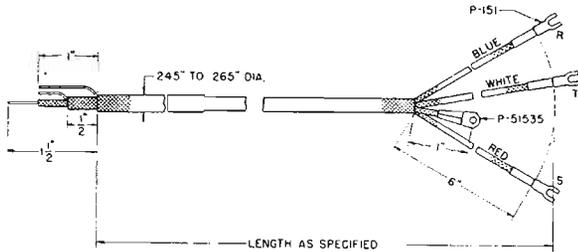
Diameter at plug end is .292 to .312 inches. Fits Kellogg Nos. 12, 13, 74, 106, 137, 152, 233, and Leich No. 202 plugs.

CORDS

SWITCHBOARD CORDS

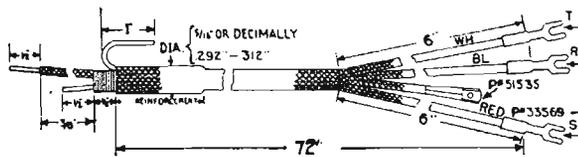
Steel and Tinsel Type—Braid Covered (Cont'd)

NO. 325-ST



Diameter at plug end is .245 to .265 inches. Fits Kellogg No. 201, Garford No. 54, and Stromberg-Carlson No. 55, 55-N, and 55-NX plugs.

NO. 358-ST



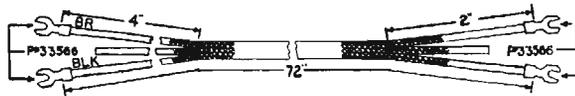
Diameter at plug end is .292 to .312 inches. Fits Kellogg No. 191 and Western Electric No. 110 plugs.

DESK STAND CORDS

TWO CONDUCTOR

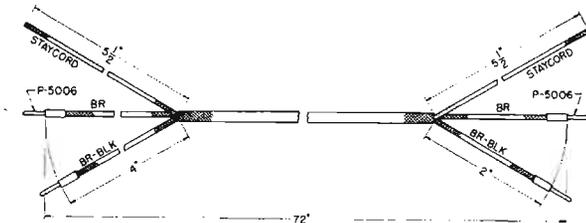
Braid Covered

NO. F-665-D



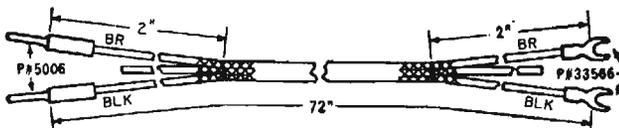
Fits Kellogg Nos. F-75, F-97, F-111, and other stands provided with terminals for flat type tips and the No. 900 and 925 type combination Masterphones. Replaces Kellogg No. F-100-D cord and Stromberg-Carlson No. D-2-C cord.

NO. 665-D



Same as No. F-665-D cord except equipped with No. 5006 spike or pin tips. Replaces Kellogg No. 100-D cord.

NO. 667-D

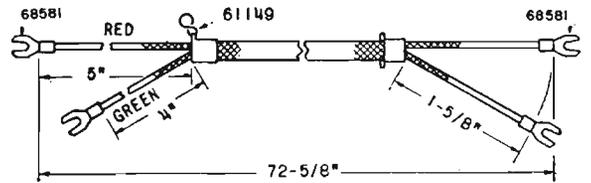


Replaces Kellogg No. 581-D cord.

DESK STAND CORDS

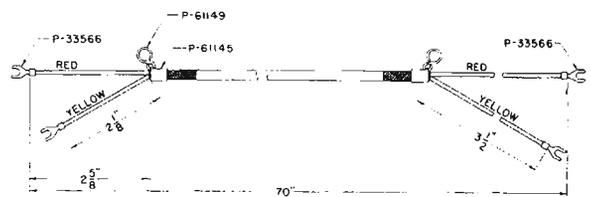
Rubber Covered Conductors

NO. F-740-D



Replaces Western Electric No. D-2-D cord. Has rubber covered conductors.

NO. 746-D

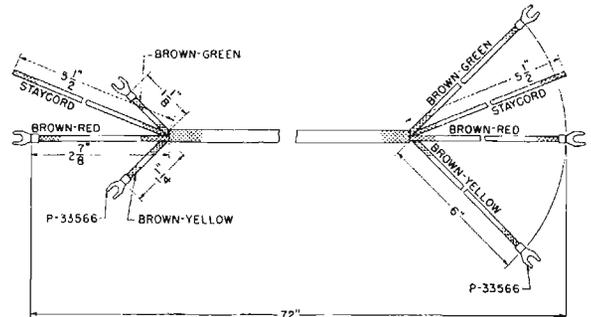


A special type desk stand cord with rubber covered conductors.

THREE CONDUCTOR

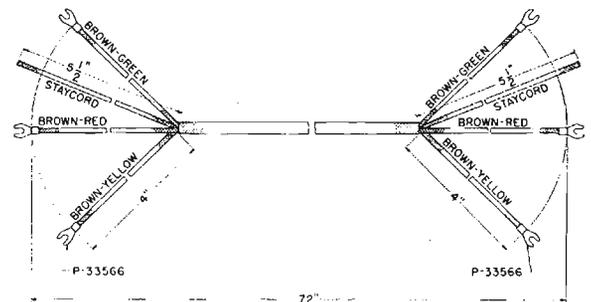
Braid Covered

NO. F-639-D



Replaces Kellogg No. F-479-D and Western Electric No. D-3-AB cords. Standard length is 72 inches. Also available in 96 and 108-inch lengths.

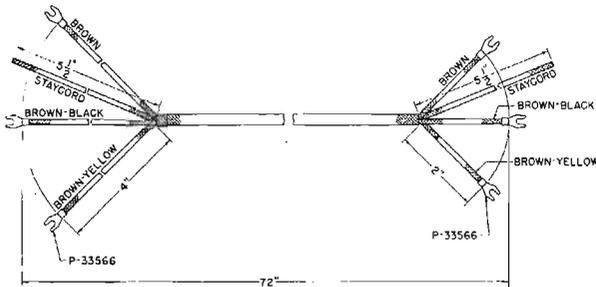
NO. F-640-D



Fits Kellogg Nos. F-115-A, F-118, F-118-B, F-135, F-138, and F-301 stands and the Nos. 900 and 925 "B" type combination Masterphones. Replaces Kellogg No. F-636-D cord.

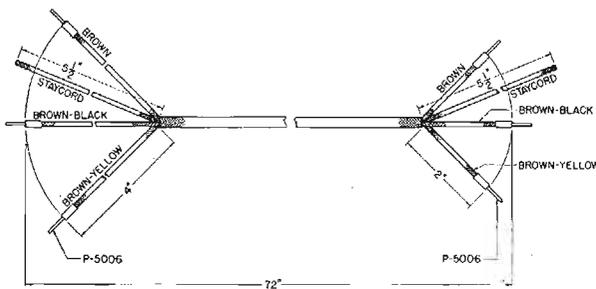
CORDS DESK STAND CORDS

Three Conductor, Braid Covered (Cont'd)
NO. F-641-D



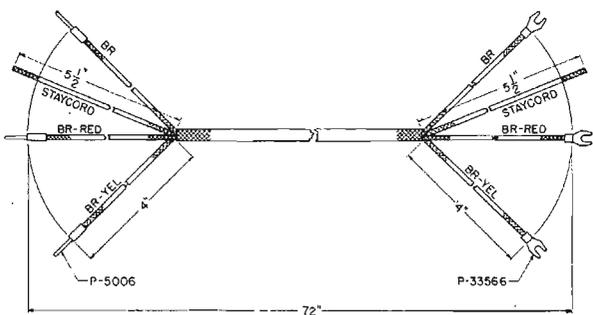
Fits Kellogg Nos. F-84, F-110, F-115, and other stands provided with terminals for flat tips. Replaces Kellogg No. F-150-D cord.

NO. 641-D



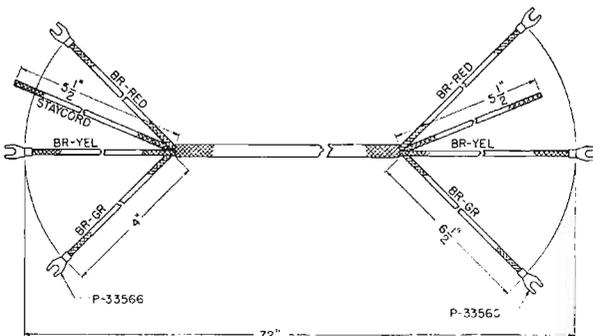
Same as No. F-641-D cord shown above except equipped with No. 5006 spike or pin tips. Replaces Kellogg No. 150-D cord.

NO. 669-D



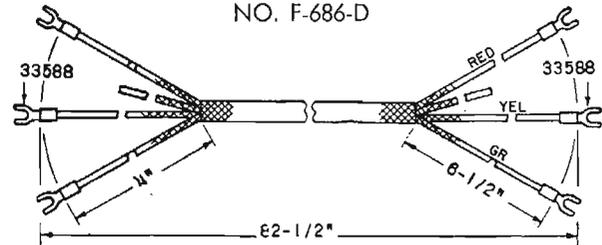
A general purpose replacement cord for old style equipment. Replaces Kellogg No. 452-D cord.

NO. F-674-D



Fits Kellogg type 700, 725, 900-A and 925-A Masterphones.

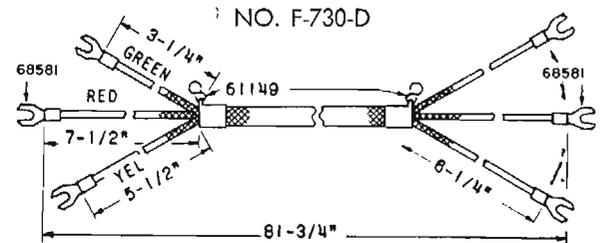
Three Conductor, Braid Covered (Cont'd)
NO. F-686-D



Replaces Stromberg-Carlson Nos. MD-3-C and MD-3-F cords. Standard length is 82½ inches.

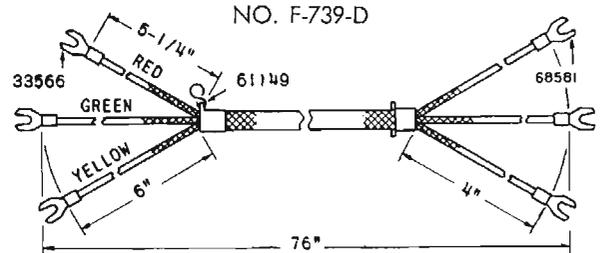
Three Conductor, Rubber Covered Conductors

NO. F-730-D



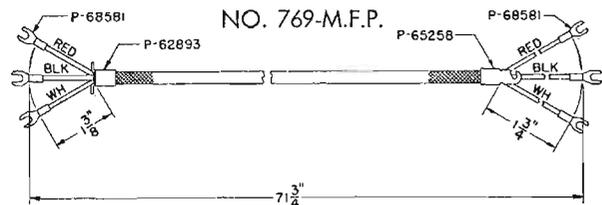
Replaces Western Electric No. D3P9 cord. Equipped with metal stay clip. Has rubber covered conductors.

NO. F-739-D



Replaces Western Electric No. D-3-AL cord. Has rubber covered conductors.

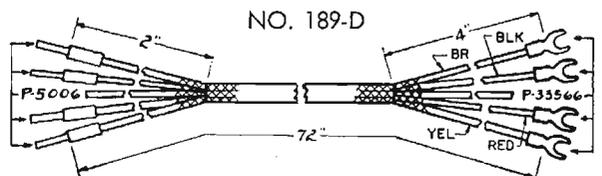
NO. 769-M.F.P.



For use with the Kellogg 1000 Masterphone. Has black over-all cotton braid. Specially impregnated and insulated for moisture and fungus proofing.

Four Conductor, Braid Covered

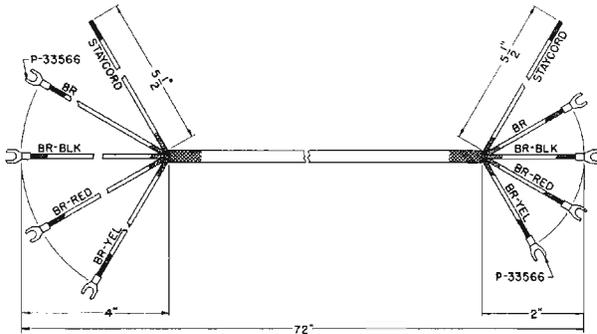
NO. 189-D



Fits most four conductor desk stands where a spike or spade terminal can be used.

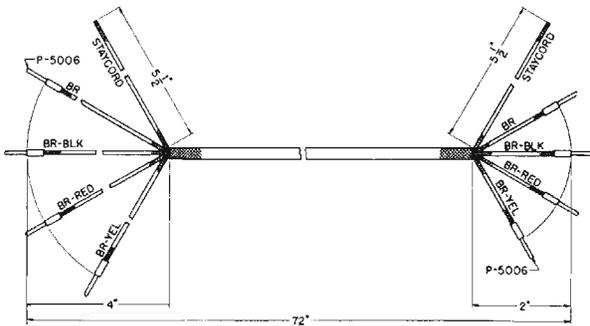
CORDS

DESK STAND CORDS
Four Conductor, Braid Covered (Cont'd)
 NO. F-666-D



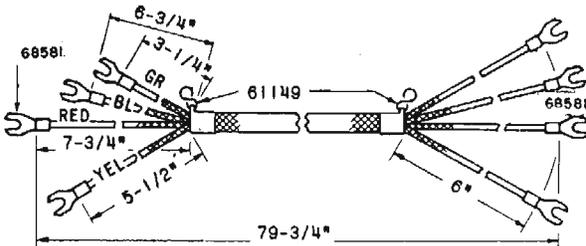
For four conductor magneto desk stands and desk set boxes provided with terminals for flat type tips. Replaces Kellogg No. F-102-D cord.

NO. 666-D



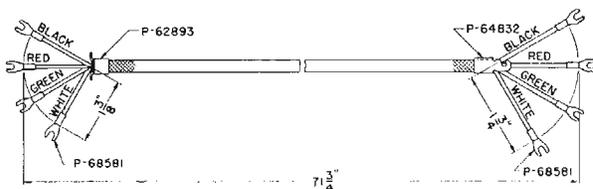
Some as No. F-666-D except has spike or pin tips No. 5006. Replaces Kellogg No. 102-D cord.

Four Conductor, Rubber Covered Conductors
 NO. F-731-D



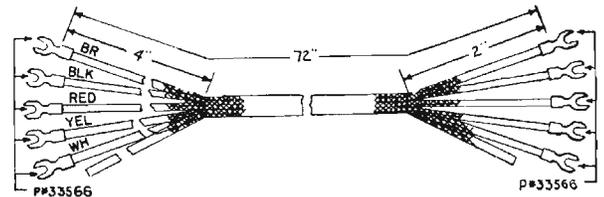
Replaces Western Electric No. D459 cord. Equipped with metal stay clip.

NO. 771-M.F.P.



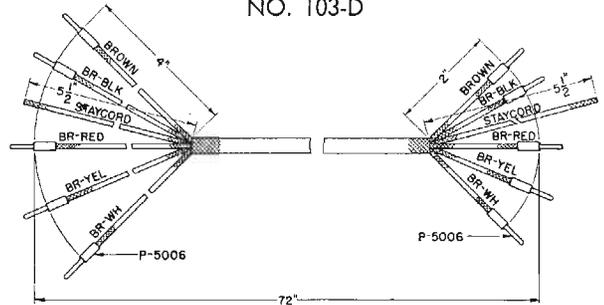
Used with the Kellogg 1000 series Masterphone. Has black over-all cotton braid. Has rubber covered conductors.

DESK STAND CORDS
Five Conductor, Braid Covered
 NO. F-103-D



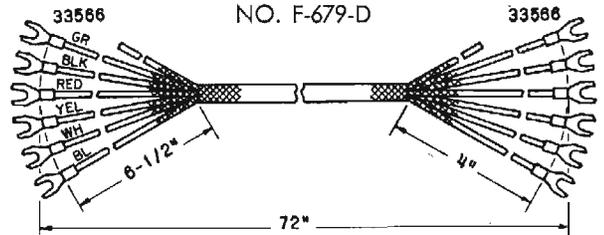
This cord is most generally used with intercommunications equipment.

NO. 103-D



Same as No. F-103-D cord except equipped with spike or pin tips No. 5006.

Six Conductor, Braid Covered
 NO. F-679-D



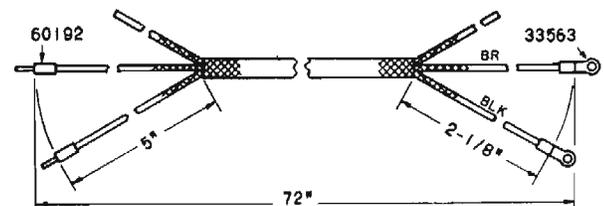
This cord is used on No. 701 Kellogg Masterphones.

OPERATOR'S CORDS

Kellogg operator's cords are manufactured under the same conditions of quality and workmanship as are all cords and in the same manner as listed under general construction features of braid covered cords above. Standard operator's cords are listed below. Cords requiring different length or trim than those shown can be furnished to meet specific requirements.

Standard cords should be ordered by code number. When ordering special cord complete information, preferably including a sketch, should be supplied. In orders requesting duplication of cords it is advisable, if possible, to send a sample of the old cord.

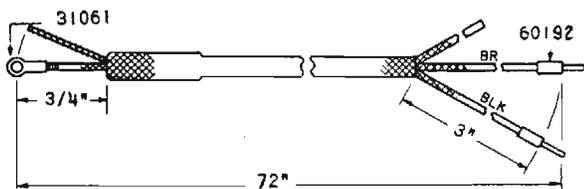
FOR HEAD RECEIVERS
Two Conductor, Braid Covered
 NO. 466-OR



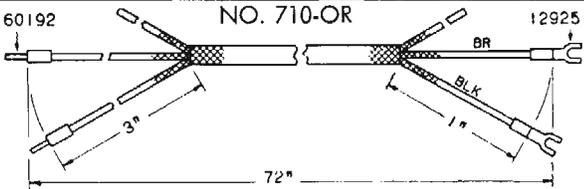
Fits Kellogg No. 139 plug and used with No. 65 type receiver. Replaces Western Electric No. 254 cord.

CORDS OPERATOR'S CORDS

Two Conductor, Braid Covered (Cont'd)
NO. 708-OR

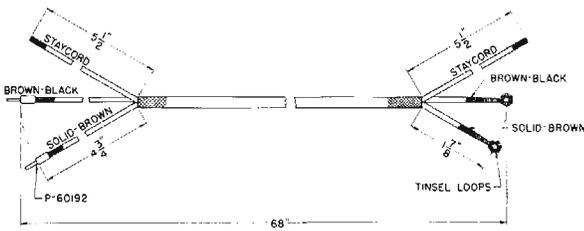


Formerly standard on Kellogg switchboards. Replaces Kellogg No. 26-OR cord and Leich No. 31 operator's receiver cord. Fits Kellogg Nos. 107 and 247 and Western Electric No. 47 plugs. Used with No. 85-A receiver.



Replaces Kellogg No. 110-OR cord. Standard on Kellogg boards using suspended type transmitter. Fits Kellogg No. 146 plug and Kellogg receiver No. 85-A.

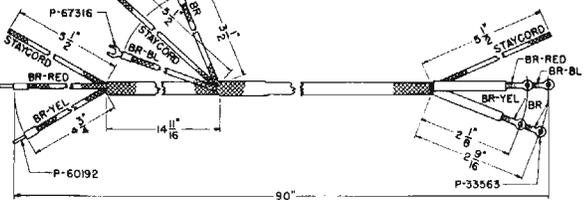
NO. 719-OR



Fits Kellogg No. 182 plug.

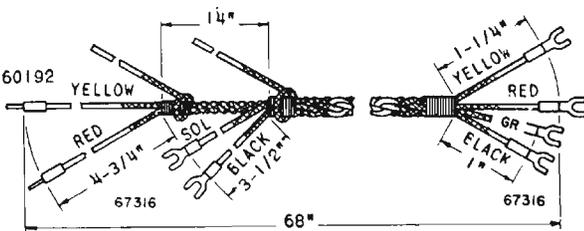
FOR HEAD AND CHEST SETS
Four Conductor, Braid Covered

NO. 709-O



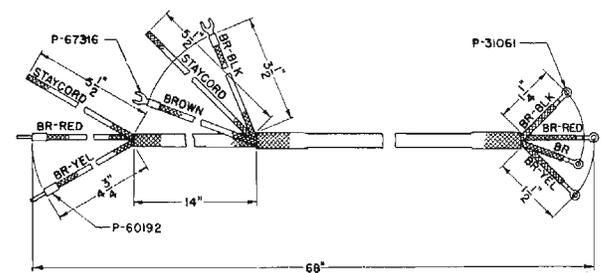
Replaces Kellogg No. 199-O cords; Western Electric No. L4B cords, and Leich No. 14-B cords. Fits Kellogg No. 139 plug and Nos. 65-A and 85-A receivers, and Western Electric Nos. 103, 112, and 137 plugs.

NO. 711-O



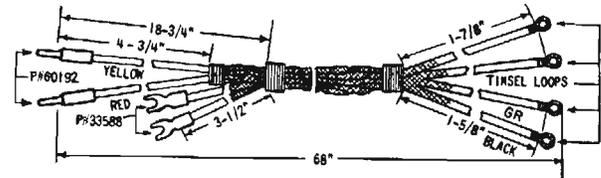
Replaces Kellogg No. 111-O cord. Used with Kellogg No. 145 plug and Nos. 65-A and 85-A receivers. Cord has over-all braid of green cotton. No over-all braid.

Four Conductor, Braid Covered (Cont'd)
NO. 712-O



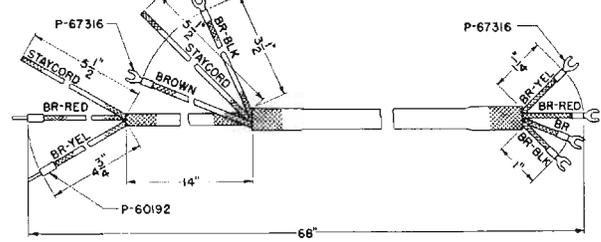
Replaces Kellogg Nos. 67-O and 239-O cords. Fits Kellogg No. 136 plug and Nos. 65-A and 85-A receivers.

NO. 713-O



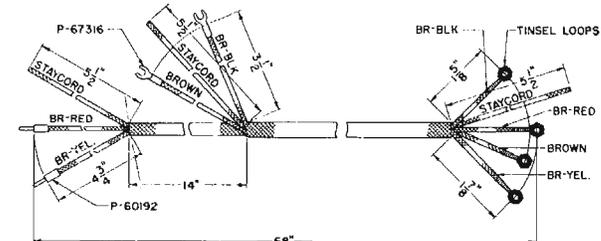
Replaces Kellogg No. 439-O cord. Used with Kellogg No. 182 plug and Nos. 65-A and 85-A receivers. Replaces Automatic Electric Nos. DB-12, MC-54220 and CD-509464 and Stromberg-Carlson No. MO-4F cards. No over-all braid.

NO. 721-O



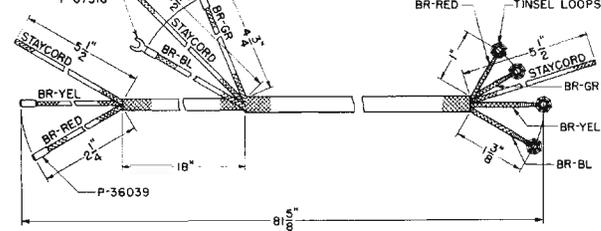
Replaces Kellogg No. 670-O cord. Fits Kellogg No. 145 plug.

NO. 722-O



Replaces Kellogg No. 672-O cord; Automatic Electric cords Nos. DB-12, MC-54220 and CD-509464, and Stromberg-Carlson No. MO-4F cord. Fits Kellogg No. 182 plug.

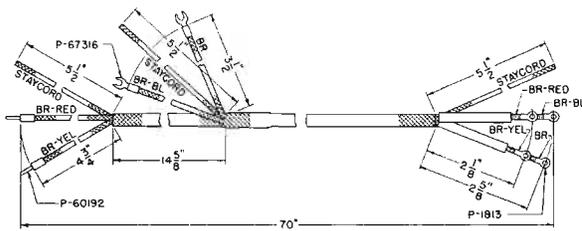
NO. 741-O



Replaces Stromberg-Carlson No. MO-4F cord. Will fit Kellogg No. 245 and Stromberg-Carlson No. 23 plugs.

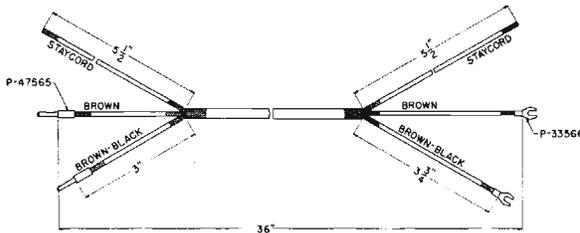
CORDS

OPERATOR'S CORDS
Four Conductor, Braid Covered (Cont'd)
 NO. 743-O



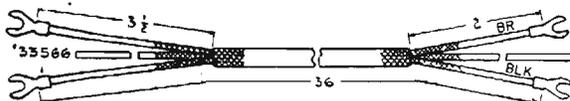
Fits Kellogg No. 139 and Western Electric No. 289-A plugs. Used with Kellogg No. 1-C and 1-L operators head and chest sets.

RECEIVER CORDS
Two Conductor, Braid Covered
 NO. F-642-TR



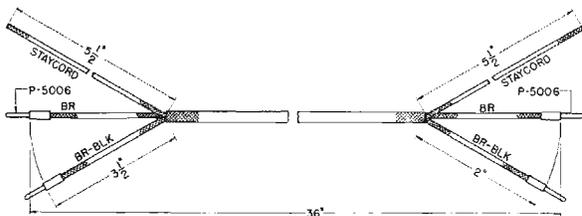
Replaces Kellogg No. 197-TR cord; Stromberg-Carlson No. MR-2-1 cord; Automatic Electric No. AR-11, CD-104436, and MC-5430 cords, and Leich No. 11-A cord.

NO. F-644-TR



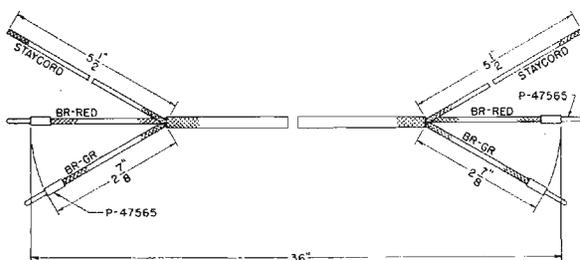
Replaces Kellogg No. F-98-TR, Leich No. 11-C, and Automatic Electric No. D-541846 cords. Fits Kellogg No. F-41-A and F-41-B receivers.

NO. 644-TR



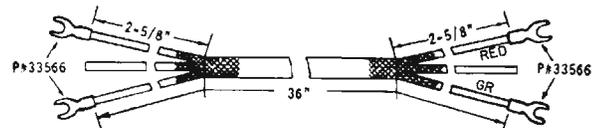
The No. 644-TR cord is the same as the No. F-644-TR except it is equipped with spike or pin tips No. 5006. Replaces Kellogg No. 98-TR cord and Leich No. 11-B cord.

NO. 644-RA



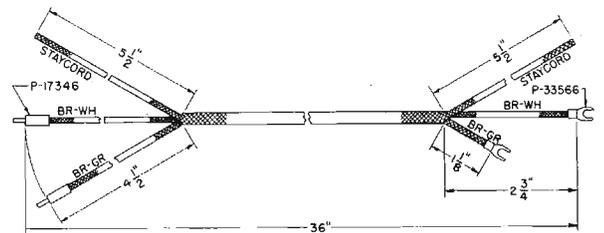
Replaces Automatic Electric Nos. AR-31, CD-100436, MC-54201, and MC-5429 cords.

RECEIVER CORDS
Two Conductor, Braid Covered (Cont'd)
 NO. F-644-RA



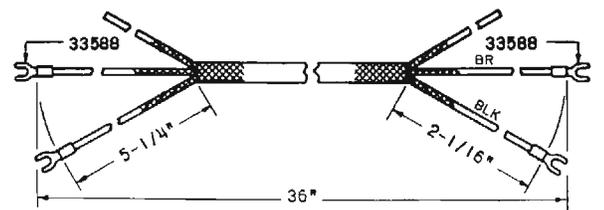
Replaces Automatic Electric Nos. AR-12, M-5431, and CD-109436 cords.

NO. 646-TR



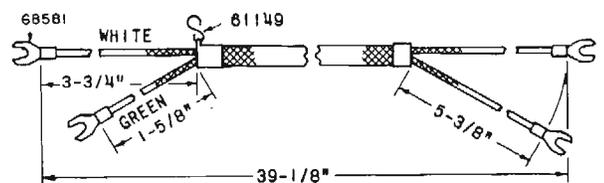
Replaces Kellogg No. 207-TR cord and Western Electric No. 549 cord. Standard for Western Electric desk stand and for the Western Electric No. 40-P transmitter arm.

NO. F-687-TR



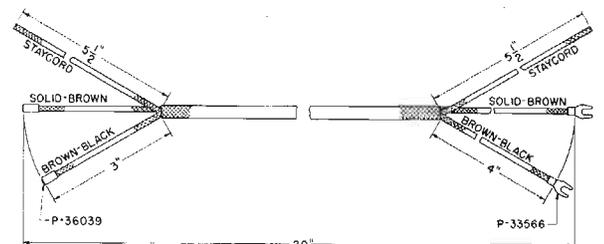
Replaces Stromberg-Carlson No. MR-2G cord.

Two Conductor, Rubber Covered Conductors
 NO. F-732-R



Replaces Western Electric No. R2B cord. Used with Western Electric desk stands Nos. 51-C, 51-AL, or 51-CN with No. 144 receiver. Also used with Western Electric No. 20-CC transmitter arm. Equipped with metal stay clip.

NO. F-744-TR



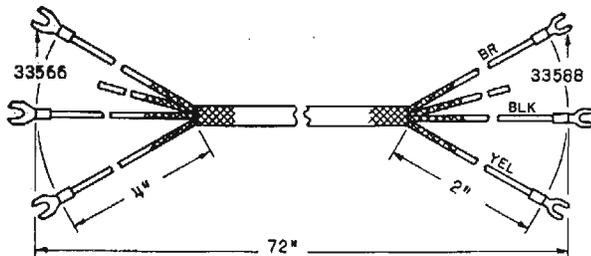
Used with Kellogg weatherproof telephones Nos. 4883 and 4888. Replaces No. 682-TR cord. Fits No. 81 receiver.

CORDS HANDSET CORDS

Standard Kellogg handset cords are listed below. Special cords to meet different requirements for length and trim can be manufactured by the Kellogg factory. When ordering special cords

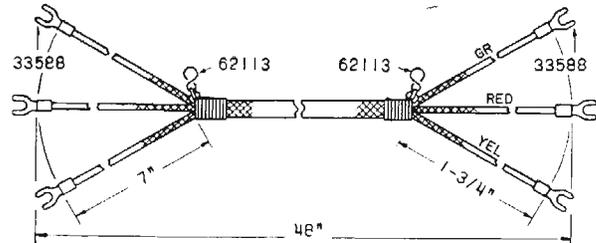
complete information, preferably including a sketch, should be included with the order. Standard cords should be ordered by code number.

Three Conductor, Braid Covered
NO. F-621-G



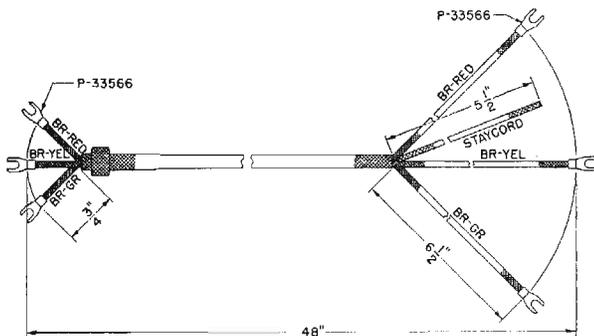
Used with Kellogg No. 22-C handsets.

Three Conductor, Braid Covered
NO. F-738-G



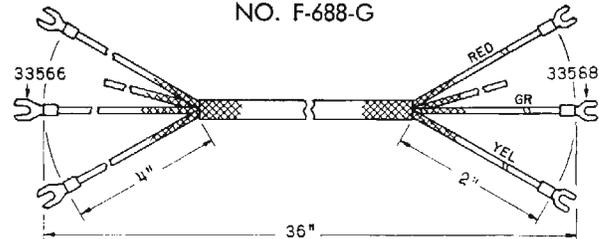
Replaces Stromberg-Carlson No. MC-3-F cord.

NO. F-673-G



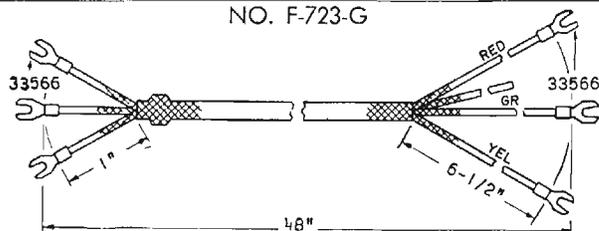
Fits Kellogg F-27-C handset used on Kellogg Masterphones of all types. Standard length is 48 inches.

Three Conductor, Rubber Covered Conductors
NO. F-688-G



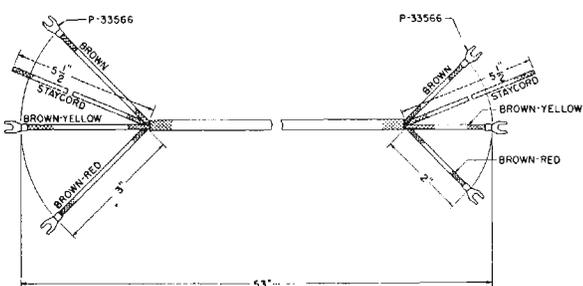
Fits Kellogg No. 32-C handset. Has rubber covered conductors.

NO. F-723-G



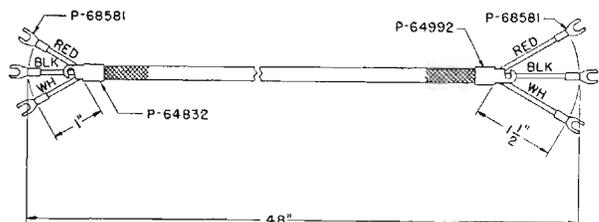
Fits Kellogg No. 27-EC handset. Has rubber covered conductors.

NO. F-690-G



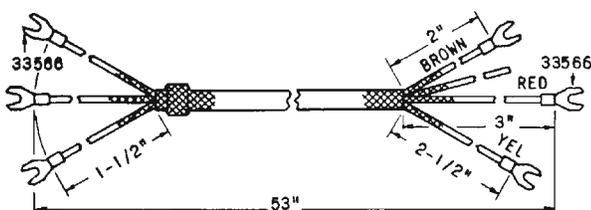
Fits Automatic Electric Monophones.

NO. 770-M.F.P.



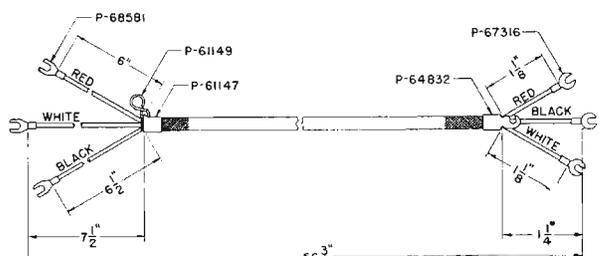
Used with the Kellogg No. 46-C handset. Rubber covered conductors with black over-all cotton braid.

NO. F-733-G



Used with Automatic Electric handset. Has black over-all cotton braid.

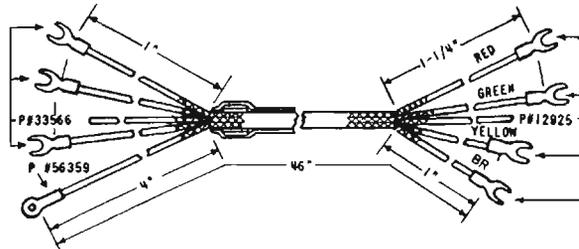
NO. 773-G



Replaces Western Electric No. H3C9 cord.

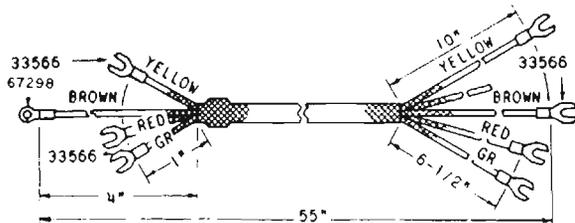
CORDS HANDSET CORDS (Cont'd)

Four Conductor, Braid Covered
NO. F-698-G



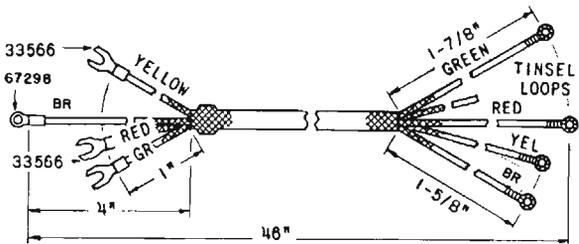
Arranged to fit Kellogg No. 145 plug and Kellogg No. F-39-C handset.

NO. F-699-G



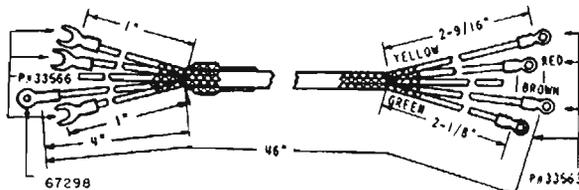
Terminals fit receiver and transmitter binding posts in wall telephones when the conventional parts are replaced with a handset. Fits Kellogg No. F-40-C handset.

NO. F-717-G



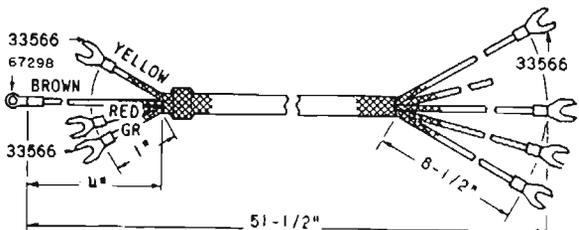
Used with Kellogg No. F-39-C handset and No. 182 plug.

NO. F-718-G



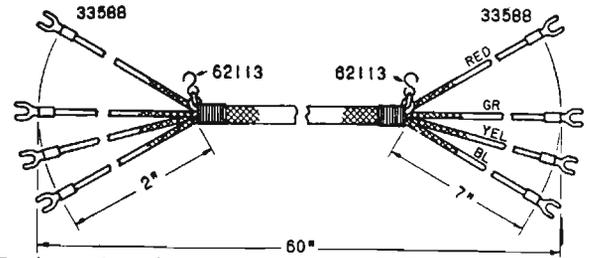
Used with Kellogg No. F-39-C handset and No. 139 plug.

NO. F-734-G



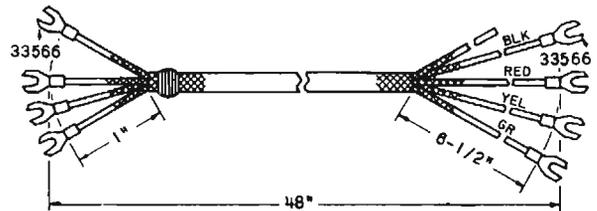
Replaces No. F-455-G cord for No. 5845 telephone. Used on No. F-43-C handset.

Four Conductor, Braid Covered (Cont'd)
NO. F-742-G



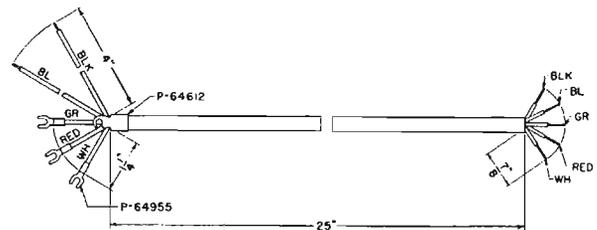
Replaces Stromberg-Carlson No. MC-4F cord.

Four Conductor, Rubber Covered
NO. F-735-G



Used with the Kellogg No. 44-C and 44-L handset. Has rubber covered conductors covered with an over-all rubber jacket.

Five Conductor, Rubber Covered
NO. 774



Used on Kellogg No. 49-C handset. Has rubber covered conductors covered with an over-all rubber jacket.

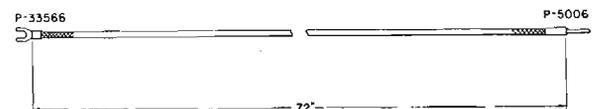
TRANSMITTER CORDS Single Conductor, Braid Covered

NO. 465-T



Replaces Western Electric No. 437 cord.

NO. 499-T



For Kellogg suspended type transmitter.

HOW TO ORDER

In ordering cords the code number of the cord must be specified. When the length dimension of cords is shown as "Per Specification" or omitted in the listings this dimension must be specified on the order.

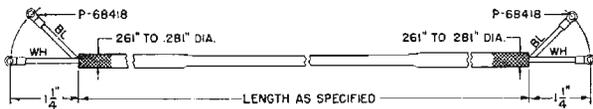
For replacement cord terminals for these cords see "Cord Terminals" on page 38.

CORDS PATCHING CORDS

Kellogg switchboard patching cords are made in a wide variety of types to meet the requirements of all telephone exchanges. These cords generally made to order to fit the exact condition of the central office equipment. They are made from one, two, or three conductor switchboard cordage of braided tinsel conductor construction. Cords can also be made up with rubber covered con-

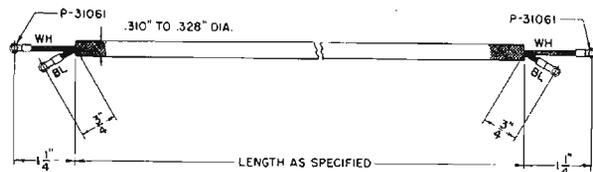
ductors. When ordering, or requesting information, on switchboard patching cords a sketch or sample of the proposed cord should be included. The code number of the plug required should also accompany the order. The most commonly used patching cords can be ordered by code number and are listed below. These cords should be ordered by code number with the desired length specified.

Two Conductor, Rubber Covered Conductors NO. 772-M.F.P.



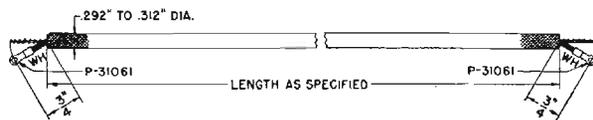
Arranged for No. 236 plug at either end. Has white glazed cotton over-all braid.

Two Conductor, Braid Covered NO. 785



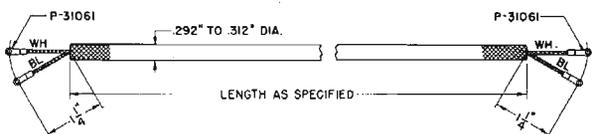
Arranged for No. 106 plug at each end.

NO. 787



Arranged for No. 42 or No. 70 plug at each end.

NO. 790

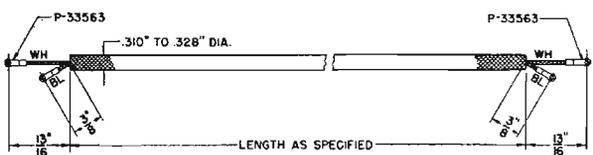


Arranged for No. 230 plug at each end.

NO. 792

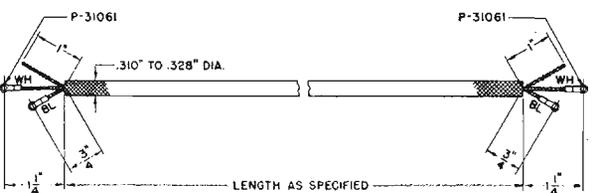
Arranged for No. 240 plug at each end. Similar to No. 793 cord shown below except for plug arrangement.

NO. 793



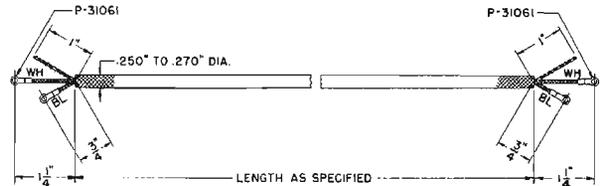
Arranged for No. 247 plug at each end.

Three Conductor, Braid Covered NO. 786



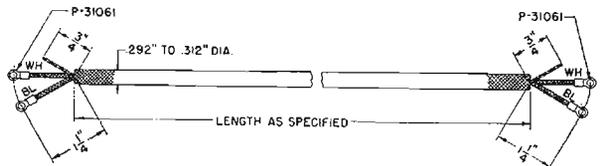
Arranged for No. 106 plug at each end.

Three Conductor, Braid Covered (Cont'd) NO. 788



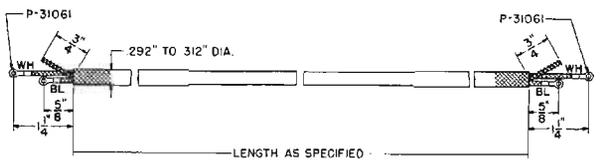
Arranged for No. 201 plug at each end.

NO. 789



Arranged for No. 230 plug at each end.

NO. 791



Arranged for No. 240 plug at each end.

NO. 794

Same as the No. 791 cord except arranged for No. 233 plug at each end.

Telephone and Switchboard Cords

The data on Kellogg telephone and switchboard cords is presented in the order shown below to simplify ordering and reference.

- | | |
|--|---|
| <p>A. Switchboard Cords.</p> <ol style="list-style-type: none"> 1. Tinsel type—two conductor. 2. Steel and tinsel type—two conductor. 3. Tinsel type—three conductor. 4. Steel and tinsel type—three conductor. <p>B. Desk Stand Cords.</p> <ol style="list-style-type: none"> 1. Two conductor. 2. Three conductor. 3. Four conductor. 4. Five conductor. 5. Six conductor. <p>C. Operator's Cords.</p> <ol style="list-style-type: none"> 1. Two conductor. 2. Four conductor. | <p>D. Receiver Cords.</p> <ol style="list-style-type: none"> 1. Two conductor. <p>E. Handset Cords.</p> <ol style="list-style-type: none"> 1. Three conductor. 2. Four conductor. 3. Five conductor. <p>F. Transmitter Cords.</p> <ol style="list-style-type: none"> 1. Single conductor. <p>G. Patching Cords.</p> <ol style="list-style-type: none"> 1. Two conductor. 2. Three conductor. <p>H. Neoprene Jacketed Cords.</p> <ol style="list-style-type: none"> 1. Handset type. 2. Desk stand type. |
|--|---|

NEOPRENE JACKETED CORDS

To meet the demand for handset and desk stand cords for installations requiring long life and serviceability Kellogg is now prepared to offer the special "Telecord" neoprene jacketed, rubber covered conductor cord.

Especially designed to meet the conditions of tropical areas and for "hard service" locations, this cord will outlast the ordinary braid covered cord several times. Rubber jacketed cords long

have been used in pay stations and other locations where hard usage demands a long life cord.

The advantages of rubber jacketed cords are included in "Telecord" neoprene jacketed cords plus the additional features of smaller diameter, greater flexibility, and added resistance to abrasion, oil, and natural acids.

Construction Features of Kellogg "Telecord" Neoprene Jacketed Cords

- (a) Two tinsel ribbons are wound around a synthetic textile thread core to form a tinsel thread.
- (b) Six tinsel threads are twisted together over a textile thread to form a flexible tinsel conductor.
- (c) A cotton separator is applied over each tinsel conductor.
- (d) Conductors are then given a covering of colored rubber compound.
- (e) Conductors are then twisted together with cotton fillers to make the cord round.
- (f) Cotton binder is applied to hold conductor in position.
- (g) Over-all sheath of vulcanized neoprene applied.
- (h) Solderless terminals are then attached.

Replacements for Kellogg and Other Manufacturers' Cords

FOR KELLOGG TELEPHONES

For Kellogg No. 1000 series desk and No. 1100 series wall Masterphones using following handsets and cords:

Handset No. 46-C, No. 770 M.F.P. cord—use No. 3000 cord.
Base cords No. 769 M.F.P.—use No. 3004 cord.

For Kellogg Nos. 900 and 925 desk and Nos. 9900 and 9917 wall type Masterphones using the following handsets and cords:
Handset No. F-27-C, No. F-673-G cord—use No. 3001 cord.
Base cord No. F-640-D—use No. 3013 cord.

FOR WESTERN ELECTRIC TELEPHONES

For Nos. 250, 302, 305, and 306 desk type telephones using following handsets and cords:

Handset No. F1AW, No. H3C-9 cord—use No. 3002 cord.
Base cord No. D-3AL-9 for Nos. 302, 306 type—use No. 3006 cord.

FOR STROMBERG-CARLSON TELEPHONES

For No. 1243 desk and No. 1250 wall type telephones using following handsets and cords:

Handset No. 23, Nos. MC-3J and WC-3J cords—use No. 3002 cord.
Base cords Nos. MC-3J and WD-3J for No. 1243 desk type—use No. 3007 cord.

FOR NORTH ELECTRIC TELEPHONES

For North Electric Nos. H-400 desk and H-800 wall type telephones the No. 3002 handset cord and the No. 3006 base cord should be used.

FOR AUTOMATIC ELECTRIC TELEPHONES

For Nos. 40 desk and 50 wall type telephones using the following handsets and cords:

Handset No. 41, cord No. AH-27—use cord No. 3003.
Base cord No. AD-57 for No. 40 desk type—use No. 3007 cord.

FOR LEICH ELECTRIC TELEPHONES

For Leich Electric Nos. 601 and 605 desk or wall telephones the No. 303 handset cord and No. 3007 base cord should be used.

Table of Replacement Cords

THREE CONDUCTOR CORDS

Kellogg Cord No.	Replace With	Kellogg Cord No.	Replace With	S. C. Cord No.	Replace With
F-639-D	3015	F-641-D	3014	MC-3J	3007
F-640-D	3013			WD-3J	3007
641-D	3016			MD-3C	3012
669-D	3017			MD-3F	3012
F-673-G	3001				
F-674-D	3005				
F-686-D	3012	W.E. Co. Cord No.	Replace With	A.E. Co. Cord No.	Replace With
F-688-G	3008	H3C	3002	AH-27	3003
F-723-G	3001	D3AL	3006	AD-57	3007
F-730-D	3018				
769-M.F.P.	3004				
770-M.F.P.	3000				

FOUR CONDUCTOR CORDS

Kellogg Cord No.	Replace With	Kellogg Cord No.	Replace With
F-698-G	3011	771 M.F.P.	3020
F-731-D	3019	189-D	3022
F-734-G	3009	666-D	3023
F-735-G	3010	W.E. Co. Cord No.	Replace With
F-666-D	3021	D4U	3019
		D4N	3019
		D4S	3019

HANDSET CORDS

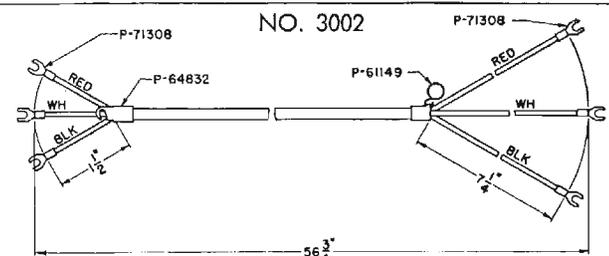
NO. 3000

Three Conductor

Replacement cord for Kellogg No. 770-M.F.P. cord where neoprene jacketed cord is desired. Fits No. 46-C handset. This cord is similar in construction details, length of cord and conductors to the No. 770-M.F.P., a drawing of which is shown on page 31.

NO. 3001

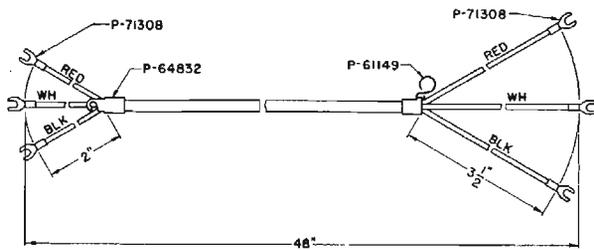
Replacement cord for Kellogg Nos. F-673-G and F-723-G cords (shown on page 31) where neoprene jacketed cord is desired. Fits No. F-27 handset. This cord is the same in length of cord and conductors as the No. F-673-G cord, a drawing of which is shown on page 31. Conductor colors on the No. 3001 cord are black, white, and red instead of as shown on the drawing.



Replacement cord for Western Electric Co. No. H3C, Stromberg-Carlson and North Electric Co. cords where neoprene jacketed cord is desired.

NEOPRENE JACKETED CORDS

HANDSET CORDS
Three Conductor (Cont'd)
 NO. 3003



Replacement cord for Automatic Electric Co. No. AH-27 and Leich Electric Co. cords where neoprene jacketed cord is desired.

NO. 3008

Replacement for Kellogg cord No. F-688-G (drawing shown on page 31) where neoprene jacketed cord is desired. This cord is similar in cord and conductor length to the No. F-688-G cord, a drawing of which is shown above. Conductor colors for the No. 3008 are black, white, and red.

Four Conductor
 NO. 3009

Replacement cord for Kellogg No. F-734-G cord where neoprene jacketed cord is desired. This cord is similar in cord and conductor length to the No. F-734-G cord, a drawing of which is shown on page 32. On handset end of No. 3009 cord red, white, and green conductors are each 1 1/2 inches long. The 4-inch conductor is black. On the stand end of the cord the conductors are 6 1/2 inches long.

NO. 3010

Replacement cord for Kellogg No. F-735-G cord (drawing shown on page 32) where neoprene jacketed cord is desired. This cord is similar in cord and conductor length to the No. F-735-G cord. Conductor colors are black, white, red, and green.

NO. 3011

Replacement cord for Kellogg No. F-698-G cord (drawing shown on page 32) where neoprene jacketed cord is desired. On the handset end of this cord the red, white, and green conductors are each 1 1/2 inches long, the black conductor is 4 inches long. On the plug end the black and white conductors are each 1 inch long and the red and green conductors are each 1 1/4 inch long.

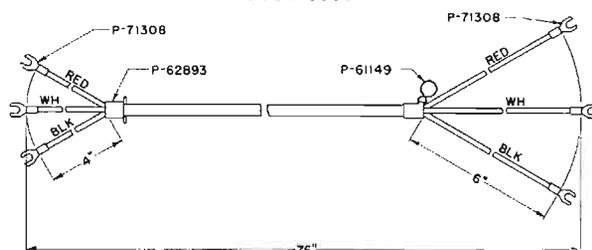
DESK STAND CORDS
Three Conductor
 NO. 3004

Replacement cord for Kellogg No. 769-M.F.P. cord (drawing shown on page 27) where neoprene jacketed cord is desired. For Kellogg No. 1000 series Masterphones. Conductor colors are black, white, and red.

NO. 3005

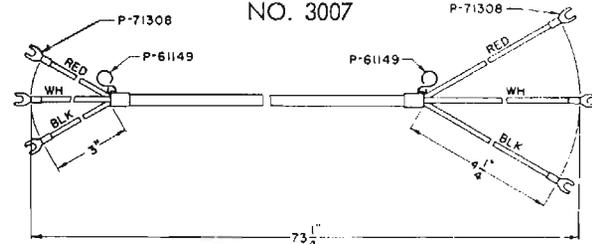
Replacement cord for Kellogg No. F-674-D cord (drawing shown on page 27) and Stromberg-Carlson cords where neoprene jacketed cords are desired. On the desk stand end of the cord the conductors, black, white, and red, are each 6 1/2 inches long. On the connector end the conductors are each 4 inches long.

DESK STAND CORDS
Three Conductor (Cont'd)
 NO. 3006



Replacement cord for Western Electric Co. No. D3AL and North Electric Co. cords where neoprene jacketed cord is desired.

NO. 3007



Replacement cord for Automatic Electric Co. No. AD-57 Leich Electric Co., and Stromberg-Carlson Co. MC-3J and WD-3J cords where neoprene jacketed cord is desired.

NO. 3012

Replacement cord for Kellogg No. F-686-D cord (drawing shown on page 27), Stromberg-Carlson Co. No. MD-3C and MD-3F cords where neoprene jacketed cord is desired. This cord is the same as the No. 3005 shown above except the over-all length is 82 1/2 inches.

NO. 3013

Replacement cord for Kellogg No. F-640-D cord (drawing shown on page 26) where neoprene jacketed cord is desired. Same as the No. 3005 cord except conductors at the stand end of the cord are 4 inches long.

NO. 3014

Replacement cord for Kellogg No. F-641-D cord (drawing shown on page 27) where neoprene jacketed cord is desired. Same as the No. 3005 cord shown above except at the desk stand end of the cord the conductors are each 2 inches long.

NO. 3015

Replacement for Kellogg No. F-639-D cord (drawing shown on page 26) where neoprene jacketed cord is desired. Similar in length of cord and conductors to the No. F-639-D cord, a drawing of which is shown above. Conductor colors are black, white, and red.

NO. 3016

Replacement cord for Kellogg No. 641-D cord (drawing shown on page 27) where neoprene jacketed cord is desired. This cord is the same as the No. 3014 cord except for the type of terminals used. (No. 5006 terminals used.)

NO. 3017

Replacement cord for Kellogg No. 669-D cord (drawing shown on page 27) where neoprene jacketed cord is desired. This cord is the same as the No. 3013 except for the type terminals on the stand end.

NEOPRENE JACKETED CORDS DESK STAND CORDS Three Conductor (Cont'd)

NO. 3018

Replacement cord for Kellogg No. F-730-D cord (drawing shown on page 29) where neoprene jacketed cord is desired. This cord is the same as the No. F-730-D cord, a drawing of which is shown on page 29, except conductor colors are black, white, and red.

Four Conductor

NO. 3019

Replacement cord for Kellogg No. F-731-D, Western Electric Nos. D4U, D4N, and D4S cords where neoprene jacketed cord is desired. This cord is the same as the No. F-731-D cord, a drawing of which is shown on page 30, except conductor colors are black, white, red, and green.

NO. 3020

Replacement cord for Kellogg No. 771-M.F.P. cord where neoprene jacketed cord is desired. This cord is similar to the No. 771-M.F.P. cord, a drawing of which is shown on page 30.

NO. 3021

Replacement cord for Kellogg No. F-666-D cord where neoprene jacketed cord is desired. This cord is similar in length of cord and conductors to the No. F-666-D cord, a drawing of which is shown on page 30, but conductor colors are black, white, red, and green.

NO. 3022

Replacement cord for Kellogg No. 189-D cord (drawing shown on page 29) where neoprene jacketed cord is desired. This cord is the same as the No. 3021 cord except for the type of terminals used. (No. 5006 terminal used on connector end.)

NO. 3023

Replacement cord for Kellogg No. 666-D (drawing shown on page 30) where neoprene jacketed cord is desired. This cord is the same as the No. 3021 cord except for the type of terminals used. (No. 5006 terminals are used on each end.)

Cord Fasteners



NO. 4



NO. 5



NO. 6

All are made of brass with hot tinned finish.

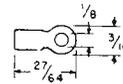
NO. 9 CORD WEIGHT



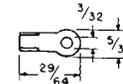
The No. 9 cord weight is the standard weight for promptly restoring switchboard cords to their proper position after use. Weight from 9 to 11 ounces, this cord weight will perform its task quickly yet will not damage the cord. The steel casing is given a rustproof treatment before being filled with lead to add weight. Dimensions: 4 inches long; 1-23/32 inches wide, and 1/2 inch thick.

CORD TERMINALS

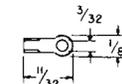
The drawing below includes all the terminals regularly used on Kellogg equipment. Terminals should be ordered by code number. When code numbers are not known they may be determined by comparing the desired terminal with the drawing.



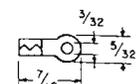
P-33563



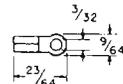
P-1813



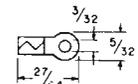
P-2986



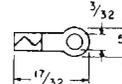
P-31061



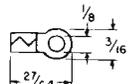
P-62050



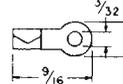
P-67297



P-67298



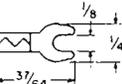
P-68418



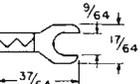
P-56359



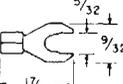
P-64955



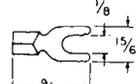
P-67316



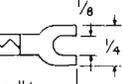
P-68581



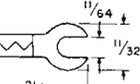
P-33566



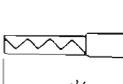
P-33588



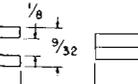
P-12925



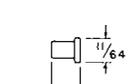
P-17132



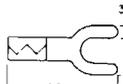
P-151



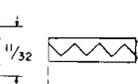
P-33569



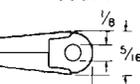
P-33574



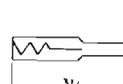
P-50820



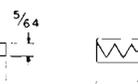
P-68417



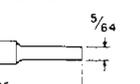
P-51535



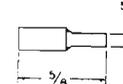
P-5006



P-17346



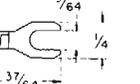
P-47565



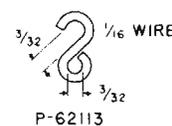
P-60192



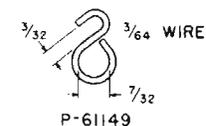
P-36039



P-71308



P-62113



P-61149

CUSHIONS, PLUG

These cushions fit snugly around the switchboard cord just below the plug and absorb the shock when the plug is returned to the plug seat. This cushioning protects both the plug and the cord from damage and excess wear.

Plug cushions are made of anti-oxidant rubber in sizes to fit all standard cords. Installed with the use of Kellogg Tools Nos. 101 for No. 1-A cushion, and 102 for No. 2-A cushion, small, cone-shaped brass tools which fit over the plug end providing a smooth, sloping surface over which the rubber cushion slides into position. See Tools for details on these installing tools.

Code No.	Description
1-A	11/32-in. outside diam., 1/8-in. inside diam., 1/8-in. thick
2-A	9/32-in. outside diam., 3/32-in. inside diam., 1/8-in. thick

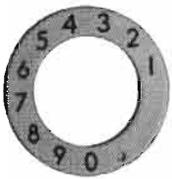
DIALS



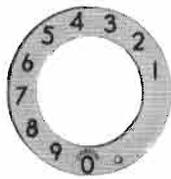
Kellogg dials are available with three types of number plates depending upon the application of the dial. A suffix letter "D" after the code number denotes that a standard number plate is supplied, numbered from 1 to 0. When a metropolitan dial is required

which has a number plate with both letters and numbers, a suffix letter "G" is listed after the code number. A number plate is available on the No. 10 type dial having numbers 1 to 0 with the word "Operator" faced on the plate along with the "0" digit. This number plate has a suffix "DO" after the code number.

A schematic diagram of each of the codes together with the suffix letters designating the number plates available with the respective dial codes is shown below. For tools used on dials see tools Nos. 3-86 and 92 under Tools, Switchboard.



TYPE D



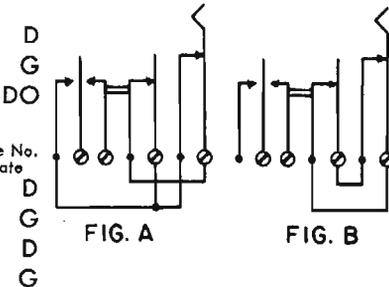
TYPE DO



TYPE G

Code No.	Wiring Diagram	Type No. Plate
TELEPHONE TYPE		
10-D	Fig. A	D
10-G	Fig. A	G
10-DO	Fig. A	DO

Code No.	Wiring Diagram	Type No. Plate
SWITCHBOARD TYPE		
12-D	Fig. B	D
12-G	Fig. B	G
13-D	Fig. B	D
13-G	Fig. B	G



DROPS, CLEAR OUT



Kellogg drops are adjusted for positive, sensitive operation. Drops are supplied without mountings and without coils unless these parts are ordered with the drop. It is necessary to include the code number of both the mounting and the coil desired when ordering. Drop coil mountings are listed under "Mountings" and coils are listed below.

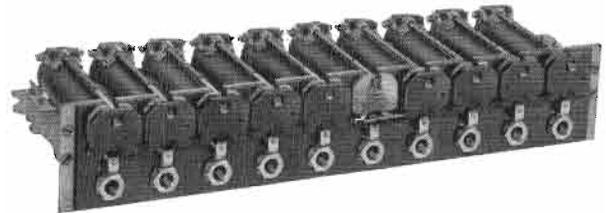
Code No.	Fits Mounting	Description
NIGHT AND CODE ALARM TYPE CONTACTS		
60	496-508-509	Regular night alarm and code night alarm contacts. Replaces No. 50.
NIGHT ALARM TYPE CONTACTS		
70	494-504-505 506-507-510	Regular night alarm contacts only. Replaces No. 51.

DROP COILS

These coils are designed for use with Kellogg clear out drops Nos. 60 and 70. They are wound to different resistances to meet varying line and switchboard conditions.

Code No.	Resistance (ohms)
DC	1000
DE	500
DS	2500

DROPS AND JACKS, COMBINED



The combined drop and jack is used as a line signal on rural and toll lines on manual type switchboards. The drop is sensitive and provides a clear signal for incoming calls. The drop shutter is mechanically restored when the switchboard plug is inserted to answer the call.

Coils and mountings are not furnished unless ordered. Coils of the proper resistance may be selected from the list of coils shown under "Coils, Drop and Jack." Mountings must be ordered separately and the code number and number of units to be mounted on each mounting strip specified with the order. Drops and jacks, combined, ordinarily are supplied unnumbered but number plates can be supplied if specified.

These drops and jacks, combined, will fit mountings Nos. 495, 497, 498, 499, 500, 502, 503, and 552.

TWO CONDUCTOR TYPE

Code No.	Fits Plug Code No.	Description
500	130	Regular night alarm contact on spring jack.
	247	Has break contact on tip conductor.
502	42	Replaces No. 303.
		Regular night alarm contact on spring jack. Double "cut-off" contacts (for toll line use). Has break contact on both tip and sleeve conductors. Replaces No. 103.
506	42	Regular night alarm contact on spring jack. Provides 1-local make contact. Double "cut-off" contacts (for toll line use). Has break contact on tip conductor, break and make contact on sleeve conductor. Replaces No. 113.
		Regular night alarm contact on spring jack. Code night alarm contact on armature. Has break contact on tip conductor. Replaces No. 300.
508	42	Regular night alarm contacts on spring jack. Has break contact on tip conductor. Replaces No. 301.
509	42	Has 1-local break and make set of springs. Regular night alarm contacts on spring jack. Double "cut-off" contacts (for toll line use). Has break contact on tip conductor, one break and one break and make on sleeve conductor.
513	42	Regular night alarm contacts on spring jack. Has break contact on tip conductor. Replaces No. 301.

DROPS AND JACKS, COMBINED (Cont'd)

THREE CONDUCTOR TYPE

Code No.	Fits Plug Code No.	Description
503	106	Regular night alarm contacts on spring jack. Has break contact on ring conductor. Replaces No. 105.
504	106	Regular night alarm contact on spring jack. Code night alarm contact on armature. Double "cut-off" contacts (for toll use). Has break contact on tip and ring conductors.
505	106	Regular night alarm contact on spring jack. Double "cut-off" contacts (for toll line use). Has break contact on both tip and ring conductors.

DROP AND JACK COILS

These coils are designed for use with all types of Kellogg combined drops and jacks. They are wound to different resistance values to meet varying line and switchboard conditions. Coils should be ordered by code number.

Code No.	Resistance (ohms)	Code No.	Resistance (ohms)
DJ-A	100	DJ-E	500
DJ-C	1000	DJ-S	2500

DROP AND RINGER, COMBINED

The combined ringer and drop is used where a bell signal is required in addition to the visual drop signal. See "Mountings" for typical illustration.

The gongs on these No. 3 type ringers and drops are 1-13/32 inches in diameter, made of brass with a polished nickel plating. The drop shutter is operated by the action of the ringer armature but must be manually restored. These combined ringers and drops are available in different resistances in accordance with the listings below. Code numbers should be given when ordering.

The spring jack and mounting used with this item are not included and must be ordered separately.

Code No.	Resistance (ohms)	Code No.	Resistance (ohms)
3-A	1000	3-E	2500
3-D	1600		

EXTENSION SHAFTS, GENERATOR

SWITCHBOARD TYPE



These generator extension shafts are designed to fit the P-15911 generator crank that is standard on all Kellogg switchboard operators type generators.

Code No.	Over-all Length	Code No.	Over-all Length
9	24 inches	14	12 1/4 inches
13	19 1/2 inches	17	20 1/8 inches

ESCUTCHEONS, KEY

These key escutcheons are made of brass with a heavy black enamel finish. Those escutcheons listed below are those most in use and are carried in stock at the factory. The sales department will be glad to consult on any size not listed or for any special requirements. Mounting screws are not furnished unless specified with the order.

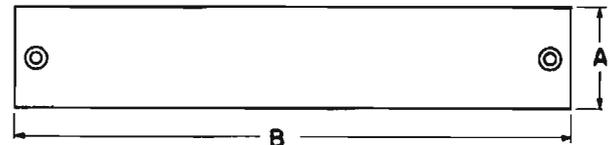
Key Blanks (Dummy Plugs)



This key blank is used on a blank position of the escutcheon for a No. 1000 type key. It is made of cold rolled steel finished in black enamel to match the key escutcheon. Four screws and nuts are supplied for assembly of the blank to the escutcheon. Size of blank is 1-1/64 inches long and 3/4 inch wide.

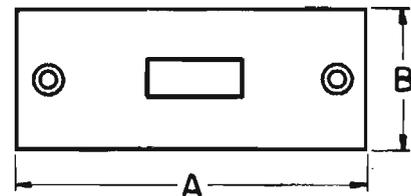
Code No.	Description
142	Key Blank

Blank Escutcheons



Code No.	Dimensions (Inches)	
	A	B
281	1/2	4
245	3/4	4
224	1	4
225	1-1/16	4
256	1-9/32	4
264	1/2	5 1/2
309	5/8	5 1/2
258	3/4	5 1/2
250	13/16	5 1/2
268	1	5 1/2
276	1-1/16	5 1/2
241	1 1/8	5 1/2
274	1-5/32	5 1/2
261	1-9/32	5 1/2
263	1/2	7-3/16
279	13/16	7-3/16
262	1	7-3/16
277	1-1/16	7-3/16
255	1 1/8	7-3/16
273	1-5/32	7-3/16

**Cam Key Escutcheons
SINGLE TYPE**

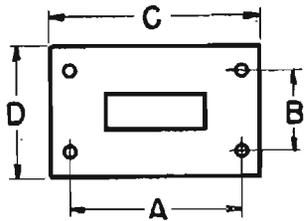


Code No.	Dimensions (Inches)	
	A	B
1053	2 1/2	3/4
1054	2 1/2	13/16
1055	2 1/2	7/8
1021	2 1/2	1
1069	4	3/4

ESCUTCHEONS, KEY

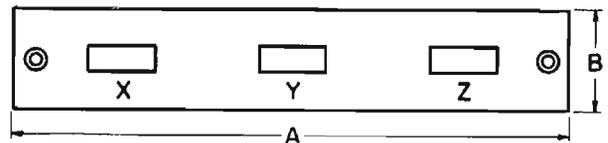
Cam Key Escutcheons (Cont'd)

SPECIAL SINGLE TYPE



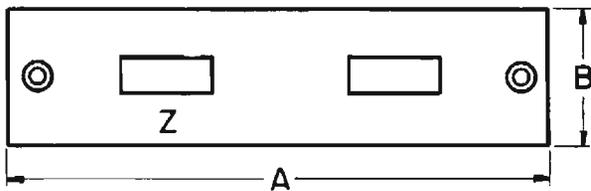
Code No.	Dimensions (Inches)				Remarks
	C	D	A	B	
1022	1 5/8	15/16	1-5/16	5/8	For Mounting 1000 Type Key to Panel

TRIPLE TYPE



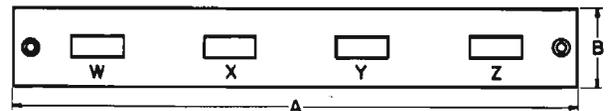
Code No.	Length Overall (Inches)	Width Overall (Inches)	Remarks
1040	5 1/2	3/4	Less Hole "Y"
1076	5 1/2	3/4	Less Hole "Z"
1078	5 1/2	3/4	Less Holes "Y" & "Z"
1014	5 1/2	13/16	
1074	5 1/2	1	
1041	5 1/2	1	Less Hole "Y"
1077	5 1/2	1	Less Hole "Z"
1075	5 1/2	1	Less Holes "Y" & "Z"
1080	5 1/2	1-1/16	Less Holes "Y" & "Z"
1000	5 1/2	1 1/8	
1002	5 1/2	1 1/8	Less Hole "Y"
1004	5 1/2	1 1/8	Less Hole "Z"
1001	5 1/2	1 1/8	Less Holes "Y" & "Z"
1043	5 1/2	1-3/16	Less Hole "Z"
1030	5 1/2	1-9/32	
1065	5 1/2	1-9/32	Less Hole "Z"

DOUBLE TYPE



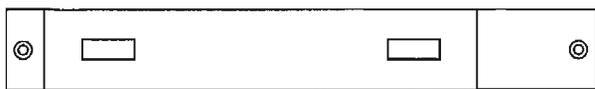
Code No.	Dimensions (Inches)		Remarks
	A	B	
1070	4	3/4	L
1015	4	13/16	
1016	4	13/16	Less Hole "Z"
1013	4	1	
1011	4	1	Less Hole "Z"
1094	4	1-1/16	
1085	4	1 1/8	
1012	4	1-3/16	
1010	4	1-3/16	Less Hole "Z"
1026	4	1-9/32	

QUADRUPLE TYPE



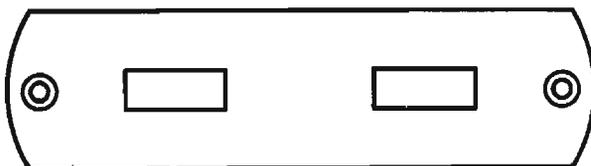
Code No.	Dimensions (Inches)		Remarks
	A	B	
1051	7-3/16	13/16	
1110	7-3/16	1	
1036	7-3/16	1	Less Hole "W"
1032	7-3/16	1	Less Holes "W" & "X"
1037	7-3/16	1	Less Holes "X", "Y" & "W"
1007	7-3/16	1 1/8	
1109	7-3/16	1 1/8	Less Holes "W" & "X"

SPECIAL DOUBLE TYPE



Code No.	Length Overall (Inches)	Width Overall (Inches)

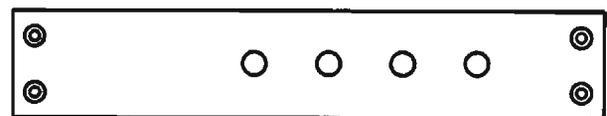
FOR MILLER TYPE KEYS



Will not mount 1000 type keys.

Code No.	Length Overall (Inches)	Width Overall (Inches)

FOR OLD STYLE FOUR PARTY KEYS (190 TYPES)

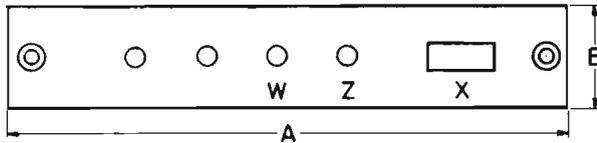


Made of polished hard rubber.

Code No.	Length Overall (Inches)	Width Overall (Inches)	Remarks

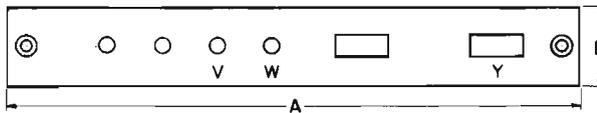
ESCUTCHEONS, KEY

Cam Key Escutcheons (Cont'd) FOR FOUR PARTY KEYS



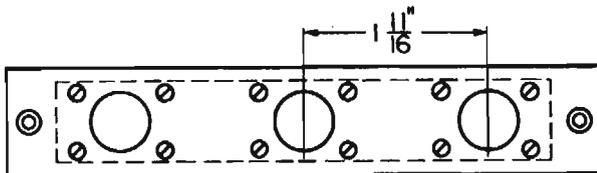
With or Without Hole for Mounting 1000 Type Cam Keys.

Code No.	Dimensions (Inches)		Remarks
	A	B	
1027	5 1/2	3/4	
1028	5 1/2	3/4	Less Hole "X"
1096	5 1/2	7/8	
1097	5 1/2	7/8	Less Hole "X"
1089	5 1/2	15/16	Less Hole "X"
1039	5 1/2	1	
1038	5 1/2	1-1/16	
1005	5 1/2	1 1/8	
1006	5 1/2	1 1/8	Less Hole "X"



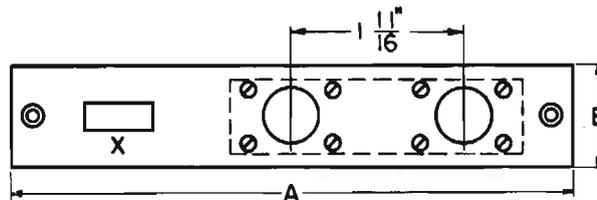
Code No.	Dimensions (inches)		Remarks
	A	B	
1114	7-3/16	1	Less Hole "Y"
1033	7-3/16	1	
1008	7-3/16	1 1/8	
1009	7-3/16	1 1/8	Less Hole "Y"
1111	7-3/16	1 1/8	Less Holes "V" & "W" (for 2 Pty. Key)

FOR ORDER WIRE KEYS



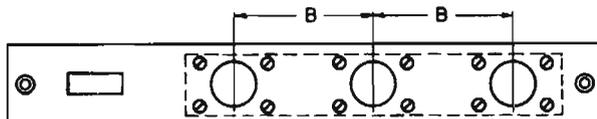
Code No.	Length Overall (Inches)	Width Overall (Inches)
1083	5 1/2	1

FOR TWO ORDER WIRE KEYS



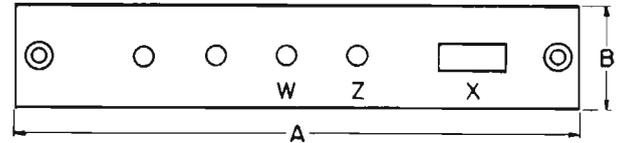
With or Without Hole for Mounting 1000 Type Cam Keys.

Code No.	A	B	"B" Dim.	Description
1098	7-3/16	3/4	1-11/16	Less Hole "X"
1101	5 1/2	1	1-11/16	



Code No.	Length Overall (Inches)	Width Overall (Inches)	"B" Dim. (Inches)
1102	7-3/16	3/4	1-11/16

Cam Key Escutcheons (Cont'd) FOR TWO PARTY KEYS



With or Without Hole for Mounting 1000 Type Cam Key.

Code No.	Dimensions (Inches)		Description
	A	B	
1050	5 1/2	7/8	Less Holes "Z" & "W" for 319 key
1064	5 1/2	1	Less Holes "X", "W" & "Z"

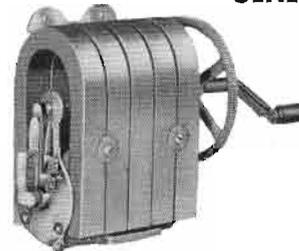


Code No.	Length Overall (Inches)	Width Overall (Inches)
1062	7-3/16	1

FILTERS, NO. 4-A NOISE

The No. 4-A noise filter is used on all Relaymatic switchboards equipped for harmonic ringing. Consists of one No. 41-B retard coil and two P-70717 condensers mounted on one P-70716 panel.

GENERATORS

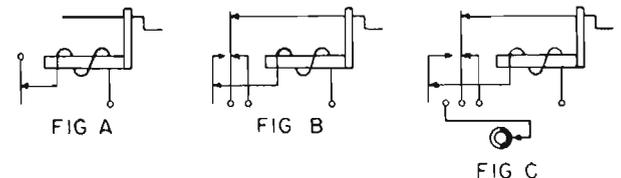


NO. 53

Kellogg generators are constructed to give long, dependable service under all conditions. The generator armatures are wound with specially insulated wire and vacuum varnish impregnated to provide the best possible protection against breakdown and to provide long life. The magnets of these generators are made of 3 1/2 % chrome steel to insure the magnetic strength will be retained at near peak levels. Gears for these generators are accurately cut to insure quiet and smooth operation.

The 3-bar generator will ring fifty 2500 ohm bells through 1500 ohms resistance and five 2500 ohm bells through 19,000 ohms resistance. The 5-bar generator is designed for extra heavily loaded lines with an output approximately 50% greater than that of the 3-bar generator. The 6-bar generator is a special purpose generator for extra heavily loaded lines.

Switchboard Operators Type*

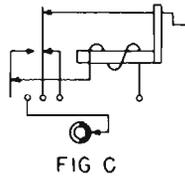
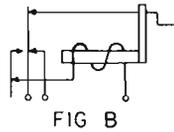


Code No.	No. Bars	Min. Output 1500 Ohm Load	Circuit	Overall Dimensions (Inches)		
				Length	Width	Height
11	4	70 volts	Fig. A	6 1/2	4	5 3/4
63**	5	80 volts	Fig. A	6 1/2	4	8 1/4
72	5	80 volts	Fig. A	6 1/2	4	5 1/2

*For extension shafts for these generators see Extension Shafts, Generators.

**Has inverted gear wheels.

GENERATORS (Cont'd)
Telephone Type



3-BAR TYPE

Code No.	No. Bars	Min. Output 1500 Ohm Load	Circuit	Overall Length	Dimensions (Inches) Width	Height
15*	3	65 volts	Fig. B	5½	4	5¾

5-BAR TYPE

53*	5	80 volts	Fig. B	6½	4	5¾
59**	5	80 volts	Fig. C	6¾	4	5¾
86*	5	80 volts	Fig. B	6½	4	5¾

6-BAR TYPE

75*	6	125 volts	Fig. B	7½	4	5¾
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MINIATURE TYPE

GN-38-B 3***	3	60 volts	Fig. B	4	2¾	3-7/64
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*A. C. type.

**Pulsating and A. C. type.

***Solid field poles equivalent to 3 bars (has Alnico magnet).

HANDSETS

Kellogg handsets are manufactured in two basic types, a bakelite housing type used on all standard Kellogg telephones, and a metal housing type applicable to all installations where space is an important factor.

Both handset types have the special Kellogg Non-Positional transmitter and bi-polar type receivers using cobalt magnets. In all except the Nos. 44-C and TS-9 handsets, bakelite type units have two brass bars molded into the bakelite handle which serve as conductors to the receiver and also reinforce the handle.

Clip connections, requiring no screws or other type terminals, are used on all Kellogg handsets except the metal type. Metal type handsets are provided with screw connections on the transmitter.

These handsets are furnished with cords attached. The cord supplied with each handset is listed with the code number of the handset.

Bakelite Type Handsets

THREE CONDUCTOR—COMMON BATTERY



NO. F-27-C



NO. 46-C

Code No.	Cord Code No.	Description
F-27-C	F-673-G	For Nos. 700, 900, and 925 desk Masterphones and Nos. 5800, 9700, and 9900 type telephones.
F-35-EC	F-727-G	For Nos. 4910 and 4902 weather-proof telephones.
46-C	770-M.F.P.	Standard for 1000 ser. Masterphones.
47-C	1000	For 1000 series Masterphone, has Coiled Kord.

HANDSETS

Bakelite Type Handsets (Cont'd)

THREE CONDUCTOR—LOCAL BATTERY

Code No.	Cord Code No.	Description
F-27-L	F-673-G	Special for increased transmission of local battery sets. Same in appearance as the F-27-C Handset.
53-L	1000	For Nos. 1042-BB-K and 1142-BB-K telephones. Similar in appearance to the 46-C except has Coiled Kord.

FOUR CONDUCTOR—COMMON BATTERY

F-39-C	F-698-G	Cord fits No. 145 operator's plug.
F-40-C	F-699-G	For conversion of local battery wall telephones.
F-43-C	F-734-G	For No. 5845 telephone.

Metal Type Handsets

THREE CONDUCTOR—COMMON BATTERY



Code No.	Cord Code No.	Description
32-C	F-688-G	For Nos. 3000, 3001, and 3002 telephones.

THREE CONDUCTOR—LOCAL BATTERY

32-L	F-688-G	Special for increased transmission in local battery sets.
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Special Type Handsets



Each of these handsets has a switch built into the handle for "press to talk" or other types of operation.

THREE CONDUCTOR—COMMON BATTERY

Code No.	Cord Code No.	Description
TS-9	CC-333	For EE-8 telephone.

FOUR CONDUCTOR—COMMON BATTERY

44-C	F-735-G	For No. 3025 telephone.
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FOUR CONDUCTOR—LOCAL BATTERY

F-44-L	F-735-G	For No. 3025 telephone.
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FIVE CONDUCTOR—COMMON BATTERY

51-C	1001	For side mounting telephone. Has push button switch, Coiled Kord.
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Supplies—Pole line hardware, poles, tools, etc.—are shown in Section II of this catalog.
Piece Parts—Replacement parts for Kellogg equipment are shown in Section III of this catalog.

HEAD BANDS



Kellogg head bands are manufactured in two types, a flat steel type band with a leather cover and a round wire type with or without a fabric cover. These head bands are supplied less receivers. If receiver is desired receiver code number must be specified when ordering. For receivers used with these head bands see Receivers.

FLAT STEEL TYPE—HINGED RECEIVER

Code No.	Construction	Receivers Required	Code No. Receiver
2	Spring steel, leather cover	1	Nos. 14-46 or 80

ROUND WIRE TYPE—SWIVEL WITH YOKE

12	Round wire, no cover	1	No. 65-A
14	Round wire, no cover	1	Nos. R-14, 85, or 87
15	Round wire, fabric cover	2	Nos. R-14, 85, or 87

HEAD AND CHEST SETS, OPERATOR'S



Kellogg operator's head and chest sets use the same transmitter, receiver, and headband on each of the codes listed below. These sets differ, however, in the cord and plug used on the various codes. For detailed information on the component parts of these sets see the listings under the components elsewhere in this section.

COMMON BATTERY

Code No.	Transmitter	Receiver	Head Band	Cord	Plug
1-C	178-C	87-A	14	743-0	139
2-C	178-C	87-A	14	713-0	182
3-C	178-C	87-A	14	711-0	145

LOCAL BATTERY

Code No.	Transmitter	Receiver	Head Band	Cord	Op'r's Plug
1-L	178-L	87-A	14	743-0	139
2-L	178-L	87-A	14	713-0	182
3-L	178-L	87-A	14	711-0	145

**HOOK SWITCH STOP
(BATTERY SAVER)**



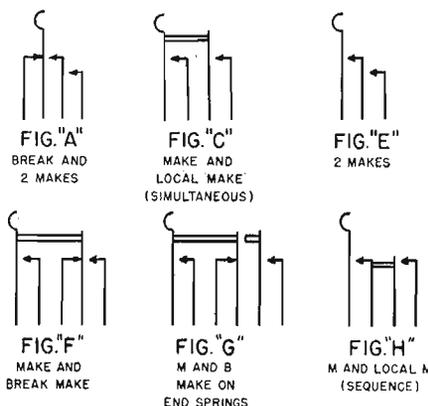
The Kellogg No. 1 hook switch stop is a battery saver lever for use on magneto party lines. The lever stops the receiver hook after it has closed the receiver contact, but before the battery contact has been closed. This permits a check on the line to see if it is busy without putting any drain on the batteries. Pressing the lever re-

leases the receiver contact and closes the battery contact to permit conversation.

HOOK SWITCHES

Kellogg hook switches are sturdy and compact. They are divided into two main classes; for regular hand receivers and for handsets. Each of these two classes is available with different mounting details. The following charts are made up in accordance with the mounting details and lever type. Order standard hook switches by code number.

Spring combinations for hook switches are shown in the drawing below. These drawings are referred to in the listings for each hook switch by the letter assigned to the schematic spring combination drawing.



HAND RECEIVER TYPES

No. 47—Side Mounting Lug Type

The No. 47 hook switch is used on No. 1016 test set and for No. 14-A receivers. It has solder type terminals. Contact spring arrangement is one break and two makes as shown in Figure "A" above. The switch hook consists of one P-64656 and one P-5935. This hook switch is of the side mounting lug type with short lever.

Wall Side Mounting Type—With Escutcheon



These hook switches are of the wall side mounting type, with escutcheon, and short lever. They are for wood sets. All these hook switches have solder type terminals.

Code No.	Hook Pc. No.	Spring Contacts	Receiver Type	Used On
99	P-46811	A	No. F-41-A	No. F-2869 telephone
103	P-46811	E	No. 41-A	Standard for local battery wood type telephones
109	P-31011	E	No. 80 Rec. No. 2 Head Band	No. F-2870 and F-2945 telephones
129	P-46811	H	No. F-41-A	No. 4800 type telephone
156	P-46811	E	No. F-41-A	No. 4885 telephone
163	P-46811	C	No. F-41-A	No. 6886 telephone

Wall Side Mounting Type—Less Escutcheon

These hook switches are of the wall side mounting type, furnished less escutcheons. They have the short lever type switch hook.

Code No.	Hook Pc. No.	Spring Contacts	Receiver Type	Used On
159	P-27871	E	No. 81-A	Nos. 4883 and 4888 telephones
178	P-46811	F	No. 41-A	No. 4901-A telephone

HOOK SWITCHES
HAND RECEIVER TYPES (Cont'd)
Wall Back Mounting Type

These hook switches are of the wall back mounting type and are furnished without escutcheon. They have an extra wall bracket and are for steel sets.

Code No.	Hook Pc. No.	Spring Contacts	Receiver Type	Used On
113*	P-46811	E	No. 41-A	Common battery hotel sets
145*	P-46811	C	No. 41-A	No. F-803 type telephone
171†	P-46811	F	No. 41-A	No. F-817 type telephone

*Solder type terminals.

†Two screw type terminals and three terminals with flexible leads (soldered).

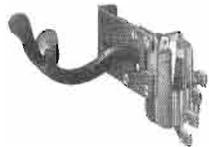
HANDSET TYPE

Wall Side Mounting Type—With Escutcheon

These hook switches are of the wall side mounting type, furnished with escutcheon and short lever for wood sets. These hook switches have screw type terminals.

Code No.	Hook Pc. No.	Spring Contacts	Used On
155	P-56280	C	No. 3800 type obsolete sets
165	P-56280	C	No. 5800 type local battery telephones

Wall Back Mounting Type



This hook switch is of the wall side mounting type, furnished less escutcheon and with extra wall bracket. It is for the No. 9817 telephone. It has switch hook No. P-56280, spring combination "F," and equipped with two screw type terminals and three terminals with flexible leads (soldered). Code No. 157.

Wall Side Mounting Type—Less Escutcheon



These hook switches are of the wall side mounting type and are furnished less escutcheons. They are of the short lever type. All are equipped with switch hook piece No. P-56280.

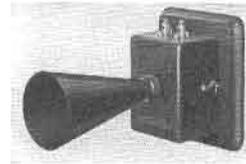
No. Code	Spring Contacts	Used On	Description
154	C	No. F-9700 Extension telephone	Replaces No. 98 hook switch. Has screw type terminals.
158	F	No. 9710 Extension telephone	Has two screw type terminals and three terminals with flexible leads (soldered).
164	F	Nos. 9720, 9735, 9736, 9740, 9741 telephones	Solder type terminals.
168	C	No. 9837 telephone	Same as No. 154 except terminals designation. Screw type terminals.
169	C	No. 9830 telephone	Solder type terminals.
170	F	Nos. 4900 and 4902 telephones	With spec. wires P-60077, 60078, and 60079 soldered to terminals.
174	G	No. 9721 telephone	Solder type terminals.
179	F	Nos. 9750 and 9751 telephones	Same as No. 164 but has screw terminals on outside spring.

HOWLERS

No. 2-B—Exchange Type

The No. 2-B howler is used in the exchange to signal subscribers who have left receivers off the hook by causing the receiver to howl. Consists of one No. 24 condenser, one No. 35-A induction coil, one No. 226 condenser, four No. 11 binding posts, one No. 4-J resistance coil mounted on one P-64779 wood base measuring 8½ by 6⅛ inches.

No. 5-A—Signalling Type



The No. 5-A howler is used with composite telephone lines for signalling purposes. Consists of a heavy adjustable unit, wound to 1700 ohms and mounted in an oak cabinet. Dimensions of base 5⅞ by 6 inches. Overall length, including horn, 9 inches.

INTER-COMMUNICATION SYSTEMS

Kellogg inter-communication systems are available in two types, non-attendant and attendant types.

NON-ATTENDANT, Key-BX systems are for use where the primary consideration is a maximum number of trunks to the telephone company main exchange, and one or two inter-communication circuits between individuals are incidental to the system. In this system each individual is his own attendant, and each individual in the system may answer, hold, and transfer all incoming trunk calls.

ATTENDANT type systems are for use where the primary consideration is maximum inter-communication between individuals within an organization and where one or more trunks to the telephone company main exchange are incidental to the system. In this system one individual at a centrally located attendant station is required to answer, hold, and transfer all incoming trunk calls.

NON-ATTENDANT, KEY-BX SYSTEMS

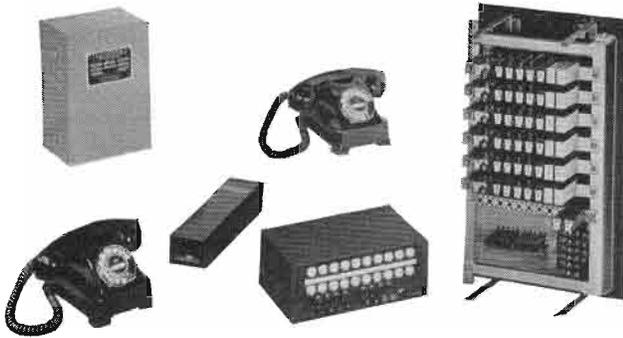
Kellogg non-attendant type inter-communication systems provide up to 20 stations and as many as 6 trunk circuits and one or two inter-communication circuits. This system is designed to provide business establishments with a specialized telephone system within the organization.

This system eliminates the necessity of floor type or cordless PBX switchboards requiring an attendant to handle outgoing, incoming, and inter-communication calls. No special attendant is required with the Key-BX system. Each individual is his own attendant and has access to all incoming and outgoing trunks, and can call any individual in the organization connected to the Key-BX system.

This equipment permits one to six trunks to a common battery manual or dial exchange; up to 20 telephone stations within the business office or building; and one or two inter-communication circuits for talking between individuals, or for conference calls between several individuals.

INTER-COMMUNICATION SYSTEMS (Cont'd)

NON ATTENDANT, KEY-BX SYSTEMS (Cont'd)



Operating Features of the Key-BX System

TRUNKS

1. Associated with each trunk is an individual push button type answer key. Trunk keys are numbered for designation purposes.
2. The trunk lamp associated with each trunk is a "line" lamp while flashing and a "busy" lamp when burning steadily.
3. A cam type hold key is provided which is arranged to hold any trunk call that has been answered.
4. For receiving incoming trunk signals an audible signal (chime or extension bell) can be furnished. This signal can be installed individual to each trunk or common to all trunks.
5. All trunk circuits multiple through all key boxes in the system.
6. Any station in the system can answer, hold, and transfer a trunk call.
7. Conference connections may be arranged by any station calling any other station and requesting them to connect with any trunk circuit which is to be used for the conference.

INTER-COMMUNICATION

1. Associated with each inter-communication circuit is an individual push button type answer key. Each key is numbered for designation purposes.
2. The inter-communication lamp is a "busy" lamp only. When the inter-communication circuit is in use this lamp burns steadily. It does not "flash" as does the trunk lamp.
3. All inter-communication circuits multiple through all key boxes in the system.
4. Conference connections may be arranged between lines by requesting each station to connect with any inter-communication circuit which is to be used for the conference.
5. A buzzer is provided in the key box for receiving incoming signals from other lines in the system.

LINES

1. Any telephone with a standard talking circuit may be used at each station.
2. Push button keys are furnished which provide selective ringing for all stations.
3. All line circuits multiple through all key boxes in the system.

Equipment for Key-BX Systems

Four types of Key-BX systems are available, differing in the total number of stations and the arrangement of the trunks and inter-communication circuits. These systems are listed below:

1. The 6-2-20 system: provides 6 trunks to a common battery manual or dial exchange, 2 inter-communication circuits and 20 stations.
2. The 6-2-10 system: provides 6 trunks to a common battery manual or dial exchange, 2 inter-communication circuits and 10 stations. Can be expanded to 20 station type.
3. The 3-1-10 system provides 3 trunks to a common battery manual or dial exchange, 1 inter-communication circuit, and 10 stations.
4. The 2-2-10 system: provides 2 trunks to a common battery manual or dial exchange, 2 inter-communication circuits, and 10 stations.

Key Boxes For the 6-2-10 system the No. 18M key box is required. For the 6-2-20 system the No. 19M key box. For the 3-1-10 system the No. 20M box. For the 2-2-10 system the No. 22M key box. Standard cabinet is metal having a black wrinkle finish. For special applications a wood cabinet can be provided. Standard wood finish is mahogany. Other, special, wood finishes can be furnished on request.

Relay Equipment Cabinet Two relay cabinets are used with these systems, the No. 25-A and 25-B. For the 6-2-10 and 6-2-20 systems the No. 25-A cabinet is required, wired for 6 trunks and 2 inter-communication circuits. For the 3-1-10 and 2-2-10 systems the No. 25-B relay cabinet is required, wired for 3 trunks and 2 inter-communication circuits.

Power Equipment The No. RFR-1027 Raytheon Rectifier can be furnished to supply the 24 volt, 0.5 ampere D.C. and A.C. power requirements of the Key-BX system from commercial power sources.

Cable For the 6-2-10 system Kellogg No. 147-L lead covered switchboard cable can be furnished. Kellogg No. 168-L, 32 pair lead covered switchboard cable can be furnished for all stations of the 6-2-20 system. For the 3-1-10 and the 2-2-10 system Kellogg No. 144-L, 16 pair lead covered cable can be furnished.

Junction Boxes Key-BX system requires No. 490-5426 junction boxes.

Audible Tone Signals An extension bell or a chime can be provided for mounting in a central location in the office or room in which the Key-BX system is in operation to call attention to an incoming trunk flashing lamp signal. Either a No. F-605-DA extension bell common to all incoming trunks or one No. N-11, 24 volt, D.C. single tone chime common to all incoming trunks can be provided. These systems can be provided with an extension bell or chime for each individual trunk if desired.

Telephones Standard Kellogg No. 1000 series Masterphones may be used with the Key-BX system. The buzzer signal provided in each key box eliminates the need for a telephone with ringer and "less ringer" type instruments are shown below. When the main exchange is common battery dial one No. D-1000-LR desk type or one No. D-1100-LR wall type Masterphone is required for each key box in the system. For dial equipment if a dial with both digits and letters is desired "with No. 10-G dial" should be specified after the code number of each telephone. For manual service the No. 1000-LR desk or No. 1100-LR wall Masterphone can be furnished.

INTER-COMMUNICATION SYSTEMS (Cont'd)

NON-ATTENDANT, KEY-BX SYSTEMS (Cont'd)
Ordering Information

Determine your requirements for Kellogg non-attendant type, Key-BX, inter-communication systems from the following chart. Kellogg will quote prices and delivery of this equipment based upon your specific requirements.

KEY-BX BOXES	No. 18M	No. 19M	No. 20M	No. 22M
Trunks to Exchange	6	6	3	2
Inter-com. circuits	2	2	1	2
Stations	10	20	10	10
RELAY CABINETS	No. 25-A	No. 25-A	No. 25-B	No. 25-B
POWER EQUIPMENT	1 No. RFR-1027 Raytheon Rectifier			
CABLE Lead Covered	147-L 26 pr.	168-L 32 pr.	144-L 16 pr.	144-L 16 pr.
JUNCTION BOXES	No. 490-5426 Cook junction boxes			
AUDIBLE TONE SIGNALS Bell Box	1 No. F-605-DA common to all trunks			
Single Tone Chime	1 No. N-11 common to all trunks			
TELEPHONE INSTRUMENTS				
Desk, Manual, C.B.	No. 1000-LR			
Desk, Dial, C.B.	No. D-1000-LR			
Wall, Manual, C.B.	No. 1100-LR			
Wall, Dial, C.B.	No. D-1100-LR			

GENERAL ORDERING INFORMATION

1. Provide one Key-BX box for each equipped station in the Key-BX system.
2. Provide one relay cabinet for each installation. Specify the number of trunks and inter-communication circuits to be equipped.
3. Provide one Raytheon Rectifier for each installation.
4. Provide lead or plastic covered cable as required. Determine number of feet required for particular installation.
5. Provide junction boxes as required.
6. Provide bell box or single tone chime if desired.
7. Provide one manual desk or wall Masterphone, or one dial desk or wall Masterphone for each station in the system.

ATTENDANT TYPE SYSTEMS

Ultimate capacity of equipment in this system is either 11 or 23 stations. In the 11-station system one or two trunks can be provided to the main exchange, and in the 23-station system one to four trunks can be provided to the main exchange. Trunks to common battery manual or dial or magneto exchanges can be furnished.

Selective talking and selective ringing are standard features but special features to meet various local conditions can be provided.

Each local station in this system has only two pieces of equipment, a telephone and a key box. The key box contains a buzzer and connecting rack for terminating the cord or wires from the telephone.

Operation of Attendant-Type Systems

The number of conversations that can be carried on at any one time with this system is limited only by the number of pairs of telephones. The number of local inter-communication stations is limited only by the ultimate capacity of the key boxes. No idle equipment is required as stations can be added from time to time when needed.

Inter-Office Calls Between Stations. To make a call from one inter-communication station to another the calling party removes the receiver, presses the key button corresponding to the station desired and then presses the ringing key. This oper-

ATTENDANT TYPE SYSTEMS (Cont'd)



ates the buzzer at the called subscriber's telephone and is answered by removing the receiver in the usual manner and pressing the "home station" button. Upon completing the conversation each subscriber hangs up his receiver, restoring both telephones to normal condition.

Trunk Calls. An outgoing trunk call is made by removing the receiver in the usual way and pressing the key button associated with one of the trunk circuits. This connects the calling party direct to the main exchange. No intermediary attendant is necessary to complete connections between inter-communication stations and the main exchange.

To answer an incoming call the attendant removes the receiver, asks for the name of the party being called, and then presses the button associated with that particular station. The party being called answers the attendant in the usual way by removing the receiver and pressing the "home station" key. When informed that an incoming call is waiting on a certain trunk the called party immediately presses that trunk button. The connection is then completed and the attendant is freed for further supervision. Upon completing the conversation the called party hangs up his receiver which releases the trunk. The operator at the main exchange takes down the connection which restores the trunk circuit to its normal condition.

Attendant-type inter-communication systems are of three types:

1. With trunks to common battery manual exchanges.
2. With trunks to common battery dial exchanges.
3. With trunks to magneto exchanges.

The equipment required for a complete installation of any of these systems is given in the chart below.

Ordering Information

Determine your requirements for Kellogg attendant type inter-communication systems from the ordering chart shown on page 48. Kellogg will quote prices and delivery of this equipment based upon your specific requirements.

ORDERING CHART FOR ATTENDANT TYPE INTER-COMMUNICATION SYSTEMS

	Trunks to Common Battery Manual Exchange		Trunks to Common Battery Dial Exchange		Trunks to Magneto Exchange	
	For 11-Station Systems	For 23-Station Systems	For 11-Station Systems	For 23-Station Systems	For 11-Station Systems	For 23-Station Systems
KEY BOXES	No. 11B for each station	No. 23B for each station	No. 11B for each station	No. 23B for each station	No. 11B for each station	No. 23B for each station
POWER	Provide 12 volts of dry cells or one No. 1026 Rectifier Battery Eliminator					
CABLE	No. 148-L as required	No. 147-L as required	No. 148-L as required	No. 147-L as required	No. 148-L as required	No. 147-L as required
JUNCTION BOXES	Provide No. 490-5313 boxes for 11-station systems and No. 490-5326 boxes for 23-station systems as required.					
EXTENSION BELL	Provide one No. F-605-BA incoming signal box for each incoming trunk.					
ATTENDANT STATION TELEPHONES	Provide one No. 1005-LR or one No. 1105-LR Masterphone		Provide one No. D-1007-LR or one No. D-1107-LR Masterphone		Provide one No. 1004-LR or one No. 1104-LR Masterphone	
ATTENDANT STATIONS	One No. 20	One No. 21	One No. 22	One No. 23	One No. 4 for one trunk or one No. 5 for two trunks.	
EXTENSION STATION TELEPHONES	No. 1004-LR, 1104-LR, or 9721 as required.		No. D-1004-LR or D-1104-LR as required.		No. 1004-LR, 1104-LR, or 9721 as required.	
RETARD COILS			For 11 Stations order 1 No. 487 Mounting and for 23 Stations order 2 No. 487 Mountings.		One No. 22-G retard coil for each equipped station	

JACKS, SPRING

The frames of Kellogg spring jacks are of heavy, rigid brass construction with phenol fibre insulation. German silver is used for the springs which are tempered to withstand long and hard usage. These jacks are designed to give a minimum of wear on the springs and on plugs which are used with them.

Jacks are listed below according to the number mounted on single mounting strips and then by the type of jack—two conductor and three conductor types.

In the listings below the number of conductor and local contacts is given. In the illustration shown here Figure A is of a standard spring jack with neither local nor conductor contacts. Figure B shows a three conductor jack with two conductor con-

tacts. All conductor contacts on Kellogg spring jacks are "break" contacts.

Figure C shows a three conductor jack with local contacts. In the listings below the type of local contacts on each jack, where they appear, is indicated by "1-M," "1-B," etc., indicating one make contact, one break contact, etc.

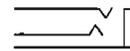


FIG. A



FIG. B

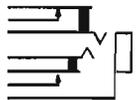
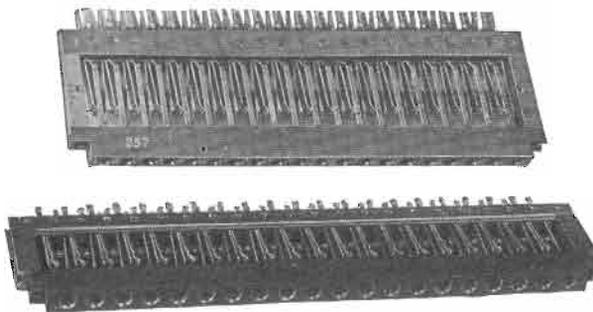


FIG. C

20 Per Strip on 1/2-inch Centers

THREE CONDUCTOR TYPE



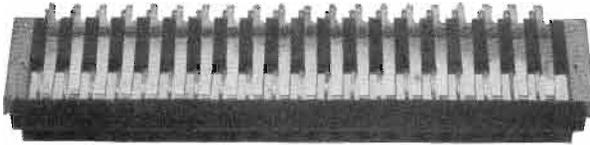
Code No.	Face Strip	Mtg. Pin Center	Used with Plugs	Cond. Contacts	Local Contacts	Description
146	10 1/4" x 1/2"	11-5/32"	# 152, 44 70, 109, 130	-	-	Lines up with # 25 Lamp Jack. (Jack Blanks 2-B or 2-D)
261	10 1/4" x 7/16"	11-5/32"	106	-	-	Lines up with # 25 Lamp Jack. (Jack Blanks 2-A or 2-C)
268	10 1/4" x 7/16"	11-5/32"	106	2	-	Lines up with # 25 Lamp Jack. (Jack Blanks 2-A or 2-C)
270	10 1/4" x 7/16"	11-5/32"	106	-	1-M	Lines up with # 25 Lamp Jack. (Jack Blanks 2-A or 2-C)

THREE CONDUCTOR TYPE (Cont'd)

Code No.	Face Strip	Mtg. Pin Center	Used with Plugs	Cond. Contacts	Local Contacts	Description
272	10 1/4" x 7/16"	11-5/32"	106	-	1-B	Lines up with # 25 Lamp Jack. (Jack Blanks 2-A or 2-C)
258	10 1/4" x 7/16"	11-5/32"	106	-	-	Lines up with # 25 Lamp Jack, Drilled for party line indicators. (Jack Blanks 2-A or 2-C)
239	7-21/32" x 3/8"	8-9/32"	201 & 141	-	-	Lines up with # 41 Lamp Jack. (Jack Blanks 4-A or 4-B)
257	7-21/32" x 3/8"	8-9/32"	201 & 141	-	-	Lines up with # 41 Lamp Jack. (Jack Blanks 4-A or 4-B)
367	7-21/32" x 3/8"	8-9/32"	201 & 141	-	-	Lines up with # 41 Lamp Jack. (Jack Blanks 4-A or 4-B) Drilled for party line indicators.
369	7-21/32" x 3/8"	8-9/32"	201 & 141	-	-	Lines up with # 41 Lamp Jack. (Jack Blanks 4-A or 4-B)
292	7-49/64" x 3/8"	8-41/64"	201 & 141	-	-	Lines up with # 35 Lamp Jack. Drilled for party line indicators. (Jack Blanks 4-A or 4-B)

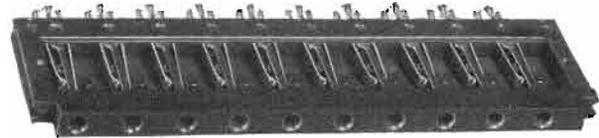
JACKS, SPRING

20 per Strip on 1/2-Inch Centers
TWO CONDUCTOR TYPE



Code No.	Face Strip	Mtg. Pin Center	Used with Plugs	Cond. Contacts	Local Contacts	Description
116	10 1/4" x 7/16"	11-5/32"	42, 55, 137, 112	-	-	Lines up with #36 Lamp Jack. (Jack Blank 2-A or 2-C)

10 Per Strip on 3/4-inch Centers
THREE CONDUCTOR TYPE



Code No.	Face Strip	Mtg. Pin Centers	Used with Plugs	Cond. Contacts	Local Contacts	Description
274	7-21/32" x 3/8"	8-9/32"	201	-	-	Lines up with #31 Lamp Jack. (Jack Blanks 4-A or 4-B)
253	7-21/32" x 3/8"	8-9/32"	201	-	-	Lines up with #31 Lamp Jack. Arranged for number plates. Otherwise same as No. 274. (Jack Blanks 4-A or 4-B)

10 per strip on 1-inch Centers
TWO CONDUCTOR TYPE

Code No.	Face Strip	Mtg. Pin Center	Used with Plugs	Cond. Contacts	Local Contacts	Description
195	10 1/4" x 7/16"	11-5/32"	42, 55 & 137	-	-	Lines up with #34 Lamp Jack. Slotted for number plate. (Jack Blanks 2-A or 2-C)

THREE CONDUCTOR TYPE



267	10 1/4" x 7/16"	11-5/32"	106	2	-	Lines up with #34 Lamp Jack. (Jack Blanks 2-A or 2-C)
269	10 1/4" x 7/16"	11-5/32"	106	-	1-M	Lines up with #34 Lamp Jack. (Jack Blanks 2-A or 2-C)
271	10 1/4" x 7/16"	11-5/32"	106	-	1-B	Lines up with #34 Lamp Jack. (Jack Blanks 2-A or 2-C)
273	10 1/4" x 7/16"	11-5/32"	106	-	-	Lines up with #34 Lamp Jack. (Jack Blanks 2-A or 2-C)
259	10 1/4" x 7/16"	11-5/32"	106	-	-	Lines up with #34 Lamp Jack. Slotted for number plates. (Jack Blanks 2-A or 2-C)
355	10 1/4" x 7/16"	11-5/32"	106	-	-	Lines up with #34 Lamp Jack. Drilled for party line indicators. (Jack Blanks 2-A or 2-C)
354	10 1/4" x 7/16"	11-5/32"	106	2	-	Lines up with #34 Lamp Jack. Drilled for party line indicators. (Jack Blanks 2-A or 2-C)
141	10 1/4" x 1/2"	11-5/32"	44, 70, 152, 109 & 130	-	-	Lines up with #34 Lamp Jack. (Jack Blanks 2-A or 2-D)
191	10 1/4" x 1/2"	11-5/32"	44, 70, 152, 109 & 130	-	1-M	Lines up with #34 Lamp Jack. (Jack Blanks 2-B or 2-D)

5 Per Strip on 2-inch Centers
THREE CONDUCTOR TYPE

Code No.	Face Strip	Mtg. Pin Centers	Used with Plugs	Cond. Contacts	Local Contacts	Description
296	10 1/4" x 7/16"	11-5/32"	106	2	-	Lines up with #37 Lamp Jack. (Jack Blanks 2-A or 2-C)
297	10 1/4" x 7/16"	11-5/32"	106	-	-	Lines up with #37 Lamp Jack. (Jack Blanks 2-A or 2-C)
318	10 1/4" x 7/16"	11-5/32"	106	-	1-M	Lines up with #37 Lamp Jack. (Jack Blanks 2-A or 2-C)

Individual Type Spring Jacks
TWO CONDUCTOR TYPE



TYPES 85 AND 277

Code No.	Mtg. Centers	Cond. Contacts	Used with Plugs	Description
85	5/8"	-	42-55-137	Mts. on 31/64" panel
277	5/8"	-	42-55-137	Mts. on 31/64" panel
298	5/8"	2	70, 109, 152, 42, 55, 56, & 112	Fits #70, 109 and 152 plugs on 7/16" panel. Fits 42, 55, 56 and 112 plug on 11/32" panel

JACKS, SPRING

Individual Type Spring Jacks
TWO CONDUCTOR (Cont'd)



TYPE 319

Code No.	Mtg. Centers	Cond. Contacts	Used with Plugs	Description
319	5/8"	1	42, 55, 137, 56, 112, 70, & 152	Fits 42-55-137 plugs on 9/32" panel. Fits 56 & 112 plugs on 11/32" panel. Fits 70 & 152 plugs on 7/16" panel
360	5/8"	-	70, 109, 152	Mts. on 9/16" panel
363	5/8"	2	130, 247, 236	Mts. on 9/16" panel for U. S. Signal Corps (Fire Control). Equivalent to W. E. Co. Jack #220-A
364	5/8"	1	236	Mts. on #603-604 Mtg. Strip. Equivalent to W. E. Co. 218-A Jack when on 5/8" centers. Also fits W. E. Co. 241-A twin plug



TYPE 366

366	5/8"	-	247	Interchangeable with W. E. Co. 237-A Jack & W. E. #47 Plug
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THREE CONDUCTOR

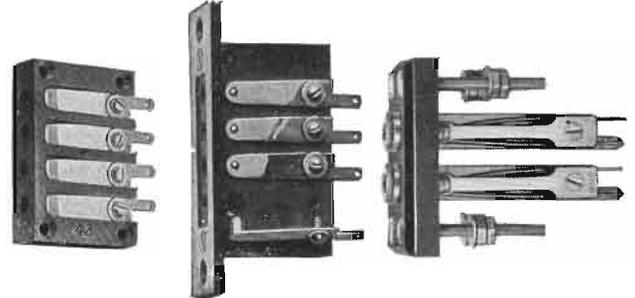


Code No.	Mtg. Centers	Cond. Contacts	Local Contacts	Used with Plugs	Description
260	5/8"	-	-	106	Test Jack. Mounts on 9/16" panel
286	5/8"	-	1 B & M	106-233	Fits Kellogg #106 plug on 1/2" panel. Fits Kellogg #233 plug or W. E. Co. #110 plug on 3/8" panel. Has local Break & Make Contact
356	5/8"	1	-	106	For 23/64" panel. Mounts on #455 mtg.
361	5/8"	2	-	70-152-230	Mounts on 9/16" panel

Operators' Type Spring Jacks
TWO CONDUCTOR

Code No.	Face Dimensions	Used with Plug	Local Contacts	Description
24	1 7/8" diam.	107	1M	Mounts from rear of jack with machine screws. Has nickel plated finish

Operator's Type Spring Jacks
FOUR CONDUCTOR

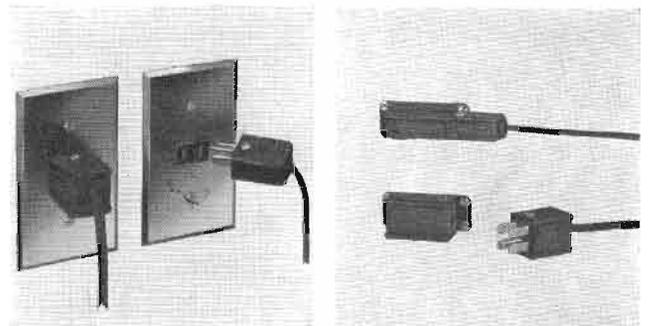


Code No.	Face Dimensions	Used with Plugs	Description
43	2" dia.	#25	For use with Operators Breast Plate Transmitter Hard Rubber frame. Mounts on 7/16" centers.
325-A	1-13/16" x 15/32"	#145	Black fibre frame on 7/16" centers. Includes #252 mtg.
310	2-11/32" x 1 1/4"	#182	Consists of two #260 Spring Jacks mounted on hard rubber mtg.

Dummy Spring Jacks
20 PER STRIP

Code No.	Face of Strip	Mtg. Pin Centers	Terminal Centers	Description
345	7-21/32" x 7/16"	8-9/32"	3/8"	Has Bakelite face
346	10 1/4" x 1/2"	11-5/32"	1/2"	Has Bakelite face

WALL OUTLET JACKS



FLUSH MOUNTING TYPE

SURFACE MOUNTING TYPE

TWO CONDUCTOR TYPE

Code No.	Face of Strip	No. of Conductors	Used with Plugs	Description
402	2 3/4" x 4 1/2"	2	302	Flush mounting type
412	1 1/4" x 1"	2	302	Surface mounting type

FOUR CONDUCTOR TYPE

404	2 3/4" x 4 1/2"	4	304	Flush mounting type
414	1 1/4" x 1"	4	304	Surface mounting type

JACKS, LAMP

LAMP JACKS ARE SHOWN ON THE NEXT PAGE

JACKS, LAMP

INDIVIDUAL TYPE



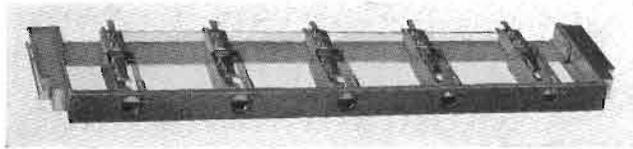
INDIVIDUAL TYPE 49

INDIVIDUAL TYPE 39

Kellogg lamp jacks are designed so that the standard switch-board lamp is securely held in the proper position to furnish the maximum amount of useful illumination. The frame of the No. 39 lamp jack is made of steel with a cadmium plate finish. The No. 49 lamp jack is made of seamless brass tubing with a nickel plate finish.

Code No.	Mounting Centers	Mounting Panel Thickness	Used With Lamp Cap
39	3/8 inches	7/8 inches	
49	9/16 inches	to 3/8 inches	No. 154

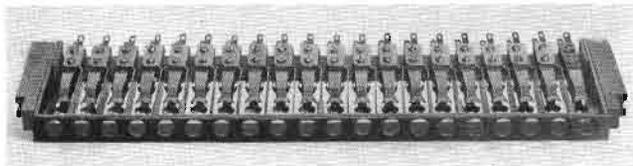
STRIP TYPE



STRIP TYPE 37

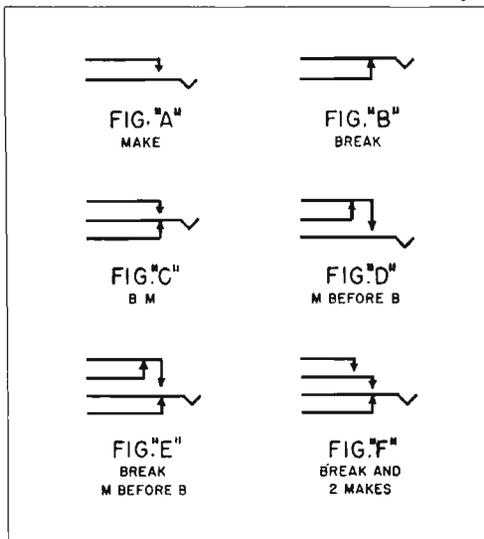
The strip type lamp jacks have a heavy brass frame. The brass face strip is finished with a chip resistant black enamel. A brass partition strip is used on all strip type lamp jacks to prevent leakage of light to the adjacent lamp caps.

Code No.	Jacks Per Strip	Mounting Centers	Strip Size (inches)	Mtg. Pin Centers	Used With Lamp Cap	Used With Spring Jack
37	5	2 in.	10 1/4 x 1/2	11-5/32	#154	296-297-318
31	10	3/4 in.	7-21/32 x 1/2	8-9/32	#154	253
34	10	1 in.	10 1/4 x 1/2	11-5/32	#154	290
25	20	1/2 in.	10 1/4 x 1/2	11-5/32	#154	146-258
41	20	3/8 in.	7-21/32 x 7/16	8-9/32	#79	239



STRIP TYPE 25

KEYS, 1000 TYPE CAM



Kellogg cam keys are constructed with a frame of an extruded section of brass forming a perfect "T." The contact springs are of nickel silver with precious metal contacts. The insulators are of the best grade of phenolic obtainable—a grade specially selected for its mechanical and electrical properties under all conditions. Kellogg cam keys are available in the following five types: 1) single locking; 2) single restoring; 3) locking and restoring; 4) double locking; and 5) double restoring.

A chart of the basic contact forms available is listed below. A large variety of spring combinations is available for each of the types of keys listed above. For any special applications or combinations not listed consult the Kellogg sales department.

In the following charts the various spring combinations are designated as being on the "head side" or "nut side" of the key. For reference purposes only this locates the spring combination with respect to the heads of the screw holding the spring stackups or to the opposite or "nut side" of the screws.

For tools used with 1000 type cam keys see tools Nos. 16, 4, 67 and 68 listed under "Tools" in this section. Unless specified when ordering cam keys, escutcheons are not furnished. Code numbers of both the keys and the desired escutcheon must be specified.

Single Locking Type

Dummy restoring springs are on Nut Side of all single locking keys.

Code No.	A	Spring Combination (Head Side)		D
		B	C	
1001	2	-	-	-
1003	-	4	-	-
1004	2	2	-	-
1005*	2	-	-	-
1014	-	-	-	2
1017	3	1	-	-
1028	-	-	2	-
1034	-	-	4	-
1035	1	-	2	-

Code No.	A	Spring Combination (Head Side)		
		B	C	D
1042	3	-	-	-
1069	1	1	2	-
1070	4	-	-	-
1072	4	-	-	-
1083	-	1	2	-
1102	-	-	3	-
1127*	-	2	-	-
1163	3	2	-	-
1170	-	2	4	-
1148	2	-	-	2
1191	2	1	-	2

*Meteor metal contacts.

**KEYS, 1000 TYPE CAM
Single Restoring Type**

The single restoring type 1000 type cam key has dummy restoring springs on the head side.

Code No.	Spring Combinations (Nut Side)		
	A	B	C
1008	-	2	2
1033	-	-	2
1068	-	-	4

Locking and Restoring Type

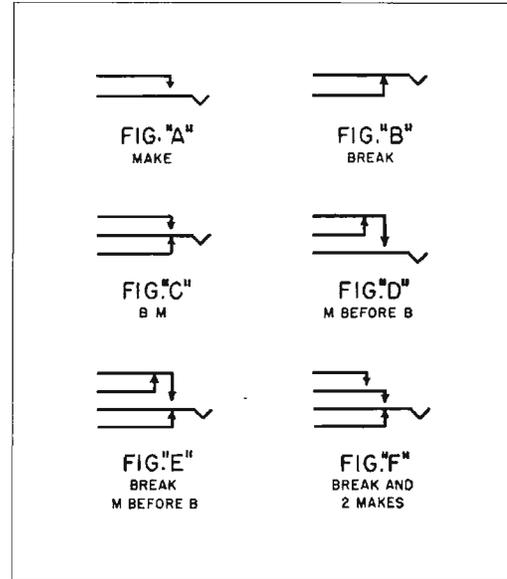
Code No.	Spring Combinations							
	Head Side (Locking)				Nut Side (Restoring)			
	A	B	C	D	A	B	C	D
1016	-	-	4	-	-	-	2	-
1021	3	-	-	-	-	-	1	1
1023	4	-	-	-	-	-	2	-
1024	1	-	2	-	1	-	2	-
1026	2	-	-	2	-	-	2	-
1027	-	-	-	2	-	-	2	-
1029	-	-	2	-	-	-	2	-
1032	1	-	2	-	-	-	2	-
1041	2	-	-	-	-	-	2	-
1043	3	-	-	-	-	-	2	-
1188	3	2	-	-	3	-	2	-
1190	-	-	2	-	-	-	1	1
1196	3	1	-	2	-	-	2	-
1197	2	-	2	-	2	-	2	-

Double Locking Type

Code No.	Spring Combinations							
	Head Side (Locking)				Nut Side (Locking)			
	A	B	C	D	A	B	C	D
1002	2	-	-	-	2	-	-	-
1010	-	2	2	-	2	-	2	-
1011	4	-	-	-	4	-	-	-
1013	-	-	4	-	-	-	4	-
1019*	-	-	2	-	-	-	2	-
1020*	2	-	-	-	2	-	-	-
1030	-	-	2	-	-	-	2	-
1036	-	-	2	-	1	-	2	-
1037	2	1	-	-	-	-	2	-
1039	-	-	-	2	-	-	-	2
1049	1	-	2	-	1	-	2	-
1051	3	1	-	-	3	1	-	-
1052	2	-	-	2	3	1	-	-
1059	-	2	-	-	-	2	-	-
1067	1	1	2	-	1	1	2	-
1074	1	-	-	2	1	-	-	2
1082	2	2	2	-	2	2	-	-
1097	3	-	-	-	2	-	-	-
1098	3	-	-	-	3	-	-	-
1105	-	-	2	2	-	-	2	-
1113	2	1	-	-	3	-	-	-
1128	2	-	-	2	-	2	2	-
1186	4	-	-	-	-	-	2	-
1187	4	-	2	-	4	-	2	-
1193	4	-	-	-	8	-	-	-

*Meteor metal contacts.

KEYS, 1000 TYPE CAM (Cont'd)



Double Restoring Type

Code No.	Spring Combinations					
	Head Side (Restoring)			Nut Side (Restoring)		
	A	B	C	A	B	C
1031	-	-	2	-	-	2
1050	1	-	2	1	-	2
1056	2	-	2	-	-	2
1064*	-	-	2	-	-	2
1124	2	-	-	2	-	-
1189	3	2	-	3	-	2
1192	2	-	2	2	-	2

*Has special indicating cam handle.

**KEYS, 1000 TYPE CAM
For Releasing Party Keys**

Two party releasing keys, both locking and restoring and single restoring types are listed under "A" type cam keys for four party keys.

**KEYS, TO RELEASE FOUR PARTY "A" TYPE
Locking and Restoring Type**

Code No.	Spring Combinations						
	Head Side (Locking)			Nut Side (Restoring)			
	A	B	C	A	B	C	
1045-A	3	-	-	-	-	-	Dummy Springs
1053-A	2	2	-	-	-	-	Dummy Springs
1062-A	2	-	2	-	-	-	Dummy Springs
1125-A	2	2	-	-	-	2	
1162-A	3	2	-	-	-	-	Dummy Springs

NOTE: Operation of springs on Restoring Side of key releases operated four party key.

Single Restoring Type

Code No.	Spring Combinations						
	Head Side			Nut Side (Restoring)			
	A	B	C	A	B	C	
1000-A	-	-	-	-	-	-	Dummy Springs
1015-A	-	-	-	-	-	-	Dummy Springs

NOTE: Operation of springs on Restoring Side of key releases operated four party key.

RELEASE KEYS FOR OLD STYLE FOUR PARTY KEYS

For use with four party keys Nos. 265, 267, and 355. Each key has two extra dead terminals on end springs.

Locking and Restoring Type

Code No.	Spring Combinations			Spring Combinations		
	Head Side (Locking)			Nut Side (Restoring)		
	A	B	C	A	B	C
1044	2	-	-	-	-	2
1045	3	-	-	Dummy Springs		
1053	2	2	-	Dummy Springs		
1062	2	-	2	Dummy Springs		

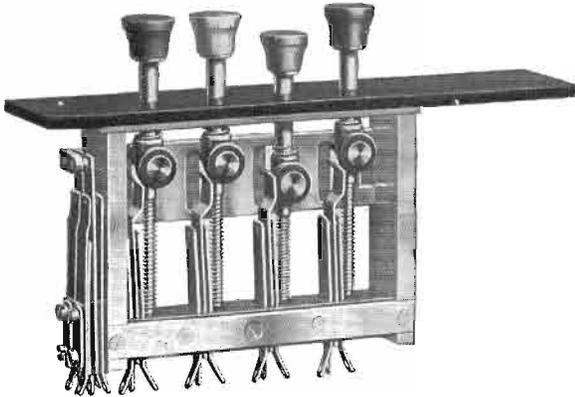
NOTE: Operation of springs on Restoring Side of key releases operated four party key.

Single Restoring Type

This key has dummy springs on both head side and nut side (restoring). Restoring side of key releases operated four party key.

Code No.	Description
1000	Single Restoring Type Four Party Key

KEYS, FOUR PARTY



Kellogg four party ringing keys are designed to insure positive action. Each key will remain in operated or locked position until restored by either the cam key or by operation of one of the other buttons.

The frames are constructed of heavy brass with a nickel plate finish. The contact springs are of Nickel Silver with contacts of precious metal. Insulating materials are of a grade specially selected for mechanical and electrical properties.

A chart of the basic spring combinations used on Kellogg keys is shown on page 52. Four party keys are available with "C" type spring combinations only. Other combinations shown are for the No. 1000 type cam keys used for restoring four party keys.

Escutcheons are not supplied with the key. In ordering it is necessary to specify the code number of the four party key, the cam key, and the escutcheon on which they are to be mounted in order to obtain a complete unit.

The two party keys listed below are of the same sturdy construction as the four party keys and are like the four party keys except they are equipped only with two keys.

For tools used on either four or two party keys see tools Nos. 33, 34, 4, 67, and 68 under Tools in this section.

For Release by "A" Type Cam Keys

LOCKING TYPE

Code No.	Sprg. Comb. (Each Key)	End Sprg. Comb.
355-A*	2-C	2-C
265-A*	1-C	2-C
267-A	1-C	--

*Two extra dead terminals on end springs.

KEYS, FOUR PARTY (Cont'd)

With Old Style Release Strip

LOCKING TYPE

Code No.	Sprg. Comb. (Each Key)	End Sprg. Comb.
265*	1-C	2-C
267	1-C	--
355*	2-C	2-C

*Two extra dead terminals on end springs.

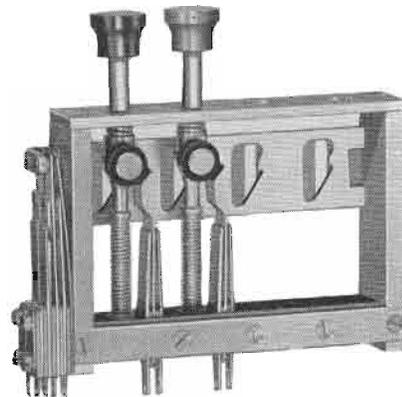
Not Released by Cam Key

LOCKING TYPE

Code No.	Sprg. Comb. (Each Key)	End Sprg. Comb.
266*	1-C	2-C
310*	1-C	--

*Two extra dead terminals on end springs.

KEYS, TWO PARTY



For Release by "A" Type Cam Keys

LOCKING TYPE

Code No.	Sprg. Comb. (Each Key)	End Spring Combination
358-A	1-C	2-C

NOTE: Used with any of cam keys listed with "A" type four party keys. Mounts on Nos. 1050 and 1111 escutcheons.

Not Released by Cam Key

LOCKING TYPE

Code No.	Sprg. Comb. (Each Key)	End Spring Combination
328	1-C	2-C

NOTE: Mounts on No. 1064 escutcheon.

KEYS, PUSH BUTTON



TYPICAL PUSH BUTTON KEY

Kellogg push button keys are available in either individual or strip types.

Tools used on push button keys are Nos. 4, 67, and 68 switchboard tools shown under "Tools" in this section.

High Button Type

RESTORING ACTION

Code No.	Sprg. Combination	Mounting Thickness
254	2C	3/4 in.
302	2C	7/8 in.

**KEYS, PUSH BUTTON
High Button Type (Cont'd)**

LOCKING ACTION

These keys mount on wood on 5/8-inch centers.

Code No.	Spring Combination	Mounting Thickness
269	2A	7/8 in.
300*	2A	7/8 in.
167	2C	7/8 in.
255	2C	3/4 in.
303	4C	7/8 in.

*Meteor metal contacts.

LOCKING OR RESTORING

These keys mount on panels 1/16 to 3/32-inch thick on 5/8-inch mounting centers.

Code No.	Plunger Action	Spring Combination
403	Locking	2C
404	Restoring	2C
405	Locking	2A
407	Locking	4C
410	Locking	2B

Individual Type

LOW BUTTON, RESTORING ACTION

Code No.	Spring Combination	Mounting Thickness
5	2A	7/8 in.
367	2B	7/8 in.
296	3A	7/8 in.
66	1A and 2C	7/8 in.
24	2C	7/8 in.
172	2C	
400	2A	

NOTE: Nos. 2, 367, 296, 66, and 24 push button keys mount on wood 5/8-inch centers. The No. 172 mounts on wood or metal on 1-5/16-inch centers—a 1 1/4-inch diameter metal escutcheon is part of the key. The No. 400 key mounts on panels 1/16 to 3/32-inch thick on 5/8-inch mounting centers.

Strip Type

RESTORING ACTION—EIGHT KEYS PER STRIP

Code No.	Sprg. Comb. (Each Key)	Length Overall	Width Overall	Jack Mtg. Centers
301	3A	5 1/2 ins.	1/2 in.	1/2 in.
318	2A	5 1/2 ins.	1/2 in.	1/2 in.

LOCKING OR RESTORING TYPE

These key strips are similar to spring jacks in construction except equipped with plugs to provide the contact action. The Nos. 314 and 313 keys are mounted on a face strip 10 1/4 by 7/16 inches. The face strip is 10 1/4 by 1/2 inches on the Nos. 312 and 366 keys. All keys listed below have 11-5/32 inches mounting pin centers.

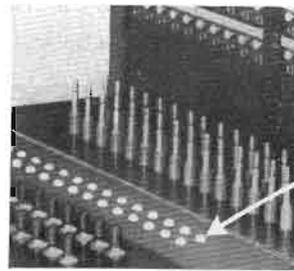
Code No.	Key Action	Keys Per Strip	Sprg. Comb. (Each Key)
314	Locking	10	1C
313	Locking	20	1C
312	Restoring	10	2A
366	Restoring	20	2A

KEY, TURN TYPE

This key mounts on panels 1/16 to 3/32-inch thick. Has locking action.

Code No.	Spring Combination	Min. Mounting Centers
411	2C	5/8 in.

LAMPS, SWITCHBOARD



Kellogg switchboard lamps fit standard lamp jacks in switchboards of all makes and are constructed to insure long life and superior performance. These lamps have tungsten filaments and are uniform in size, brilliance and current consumption.

Shown below is a listing of the lamp required for each type of switchboard and other operation.

FOR ANNUNCIATOR SYSTEMS

1. 24 volt systems—use lamp No. 1224-TA.
2. 48 volt systems—use lamp No. 2448-TA.

BALLAST LAMPS

1. 48 Relaymatic—use lamp No. 1224-TA.

BUSY LAMPS, SWITCHBOARD

1. 24 volt multiple switchboards—use lamp No. 2448-TD.
2. 48 volt multiple switchboards—use lamp No. 4896-TD.

CORD LAMPS, SWITCHBOARD

1. 24 volt multiple and non-multiple switchboards—use lamp No. 1632-TD.
2. 48 volt multiple switchboards—use lamp No. 2448-TD.

INDUSTRIAL APPLICATIONS

The Nos. 6-TA, 8-TA, 12-TA, and 30-TA lamps are used in all types of industrial applications.

LINE LAMPS, SWITCHBOARD

1. 24 volt multiple and non-multiple switchboards—use lamp No. 1632-TD.
2. 48 volt multiple switchboards—use lamp No. 2448-TD.

PILOT LAMPS, SWITCHBOARD

1. 24 volt multiple and non-multiple switchboards—use lamp No. 1632-TD.
2. 48 volt multiple switchboards—use lamp No. 2448-TD.

RESISTANCE LAMPS, RINGING

For ringing circuits—use lamp No. 110-A.

TRUNK LAMPS, SWITCHBOARD

1. 24 volt multiple and non-multiple switchboards—use lamp No. 1632-TD.
2. 48 volt multiple switchboards—use lamp No. 2448-TD.

Industrial and Special Purpose Lamps

Code No.	Voltage	Current Consumption		Approximate Cold Resistance (ohms)
		Min. Amps.	Max. Amps.	
6-TA	6	.110	.150	7
8-TA	8	.080	.100	11
12-TA	12	.085	.115	14
30-TA	30	.090	.110	35

For 24- and 48-volt Telephone Systems

Code No.	Voltage	Current Consumption		Approx. Cold Resis. (ohms)
		Min. Amps.	Max. Amps.	
1224-TA	12	.065	.075	24
1632-TD	16	.028	.036	70
	24	.035	.050	
2448-TD	24	.027	.037	110
	48	.040	.060	
2448-TA	24	.030	.040	85
	48	.042	.062	
4896-TD	48	.012	.025	350

MOUNTINGS

Mountings for all types of Kellogg equipment are shown in the charts below. The most commonly used mountings in each group are listed.

For special mountings or for mountings not listed below consult the Kellogg sales department for detailed information. In some instances mounting information is given with specifications furnished with an original installation. This applies to the relay mountings for Nos. 1700—1800, 3000, 7007, 7100, 7200, 7300, and 7400 type relays which are designed for various

MOUNTINGS FOR COMBINED DROPS AND JACKS
For Mounting Nos. 100, 300, or 500 Series Drops and Jacks

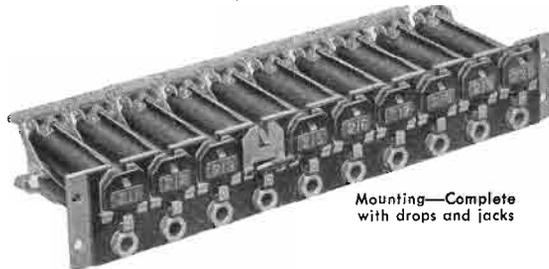
INDIVIDUAL TYPE, SCREW MOUNTED

Code No.	Width	Length Overall	Mtg. Centers	Length of Face	Description
552	1 3/4"	1 3/4"	1-7/16"	1 3/4"	Drilled for Code Night Alarm.

5 PER STRIP, SCREW MOUNTED

497	1 3/4"	6-9/16"	6 1/4"	5-55/64"	Replaces #257 Mtg.
499	1 3/4"	6-9/16"	6 1/4"	5-55/64"	Replaces #333 Mtg.
500	1 3/4"	6-23/32"	6 1/4"	5-55/64"	Replaces #395 Mtg. Same as #497 Mtg. except with adapters for W. E. Co. boards for flush mtg.

10 PER STRIP, SCREW MOUNTED



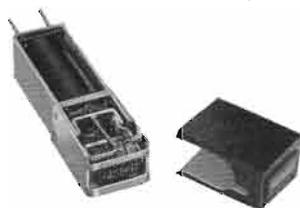
Mounting—Complete with drops and jacks

495	1 3/4"	10-31/32"	10-21/32"	10 1/4"	Replaces #329 Mtg.
502	1 3/4"	10-31/32"	10-21/32"	10 1/4"	Replaces #426 Mtg. Same as #495 except drilled for Code Night Alarm.

10 PER STRIP, LUG MOUNTED

498	1 7/8"	10 3/4"	11-5/32"	10 1/4"	Replaces #258 Mtg.
503	1 7/8"	10 3/4"	11-5/32"	10 1/4"	Replaces #482 Mtg. Same as #498 except drilled for Code Night Alarm.

METERS, MESSAGE REGISTER



mounted individually or in strips. The cover is of steel with a heavy black enamel finish. Over-all dimensions are 5-11/16 inches long, 1 1/2 inches wide, and 1 3/8 inches deep.

Kellogg message register meters are standard equipment in Kellogg Masterbuilt switchboards and have many special uses where consecutive numbering records are required. They can be

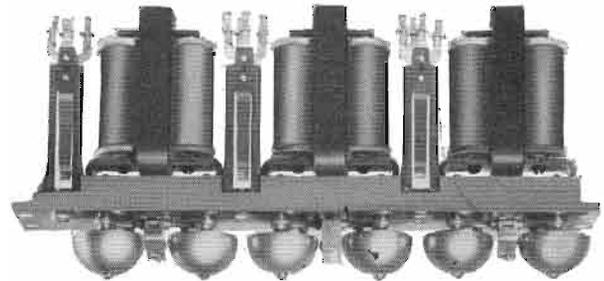
Relaymatic installations to meet a definite requirement. In such cases equipment drawings and specifications should be referred to in ordering additional or replacement equipment.

Mountings listed here are shown in the following order: 1) for combined drops and jacks; 2) for combined ringer and drop; 3) for condensers; 4) for drops; 5) for 1000 type keys; 6) for mechanical signals; 7) for message registers; 8) for operators jacks; 9) for retard coils; 10) for relays; and 11) for spring jacks.

These meters mount on Nos. 343, 380, 446, and 1023 mounting strips.

Code No.	Volts	Coil Resistance	Description
1-A	24	300 ohms	Replaces W. E. No. 5-A
1-B	48	500 ohms	Replaces W. E. No. 5-B

MOUNTINGS FOR COMBINED RINGER AND DROP
Three per Strip, Screw Mounted



Code No.	Mtg. Centers	Dim's of Face	Description
455	10-21/32"	10 3/8" x 1 3/4"	Provides mounting space for three #3 combined Ringers & Drops and three #319 Spring Jacks.

MOUNTINGS FOR CONDENSERS
16 per Strip, Screw Mounted

Code No.	Mtg. Spaces Per Strip	Drilled for Condensers	Description
335	16	Code No. 36	2 1/8" Mtg. Centers

18 per Strip, Screw Mounted

1500	18	Code No. 64	1-9/16" Mtg. Centers
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MOUNTINGS FOR DROPS



For No. 60 Drops, Drilled for Night Alarm Screw

SCREW MOUNTED				
Code No.	Mtg. Spaces Per Strip	Width	Length Overall	Mtg. Centers
508	5	1 1/4"	6-11/16"	6 1/4"
496	12	1 1/4"	13-7/16"	13"
LUG MOUNTED				
509	10	1 1/4"	10 1/4"	11-5/32"

MOUNTINGS

MOUNTINGS FOR DROPS (Cont'd)

For No. 70 Drops, Not Drilled for Night Alarm Screw
SCREW MOUNTED

Code No.	Mtg. Spaces per Strip	Width	Length Overall	Mtg. Centers
506	1	1"	1 1/2"	1 1/4"
504	5	1"	6-11/16"	6/4"
510	8	1"	10-31/32"	10-21/32"
494	10	1"	10-31/32"	10-21/32"
507	12	1"	13-7/16"	13"

LUG MOUNTED

505	10	1"	10 1/4"	11-5/32"
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MOUNTINGS FOR 1000 TYPE KEYS

5 PER STRIP, LUG MOUNTED

Code No.	Mounting Centers	Length of Face	Width	Keys Mounted
403	11-5/32 in.	10 1/4 in.	1 in.	Horizontal
454	11-5/32 in.	10 1/4 in.	1 1/2 in.	Vertical

6 PER STRIP, SCREW MOUNTED

435	10-21/32 in.	11-3/32 in.	1 3/4 in.	Vertical
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10 PER STRIP, LUG MOUNTED

400	11-5/32 in.	10 1/4 in.	1 1/2 in.	Vertical
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402	11-5/32 in.	10 1/4 in.	1 7/8 in.	Vertical
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453	11-5/32 in.	10 1/4 in.	1 1/4 in.	Vertical
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10 PER STRIP, SCREW MOUNTED

483	10-21/32 in.	11-3/32 in.	1 3/4 in.	Vertical
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MOUNTINGS FOR MECHANICAL SIGNALS

INDIVIDUAL TYPE, SCREW MOUNTED

Code No.	Drilled for Mech. Signal	Mtg. Centers	Length of Face	Width
472	Code #7-8	1-9/16 in.	1-15/16 in.	1 1/4 in.

5 PER STRIP, SCREW MOUNTED

450	Code #7-8	6 1/4 in.	5-55/64 in.	1 3/4 in.
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20 PER STRIP, LUG MOUNTED

200	Code #12	11-5/32 in.	10 1/4 in.	1 in.
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MOUNTINGS FOR MESSAGE REGISTER METERS

INDIVIDUAL TYPE, SCREW MOUNTED

Code No.	Mtg. Spaces Per Strip	Width	Length of Face	Mounting Centers	Length Overall	Description
380	1	1-3/16"	1 1/2"	2 5/8"	3 7/8"	Mounts Kellogg #1 Type or W. E. Co. #5 type meters. Wood mounting screws furnished.

(Meters shown on page 55)

15 PER STRIP, SCREW MOUNTED



1023	15	1 7/8"	26"	25 1/4"	26"	Mounts Kellogg #1 Type or W. E. Co. #5 type meters.
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MOUNTINGS FOR OPERATORS JACKS

INDIVIDUAL TYPE, SCREW MOUNTED

Code No.	Mtg. Spaces per Strip	Mtg. Screw Centers	Width	Length of Face	Description
452	1	2-15/16"	1-3/16"	3 1/2"	Mounts #325 Spring Jack

MOUNTINGS FOR RETARD COILS

INDIVIDUAL TYPE, SCREW MOUNTED

Code No.	Mtg. Spaces Per Strip	Length Overall	Mtg. Centers	Width	Description
319	1	1-3/16"	-	1-5/16"	Angle Mtg. Mts. 2 or 4 Term. Coils.

12 PER STRIP, SCREW MOUNTED

487	12	11"	10 1/4"	2 7/8"	6 Coils in A Row (2 Rows)
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MOUNTINGS FOR RELAYS

FOR NO. 10 TYPE RELAYS

Code No.	Mtg. Spaces Per Strip	Mtg. Centers	Length Overall	Width	Centers Spaced	Sketch Fig.	Description
357	26	22-13/16"	23 3/4"	3/4"	13/16"	"A"	
375	15	13-1/16"	13-13/16"	3/4"	13/16"	"A"	
376	20	17-15/16"	18-11/16"	3/4"	13/16"	"A"	Without overall can cover
377	30	25 1/4"	26"	3/4"	13/16"	"A"	
408	24	20 3/8"	21 1/8"	3/4"	13/16"	"A"	
473	20	17-15/16"	18-11/16"	3/4"	13/16"	"B"	

FOR NO. 72 TYPE RELAYS

279	20	25 1/4"	26"	3 3/4"	1-3/32"	2 Rows. 10 per Row	Vertical Spacing 4".
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FOR NO. 440 TYPE RELAYS

346	40	25 1/4"	26"	3 3/4"	1-3/32"	2 Rows. 20 per Row.	Vertical Spacing 4 1/2". Has Overall cover.
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STRIP TYPE MOUNTINGS



On all mountings except the 1008 one relay cover will be supplied for each equipped space (pr. of relays). Different types of covers are required for different relays. In ordering mounting strips, therefore, specify the code numbers of the relays which will be mounted so that the proper cover may be supplied. The No. 1008 has single over-all cover.

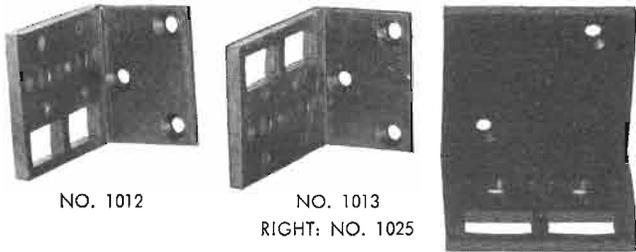
Code No.	No. of Prs. of Relays Mounted	Length Overall	Mtg. Centers	Vertical Spacing
1000	5	13-13/16"	13-1/16"	2"
1011	6	16 1/4"	15 1/2"	2"
1001	7	18-11/16"	17-15/16"	2"
1021	7	20 1/2"	19 3/4"	2"
1002	8	21 1/8"	20 3/8"	2"
1003	10	26"	25 1/4"	2"
1004	10	13-13/16"	13-1/16"	4"
1007	20	26"	25 1/4"	4"
1008	20	26"	25 1/4"	4 1/4"

MOUNTINGS FOR 7000 TYPE RELAYS

Mounts six 7000, 7001, 7002, 7003, 7004, 7005, or 7006 Relays.

Code No.	Overall Length	Mtg. Centers	Vertical Spacing	Width
806	2' 10-9/16"	2' 9-13/16"	2 1/4"	1 1/4"

MOUNTINGS FOR 2000 TYPE RELAYS



ANGLE MOUNTING

Code No.	No. of Pcs. of Relays Mounted	Overall Dim's. of Mtg. Face Height	Width	Description
1012	1	1 7/8"	2 5/8"	Mounts on right side of cab.
1013	1	1 7/8"	2 5/8"	Mounts on left side of cab.
1014	1	2-1/16"	2 5/8"	Mounts on roof of cabinet
1024	1	2-1/16"	2 5/8"	Mounts on floor of cabinet

MOUNTINGS FOR Nos. 1700, 1800, 3000, 7007, 7100, 7200, 7300, AND 7400 TYPE RELAYS

Mountings for these relays are designed for various Relay-matic installations to meet a definite requirement. Additional mountings, when needed, should be ordered the same as the original mountings, as listed in the switchboard specification.

Order for No. 1700 and 1800 type relays for special applications should include complete information regarding mounting space in order that the mountings may be designed to properly fit the allotted space.

MOUNTINGS FOR SPRING JACKS

EQUIVALENT TO W. E. CO. NOS. 184 AND 185

Code No.	Mtg. Spaces Per Strip	Drilled For Spring Jack	Width	Length of Face	Description
600	24	360-361	1 1/4"	6-15/16"	Equivalent of W.E. Co. #184 Jack Strip but mounts Kellogg Jack only. Used with plugs 70-152-230-240.
601	48	360-361	2 1/8"	6-15/16"	Equivalent of W.E. Co. #185 Jack Strip but mounts Kellogg Jack only. Used with plugs 70-152-230-240.

DUPLICATE OF W. E. CO. NOS. 184 AND 185

603	24	362-363	1 1/4"	6-15/16"	Duplicate of W.E. Co. #184 Jack Strip. Mounts either Kellogg or W. E. Co. Jacks. Used with Kellogg Plugs 247-130-236.
604	48	362-363	2 1/8"	6-15/16"	Duplicate of W.E. Co. #185 Jack Strip. Mounts either Kellogg or W. E. Co. Jacks. Used with Kellogg Plugs 247-130-236.

PINS, INDICATOR



Indicator pins are for use on multiple jacks to indicate the equipped stations of a party line. The pins are made of iron wire properly treated to prevent rust. The concave heads are filled with colored lacquer. Pins should be ordered by code number for the color desired.

Code No.	Color	Code No.	Color
5	Red	8	Blue
6	White	15	Yellow
7	Green		

PLATES, NUMBER

For Combined Drops and Jacks

NO. 10

These number plates are standard for numbering combined drops and jacks. They are carried in stock number from 0 to 999 and are made of nickel silver having a black lacquered finish. Over-all dimensions: 5/8 by 5/16" inch. In ordering specify the numbers desired.

Key and Plug Shelf Type

NO. 4

These number plates are used for numbering the different panels of each position or section of a switchboard. They are made of ivory 1/4 inch thick and 3/4 inch in diameter. The inscription is engraved and filled with black paint. Order by code number and specify characters desired.

NO. 5

These number plates are used for numbering each cord circuit. They are 3/8 inch in diameter and 1/8 inch thick. Made of polished ivory. The numerals are engraved and filled with black paint. Order by code number and specify characters desired.

Spring Jack Type

NO. 2



This number plate is made of brass with a black enamel finish. Inscription is filled with white. Used with No. 253 spring jack. Over-all dimensions: 3/8 x 1/4 inch.

NO. 3

Same as No. 2 number plate except dimensions are 27/64 by 19/64 inch. Used with Nos. 40, 95, and 195 spring jacks.

Stile Strip Type

NO. 57



Standard stile strip number plate. Is made of polished white celluloid. The numerals are engraved and filled with black paint. Mounting screws not supplied unless specified. Order by code number and specify numerals desired. Size: 1/4 inch square.

NO. 116

Same as No. 57 listed above except made of red opaque polished celluloid.

Switchboard Type

NO. 46



Used for numbering the positions of a switchboard. Made of white polished ivory, engraved and filled with black paint. Over-all dimensions: 1 3/4 by 1 1/4 inches. Order by code number and specify the characters desired.

Transmitter Type

NO. 88

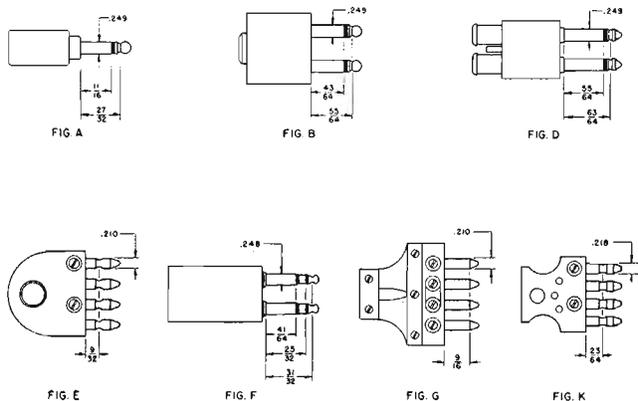
This number plate is of steel, heavily black enameled. Clear transparent celluloid is used to protect the white card which is furnished blank. Mounting screws are not supplied unless specified. Used with old style transmitters.

PLUGS

Operator's, switchboard, and wall outlet plugs are shown below. These plugs are designed and made of materials to give maximum service. The tips are made of brass and hard rubber insulation is used. All connections are protected by fibre sleeve held securely in place.

Detailed sketches are shown for each type operator's plug. For switchboard plugs a general sketch is shown. To determine length of the tip, ring, and sleeve, or tip and ring conductors on each plug, refer to the list showing A, B, and C dimensions for these plugs.

Operator's Plugs



2 CONDUCTOR

Code No.	Fits Cord	Fits Jack	Sketch Figure	Description
107	708	24	A	Replaces #75 Plug
4 CONDUCTOR				
136	712	57	B	Replaces #25 Plug
139	{ 466 709 }	310	D	Made of (2) #130 Plugs. Replaces W.E.Co. 137 & 152 Fits W.E.-99 Jack
145	{ 711 721 }	43	G	Has round cord hole
146	710	43	G	Same as #145 but has strap term. across 2 center terms. Semi-circle cord hole
182	{ 713 722 }	325-A	E	
236	772	364	F	Profiling of #247 Plug. W. E. Co. 241-A
245	741	None	K	Replaces Strom. Carlson #23 Plug

6 CONDUCTOR

240	387	{ 360 361 }	F	Made of two #152 Plugs Used for toll test panels
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Switchboard Plugs

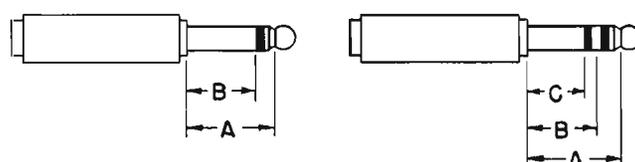


FIG. A

FIG. B

Code No.	Dimensions Tip "A"	Ring "B"	Sleeve Diam.	Fits Cord	Used With
55	55/64"	35/64"	.2495"	301, 304, 901	Spring Jacks #116, 186, 195, 215, 85, 277, 319
70	31/32"	7/8"	.2495"	304, CD-138	Spring Jacks #146, 148, 141, 191, 94, 298, 319, 371, 357, 359
109	15/16"	13/16"	.2495"	301, 304	Spring Jacks #146, 148, 141, 191, 94, 298, 360, 357, 359
112	55/64"	47/64"	.2495"	301, 304	Spring Jacks #215, 298, 319, 116
130	63/64"	55/64"	.2495"	301, 304	C.D.&J. #302, 303, 510, 500. Spring Jacks 146, 148, 141, 191, 362, 363
144	1-3/16"	7/8"	.2485"	331	Replaces Swedish American Plugs
187	55/64"	23/32"	.2498"	301, 304	C.D.&J. 507. Spring Jacks #215
247	1"	27/32"	.2495"	397, CC-63, CC-64, CC-65	C.D.&J. 302, 303, 500, 510. Spring Jacks #362, 363, 366. Replaces W.E. Co. #47 Plug
255	1"	25/32"	.2495"	397	Spring Jacks #362, 363, 366

3 CONDUCTOR



Code No.	Dimensions Tip "A"	Ring "B"	Sleeve "C"	Sleeve Diam.	Fits Cord
106	1 1/8"	27/32"	47/64"	.2495"	303, 309, 326; Used with C.D.&J. #105, 106, 107, 116, 504, 503, 505, 507, 514. Spring Jacks #261, 268, 270, 272, 258, 267, 269, 271, 273, 285, 324, 354, 259, 355, 296, 297, 318, 290, 284, 260, 286, 356, 377, 379, 380, 372, 384, 386, 388, 389, 383, 382
137	7/8"	21/32"	17/32"	.2495"	303, 309 Used with Spring Jacks #116, 186, 195, 85, 277, 319

PLUGS

Switchboard Plugs

3 CONDUCTOR (Cont'd)

Code No.	Dimensions Tip "A"	Ring "B"	Sleeve "C"	Sleeve Diam.	Fits Cord	Used With	
152	31/32"	25/32"	41/64"	.2495"	303	Spring Jacks # 146, 148, 141, 191, 94, 298, 319, 360, 361, 371, 359, 357	
185	31/32"	23/32"	39/64"	.207"	390	Sprg. Jack #371	
199	31/32"	23/32"	9/16"	.221"	325-ST	Garford & 326-TO Spring Jack	
*201	15/16"	21/32"	9/16"	.2215"	325	Spring Jack 239,	
*Has over-all shell.						326	257, 367, 369, 292, 274, 253, 293, 336, 254



233	1"	3/4"	41/64"	.2495"	358	Replaces W. E. Co. #110 Plug for use on 3/8" Panel
235	45/64"	43/64"	19/32"	.2495"	358	Replaces Strom. 745 Carlson 53-X & 53-N Plugs
268	31/32"	23/32"	39/64"	.2495"	CD-494	Spring Jack CD-508 JK-33 CD-588



Wall Outlet Plugs

For illustration of these plugs see Jacks, page 50.

Code No.	No. of Conductors	Description
302	2	Fits Jacks #402 and 412
304	4	Fits Jacks #404 and 414

PLUGS, DUMMY

Kellogg dummy plugs are used for designating lines in trouble, service discontinued, etc. They are available in colored celluloid or in brass finished with enamel. These plugs have flat heads for marking purposes.

For Line Jacks

BRASS TYPE—FOR 1/4-INCH DIAMETER JACK SLEEVES			CELLULOID TYPE—FOR .222-IN. DIAMETER JACK SLEEVES		
Code No.	Plug Diameter	Color	Code No.	Plug Diameter	Color
83	.249 in.	White	93	.219 in.	White
84	.249 in.	Black	94	.219 in.	Black
85	.249 in.	Red	95	.219 in.	Red
86	.249 in.	Blue	97	.219 in.	Yellow
87	.249 in.	Yellow	98	.219 in.	Green
88	.249 in.	Green			

PLUGS, DUMMY (Cont'd)

Hard Rubber Type

NO. 24



Made of polished hard rubber. The over-all plug length is 1.240 inches and the diameter is .2495 in. Used on jacks having 1/4-inch inside diameter sleeves. Generally used to plug out multiple jacks.

NO. 120

Generally used for filling blank holes in key escutcheon as when a two-party key is mounted on an escutcheon drilled for a four-party key. Head diameter is 9/16 inch.

NO. 132

Generally used to fill hole in switchboard cabinet when generator is not used. The No. 132 dummy plug fills the hole for the generator crank. Head diameter is 7/8 inch.

Drop Shutter Type

NO. 232

This dummy plug is used to hold up the drop shutter on mounting strips having unequipped spaces of drops. Made of brass with head finished in black enamel.

Trouble Sleeve Type



Trouble sleeves are made of fibre tubing and are used for designating defective cords and plugs. The tubing is split to allow for variation in plug diameters. They are furnished in two sizes.

Code No.	Description
163	For plugs .2495 inch in diameter
223	For plugs .2215 inch in diameter

Lamp and Key Hole Blank

NO. 256

Used blank space for No. 49 lamp jack. Head finished with silver hammertone finish. Used in holes 29/64 to 31/64-inch diameter.

NO. 257

Used in blank space for No. 400 type push button key. Head finished in silver hammertone finish. Used in holes 33/64 to 35/64-inch diameter. Otherwise the same as No. 256.

NO. 133-B

This dummy plug is used as a lamp hole blank in unequipped positions on the keyshelf. Made of maple with head finished in black lacquer. Head diameter, 1/2 inch; body diameter, .333 inch; over-all length, 1.295 inches.

NO. 134-B

This dummy plug is used as a plug hole blank in unequipped positions on the plugshelf. The No. 134-B is the same as the No. 133-B except the body diameter is 31/64 inch and the over-all length is 1-51/64 inches.

NO. 135-B

This dummy plug is the same as the No. 134-B except the body diameter of the plug is 27/64 inch.

NO. 231-B

This dummy plug is the same as the No. 134-B except the body diameter is 7/16 inch.

POWER EQUIPMENT

All power, protection, and cross-connecting equipment is listed in this section to facilitate ordering. Included with this equipment are storage batteries, main distributing frames, battery eliminators, rectifiers, and all types of ringing current supplies.

Wherever possible complete information necessary for ordering this equipment is given. In some instances it is neither possible nor advisable to order from catalog listings only. In these cases the Kellogg engineering department should be consulted for a detailed analysis of the particular installation and its power, or other requirements.

Storage Batteries

In selecting the proper battery for a telephone installation it is necessary to consider the requirements of the particular exchange and the ratio of cost to potential life of the battery that will meet these requirements. Generally the life of a battery is determined by two factors: type of plates, and method of charging.

There are two general types of plates—Planté and Faure. Both types have been proved in telephone work; however, longer life is generally conceded to the Planté type while the Faure type usually has lower unit capacity cost.

Planté plates are formed from lead with the active material electro-chemically deposited on ribbons or grooved strips. The Faure (or pasted) plate is formed by the mechanical pasting of

active material in the open spaces of the grid-shaped, lead antimony sheet. This construction is used by virtually all manufacturers of Faure cells.

The batteries listed below are all of the sealed jar type which completely confines the spray within the cells. This eliminates the need for special compartments, trays, or battery rooms. Open-type batteries are still available, however, for large installations. These, as well as repair parts, can be furnished on order.

Sealed glass jar type batteries are shipped complete with electrolyte, intercell connectors, and other necessary parts to insure quick and satisfactory installation. Cells are shipped charged, ready for immediate service.

EXIDE STORAGE BATTERIES



EXIDE-MANCHEX TYPE—The Exide-Manchex type is the more durable of the two types because of its rugged plate construction. The manchester positive plate consists of a lead antimony alloy grid, perforated with openings into which the pure lead buttons of active metal are forced. This alloy grid resists the "forming" action of the current during charge and discharge, and, therefore, retains its strength, shape, and dimensions throughout the entire life of the plate. Its heavy framework of interlocking rib and bar design holding the active material locked in place by the horizontal bars.

EXIDE-TYTEX TYPE—This pasted plate type will furnish greater ampere hour capacity in a given space than the Exide-Manchex type and the initial cost is lower. The active material of both positive and negative plates is pasted on both sides of the lead antimony grid or framework of interlocking rib and bar design, and locked in place by the horizontal bars. Where space is limited and cost is a consideration, where service requirements are light and operating conditions satisfactory, the results obtained from the pasted plate type may justify its selection.

A thermometer and a hydrometer syringe should be ordered with all batteries.

There are two types of Exide batteries used in telephone service: The Exide Manchex (Planté type) and the Exide Tytex (Faure). These are furnished in capacities to meet virtually every requirement. In all types listed the cell covers are sealed at the top of the jars and have spray-proof vents.

Exide-Manchex Type

TYPES DME, EME, and FME

With the exception of the three smallest sizes (DME-A), all types have burned ring seal post construction with copper inserts in the posts to improve their conductivity. All types have manchester positive and Exide Permanized negative plates, wood and slotted plastic separators.

The cells are shipped assembled, sealed, charged and filled with electrolyte, ready for service. Bolt connectors, lead plated copper intercell connectors, and lugs are furnished with two cells or more. Each cell is a unit not requiring crates. Information on racks for these cells will be furnished upon request.

SINGLE CELL UNITS

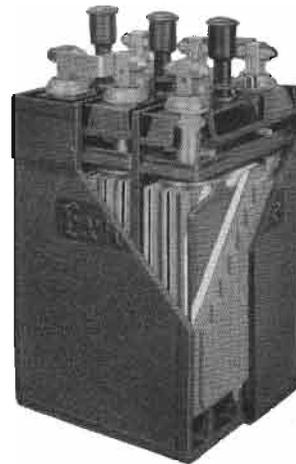
Type & Size	Ampere Hours Capacity at 8 Hour Rate to 1.75 Volts Final	Approximate Dimensions in Inches			LCL Shipping Weight in Pounds
		Length	Width	Height	
DME-5A	40	3-1/16"	7-13/16"	12 5/8"	29
DME-7A	60	3 7/8"	7-13/16"	12 5/8"	35
DME-9A	80	4-11/16"	7-13/16"	12 5/8"	42
DME-11	100	5 1/2"	7-13/16"	12 1/2"	50
DME-13	120	6-5/16"	7-13/16"	12 1/2"	59
DME-15	140	7 1/8"	7-13/16"	12 1/2"	66
DME-17	160	7-15/16"	7-13/16"	12 1/2"	73
EME-11	200	6 1/8"	9-15/16"	15 1/4"	96
EME-13	240	6 7/8"	9-15/16"	15 1/4"	113
EME-15	280	7 3/4"	9-15/16"	15 1/4"	126
EME-17	320	8 5/8"	9-15/16"	15 1/4"	138
EME-21	400	10 3/8"	9-15/16"	15 1/4"	165
EME-25	480	12 1/8"	9-15/16"	15 1/4"	191
FME-15	560	8"	13-5/16"	19-9/16"	234
FME-17	640	8 7/8"	13-5/16"	19-9/16"	259
FME-21	800	10 5/8"	13-5/16"	19-9/16"	308
FME-25	960	12 3/8"	13-5/16"	19-9/16"	373

POWER EXIDE STORAGE BATTERIES (Cont'd)

Exide-Tytext Pasted Plate Types TYPES DOE, EOE, and FOE

These Exide pasted plate batteries are (like the Exide-Manchex type) assembled in clear molded glass jars with the elements resting upon ribs in the bottom. With the exception of the three smallest sizes (DOE-A) all types have burned ring post construction with copper inserts in the posts to improve their conductivity. These cells are shipped assembled, sealed, charged and filled with electrolyte. Information on racks for these will be furnished on request.

Type & Size	Ampere Hours Capacity at 8 Hour Rate to 1.75 Final Volts	Approximate Dimensions in Inches			LCL Shipping Weight in Pounds
		Length	Width	Height	
DOE-5A	50	3-1/16"	7-13/16"	12 5/8"	27
DOE-7A	75	3 7/8"	7-13/16"	12 5/8"	33
DOE-9A	100	4-11/16"	7-13/16"	12 5/8"	39
DOE-11	125	5 1/2"	7-13/16"	12 1/2"	47
DOE-13	150	6-5/16"	7-13/16"	12 1/2"	55
DOE-15	175	7 1/8"	7-13/16"	12 1/2"	61
DOE-17	200	7-15/16"	7-13/16"	12 1/2"	68
EOE-13	240	6 1/8"	9-15/16"	15 1/4"	91
EOE-15	280	6 7/8"	9-15/16"	15 1/4"	105
EOE-17	320	7 3/4"	9-15/16"	15 1/4"	116
EOE-19	360	8 5/8"	9-15/16"	15 1/4"	125
EOE-29	560	12 1/8"	9-15/16"	15 1/4"	176
FOE-17	608	8"	13-5/16"	19-9/16"	210
FOE-19	684	8 7/8"	13-5/16"	19-9/16"	229
FOE-29	1064	12 3/8"	13-5/16"	19-9/16"	336



Rubber Jar Types TYPES EB AND FB

These are thick pasted plate batteries assembled in molded rubber jars with the elements resting on ribs in the bottom. They are designed particularly for telephone service. A special feature of this battery design is its explosion control construction. The cells are shipped assembled, sealed, charged and filled with electrolyte.

Type & Size	Ampere Hour Capacity at 8 Hour Rate to 1.75 Final Volts	Approximate Dimensions in Inches			LCL Shipping Weight in Pounds
		Length	Width	Height	
2-EB-7 Units	180	7 5/8"	10-7/16"	19 1/8"	130
3-EB-7 Units	180	11"	10-7/16"	19 1/8"	190
EB-9 Cells	240	5-3/16"	10 3/4"	19 1/8"	82
EB-11 Cells	300	6-3/16"	10 3/4"	19 1/8"	100
EB-15 Cells	420	8 1/8"	10 3/4"	19 1/8"	135
EB-19 Cells	540	10-3/16"	10 7/8"	19 1/8"	166
EB-23 Cells	660	12-3/16"	10 7/8"	19 1/8"	204
FB-15 Cells	840	8-7/16"	14 5/8"	23 3/4"	255
FB-19 Cells	1080	10-7/16"	14 5/8"	23 3/4"	313
FB-23 Cells	1320	12-7/16"	14 5/8"	23 3/4"	371
FB-29 Cells	1680	15 1/4"	14 5/8"	23 3/4"	461

Exide BTMH-2, CTMH-2, ETMH-2 and PTMH-2 EXIDE MANCHESTER TYPE

These two plate batteries are adapted to those general services where the current requirements are small. For convenience in handling and installation, these batteries are assembled in wood crates of from 4 to 8 cells in single row arrangement while 6 and 8 cell batteries can be obtained in double row arrangement. The crates of the two larger sizes, PTMH-2 and ETMH-2 are equipped with steel handles. The intercell connectors in each crate of cells are burned to the posts.

When shipped, these cells are assembled in crates, sealed, charged and filled with electrolyte ready for service.

Multi-Cell Units

Type & Size	Capacity in Ampere Hours at 8 Hour Rate to 1.75 Final Volts	No. of Cells Per Unit	Approximate Dimensions in Inches			LCL Shipping Weight Per Unit in Pounds
			Length	Width	Height	
BTMH-2	14-4	3	9 1/4"	5-9/32"	8-11/16"	37
					8-11/16"	41
					10 1/4"	40
					10 1/4"	58
					10 1/4"	68
					10 1/4"	102
					10 1/4"	115
					10 1/4"	184
CTMH-2	25	3	9 1/4"	5-9/32"	8-11/16"	41
					8-11/16"	41
					10 1/4"	40
					10 1/4"	58
					10 1/4"	68
					10 1/4"	102
					10 1/4"	115
					10 1/4"	184
PTMH-2	50	2	6 3/8"	7 1/2"	10 1/4"	40
					10 1/4"	58
					10 1/4"	68
					10 1/4"	102
					10 1/4"	115
					10 1/4"	184
					10 1/4"	201
					10 1/4"	266
ETMH-2	100	2	9 3/4"	7 1/2"	10 1/4"	68
					10 1/4"	102
					10 1/4"	115
					10 1/4"	184
					10 1/4"	201
					10 1/4"	266
					10 1/4"	266
					10 1/4"	266

Exide BTER, KZHGR, and LXGH

PASTED PLATE TYPE IN MULTI-UNIT GLASS CONTAINERS

The elements are made up of plates of the pasted type, assembled with both wood and Vitrex glass separators in strong multi-compartment molded glass containers. Spray proof, easy to remove vent plugs are furnished. Each unit has one cell equipped with pilot balls to give an indication of the state of charge.

The units are shipped assembled, sealed, charged and filled with electrolyte ready for service. Interunit connectors will be furnished when 2 or more units are ordered (specify whether end to end or side to side connectors are wanted). No intertier, inter-row, or interrack connectors are included. A thermometer, a hydrometer syringe, and 2-connector bolt wrenches should be ordered with batteries.

Type and Size	Capacity in Ampere Hours at 8 Hour Rate to 1.75 Final Volts	No. of Cells Per Unit	Approximate Dimensions in Inches			LCL Shipping Weight Per Unit in Pounds
			Length	Width	Height	
3-BTER-5	14-4	3	9 1/4"	5-9/32"	8-11/16"	37
3-KZHGR-7	25	3	9 1/4"	5-9/32"	8-11/16"	41
2-LXGH-7	50	2	6 3/8"	7 1/2"	10 1/4"	40
3-LXGH-7	50	3	9-7/32"	7 1/2"	10 1/4"	58
2-LXGH-13	100	2	9 3/4"	7 1/2"	10 1/4"	68
3-LXGH-13	100	3	14-13/32"	7 1/2"	10 1/4"	102

POWER

GOULD STORAGE BATTERIES

Gould batteries are available in a comprehensive range of capacities in four types of cells—Plante, Flote, Kathanode, and Dreadnaught.

All Gould cells are assembled in glass jars with hard rubber covers. Plante, Kathanode and Dreadnaught are of Gould dual suspension construction. This features projections which rest on opposite top edges of the jar to support the weight of the element, and hard rubber channels resting on the lug ends of the plates of one group to support the free ends of the plates of the group of opposite polarity. Flote utilizes the supported element design, the plates resting on ribs molded into the bottom of the jar.

Gould Plante cells contain elements of Plante pure lead positive and pasted negative groups insulated with white cedar separators. The positive plates are formed from pure lead blanks by a spinning operation, and the active material is chemically formed from the pure lead plate itself. This type of Gould battery should be selected where long life and minimum maintenance are the primary considerations.

Flote batteries are assembled in "Steel Glass" jars featuring element supporting ribs in the bottom of the jar. Elements are held firmly in place by corner and side locks consisting of tapered

hard rubber wedges. The positive plates are of Flote construction, featuring heavy grids of a pattern designed to lock the active material firmly in place. These batteries have built in charge indicators which show the state of charge at a glance. This type of Gould battery should be selected where long life and high capacity are required and minimum space available.

Kathanode cells are assembled with glass-insulated positive groups and pasted negatives, with white cedar separators. Fibre glass retaining mats are held in place against the positive plate by perforated rubber envelopes, encasing the positive plate in a complete sheath of glass and rubber. This construction is recommended for partial cycle service and for float service where the battery may be subjected to abuse during charge.

Dreadnaught cells contain pasted negatives and rubber insulated pasted positives. Perforated rubber envelopes encase the positive plates, and cedar separators provide insulation and proper spacing. This Gould battery should be selected when minimum initial cost is the first consideration, and for float service where careful maintenance is practiced.

Gould Plante. These cells are shipped completely assembled and charged, supplied with inter-cell, inter-row and terminal connectors.



Gould Plante

These cells are shipped completely assembled and charged, supplied with inter-cell, inter-row and terminal connectors.

SINGLE CELL UNITS

Type	Ampere Hours Capacity 8 Hour Rate to 1.75 Volts	Length	Dimensions Width	Height	Shipping Weight
DP-5	40	4-15/16"	8-1/16"	12 1/2"	32
DP-7	60	5-13/16"	8-1/16"	12 1/2"	38
DP-9	80	6-13/16"	8-1/16"	12 1/2"	45
EP-5	80	5"	10"	16 1/8"	55
EP-7	120	5 7/8"	10"	16 1/8"	70
EP-9	160	6 3/4"	10"	16 1/8"	85
EP-11	200	9 1/4"	10 1/8"	16-13/16"	120
EP-13	240	9 1/4"	10 1/8"	16-13/16"	130
EP-15	280	13 1/4"	10 1/4"	18-9/16"	155
EP-17	320	13 1/4"	10 1/4"	18-9/16"	165
EP-19	360	13 1/4"	10 1/4"	18-9/16"	175
EP-21	400	13 1/4"	10 1/4"	18-9/16"	185
FP-9	320	8 7/8"	13 7/8"	20 7/8"	205
FP-11	400	8 7/8"	13 7/8"	20 7/8"	220
FP-13	480	10 1/4"	13 3/4"	20 7/8"	245
FP-15	560	12 3/8"	14"	20 7/8"	275
FP-17	640	12 3/8"	14"	20 7/8"	300
FP-19	720	14 3/4"	14"	20 7/8"	340
FP-21	800	14 3/4"	14"	20 7/8"	355

Gould Kathanode

Shipped completely assembled, sealed and charged with all necessary accessories—ready for immediate installation and service.

SINGLE CELL UNITS

Type	Capacity in Ampere Hours 8 Hour Rate to 1.75 Volts	Length	Dimensions Width	Height	Shipping Weight
DK-5	40	4-15/16"	8-1/16"	12 1/2"	29
DK-7	60	4-15/16"	8-1/16"	12 1/2"	31
DK-9	80	5-13/16"	8-1/16"	12 1/2"	36
DK-11	100	6-13/16"	8-1/16"	12 1/2"	41
DK-13	120	6-13/16"	8-1/16"	12 1/2"	44
EK-5	80	5"	10"	16 1/8"	50
EK-7	120	5"	10"	16 1/8"	56
EK-9	160	5 7/8"	10"	16 1/8"	67
EK-11	200	6 3/4"	10"	16 1/8"	78
EK-13	240	6 3/4"	10"	16 1/8"	85
EK-15	280	9 1/4"	10 1/8"	16-13/16"	123
EK-17	320	9 1/4"	10 1/8"	16-13/16"	130
EK-19	360	9 1/4"	10 1/8"	16-13/16"	133
EK-21	400	13 1/4"	10 1/4"	18-9/16"	175
EK-23	440	13 1/4"	10 1/4"	18-9/16"	180
EK-25	480	13 1/4"	10 1/4"	18-9/16"	185
EK-27	520	13 1/4"	10 1/4"	18-9/16"	190
FK-17	608	10 1/4"	13 3/4"	20 7/8"	235
FK-19	684	10 1/4"	13 3/4"	20 7/8"	245
FK-21	760	12 3/8"	14"	20 7/8"	255
FK-23	836	12 3/8"	14"	20 7/8"	265
FK-25	912	14 3/4"	14"	20 7/8"	300
FK-27	988	14 3/4"	14"	20 7/8"	310
FK-29	1064	14 3/4"	14"	20 7/8"	320
FK-31	1140	14 3/4"	14"	20 7/8"	330

POWER GOULD STORAGE BATTERIES

Gould Flote

These suspended element type batteries are shipped, charged and sealed with all necessary inter-cell, inter-row and terminal connectors ready for service.

SINGLE CELL UNITS

Type	Capacity in Ampere Hours, 8-Hour Rate 1.75 Volts	Dimensions			Shipping Weight
		Length	Width	Height	
DF-5	48	4½"	8-5/16"	12-7/16"	34
DF-7	72	6¾"	8-5/16"	12-7/16"	47
DF-9	96	6¾"	8-5/16"	12-7/16"	52
EF-5	96	7⅞"	10⅞"	16-3/16"	72
EF-7	144	7⅞"	10⅞"	16-3/16"	79
EF-9	192	7⅞"	10⅞"	16-3/16"	86
EF-11	240	10-5/16"	10⅞"	16-3/16"	120
EF-13	288	10-5/16"	10⅞"	16-3/16"	127
FF-7	288	7⅞"	14½"	19¼"	127
FF-9	384	8¼"	14½"	19¼"	149
FF-11	480	9⅞"	14½"	19¼"	170
FF-13	576	10"	14½"	19⅝"	202
FF-15	672	10⅞"	14½"	19⅝"	223
FF-17	768	12⅝"	14½"	19⅝"	270
FF-19	1056	15¼"	14½"	19⅝"	345

Gould Small Glass Jar Batteries

These small glass jar batteries may be used for inter-communication systems, operators transmitter batteries, manual and dial PBX, central office No. 2 battery service, etc.

GOULD PLANTE

Single cells—assembled in multi-cell wood trays.

Type	Capacity in Ampere Hours, 8-Hour Rate 1.75 Volts	Dimensions			Shipping Weight
		Length	Width	Height	
WPE-3	9.2	2-3/16	4-5/16	8¾	6½
XPE-3	20	2½	6¾	10-13/16	15
YPE-3	28	2½	6¾	15-9/16	23

GOULD DREADNAUGHT

Single cells—assembled in multi-cell wood trays.

WSC-3	9.2	2-3/16	4-5/16	8¾	6½
XSC-3	20	2½	6¾	10-13/16	15
YSC-3	28	2½	6¾	15-9/16	23

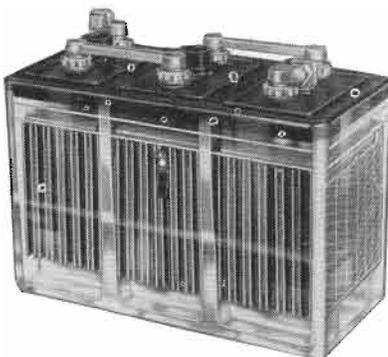
Gould Dreadnaught

Shipped completely assembled, sealed and charged—with connectors and lugs ready for immediate installation and service.

SINGLE CELL UNITS

Type	Capacity in Ampere Hours, 8-hour Rate 1.75 Volts	Dimensions			Shipping Weight
		Length	Width	Height	
DD-5	36	4-15/16"	8-1/16"	12½"	28
DD-7	54	4-15/16"	8-1/16"	12½"	31
DD-9	72	5-13/16"	8-1/16"	12½"	36
DD-11	90	6-13/16"	8-1/16"	12½"	41
DD-13	108	6-13/16"	8-1/16"	12½"	44
ED-5	80	5"	10"	16⅞"	50
ED-7	120	5"	10"	16⅞"	56
ED-9	160	5⅞"	10"	16⅞"	67
ED-11	200	6¾"	10"	16⅞"	78
ED-13	240	6¾"	10"	16⅞"	85
ED-15	280	9¼"	10⅞"	16-13/16"	123
ED-17	320	9¼"	10⅞"	16-13/16"	128
ED-19	360	9¼"	10⅞"	16-13/16"	133
ED-21	400	13¼"	10¼"	18-9/16"	175
ED-23	440	13¼"	10¼"	18-9/16"	180
ED-25	480	13¼"	10¼"	18-9/16"	185
ED-27	520	13¼"	10¼"	18-9/16"	190
FD-17	608	10¼"	13¾"	20⅞"	235
FD-19	684	10¼"	13¾"	20⅞"	245
FD-21	760	12⅜"	14"	20⅞"	255
FD-23	836	12⅜"	14"	20⅞"	265
FD-25	912	14¾"	14"	20⅞"	300
FD-27	988	14¾"	14"	20⅞"	310
FD-29	1064	14¾"	14"	20⅞"	320
FD-31	1140	14¾"	14"	20⅞"	330

Gould Flote MULTI-CELL UNITS



These batteries are available in multi-cell glass jar units; two, three and four-cell containers as specified below. Smaller unit may be trayed as required.

Type	Capacity in Ampere Hours 8-Hour Rate 1.75 Volts	Number Compartments in Containers	Number Cells in Unit	Dimensions (inches)			Shipping Weight
				Length	Width	Height	
BF-52	15	2	1	3½	9	8	18
BFI-54	15	2	2	3⅞	8⅝	8	20
BF-92	30	2	1	5¼	9	8	31
BF-94	30	2	2	5¼	9	8	34
CF-52	10	1	1	2⅝	3⅝	7¾	8
CF-54	10	2	2	2-13/16	7¼	7¾	12
PF-92	20	1	1	4⅝	3⅝	7¾	13
PF-94	20	3	2	4⅝	10-7/16	7¾	26
PF-96	20	3	3	4⅝	10-7/16	7¾	29
RT-72	50	2	1	5⅝	7½	10¼	44
RT-74	50	2	2	5⅝	7½	10¼	48
RT-76	50	3	3	8⅞	7½	10¼	65
RT-78	50	4	4	10⅝	7¼	10⅝	86
RT-132	100	2	1	9-7/16	7½	10¼	63
RT-134	100	2	2	9-7/16	7½	10¼	69
RT-136	100	3	3	13-13/16	7½	10¼	97

**POWER
CHARGING EQUIPMENT**

Storage batteries are charged, in general, by the trickle, or the automatic control method. The trickle method consists of charging the batteries continuously over a 24 hour period at a constant rate sufficient to compensate for drain and battery losses.

This automatic control method allows charging equipment to operate automatically or start when battery discharge reaches a predetermined point. The charge automatically disconnects when battery becomes fully charged.

Automatic control of the charging equipment eliminates the

possibility of starving or overcharging the battery. The control unit may be either an ampere hour meter or voltmeter relay. An automatic starting rectifier must be used with the automatic charging control circuit. The General Electric Tungar or copper oxide type of rectifiers listed below are the automatic starting type and are suitable for use with an automatic charging control circuit. The Raytheon Recticharger which has copper oxide or selenium rectifying units has its own control unit built in as a part of the rectifier circuit.

Raytheon Rectichargers



A Recticharger with a small storage battery floating across its terminals makes a complete AC to DC telephone power unit. Basically it is a dry disc copper oxide or selenium rectifier with a Raytheon control circuit which maintains a substantially constant DC voltage output at any load in the presence of wide changes in AC input voltage. Built-in filters insure quiet operation.

When the load current demand is less than the Recticharger rating, the Recticharger supplies all of the current required and, at the same time, delivers to the battery a trickle charge of the right amount to make up for internal battery losses and to prevent destructive chemical action as well as replace any load taken from the battery while the load was greater than the output of the Recticharger. If the current demand exceeds the rating, the excess is supplied by the battery. When the load drops back to a value below the Recticharger rating, the Recticharger output remains at its maximum rated value. The difference between the Recticharger rating and the load current is then supplied to the battery until it is fully charged. When this point is reached the Recticharger output is reduced to a point where it is operating the switchboard and trickle charging the battery again.

The battery acts as a reservoir of power to supply any peak DC current demand over the current rating of the Recticharger, or to furnish all the DC power in case of AC interruption.

Battery activity is reduced to a minimum, and maximum battery life is assured. The only maintenance required is the replacement of battery water lost through evaporation.

A Recticharger may be used to supplement existing constant current chargers with filters for telephone service. When this method is employed, the effect of following the load and keeping the battery fully charged is achieved.

This doubles the available power and is accomplished by installing a special relay and a Recticharger of the proper rating with the constant current charger. The output current rating of the charger should not exceed the rating of the Recticharger. If the rating is higher, the output current must be adjusted to match the Recticharger current rating.

Input. Input is 95-130 volts, 60 cycle stabilized frequency, single phase. All Rectichargers are equipped with AC input voltage, stabilizing equipment providing for operation on AC lines that may fluctuate from 95 to 130 volts.

Ratings. Normal Recticharger ratings are based on their being installed in live air and where the ambient temperature will not exceed 95° F. for appreciable periods.

Mounting. All equipment is enclosed in a steel cabinet provided with a hinged door. The cabinet is arranged for wall mounting. Brackets are available for floor or table mounting.

Cat. No.	Battery Cells	Amps. Cont.	Dimensions (inches)			Shipping Weight
			Width	Depth	Height	
1066	11/12	1.0	14½	7¾	14¾	62 lbs.
1073	11/12	2.0	14½	9½	14¾	94 lbs.
1058	11/12	3.0	19	11	21	163 lbs.
1067	11/12	6.0	19	15¼	28	233 lbs.
1068	22/24	1.0	14½	9½	14¾	93 lbs.
1076	22/24	2.0	19	11	21	173 lbs.
1069	22/24	3.0	19	15¼	28	231 lbs.
1070-B	22/24	6.0	19	15¼	28	270 lbs.

Electronically Controlled Rectichargers



The Raytheon electronically controlled Recticharger is an addition to the standard line of Raytheon Rectichargers.

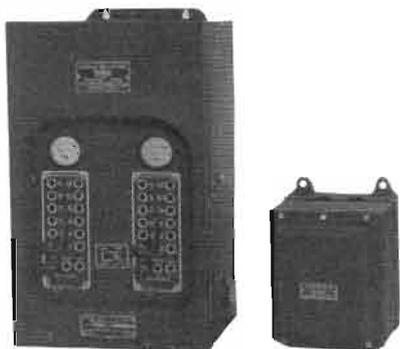
In order to reduce space, an electronic amplifier containing standard tubes conservatively rated is used in conjunction with a saturable core reactor. This amplifier also provides for greater flexibility of adjustment, a greater frequency range, and a variety of input and output voltage combinations, in addition to closer tolerance of regulation.

The use of the amplifier provides several additional advantages to the older type Recticharger. These are: closer regulation over both load and line changes, interchangeable input and output voltage, and the use of either 50 or 60 cycle frequency input current. There is, also, a current limiting feature which will lower the output voltage when the current exceeds a certain adjustable point, making the unit self protecting.

Cat. No.	Battery Cells	Amps.	Dimensions (inches)			Shipping Weight
			Width	Depth	Height	
RCT-2013-A	11/12	12.0	17	15-3/16	21	232 lbs.
RCT-2016-A	11/12	24.0	17	15-3/16	28	320 lbs.
RCT-2013-B	22/24	6.0	17	15-3/16	21	232 lbs.
RCT-2016-B	22/24	12.0	17	15-3/16	28	320 lbs.

POWER CHARGING EQUIPMENT

G. E. Tungar Battery Chargers FOR 3 TO 24 LEAD CELLS



This 12 ampere, full-wave tungar No. 6RB6B17 (or No. 6RB-6B14, see below) when used in conjunction with Cat. No. 3126680 filter reactance makes an excellent combination for "float" charging telephone batteries. Wide range of charging is obtainable with this combination (from 6 to 60 volts, 3 to 12 amperes).

In small and medium size exchanges where motor-generator sets are now in service, this combination is often used to supplement the motor-generator set especially during "low load" periods. This combination is particularly desirable for this purpose during week ends in exchanges where a charging rate of 12 amperes or less is sufficient. This enables shutting down the motor-generator set and operating during this period at the much higher efficiency obtained from the Tungar.

This Tungar employs the plug type control which simplifies balancing both sides of the outfit, as a visual indication of the settings on each side is given. An ammeter is provided on each side.

This Tungar is highly efficient and two or more units can be connected in parallel to obtain charging rates above 12 amperes. The full load efficiency is approximately 54 per cent when used in conjunction with Cat. No. 3126680 reactance. The units use two standard 6 ampere Tungar bulbs Cat. No. 189049.

Cat. No.	A.C. Input		Dimensions (inches)			Shipping Weight
	Volts	Cycles	Height	Width	Depth	
6RB6B17	115	50-60	19 ⁷ / ₈	11 ¹ / ₂	11 ⁵ / ₈	91 lbs.
6RB6B16	230	50-60	19 ⁷ / ₈	11 ¹ / ₂	11 ⁵ / ₈	91 lbs.
6RB7B13	230	25-40	19 ⁷ / ₈	11 ¹ / ₂	11 ⁵ / ₈	96 lbs.
3126680	External Filter Reactance		10 ¹ / ₂	6 ¹ / ₂	7 ³ / ₄	73 lbs.

FOR 9 TO 24 LEAD CELLS

This Tungar was designed to meet the requirements of intercommunicating systems and PBX's. It can be used wherever a full-wave filtered output is required up to 3 amperes from 19 to 52 battery volts. Six sets of secondary taps brought to a terminal board located just inside the left-hand door, in conjunction with a rheostat controlled from the front panel permit a simple and easy method of adjusting the output over the entire range. A high grade D'Arsonval ammeter gives accurate indication of the charging rate. A suitable filter reactance is incorporated in the design to give quiet operation on telephone batteries.

Will give full 3.0 ampere charging rate at 52 battery volts and taper to 1.75 amperes at 65 battery volts. Full load efficiency, 48 per cent. Power-factor, 92 per cent. Uses two No. 12 x 825 bulbs.

G. E. Tungar Battery Chargers (Cont'd) FOR 9 TO 24 LEAD CELLS (Cont'd)

Cat. No.	A.C. Input		Dimensions (inches)			Shipping Weight
	Volts	Cycles	Height	Width	Depth	
3049455	115	60	17 ¹ / ₂	12 ¹ / ₈	14 ⁷ / ₈	88 lbs.
3049456	115	25-50	17 ¹ / ₂	12 ¹ / ₈	14 ⁷ / ₈	105 lbs.
3049457	230	60	17 ¹ / ₂	12 ¹ / ₈	14 ⁷ / ₈	88 lbs.
3049458	230	25-50	17 ¹ / ₂	12 ¹ / ₈	14 ⁷ / ₈	105 lbs.

FOR 3 TO 12 OR 18 LEAD CELLS

This Tungar is similar to Model No. 6RB6B17, the only difference being in the rated output voltage. When used in conjunction with Cat. No. 3126680 reactance it is adaptable to charging telephone batteries of 3 to 12 cells at an adjustable rate of 3 to 12 amperes. Can be used with up to 18 cells when used with the reactance. The plug type of control is used, and two ammeters are provided. It incorporates all the features of the Model No. 6RB6B17 unit.

Cat. No.	A.C. Input		Dimensions (inches)			Shipping Weight
	Volts	Cycles	Height	Width	Depth	
6RB6B14	115	50-60	19 ⁷ / ₈	11 ¹ / ₂	9 ⁵ / ₈	82 lbs.
6RB6B12	230	50-60	19 ⁷ / ₈	11 ¹ / ₂	9 ⁵ / ₈	96 lbs.

G. E. Copper Oxide Battery Chargers

The G.E. copper oxide rectifier for telephone service obtains output adjustment over an extremely wide range in very small steps. The copper oxide rectifying unit is a permanent, reliable, and safe assembly.

After the charging rate is adjusted no other attention is required. The dial mounted on the front of the cabinet gives perfectly uniform adjustment from zero to full load. Since all the adjustment is made with a transformer the efficiency of the rectifier is high. No bulbs are used with this unit.

The lower section of the black crackle finish metal cabinet is perforated to allow free circulation of air to cool the unit.

These units are for use with 115 volt, 60 cycle, AC power supply.

Model	Cells	Amperes	Dimensions (inches)			Shipping Weight
			Height	Width	Depth	
6RC49D2*	12	0.5	10 ⁷ / ₈	11 ⁷ / ₈	9 ¹ / ₄	35 lbs.
6RC98D1	12	1.0	19	13 ³ / ₈	14 ⁷ / ₈	
6RC98D2	12	2.0	19	13 ³ / ₈	14 ⁷ / ₈	
6RC98D3	12	3.0	19	13 ³ / ₈	14 ⁷ / ₈	
6RC99D3	12	4.0	25	13 ³ / ₈	14 ⁷ / ₈	
6RC99D2	12	5.0	25	13 ³ / ₈	14 ⁷ / ₈	
6RC99D1	12	6.0	25	13 ³ / ₈	14 ⁷ / ₈	
6RC95D2	12	8.0	25	20 ³ / ₈	14 ⁷ / ₈	
6RC96D7	12	12.0	31	20 ³ / ₈	14 ⁷ / ₈	
6RC98D5	24	1.0	19	13 ³ / ₈	14 ⁷ / ₈	
6RC99D4	24	2.0	25	13 ³ / ₈	14 ⁷ / ₈	
6RC99D6	24	3.0	25	13 ³ / ₈	14 ⁷ / ₈	
6RC100D1	24	4.0	31	13 ³ / ₈	14 ⁷ / ₈	
6RC96D8	24	5.0	31	20 ³ / ₈	14 ⁷ / ₈	
6RC98D9	24	6.0	31	20 ³ / ₈	14 ⁷ / ₈	

*Has transformer taps with resistance for controlling output.

POWER

Lorain Battery Chargers

The Lorain Flotrol battery charger is a completely automatic constant voltage charger which operates without moving parts. Once installed and adjusted for a specific battery, further adjustment is unnecessary. All Flotrol units are equipped with heavy duty oversized selenium rectifiers. All units compensate for changes in input voltage and output load. The output voltage is maintained within the limits of plus or minus one per cent under all normal load conditions.

Any small changes in battery voltage due to switch operation, talking, or other load requirements are instantly picked up by the Flotrol and the current for this type of operation supplied not by the battery but by the Flotrol itself. The close voltage regulation of the Flotrol permits the charger to carry the load of the exchange up to the full rating of the Flotrol. At the same time the battery is maintained at full charge without being overcharged. This insures maximum stand-by capacity in case of a power failure and at the same time greatly lengthens the years of service obtainable from a battery because the battery is not worked in normal service.

Flotrols made to deliver from 1 ampere, 24 volts up to 24 amperes. 48 volts can be supplied for single-phase operation. Larger sizes are made only for three phase operation. Three-phase chargers are made in six sizes supplying 50 to 100 amperes in the 24 volt chargers and having capacities of 25, 50, 75, and 100 amperes in the 48 volt chargers. Chargers as large as 100 amperes, 24 volts or 50 amperes, 48 volts are made for 23 inch relay rack mounting. Where it is desirable to mount this type of equipment on the floor, a special short rack can be supplied. The floor space required for this type of unit is only 15 by 24½ inches, the total height being 52 inches.

FLOTROL TYPE CHARGERS



Cat. No.	Phase	Input Volts	Cycles	Output		Size (inches)
				Amps.	Volts	
24A*	1	105-125	60	1.0	24	14x8x15
75A**	1	105-125	60	3.0	24	19x8x15¾
150A**	1	105-125	60	6.0	24	19x8¼x24½
300A**	1	105-125	60	12.0	24	19x13¼x31½
600A***	1	210-250	60	24.0	24	23x15x45½
1250A***	3	210-250	60	50.0	24	23x15x45½
2500A***	3	210-250	60	100.0	24	23x15x45½

*For wall mounting.

**For relay rack or wall mounting.

***For relay rack mounting.

Lorain Battery Chargers (Cont'd)

DUAL RANGE CHARGERS

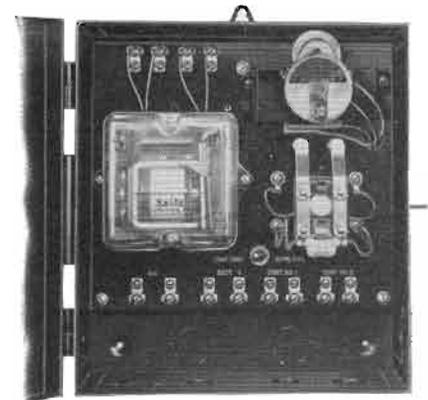
Cat. No.	Phase	Input Volts	Cycles	Output		Size (inches)
				Amps.	Volts	
150D**	1	105-125		6.0	24	19x8¼x24½
		210-230		3.0	50	
300D**	1	105-210		12.0	24	19x13¼x31½
		210-230		6.0	50	
75B**	1	105-125	60	1.5	50	19x8x15¾
150B**	1	105-125	60	3.0	50	19x8¼x24½
300B**	1	105-125	60	6.0	50	19x8¼x24½
600B***	1	105-125	60	12.0	50	23x15x45½
1200B***	1	105-125	60	24.0	50	23x15x45½
1250B***	3	210-250	60	25.0	50	23x15x45½
2500B***	3	210-250	60	50.0	50	23x15x45½
3750B	3	210-250	60	75.0	50	36x28x66
5000B	3	210-250	60	100.0	50	36x28x66

*For wall mounting.

**For relay rack or wall mounting.

***For relay rack mounting.

Exide ES Charge Control



This Exide Model No. ES charge control unit is used to control the charging of an automatic starting type rectifier. The control unit works equally well with either the bulb or dry disc type rectifier.

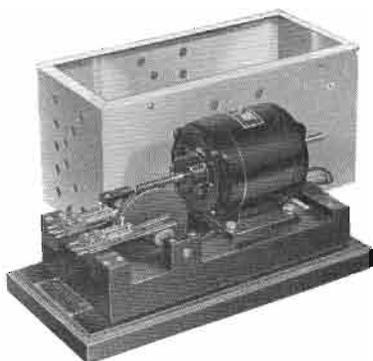
This unit consists of a small, self-starting synchronous motor driven time switch which operates from 115 volts, 60 cycle, A.C. power supply. This time switch starts the charge by operating an Exide T.V.R. voltage relay. The voltage relay winding is bridged across the battery terminals with one side of the winding connected through the contacts of the time switch which are closed 59 minutes and open 1 minute each hour. If the battery voltage is below 2.3 volts per cell at 77°F. the T.V.R. relay will remain unoperated and through its back contacts close the winding circuit of an auxiliary relay which closes A.C. through the contacts to the rectifier and starts the battery charge.

When the battery voltage rises to a predetermined point the T.V.R. relay operates. This stops the charge.

The unit is installed in a wall mounting steel cabinet 11⅞ inches high, 10-7/16 inches wide and 4 inches deep. The cabinet has a hinged door which may be padlocked if desired. When ordering it is necessary to specify the type of charger and the number of cells as the control is built for a definite number of cells.

POWER

Interrupters



These Kellogg automatic ringing interrupters furnish automatic ringing and signalling tones. The motors for these interrupters operate from either 115 volt, 60 cycle, A.C. power supply or from the regular exchange storage battery. The interrupters can be equipped with six sets of interrupter springs and a three-tone commutator.

A tone mechanism equipped with a three-tone commutator is available when required. This will produce a high tone of 360 interruptions per second for howler service, a medium tone of 280 interruptions per second for dial and miscellaneous tones, and a low tone of 160 interruptions per second for "busy back" and "out of order" tone.

Automatic ringing is accomplished directly through cam operated interrupter spring contacts which operate a relay in the cord circuit and send the ringing current out on the line for one second and then withholds it for five seconds. The interrupter cams make 10 R.P.M. to furnish a six second cycle of ringing interruptions of one second make and five seconds break or open period.

The interrupter is complete with driving motor, mounting base and glass top, ventilated steel cover. Floor space required is 15 by 7 inches.

The two code numbers listed below, the No. 10-A and No. 10-D, are used in pair with the No. 10-A as the regular or No. 1 machine and the No. 10-D as the emergency or No. 2 machine, held in reserve for emergency service.

Code No.	Power Supply
10-A	115 volts, 60 cycle, A.C.
10-D	24 volts, D.C.

NO. 13 INTERRUPTER

The No. 13 interrupter is made up of a No. 11 and No. 12 interrupter mounted on a wood base 14 $\frac{1}{4}$ by 8 by 1 inch with a glass top, ventilated steel cover 12 by 7 $\frac{1}{2}$ by 5 $\frac{3}{4}$ inches. The No. 11 interrupter is an automatic two-circuit ringing interrupter consisting of a 110 volt, 60 cycle synchronous motor equipped with reduction gears and extension shaft to produce 10 R.P.M. The shaft is equipped with a cam to break and make two sets of springs. The No. 12 interrupter is an automatic two-circuit ringing interrupter the same as the No. 11 except that it is designed to operate from 100 volts, 20 cycles A.C. furnished by a pole changer. The No. 12 interrupter is intended as an emergency machine to be used in case of failure of the commercial 110 volt supply.

Automatic Interrupter Switching Circuit

This circuit consists of a series of relays which automatically start the No. 2 emergency interrupter and switch all interrupter and tone circuits from the regular to the emergency machine whenever there is an interruption in the commercial A.C. supply. During this interruption the No. 2 machine operates from the office storage battery.

As soon as the A.C. circuit has been restored to service, the No. 1 regular interrupter is started and the interrupter and tone circuits automatically switched back again to the regular machine. The No. 2 machine then is stopped and held in reserve for the next power interruption.

Meter, No. 2 Frequency

The Kellogg No. 2 frequency meter is designed for checking and adjusting pole changer frequencies. This meter operates on the stroboscopic principle and its use requires no computations or other measuring devices. Readings are made directly.

The meter is portable, housed in a wood box approximately 10 inches square and 6 inches high. The net weight is 10 pounds.

This meter is designed to check any of the following frequencies: 16 $\frac{2}{3}$, 20, 25, 30, 33 $\frac{1}{3}$, 42, 50, 54, 60, 66, and 66 $\frac{2}{3}$ cycles per second. It operates directly from 110-115 volt, 60 cycle power supply and the ringing current of the pole changers being tested.

Pole Changers

The pole changer is used to convert direct current to alternating current for telephone ringing purposes. It operates on the same principle as the ordinary door bell with weighted vibrator to regulate the frequency of vibration. The telephone exchange storage battery of 24 volts can be used to operate the vibrator, or a separate set of batteries of the correct voltage and ampere hour capacity may be used.

Pole changers are supplied with a single vibrating unit for straight line service or with four or five vibrating units of different frequencies for party line service.

Kellogg pole changers require only a minimum of maintenance. They hold their adjustment over a long period of time. There are only three vibrating springs; one is used to operate the pendulum or vibrator reed; the other two, together with the swinging vibrator, produce the desired frequency of ringing current.

To protect the pole changer contacts, a 15 or 25 watt, 120 volt mazda lamp should be installed in the live side of the ringing leads in each position of the switchboard.

SINGLE FREQUENCY TYPE

These pole changers provide A.C. only in single frequency. They are storage battery type (side swinging). Both code numbers listed below have the following parts in common: One P-69662 and two P-65789 resistors; two No. 66 and one No. 68 condensers; six No. 11 binding posts, and one No. 26 number plate. Input voltage, frequency, and code number of the transformer set supplied are given in the listing below.

Code No.	Volts (Input)	Frequency	Transformer Set
41	24	20	No. 2-A
43	24	60	No. 3-C

POWER

Pole Changers (Cont'd)

SINGLE FREQUENCY—FOR RELAYMATIC

This pole changer is used on the Relaymatic standardized power panel. It includes one P-69662 and two P-65789 resistors; two No. 64 and one No. 132 condensers; one No. 5-C transformer; two No. 65-A and one No. 41-B retard coils; relays Nos. 2106 S-JD, 1870 S-DS, and a No. S-GT coil.

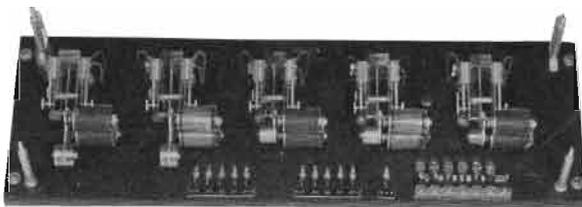
Code No.	Volts (Input)	Frequency (Cycles)
46	48	16

FOUR FREQUENCY TYPE

This pole changer provides four frequencies for the first four parties of harmonic ringing. It is designed for relay rack mounting. It includes four P-69662 resistors and a No. 29-A transformer set.

Code No.	Volts (Input)	Frequency (Cycles)
39	24	Position 1 16 2/3
		Position 2 33 1/3
		Position 4 50
		Position 5 66 2/3

FIVE FREQUENCY TYPE



This pole changer provides the five frequencies of five party synchronomic ringing. Each of these pole changers includes five P-69662 resistors.

Code No.	Volts (Input)	Frequency (Cycles)					Trans. Set
		Pos. 1	Pos. 2	Pos. 3	Pos. 4	Pos. 5	
42	24	16	30	42	54	66	No. 27-B
44*	48	16	30	42	54	66	No. 30
45**	48	16	30	42	54	66	No. 31

*For relay rack mounting.

**For Relaymatic mounting.

Pole Changer Filters



The Kellogg pole changer filter is designed to reduce cross-ringing, radio interference, and ringing induction in the switchboard and outside cables.

Basically, these filters are of the band or frequency pass type and serve as blocking filters for the stray harmonic frequencies present in pole changer voltages. These harmonics are created as part of the basic frequency since the form of the pole changer frequency is, in general, a "square" wave, made up of the basic frequency and many harmonics of that basic frequency.

Pole Changer Filters (Cont'd)

In some cases the harmonics of a low ringing frequency are sufficiently high in voltage to ring other telephones on the line. By blocking these harmonics this "cross-ringing" is prevented.

Each of the filters listed below is designed to mount on a single No. 1003 relay mounting strip.

HARMONIC FREQUENCY FILTERS

Code No.	Frequency (Cycles)	Code No.	Frequency (Cycles)
1-A	33 1/3	1-D	16 2/3
1-B	50	2-B	25
1-C	66 2/3		

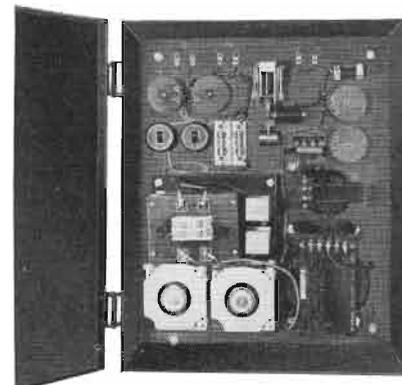
SYNCHROMONIC FREQUENCY FILTERS

Code No.	Frequency (Cycles)	Code No.	Frequency (Cycles)
2-C	30	1-C	66
1-B	42	1-D	16
2-D	54		

STRAIGHT LINE FILTERS

Code No.	Frequency (Cycles)
2-A	20

No. 2-A Power Unit



The Kellogg No. 2-A power unit, used with a 24-volt storage battery, forms a complete power installation for PBX, magneto, or small common battery switchboards handling any number of calls up to 2,500 per day. It supplies ringing current of 105 volts, 20 cycle, and does not interfere with radio reception.

This compact unit combines in one cabinet all the necessary fuses, switches, condensers, pole changer, transformer, dry charger, and filter equipment. All of the equipment is mounted on a wood backboard inside the black enameled steel cabinet. Dimensions of mounting cabinet: 20 inches high, 16 inches wide, and 8 inches deep. Two conduit knockout holes are provided at top, one for entrance of commercial current and ringing leads to switchboard; the other for direct current leads to storage battery.

The direct current charging rate of the copper oxide charger used is variable from approximately 100 milliamperes to 1 ampere by means of slide band resistors.

Code No.	A.C. Input		Ringing		Net Weight
	Volts	Cycles	Volts	Cycles	
2-A	110-115	60	105	20	100 lbs.

POWER

Raytheon Rectifiers



Raytheon Rectifiers are used to obtain telephone D.C. power direct from an A.C. source. They are designed particularly for PBX switchboards, either dial or manual.

Rectifiers provide long, trouble-free, economical operation. Each Rectifier will operate a telephone system for 24 hours a day as long as the maximum current demand does not exceed the output rating of the Rectifier. Current ratings are

based on installations being in live air where the maximum ambient temperature does not exceed 95°F.

Rectifiers are available with change of source relays which make it possible to furnish D.C. with dry cells during an interruption of the A.C. power source.

RECTIFIERS USING DRY DISC RECTIFYING UNITS

Cat. No.	D.C. Output Volts	Output Amps.	A.C. Supply Frequency	Dimensions (inches)			Shipping Weight
				Width	Depth	Height	
1024	6	0.5	50-60	7	6¼	10½	17 lbs.
1026	12	0.5	50-60	7	6¼	10½	17 lbs.
1027	24	0.5	50-60	7	6¼	10½	34 lbs.
1028-A	6	1.0	50-60	7	6¼	10½	20 lbs.
1044-E	24	1.0	60	14½	7⅝	14⅞	84 lbs.
1044-ER*	24	1.0	60	14½	7⅝	14⅞	84 lbs.
1043	24	1.5	60	14½	7⅝	14⅞	90 lbs.
1043-R*	24	1.5	60	14½	7⅝	14⅞	90 lbs.
1040	24	3.0	60	14½	9⅝	14⅞	100 lbs.
1040-R*	24	3.0	60	14½	9⅝	14⅞	100 lbs.
1041	24	4.5	60	19	12	14⅞	142 lbs.
1042	24	6.0	60	19	12	21½	179 lbs.
1082	48	3.0	60	19	12	21½	190 lbs.
1079	48	4.0	60	19	15-3/16	28	210 lbs.

*With change of source relay. Change of source relays can be supplied on all models where not listed. Order by adding suffix letter "R" to the catalog number.

FOR OPERATORS' TRANSMITTER ON MAGNETO SWITCHBOARD



A full 4 volts is furnished by this Rectifier for the best operation of telephone operators' headset transmitters. Life-time dry disc rectifying units are used.

Operates from 115 volts, 50-60 cycles A.C. power supply. Delivers 4 volts D.C. Power consumption is 4½ watts. Will supply 1 or 2 transmitters.

If there is an A.C. power interruption, a relay automatically disconnects the Rectifier and connects a set of dry cells provided by the telephone company for this emergency. The Rectifier is automatically re-connected as soon as the A.C. power circuit is restored to service.

Cat. No.	D.C. Output Volts	Output Amps.	A.C. Supply Frequency	Dimensions (inches)			Shipping Weight
				Width	Depth	Height	
1057-R	4	0.23	50-60	7	6¼	10¼	17 lbs.

Rotary Ringing Equipment

Rotary ringing equipment provides long, trouble-free performance for all applications. The items listed here provide a complete range for all exchanges, large and small. Special ringing equipment may be obtained by submitting specifications.

MAGNETO RINGING SET NO. MG-125



This compact, two-bearing motor-generator set contains a squirrel cage motor and a magneto type generator with permanent magnet rotor. The design completely eliminates all brushes, commutators and slip rings and insures continuous operation over long periods of time without attention. Operation is quiet, causes no interference with

radio reception and has close voltage regulation. All terminals are mounted on insulating blocks recessed in the base with facilities for direct conduit connection. An insulating transformer is furnished with each set to prevent accidental demagnetization of the rotor.

The set operates on 115-volt, 60-cycle, single phase supply and delivers 80 volts, 19 cycles at 15 watts maximum output. Required floor space is 11-5/16 inches by 7½ inches for the ringing set and 5 by 5 inches for the transformer. Shipping weight is 75 pounds. Where stand-by supply is required a ringing dynamotor may be employed.

RINGING DYNAMOTOR



Ringling dynamotors operate from 24 or 48-volt battery supply and deliver 19 cycles at 115 volts, no load, and 80 volts at rated load. They are useful as standby sets for AC driven magneto ringers or as a principal source of ringing current where voltage variations are

not excessive and where space and cost are important. Where tone and interrupter equipment are required, a separately driven interrupter should be employed or a motor-generator ringing set should be used. Time limit automatic starters are provided on sets of 75 watts output and above.

Cat. No.	Watt Output	Floor Space	Shipping Weight
1	30	11½ x 8 in.	70 lbs.
2	75	18½ x 9¾ in.	175 lbs.
3	150	20 x 10½ in.	225 lbs.
4	300	24 x 14 in.	300 lbs.

POWER
ROTARY RINGING EQUIPMENT (Cont'd)

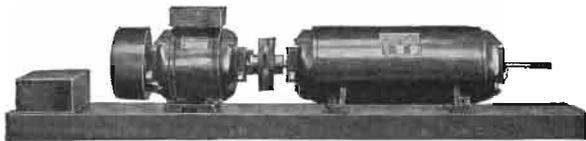
RINGING ROTARY CONVERTERS WITH FIVE CIRCUIT INTERRUPTER

These inverted rotary converters, driven by 44-52-volt battery, deliver ringing current through a transformer tapped for voltage adjustment and are also equipped with self-contained tone and interrupter. They are especially useful for large PBX or PAX installations or moderate sized exchanges. The tone commutator provides a single tone of approximately 140 I.P.S. Each of the four interrupter spring sets furnishes a one-second make followed by a five-second break period.

The rotary converters are completely enclosed by removable covers, and are provided with ball bearings and with rubber-bushed mounting holes in the feet.

Cat. No.	Input Volts	Output Volts	Floor Space	Shipping Weight
1	44-52-DC	25	13½ x 6¾ in. 7¾ x 4⅛ in. (trans)	40 lbs. 15 lbs.
2	44-52-DC	50	15 x 6¾ in. 7¾ x 5¾ in. (trans)	50 lbs. 25 lbs.

25-Watt Four and Five Frequency Harmonic Ringing Motor-Generator Sets



These ringing motor-generator sets supply constant frequency ringing current for harmonic party line installations and are trouble-free in operation. A speed governor is used for both AC and DC motor driven sets, holding the ringing frequencies constant.

The generator rotors consist of Alnico castings eliminating brushes and slip rings. One generator supplies four frequencies and together with the motor and accessories is mounted on a channel iron base. The generator outputs are 16⅔, 33⅓, 50 and 66⅔ cycles, 25 watts at each frequency, at voltages of 75, 100, 135 and 175 volts (at no load) respectively. When a fifth frequency (25 cycles at 100 volts) is required, it is added in the form of a separate unit, and mounted on a long base with the four-frequency set. For AC supply the fifth frequency set consists of a synchronous motor belted to a 25-watt, 25-cycle generator having an Alnico rotor. For DC supply the fifth frequency is furnished by a 25-watt, 25-cycle dynamotor equipped with a speed governor.

An insulating transformer is needed for each frequency except the fifth frequency supplied by the dynamotor.

Cat. No.	Motor	Floor Space	Weight
1	115 volt, 60 cycle, single phase	62 x 10 in.	325 lbs.
2	24 volt, DC	60 x 10 in.	325 lbs.
3	48 volt, DC	60 x 10 in.	325 lbs.
F	Fifth frequency, 25 cycles	82 x 10 in.	550 lbs.
I	Interrupter—specify circuits and timing	Same	plus 20 lbs.
T	Tone Commutator (133-400 cycles)	Same	plus 5 lbs.

FOUR AND FIVE FREQUENCY SYNCHROMONIC MOTOR-GENERATOR RINGING SETS

Each set consists of one motor belted to four or five separate generators. Four-frequency sets produce 30, 42, 54, and 66 cycles at 100, 125, 150 and 160 volts, no load, respectively. Where a fifth frequency is required it may be either 16 or 20 cycles at 100 volts.

These are available as companion sets for either AC or DC drive. DC drive motors are supplied with governors. The 25-watt sets have one generator which provides exciter current for all generator fields and one transformer, center tapped for coin collect voltages. Time limit automatic starters are furnished for the 50 and 150 watt DC driven sets. Starters are provided for 150 watt AC driven sets.

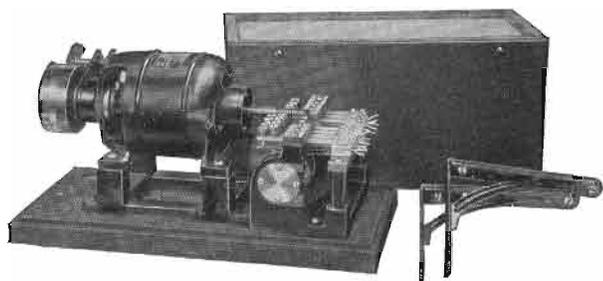
Where tone and interrupter equipment is required a separate motor driven interrupter, independently mounted, should be specified.

Cat. No.	Watts Output	Motor	Floor Space	Weight
1	25	24 volts, DC	48 x 18 x 14 ins.	500 lbs.
2	25	48 volts, DC	48 x 18 x 14 ins.	500 lbs.
3	25	115 volts, 60 cycle, Single phase	48 x 18 x 14 ins.	500 lbs.
3F*	25	115 volts, 60 cycle, Single phase	56 x 18 x 14 ins.	550 lbs.
4	50	48 volts, DC	68 x 36 ins.	1000 lbs.
5	50	115-230 volts, 60 cycle, Single phase	68 x 36 ins.	1000 lbs.
6	50	220-440 volts, 60 cycle, Single phase	68 x 36 ins.	1000 lbs.
6F**	50	220-440 volts, 60 cycle, Single phase	68 x 36 ins.	1000 lbs.
7	150	48 volts, DC	84½ x 28 ins.	1400 lbs.
8	150	115-230 volts, 60 cycle, Single phase	84½ x 28 ins.	1400 lbs.
9	150	220-440 volts, 60 cycle, Single phase	84½ x 28 ins.	1400 lbs.
9F†	150	220-440 volts, 60 cycle, Single phase	84½ x 28 ins.	1450 lbs.

* Same as No. 3 plus fifth frequency. Specify whether 16 or 20 cycles.

** Same as No. 6 plus fifth frequency. Specify whether 16 or 20 cycles.

† Same as No. 9 plus fifth frequency. Specify whether 16 or 20 cycles.

POWER**ROTARY RINGING EQUIPMENT (Cont'd)****INTERRUPTERS**

One of the most important functions of telephone ringing equipment is ability to provide tones for dial, busy signals, and other miscellaneous signalling purposes, interrupters for producing variously timed pulses and automatic ringing circuits providing sequential time ring for automatically coded ringing. This may be accomplished by use of a separate motor driven interrupter or may be combined directly with the ringing generators. The general description of interrupters below applies to all such interrupter equipment. The interrupter proper consists of a slow speed shaft, worm driven from an extension of the generator shaft, or a special motor shaft, and spring type contactors. The normal speed of the interrupter shaft is 10 rpm. or 6 seconds for one complete interrupter cycle. All times and frequencies given below refer to a 6-second interrupter speed. In special instances, a 5-second cycle may be provided with consequent change in indicated timings.

Specify whether low tone of 133 cycles or high tone of 400 cycles, or both, are required.

INTERRUPTERS. Interrupters are available at 40, 60, 120, or 240 I.P.M. Specify each interrupter speed required.

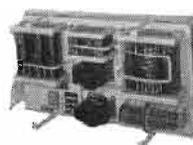
RINGING CIRCUITS.

Standard Ring 1. This provides 1-second ring, 5 seconds off. These are arranged to operate in sequence thus making the full power of the ringing equipment available for each circuit being signalled. Specify number of Ring 1 circuits required. Maximum of five circuits without overlapping ringing intervals.

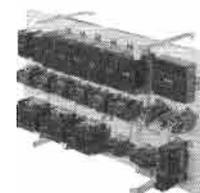
Standard Ring 2. This provides a .4 second ring, .2 second off, .4 second ring. Specify number of Ring 2 circuits required. Maximum of five circuits without overlapping ringing intervals.

MISCELLANEOUS. Considerable variety of miscellaneous timing circuits can be provided. Each such circuit may include three springs: a common, a normally closed, and a normally open contact. Information for each circuit should include duration of contact closure, number of closures per 6-second cycle, relative time of closures to other related circuits. The minimum closure interval is 0.125 seconds and the minimum re-closure interval for the same spring is 0.5 seconds.

The separate motor-driven interrupter is available in any number of circuits from 4 to 19. Interrupters installed as part of ringing generator sets are mounted as described for each set. Where ordered as a separate motor driven interrupter, this will be furnished on a wooden base with a glass top metal cover. Interrupter combinations should be completely specified as above. Also specify whether 115-volt, 60 cycle, single phase motor is required or a 48-volt DC motor. Floor space required is 14½ x 17½ inches up to 12 circuits. Shipping weight is 50 pounds. Exact dimensions and weight will be furnished on larger interrupters on request.

SUB-CYCLE RINGING EQUIPMENT**LORAIN K-5 DECIMONIC SUB-CYCLE RINGING CONVERTER**

FRONT VIEW



REAR VIEW

The Lorain K-5 sub-cycle ringing converter was designed for use with the Kellogg decimonic type frequency selective ringer by

the combined engineering staffs of Kellogg and the Lorain Products Corporation.

This converter supplies five party selective or 10 party semi-selective ringing circuits with ringing frequencies of 20, 30, 40, 50, and 60 cycles. Exchanges having up to 7000 lines, handling up to 85,000 calls per day can be supplied from one K-5 converter.

The Kellogg 1000 series Masterphone can be supplied with ringers especially designed for operation on decimonic frequencies. These ringers have been tested and perfected for reliability of operation and ease of adjustment.

Kellogg ringers of the decimonic type also are available for replacement of ringers from other manufacturers' telephones. For detailed information on these ringers see "Ringers" in this section.

The K-5 sub-cycle converter is self-starting. This feature makes it adaptable for use on start-stop operation. The total power consumption of the K-5, however, is lower than comparable motor driven apparatus and therefore may be operated continuously without excessive power costs.

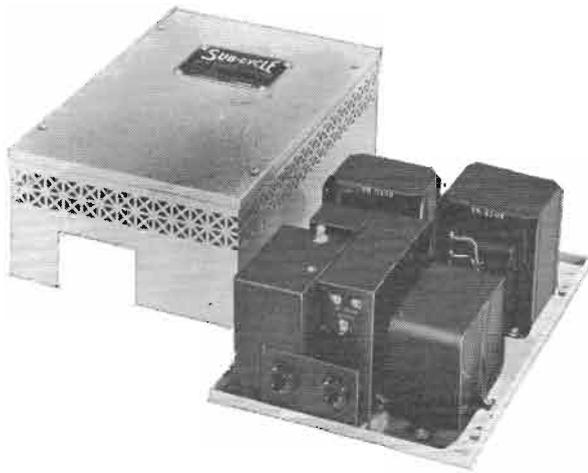
This converter operates directly from 105-125 volt, 60 cycle commercial power supply and can be used as a source of ringing power wherever the above power supply is available.

The frequencies of this converter cannot shift; the unit is supplied from a regulated source of 60 cycle power. The frequencies are directly based upon the supply frequency. They cannot shift unless the 60 cycle supply line shifts in frequency.

Because harmonics in the ringing voltage contribute to the tendency to cross-ring, the K-5 is made without reverting tone in the various frequencies (reverting tone is furnished by higher harmonics). In order to supply reverting tone, two terminals are provided to supply the tone which can be used for any frequency.

POWER
SUB-CYCLE RINGING EQUIPMENT (Cont'd)

LORAIN SUB-CYCLE RINGING CONVERTERS



MODEL S SUB-CYCLE RINGING CONVERTER

The Lorain sub-cycle ringing converter produces a powerful ringing current. These machines have no moving parts—nothing to adjust, require no routine maintenance. The output frequency is always one-third of the input frequency, regardless of fluctuations in the power supply. The converters must be ordered for the frequency supplied in the locality where it is to be used. Sub-cycles are made in different models, one for 60 cycle operation and another for 50 cycle operation. In ordering it is necessary to specify the frequency of the power supply. On 60 cycle units the output is 20 cycles; where the input is 50 cycles the output is $16\frac{2}{3}$ cycles.

MODEL S-60

This unit is for offices up to 1600 stations, produces 20 cycle ringing current from AC supply. Operates on 105-125 volts, 60 cycles AC. Output is approximately 20 watts 90 volts no load. Cabinet is finished in black wrinkle lacquer. Size: $9\frac{5}{8} \times 14\frac{1}{8} \times 5-11/16$ inches. Shipping weight: 35 pounds.

MODEL S-50

This unit is the same as the Model S-60 listed above but is for use on 50 cycle supply. Shipping weight: 40 pounds.

MODEL SGB-50

This unit is the same as the Model S-60 except for 210-250 volts, 50 cycle supply. Shipping weight: 40 pounds.

MODEL SP-60

This unit is for exchanges up to 1600 stations, produces positive and negative impulses pulsating current without moving parts for biased selective ringing, in addition to 20 cycle AC ringing current. Operates on 105-125 volts, 60 cycle AC supply. Output is 15 to 20 watts at 90 volts no load. Cabinet finished in black wrinkle lacquer. Size: $5\frac{3}{4} \times 9\frac{5}{8} \times 14\frac{1}{8}$ inches.

MODEL SP-LB-60

This unit is the same as the Model SP-60 but provides higher voltage for breaking down tubes when used in series with ringers.

MODEL BX-60

This unit is for offices up to 1600 stations. It provides 20 cycle AC ringing supply. Output is approximately 15 to 20 watts at full load is 90 volts. Similar to standard equipment used by the Bell System. Equipped with safety switch and enclosed used cut-out. Cabinet size: $5\frac{3}{4} \times 9\frac{5}{8} \times 14\frac{1}{8}$ inches. Finished in gray enamel.

MODEL CC-60

This is a heavy duty unit designed for use with exchanges having up to 4000 stations, particularly for use in cases where ringing load is abnormally heavy. Produces 20 cycle AC ringing supply. Operates from either 105-125 volts or 210-250 volts, 60 cycle supply. Output is approximately 40 to 50 watts. Either one of two output voltages available by changing a tap on converter, 130 or 90 volts. Size: $6\frac{1}{8} \times 10\frac{1}{8} \times 16\frac{3}{8}$ inches. Shipping weight: 68 pounds. Furnished in black wrinkle finish.

MODEL CC-50

This unit is the same as the Model CC-60 above except for 50 cycle supply. Same size case. Shipping weight: 75 pounds.

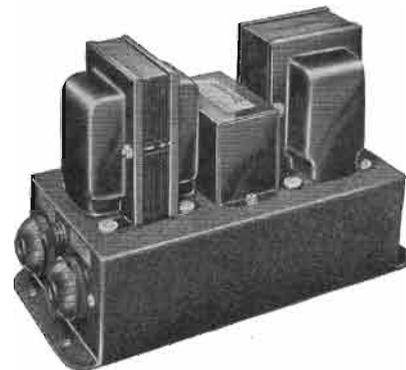
MODEL CCP-60

This unit provides pulsating ringing for 60 cycle offices.

MODEL CCP-50

This unit is the same as the CCP-60 except for 50 cycle offices. Shipping weight: 75 pounds.

MODEL M-7.5-60



This Model M-7.5-60 sub-cycle was designed to meet the need for a small, static-type ringing converter. It may be used with PBX's, inter-communicating systems, cordless boards, and in small exchanges. It has all the features of larger model sub-cycle units but is reduced in sizes and power. A "tone coil" producing revertive ringing tone is furnished.

Used on 105-125 volt, 60 cycle regulated lighting current, has a rated output of $7\frac{1}{2}$ watts, 20 cycles, 90 volts. Housed in metal cabinet finished in black crackle lacquer. Size: $11 \times 5 \times 6\frac{3}{4}$ inches. Shipping weight: 18 pounds.

MODEL M-7.5-50

Same as Model M-7.5-60 except for 50 cycle operation.

MODEL MGB-50

Same as Model M-7.5-60 except for 50 cycle operation on 210-250 volts.

POWER

SUB-CYCLE RINGING EQUIPMENT (Cont'd)

STEP-DOWN TRANSFORMERS FOR USE WITH SUB-CYCLE CONVERTERS

To operate Sub-Cycle converters on 210-240 volts commercial supply the use of step-down transformers is recommended.

Cat. No.	Description	For Model Nos.	Weight
T-155	220 V. to 110 V. 50 or 60 cycles	S-60, SP-60, BX-60	8 lbs.
T-203	220 V. to 110 V. 50 or 60 cycles	CC, CCP	13 lbs.

AUXILIARY TRANSFORMERS NO. T-2259

For use with Sub-Cycle Models Nos. S-60 or BX-60.

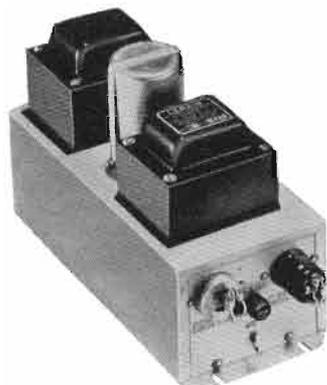
This transformer should be used for offices having super-imposed ringing. The No. T-2259 transformer is connected to the output of the Sub-Cycle and provides a path for the direct current used in superimposed ringing. However, the AC voltage on the output terminals of the transformer may be varied from 90 to 130 volts. Size: 3⁷/₈x4¹/₂x4¹/₈ inches. Shipping weight: 8 pounds.

NO. T-2378

For use with Sub-Cycle Model CC. The T-2378 transformer is used where high ringing voltages are required. By means of this transformer it is possible to obtain ringing voltages of 90, 150, 175, 200, 250, or 300 volts. Under certain conditions these higher ringing voltages can be used advantageously.

Size: 6x5x4¹/₄ inches. Shipping weight: 17 pounds.

STANDBY RINGER CONVERTER



This DC to AC converter has been developed to provide standby ringing capacity in case of power failure. These are made in two sizes, one for operation on 20-26 volts DC, the other to operate on 40-52 volts DC. Both supply 100-115 volts, provides approximately 20 cycle output. This unit has an automatic protection circuit built in so that over-loads will not burn out the vibrator.

The output voltage of this unit is constant even though the battery voltage may vary.

The vibrator is provided with a plug-in base and an extra vibrator can be installed in the same manner a radio tube is replaced in a socket.

In ordering specify battery voltage to be used on converter. Output is approximately 10 watts. Size: 7⁵/₈x5¹/₈x12³/₄ inches.

POWER SWITCHBOARDS

WALL TYPE

In small exchanges the wall type power board requiring a minimum of space is usually sufficient. This saving in space is due to the simplified types of power equipment now in general use, such as sealed type batteries, trickle charging, automatic control of charging, and automatic switching circuits.

Ebony asbestos is generally used for power panels because it does not chip, buckle or warp, has high electrical resistance, and is practically unaffected by chemicals. It is free from metallic veins or other substances detrimental to the performance of power switchboards.

The power equipment mounted on this panel may include an ammeter, voltmeter, switches, fuses, sub-cycle ringing equipment, pole changers, etc.

The Kellogg engineering department should be consulted for assistance in preparing power boards and for cost estimates for boards of correct style and type to meet specific conditions.

RELAY RACK TYPE



Relay rack mounting economically provides space for necessary power equipment in convenient, efficient panels mounted on standard relay rack uprights.

This type of power board is made up of a number of ebony asbestos panels, each arranged to control a certain portion of the power apparatus. This is a flexible arrangement and can be adapted to meet almost any condition that may arise in any telephone exchange up to a point where it is necessary to use a generator for charging the exchange battery.

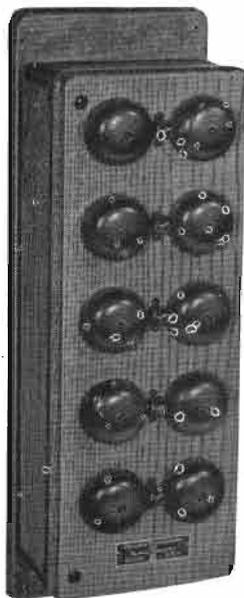
A relay rack power control board is usually located on the non-growing end of the relay rack and consists of the necessary panels with meters, etc., to control all the power equipment. The rack also mounts the rectifier, interrupter, pole

changers, transformer set, etc., in the same relay bay.

On the relay rack illustrated is shown various necessary apparatus for the efficient operation of a medium sized exchange. At the very top of the rack is shown the train of relays making up the automatic interrupter switching circuit. On the panel immediately below the relays a sub-cycle converter and emergency pole changer are mounted. Transformers, condensers, etc., are on the rear of the panel, behind the pole changer. The power panel is just below this apparatus and mounts the switches, ammeter, voltmeter, etc. Next is the Junior Wire Chief's Test Desk and below the desk is the Kellogg No. 13 interrupter.

POWER

Test Sets, Pole Changer

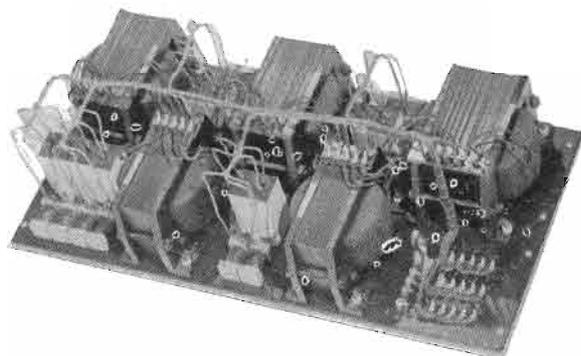


Kellogg pole changer test sets are used to determine whether the pole changers of the exchange are operating satisfactorily. The sets are made up of harmonic ringers and condensers, with the ringers selected to match the frequency of the pole changers. The No. 1 test set is for the No. 39 pole changer, the No. 5 for the No. 42 pole changer.

Code No.	Party	Ringer	Freq. (Cycles)	Res. (ohms)	Condensers Amt.	Code
1	1	72-A-1	33 $\frac{1}{3}$	500	1	#12
2	2	72-A-3	50	500	1	#12
3	3	72-A-3	66 $\frac{2}{3}$	500	1	#12
4	4	72-A-4	16 $\frac{2}{3}$	2500	1	#12
5	1	73-A-1	30	1000	1	#37
2	2	73-A-2	42	1000	1	#37
3	3	73-A-3	54	1000	1	#37
4	4	73-A-4	66	1000	1	#37
5	2	72-A-4	16 $\frac{2}{3}$	2500	1	#37

Five-Frequency Transformer Sets

NO. 27-B



The Kellogg No. 27-B transformer set is equipped with five transformers arranged for harmonic ringing. The five transformers furnish 16, 30, 42, 54, and 66 cycle ringing current ranging in voltage from 110 volts for the 16 cycle frequency to 155 volts for the 66 cycle frequency. The transformers are mounted on an Eboni Electro panel, 26 inches long, 12 $\frac{3}{4}$ inches wide, and $\frac{3}{4}$ inch thick, which is arranged for relay rack mounting. The transformer panel is equipped with the necessary condensers, resistors, distributing bars, and terminals for connecting to the pole changers and switchboard. For 24 volt operation.

NO. 30

This unit is the same as the No. 27-B transformer set except designed for 48 volt operation.

NO. 31

This unit is the same as the No. 30 transformer set except it uses terminal strips instead of distributing bars and is for mounting inside a harmonic ringing Relaymatic power bay. Length of panel: 33 $\frac{1}{4}$ inches. Used with No. 45 pole changer. For 48 volt operation.

Tone Generators

These Lorain tone generators make use of the harmonics developed when a magnetic material is saturated, to generate dial tone. These generators do not have any moving parts. Taps are provided on the output to increase or decrease the tone level. Two different types of units are produced.

Models A and B provide both high and low tone, Models CK, C, and DK provide a single tone. The single tone units provide a tone of 600 cycles modulated at 120 cycles. All models provide both high and low tones which are similar in quality to tones generated by buzzer type tone generators. Model B is made for operation on 210-250 volts, 50 cycles. All other models operate on 105-125 volts, 60 cycles.

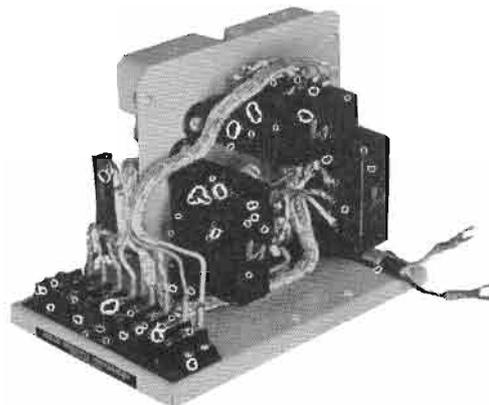
MODEL A

Provides low tone, 480 cycles modulated at 120 cycles, high tone 480 cycles with peaked wave. Size 4 $\frac{5}{8}$ x7 $\frac{5}{8}$ x14 inches. Output 100 milliwatts low tone, 65 milliwatts high tone.

MODEL B

Same as Model A except for operation on 210-250 volts, 50 cycles, 400 cycles modulated at 100 cycles, etc.

MODEL CK



Single tone 600 cycles modulated at 120 cycles, used for dial tone. Output 25 milliwatts, operates from 105-125 volt, 60 cycle supply. Size: 4 $\frac{1}{8}$ x6x4 $\frac{3}{4}$ inches, mounting holes fit Time-O-Matic mounting panel. No cover provided.

MODEL C



Output same as Model CK except mounting does not fit Time-O-Matic panel. Equipped with 6 foot cord and plug on input and provided with cover. Size: 4 $\frac{1}{8}$ x6 $\frac{3}{4}$ x5 inches.

MODEL D AND DK

Same dimensions and construction as Model C except larger coils and rated at 100 milliwatts output.

PROTECTION AND CROSS-CONNECTING EQUIPMENT

Protection and cross-connecting equipment is mounted on a main distributing frame in the central telephone office. Two types of main distributing frames are used: wall mounting for small exchanges and self-supporting floor mounting, upright racks for larger exchanges.

Three types of protector units are available for mounting on the main frame:

1. Carbon lightning arresters and heat coils.
2. Carbon lightning arresters and fuses.
3. Carbon lightning arresters, fuses, and heat coils.

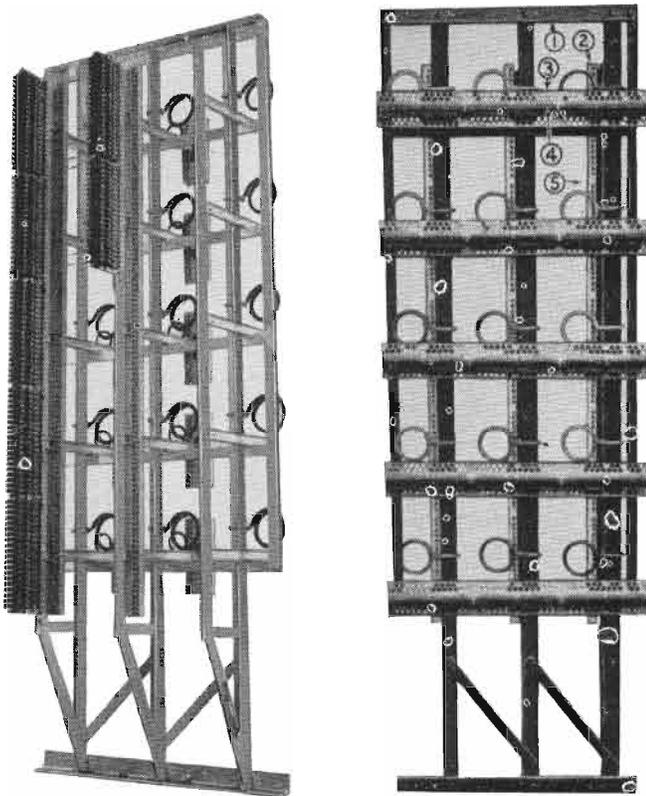
Every switchboard should be protected from lightning by some form of carbon arrester for each incoming line. Where there is

danger from electric light and power circuits a fuse or heat coil protector is used in addition to the carbon arrester.

Fanning strips mounted on the distributing frame make it possible to connect any switchboard number by means of a jumper wire to any outside line. This jumper wire provides a flexible link between the switchboard and line cables as a means of connecting or transferring any switchboard number to any cable pair. This makes it unnecessary to change the telephone number when a subscriber moves from one part of town to another.

The main distributing frame also affords a convenient means for testing both outside line and switchboard circuits and cutting them in and out of service.

Cook Type "L" Main Distributing Frames



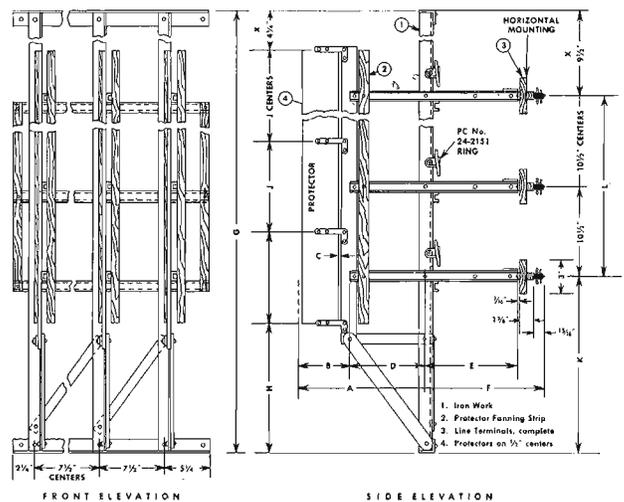
The type "L" floor type main distributing frame is constructed in sectional form, 100 or more pairs in height. Additions may be made on either the right or left side of the frame without disturbing existing equipment.

The verticals and top and bottom pieces are of angle iron and the shelf and cross-connecting pieces are of channel iron. Braces are of bar steel. The finish is gray enamel and the frame is shipped knocked-down.

Switchboard protectors built on 1/2-inch centers and standard line terminal blocks may easily be attached as required. Vertical, steel protector mounting bars and numbered maple fanning strips are mounted on the frame. A ground lug is attached to the lower end of each protector mounting bar to assure a good ground connection.

The type "L" frame is built with either a single or double floor angle. The uprights of a standard 100-pair section are 6 feet high but special uprights made to attach to the ceiling of the terminal room are available.

Cook Vertical and Horizontal Type "L" Frames



On the vertical type frame each line terminal block is mounted on an individual vertical fanning strip. On the horizontal type frame the line terminal blocks are mounted on continuous horizontal fanning strips.

Both types include the iron frame work, large jumper rings, bolts, nuts, and ground connections. Fanning strips are made of hard maple with holes equal in number to the protector capacity. Protectors are furnished as specified and line terminals, protector number plates, and fanning strips are numbered as ordered.

Vertical Type—On the vertical type frame, each line terminal block of 20 to 26 pairs of clips from two to six clips high is mounted on an individual fanning strip.

Horizontal Type—On the horizontal type frame, continuous type fanning strips run from one end of the frame to the other. The number of line terminal blocks mounted on each continuous type fanning strip depends on the width of the frame. Either No. 1000 or No. 5000 line terminals are supplied, as ordered.

The iron framework weighs approximately 24 pounds per 100 pairs.

DIMENSIONS OF TYPE "L" MAIN FRAMES

Number of Pairs of Protectors per Vertical	G*	H	J	K	L
100	6' 0"	1' 3 1/4"	10 1/2"	1' 8 1/2"	3' 6"
110	6' 10 1/2"	1' 8 1/4"	5 1/2" & 10 1/2"	1' 8 1/2"	4' 4 1/2"
150	8' 7 1/2"	1' 8 1/4"	5 1/2" & 10 1/2"	1' 8 1/2"	6' 1 1/2"
160	8' 7 1/2"	1' 3 1/4"	10 1/2"	1' 8 1/2"	6' 1 1/2"
200	10' 0"	10 3/4"	10 1/2"	1' 4"	7' 10 1/2"

*This dimension is variable with the height of the ceiling. Standard dimensions are shown.

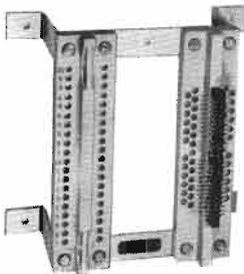
PROTECTION AND CROSS-CONNECTING EQUIPMENT

Cook Vertical and Horizontal Type "L" Frames (Cont'd)

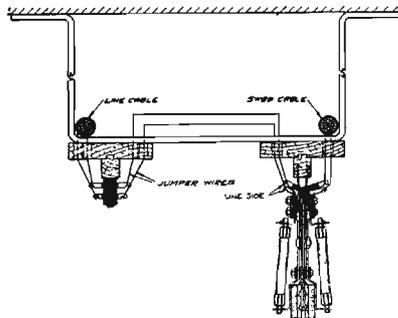
PROTECTOR AND LINE TERMINAL DIMENSIONS

Type of Protector	Size of Main Frame	Dimensions (inches)					
		A	B	C	D	E	F (2 clip)
100	100 to 400 Pairs	10 1/4	4 1/4	1/2	6	6 1/2	8 7/8
	400 to 1000 Pairs	12 5/8	4 1/4	1/2	8 3/8	10 5/8	13
	1000 Pairs and Larger	14 1/2	4 1/2	1/2	10 1/4	18 1/2	20 7/8
105	100 to 400 Pairs	14 5/8	8 5/8	1	6	6 1/2	8 7/8
	400 to 1000 Pairs	17	8 5/8	1	8 3/8	10 5/8	13
	1000 Pairs and Larger	18 7/8	8 5/8	1	10 1/4	18 1/2	20 7/8
H-36	100 to 400 Pairs	12	6	5/8	6	6 1/2	8 7/8
	400 to 1000 Pairs	14 3/8	6	5/8	8 3/8	10 5/8	13
	1000 Pairs and Larger	16 1/4	6	5/8	10 1/4	18 1/2	20 7/8

Cook L-9 Wall Type Distributing Frame



The picture above shows the frame with the protector fanning strip on which protectors are to be mounted.



The diagram above is the top view of the frame with protectors mounted.

This compact, wall type distributing frame is designed to mount No. 100, 105, or H-36 Cook central office protectors and 2-clip, 26-pair line terminals. The frame consists of two pieces of hard, kiln dried maple, one piece drilled and arranged for line terminals, the other piece drilled and milled for mounting the protectors, and two heavy mounting brackets made of bar iron.

The frame is furnished complete with line terminals. Protectors are extra and may be selected according to requirements.

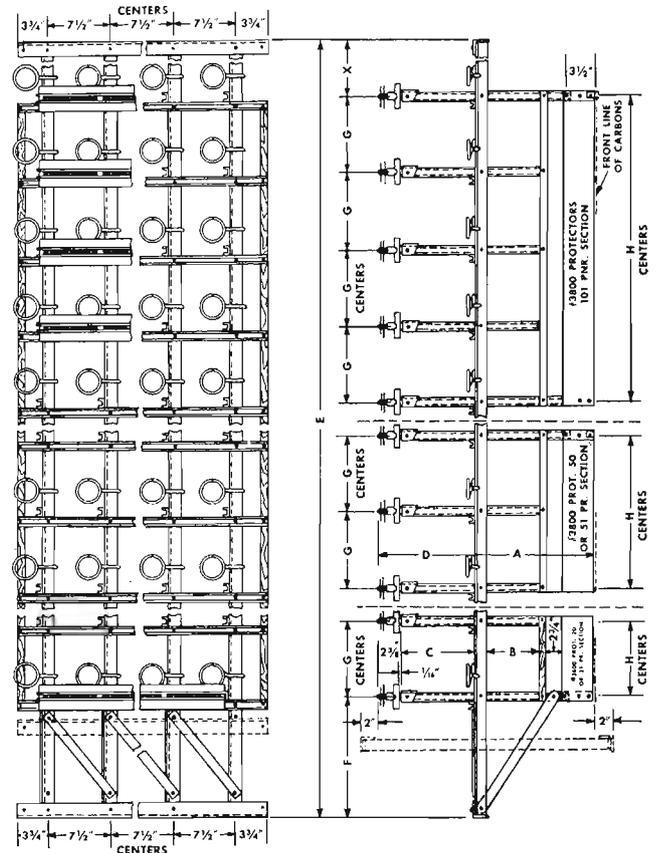
Cat. No.	No. of Pairs Protector Side	No. of Pairs Cable Side	Height Over-all (inches)	Shipping Weight
361-1050	20	26	13	10 lbs.
361-1052	40	52	23 1/2	18 lbs.
361-1054	60	78	34	32 lbs.
361-1056	80	102	44 1/2	46 lbs.
361-1058	100	130	55	60 lbs.

Main Distributing Frames

Special main distributing frames for special applications and special installations are available upon order. The Kellogg engineering department will make recommendations upon submission of the necessary information on the particular requirement.

Standard main distributing frames, not generally used and not shown, also are available. For information on these frames consult either the Kellogg engineering or sales department.

Cook No. 38 Main Distributing Frame



The No. 38 main frame is designed to mount the No. 3800 Cook protector on 3/8-inch centers. It is similar to the type "L" frame except it has no protector mounting bar. The protectors are mounted directly to the shelf channels. Additions to the frame may be made to either the left or right side.

Continuous type fanning strips are mounted horizontally. The dimensions of the frame may be varied to suit conditions.

The dimensional diagram at the left above shows the front view of the No. 38 main distributing frame. For sizes of this frame also refer to the table below.

The dimensional diagram at the right above shows the side view of the No. 38 main distributing frame. Sizes are also shown in the table below. Dimensions marked "X" are variable with the height of the ceiling of the room where the frame is to be installed. Standard dimensions are shown.

DIMENSIONS OF MAIN FRAME

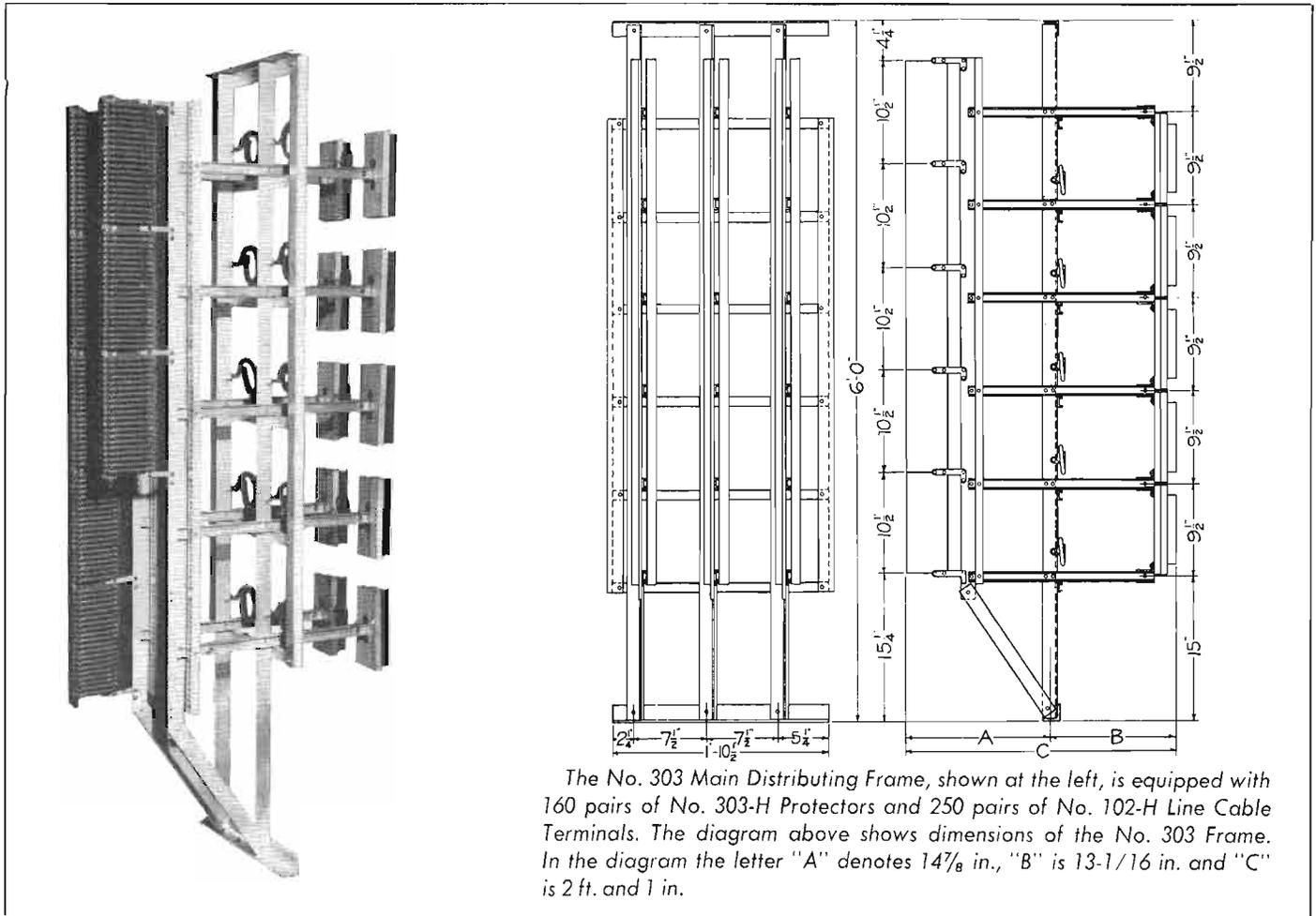
Number of Protector Pairs Per Section	Dimensions (inches)				
	E	F	G	H	X
101 Pair	72	19 3/4	9 3/4	39	13 1/4
51 Pair	X	X	10 1/8	20 1/4	X

X These dimensions are variable with the height of the ceiling. Standard dimensions are shown.

DIMENSIONS OF PROTECTORS AND TERMINALS

Type of Protector	Type of Main Frame	Dimensions (inches)			
		A	B	C	D (2-clip)
3800	100 to 400 Pair	11 1/8	4 7/8	6 1/2	2 7/8
	400 to 1000 Pair	13 1/2	7 1/4	10 5/8	13
	1000 Pair and Up	15 3/8	9 1/8	18 1/2	20 7/8

PROTECTION AND CROSS-CONNECTING EQUIPMENT



The No. 303 Main Distributing Frame, shown at the left, is equipped with 160 pairs of No. 303-H Protectors and 250 pairs of No. 102-H Line Cable Terminals. The diagram above shows dimensions of the No. 303 Frame. In the diagram the letter "A" denotes 14⁷/₈ in., "B" is 13-1/16 in. and "C" is 2 ft. and 1 in.

Reliable Main Distributing Frames

Reliable type 303 and 308 main distributing frames offer two arrangements in terminating outside exchange cables and switchboard cables. The outside cable can be terminated on either the line terminal or protector side. Cross connections are provided by jumper wires. The frame is strong and rigid with jumper rings provided on the main uprights. Protector fanning strip and line terminal fanning strips are provided.

Each vertical section has a capacity of 100 or more pairs of protectors mounted in banks of 20 pairs each, and 130 or more pairs of 112F line terminal blocks in 26-pair blocks. Terminal blocks may be attached in either vertical or horizontal rows as ordered.

Line terminals and protectors are numbered as specified.

All line terminals are mounted on molded bakelite fanning blocks in sections which provide continuous vertical or horizontal strips, as specified. This provides terminating space for as many pairs in a vertical position as can be accommodated in a horizontal position. If complete verticals are not filled by the equipment specified, iron work is still provided so additions may be made of standard units.

A ground strip is attached to the bottom bank of each vertical for attachment to continuous bus bar or cable for the central office ground.

CENTRAL OFFICE PROTECTORS

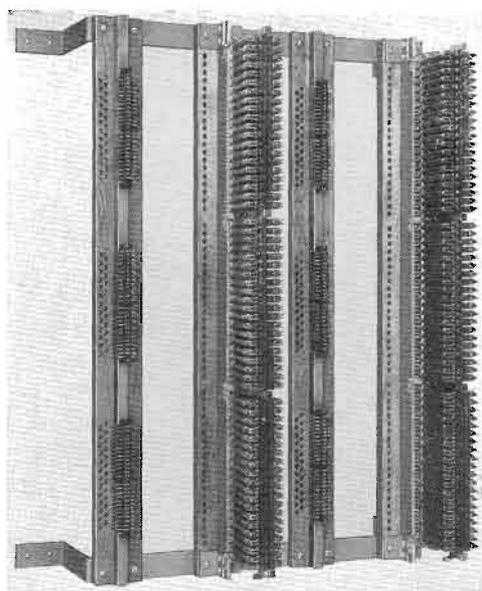
Code No.	Description
303-F	2 No. 106 fuses; 2 No. P495 sawtooth discharge blocks, and 2 No. P663 carbon blocks per pair.
303-H	2 No. 107 heat coil fuses; 2 No. P495 sawtooth discharge blocks, and 2 No. P663 carbon blocks per pr.
308-F	2 No. 114 fuses; 2 No. 4393 carbon and dielectric assemblies per pair.
308-H	2 No. 115 heat coil fuses and 2 No. 4393 carbon and dielectric assemblies per pair.
308-A	Same as No. 308-H, plus alarm system.
LINE TERMINAL BLOCKS	
112-F	For floor type frames. Unit mounting made with 20 to 26 terminals per row in 1 to 6 rows with fanning strip base and mounting bracket.
PROTECTOR FANNING STRIP	
303	For floor type frames using No. 303 protectors. Two single units per vertical. Numbered beginning with one from the top down and from left to right unless otherwise specified.
308	Same as the No. 303 except for No. 308 protectors.

NOTE: No. 308 switchboard protectors are supplied in 20, 22, and 25 pair units. The 20 pair unit is 8 inches long. Fuses are spaced on 3/8-inch centers.

No. 303 switchboard protectors are supplied in 20, 22, and 25 pair units. The 20 pair unit is 10 1/2 inches long. The fuses are spaced on 1/2-inch centers.

PROTECTION AND CROSS-CONNECTING EQUIPMENT

Reliable Wall Type Frames

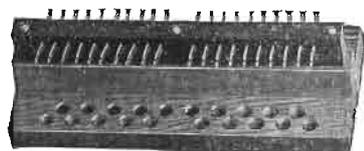


These Reliable main distributing wall frames are for use where space does not permit the installation of floor type frames. These frames use Reliable No. 303 or 308 type switchboard protectors.

Each unit consists of switchboard protector mounting bar and fanning strip in one vertical and one vertical of No. 112-F molded line terminal strips; all mounted on a substantial painted steel frame. Switchboard protectors must be ordered in addition to the unit.

Cat. No.	Protector Side	Line Terminals	Length	
			Ft.	Ins.
308-W-20	20 pair	26 pair		11
303-W-20	20 pair	26 pair	1	1½
308-W-40	40 pair	52 pair	1	7
303-W-40	40 pair	52 pair	2	
308-W-60	60 pair	78 pair	2	3
303-W-60	60 pair	78 pair	2	10½
308-W-80	80 pair	104 pair	3	1
303-W-80	80 pair	104 pair	3	11
308-W-100	100 pair	150 pair	3	7
303-W-100	100 pair	150 pair	4	7½

RELIABLE NO. 112-F LINE TERMINAL STRIPS



The Reliable No. 112-F type line terminal strips are made of high grade precision molded phenolic plastic.

Each strip consists of a fanning type base on which are mounted unit terminal strips containing 20 or 26 solder coated bronze soldering terminals. The base can be furnished with one to six rows of terminal strips. The top of the terminal block will be numbered as specified.

These sturdy units are molded with a black lustrous finish and provide excellent dielectric qualities with high surface insulation resistance.

The bases, 2¾ inches wide and 8 inches long, are supplied with interlocking steel brackets for vertical or horizontal installation on main frames, straight brackets for general use.

48-Volt Alarm System

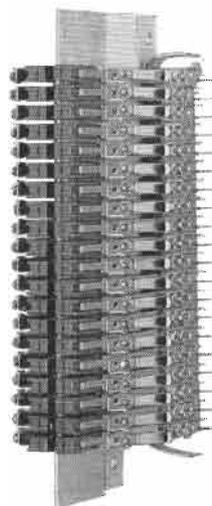
FOR RELIABLE NO. 308-HA PROTECTORS

The Reliable 48-volt alarm system for No. 308-HA protectors consists of an alarm unit for one or more verticals containing a buzzer, relay, off and on switch, and terminals for remote installation of the buzzer or other alarm device. The top protector bank of each vertical is equipped with a bracket and 48-volt signal lamp. Each bank has an alarm switch unit consisting of two precious metal contact buttons which are closed by the heat coil fuse plunger operating the switch vane. The protector alarm switch units are connected in series parallel so that any heat coil fuse may operate to cause the signal lamps and buzzer to be energized. A relay is provided to keep the buzzer circuit free of the signal lamp circuit.

The switch unit consists of a vertical hinged plated bronze vane, containing a precious metal contact button. There is one vane on each side of a 20-pair protector. The vane end contact is moved by the quick action of the heat coil fuse plunger when the fuse opens. This causes the vane to rotate from its present position so that its contact button strikes with a positive pressure and wiping action on a similar stationary precious metal contact button. The switch is opened and reset by a slight lift and turn of the vane. Reliable heat coil fuses may be operated and reset an indefinite number of times if the current does not exceed approximately 10 amperes.

The Reliable alarm system is easily wired with two battery leads to the alarm unit, while another wire is run from the alarm unit to all of the lamps located at the top of the verticals. The common protector ground wire provides a return circuit for the alarm circuit.

Cook No. 3800 Central Office Protector



This protector mounts on the No. 38 main distributing frame. Heat coils and carbon discharge blocks protect against sneak currents and high potentials. Pairs are mounted on ¾-inch centers.

Operation—This protector opens the switchboard circuit, grounds the outside line and operates an alarm signal. It is reset by relatching the operating spring over the heat coil. The coil does not have to be changed, reversed, or resoldered.

Construction—The mounting plate is cadmium plated steel, formed to secure great strength and rigidity. The ends of the mounting plate fasten directly to the shelf channels of the main frame. All springs are of nickel silver, of ample strength to give positive operation and strong, permanent contact pressure. Line connections are on one side of the protector and switchboard connections are on the other side.

Insulation—All current carrying parts are insulated with hard rubber and bakelite.

Lightning Arresters—No. 2614 sealed-gap unit dischargers are standard. They are made of two carbons, separated by an acetate dielectric and cemented into a unit. They will permanently ground under continuous discharge. They are easily installed and removed.

PROTECTION AND CROSS-CONNECTING EQUIPMENT

Cook No. 3800 Central Office Protector (Cont'd)



Heat Coils—The No. 3800 self-soldering, wire wound heat coils will carry .35 amperes for 3 hours, and will operate within 210 seconds on .5 ampere in an ambient temperature of 68° F. They can be reset without charging.

Temporary Disconnect—To open the circuit, a thin insulator is inserted between the outside spring and the spring holding the heat coil.



Testing—The No. 3800 test plug can be slipped over any pair of protectors, and offers means to test the outside line, the heat coils, and the switchboard circuit. When the test plug is withdrawn, the protector is left in an operating condition.

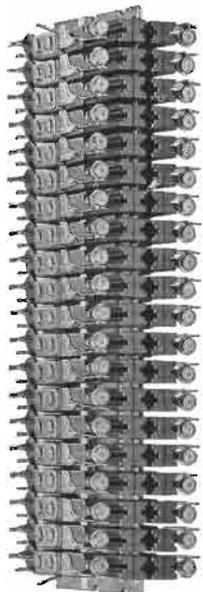
NO. 3800 PROTECTOR PARTS

Cat. No.	Description
380-60	No. 3800 Test Plug
380-30	No. 3800 Heat Coil
380-40	Unit Discharger for No. 3800 Protector (with .003 inch dielectric).
380-130	Unit Discharger for No. 3800 Protector (with .005 inch dielectric).

NO. 3800 PROTECTORS

Cat. No.	Description	Dimensions (inches)			Shipping Wt. Per 100 Pairs
		Length	Width	Depth	
380-1320	20-pair section	8 ⁵ / ₈	3	4 ³ / ₄	23 lbs.
380-1382	20-pair section (with third lug)				
380-1321	21-pair section	9	3	4 ³ / ₄	23 lbs.
380-1351	51-pair section	20 ¹ / ₄	3	4 ³ / ₄	22 ¹ / ₂ lbs.
380-1361	101-pair section	39	3	4 ³ / ₄	22 ¹ / ₂ lbs.
380-1378	101-pair section				

Cook No. 100 Central Office Protector



The No. 100 central office protector utilizes heat coils and carbons. Line connections are on one side of the protector and switchboard connections on the other side. Pairs are mounted on 1/2-inch centers. Testing may be done easily without removing heat coils.

Operation—This protector opens the switchboard circuit, grounds the outside line, and operates an alarm signal. The protector is reset by simply relatching the operating spring to the heat coil. The coil does not have to be changed, reversed, or re-soldered.

Construction—heavy nickel silver holding springs insure a positive permanent pressure between the lightning arrester carbons and ground plate.

Mounting plates are metal and may be mounted on a standard frame carrying protectors on 1/2-inch centers. The circuit from the heat coil spring to the switchboard terminal is carried between the grounded mounting plates and is well shielded.

Cook No. 100 Central Office Protector (Cont'd)

Insulation—All current carrying parts are thoroughly insulated with hard rubber and bakelite.

Lightning Arresters—These consist of two grooved carbons, separated by an acetate dielectric .005 inch thick and will permanently ground under continuous discharge. Sealed gap unit discharges are furnished when specified.



Heat Coils—These No. 100 self-soldering, wire wound heat coils have approximately 3 1/2 ohms resistance, will carry .35 amperes for three hours and will operate within 210 seconds on .5 ampere in an ambient temperature of 68° F.

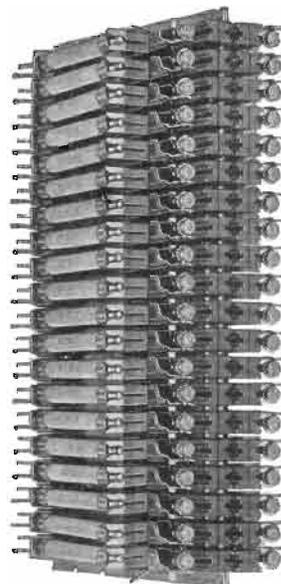
Temporary Disconnect—Before opening the circuit, insert toothpick through the slot of the carbon to keep the ground and alarm spring from making the contact when the operating spring is released.



Testing—The No. 111 test plug can be slipped over any pair of protectors and offers means to test the outside line, the heat coils, and the switchboard circuit. When test plug is withdrawn the protector is left in operating position.

Cat. No.	Description	Dimensions (inches)			Shipping Wt. Per 100 Pairs
		Length	Width	Depth	
360-1210	10-pair section	5 1/2	2	3 1/2	17 lbs.
360-1220	20-pair section	10 1/2	2	3 1/2	17 lbs.
360-70	No. 100 Heat Coil				
41-11	Acetate dielectric (.005 inch)				
370-10	No. 100 Test Plug				
41-1282	Carbons for No. 100 Protector				
41-2612	Unit Dischargers for No. 100 Protector				

Cook No. 105 Central Office Protector



The No. 105 protector is similar to the No. 100 except that it is equipped with fuses as well as heat coils and arresters.

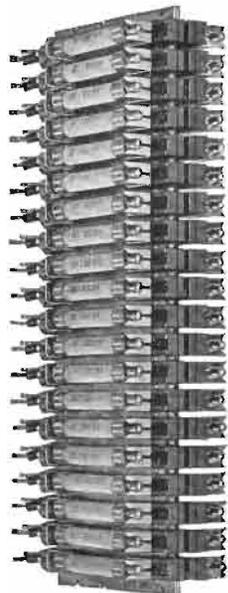
Fuse Clips—Fuses are held under positive tension in clips, but may easily be removed and replaced. Lightning arresters are held under constant pressure against ground plate by heavy springs.

Fuses—Fuses are No. 214-2200, A-22 Lavite, three ampere.

Cat. No.	Description
392-1510	No. 105 Protector, 10-pair section.
392-1520	No. 105 Protector, 20-pair section.

PROTECTION AND CROSS-CONNECTING EQUIPMENT

Cook H-36 Central Office Protector



This protector is designed to protect circuits where heat coils are not required.

Construction—This protector is built in 10 and 20 pair sections on metal plates. The pairs are on 1/2-inch centers.

Fuse Clips—Fuses are held under positive tension in Cook clips, but may easily be removed and replaced. The lightning arresters are held under constant pressure between heavy nickel silver springs and ground plate.

Terminals—Line terminals are on one side and switchboard terminals are on the other. Each terminal is thoroughly insulated and tinned.

Insulation—All current carrying parts are separated by rubber insulation.

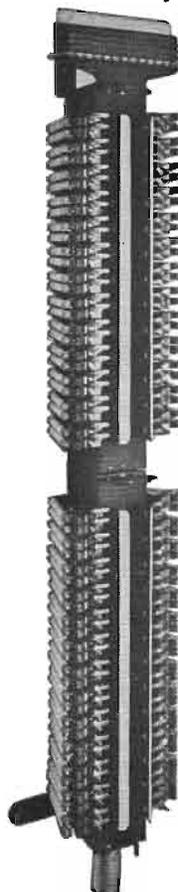
Lightning Arresters—Two carbons, one grooved and one plain, separated by a .005-inch acetate dielectric, are

standard. Under the influence of a continuous arc, this protector will ground the outside line until the fuse opens the circuit. True Gap dischargers, which do not ground the line, will be supplied when specified.

Fuses—Unless otherwise specified, this protector is furnished with No. A-45 Lavite fuses that blow at 1 ampere. No. A-46 wood fuses will be furnished when specified.

Cat. No.	Description	Dimensions (inches)			Shipping Weight
		Length	Width	Depth	
296-3610	10-pair section	5 1/2	1 1/2	5 1/2	21 lbs.
296-3620	20-pair section	10 1/2	1 1/2	5 1/2	21 lbs.
306-4500	No. A-45 Lavite Fuse for H-36 Protector				
307-4600	No. A-46 Wood Fuse for H-36 Protector				

Cook Type "T" Main Distributing Frame



The type "T" wall mounting main distributing frame is the unit of the Cook Trans-Mount system designed for the termination and distribution of the outside paper-wrapped lead covered cable directly to the line cable terminals. This eliminates the splicing of silk, cotton, or wool ends to the paper-wrapped cable for termination on exposed terminal blocks.

The type "T" is equipped with a moisture-proof, compact corebox, metal fanning strip with insulating bushings in fanning holes, and a white designation strip for numbering pairs. Other features are the self-soldering nozzle insuring tight cable sheath points, rubber covered rings for distributing cross-connection jumpers, solder clips for both ends of the jumpers, and strong, rigid, wall-mounting brackets.

The terminal block provided for switchboard cable has a bakelite fanning strip and a white designation strip for numbering pairs.

This frame is furnished in standard 26, 52, and 104 pair units but multiples of these sizes are available. The Cook type "H" protector with standard fuse and high-potential discharge block is installed only as required and also is standard equipment for the other apparatus in Cook's Trans-Mount system.

Cat. No.	Capacity	Dimensions (inches)	Shipping Weight
519-1	26-pair	26 1/2 x 7 1/2 x 7	26 lbs.
519-2	52-pair	46 1/2 x 7 1/2 x 7	37 lbs.
519-3	104-pair	50 x 19 x 7	82 lbs.

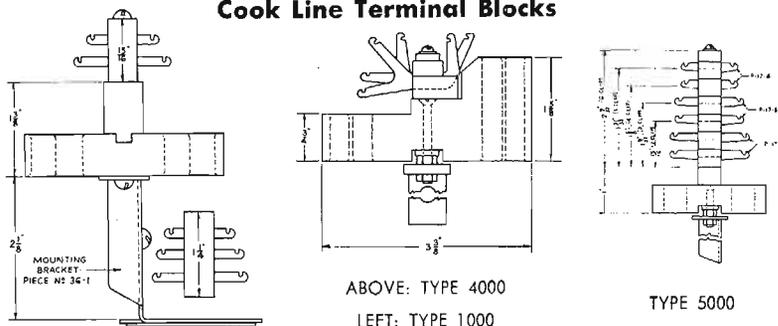
Cook Type "H" Protector Mounts



This type "H" protector unit is used in all apparatus of the Cook Trans-Mount system. Built on a bakelite base, it provides primary protection with a fuse and high-potential discharger and secondary high-potential protection after the fuse has blown.

These protector mounts are installed only as required and mount standard fuses and dischargers. Non-corrosive studs and washers, phosphor bronze springs and clips, and True-Gap dischargers are standard.

Cook Line Terminal Blocks



Solder clips (from 2 to 5 clips high) are set in a rubber block mounted on a maple fanning strip. The block mounting 20 pairs is 7-7/32 inches long and 26 pairs is 7 3/8 inches long.

TYPE 4000

Three point solder clips are set in a rubber block for mounting on a continuous fanning strip. The block mounting 20 pairs is 8-15/32 inches long and 26 pairs is 8-31/32 inches long.

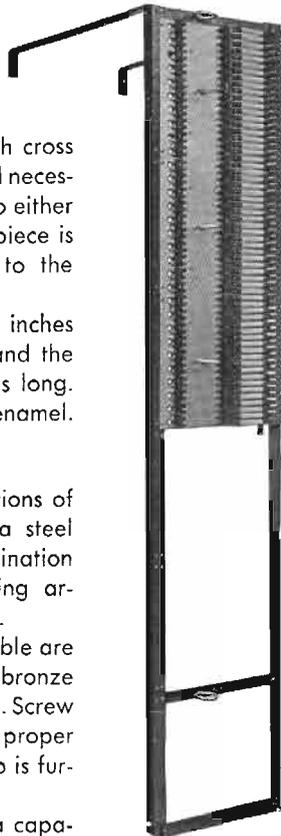
TYPE 5000

Available from 2 to 10 clips high and from 10 to 50 pairs long on mounting centers of 6 1/2 inches and longer. The rubber block mounting 20 pairs is 8-15/32 inches long and 26 pairs is 8-31/32 inches long.

PROTECTION AND CROSS-CONNECTING EQUIPMENT
Cook L-10 Main Distributing Frame

This floor type main frame is of all steel construction and is used for mounting H-51 central office protectors. It consists of two vertical upright angle iron supports with cross pieces, wall braces, jumper rings, and necessary bolts. Additions may be made to either the right or left side. The top cross piece is drilled to attach a cable bracket to the switchboard.

The vertical uprights are 6 feet, 9 inches high. The frame is 16 inches wide and the adjustable wall braces are 18 inches long. All steel parts are finished in gray enamel.



H-51 PROTECTOR

These protectors are made in sections of 10 pairs. Each section consists of a steel panel on which are mounted a combination of line terminals, fuses and lightning arresters. This protector is fire resistant.

Outside cable and switchboard cable are soldered directly to the phosphor bronze terminals set in hard rubber insulation. Screw and washer contacts are provided for proper cross connection. An extra solder clip is furnished to make a common ground.

No. A-12 composition fuses with a capacity of 1 ampere are used. Grooved carbons and .005-inch acetate dielectrics are standard. Under the influence of a continuous arc, a perma-ground is established. True Gap dischargers that do not ground the line will be supplied when specified. Arresters ground on a copper ground strip that runs the length of the mounting plate, with provisions to make the ground continuous.

Jumper rings are mounted in the center of each plate. Metal pins on the back are provided for tying up the cable. Where wires run through the metal base, fibre insulation is provided.

Cat. No.	Description
153-1260	L10 Frame
423-1910	H-51 Protectors
41-2002	Grooved Carbons for H-51 Protector
41-11	Acetate Dielectric (.005 inch) for H-51 Protector
41-1907	True Gap Dischargers for H-51 Protector
41-1200	A-12 Composition Fuses (1 amp.) for H-51 Protector

Protection Equipment

Protection equipment for station installations, both indoor and outdoor type, cable terminals, and similar equipment are shown in the Supply Section of this catalog.

Special protection equipment for special applications and special installations are available upon order. The Kellogg engineering department will make recommendations upon submission of the necessary information on the particular requirement.

RACKS, CONNECTING

Kellogg connecting racks are of one piece molded bakelite construction and are designed so that lead wires can be quickly and easily connected. They are neat and compact and are furnished with an attractively finished black enamel cover. The blocks are mounted with wood screws. Kellogg connecting racks are available in three sizes to meet a large variety of applications.

Two-Point Type

NOS. 24-A AND 25-A

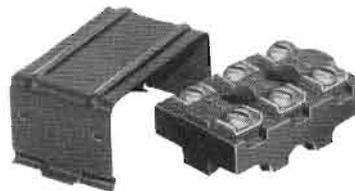


These connecting racks are for connecting two wires. The No. 24-A is furnished complete with cover. Mounting screws are not supplied.

The No. 25-A is the same as the No. 24-A but furnished less cover.

Three-Point Type

NOS. 24-B AND 25-B



These connecting racks are for connecting three wires. The No. 24-B is furnished with cover. Mounting screws are not supplied.

The No. 25-B is the same as the No. 24-B but furnished less cover.

Four-Point Type

NO. 27



For connecting four wires. Furnished complete with cover and wood screws for mounting purposes.

RECEIVERS

Kellogg receivers are designed for maximum efficient operation under all types of circuit conditions. Receivers are available in three basic types: 1) for telephone use in both handset and hand-receiver types; 2) industrial types, and 3) operator's head and chest set types.

TELEPHONE TYPE—FOR HANDSETS



LEFT: NO. 89-A RECEIVER (FRONT VIEW)



RIGHT: NO. 89-A RECEIVER (REAR VIEW)

Code No.	Res. (ohms)	Used On
84-A	48	Nos. 52-L, 53-L, 56-C, 56-L, 61-L, and 62-L handsets.
89-A	48	Nos. 46-C and 47-C Masterphone handsets.
P-55919	47.4	Nos. F-27-C, F-27-L, F-27-EC, F-27-CWL, F-35-EC, F-39-C, F-40-C, F-40-L, 42-C, F-43-C, F-43-L, 44-C, F-44-L, 49-C, 54-C, 55-C, 57-C, 58-C, 59-C, & 60-C handsets.
P-44405	100	Nos. 32-C and 32-L metal handsets.
P-61575	100	No. 33-C metal handsets.
P-69602	2000	Nos. 48-C and 51-C handsets.

RECEIVERS (Cont'd)

TELEPHONE TYPE—FOR HAND-RECEIVERS

Code No.	Res. (ohms)	Used On
F-41-A	62	No. F-817 type, 4884, 4885, 4886, 4809, 4812, 4816, 4820, 4824, 4880, 6886, F-2921, F-2869, F-28, F-90-A, F-97, F-97-B, F-118, F-148, F-600, F-601, F-618, F-684, F-301, and 305 telephones and all hand-receiver type telephones.



F-41-EA	62	Same as No. F-41-A shown above except has rubber covered cord. Used on Nos. 4901, 4901-A, 4903, 4905, F-1983, and F-138 telephones and all hand-receiver type telephones.
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INDUSTRIAL TYPE

Code No.	Res. (ohms)	Fits Cord	Head Band	Used On
80-A	60	Per Spec.	No. 2	For railroad service. Used on Nos. F-2945, F-2870, & F-601 telephones.
80-B	400	Per Spec.	No. 2	For dispatchers' sets.



OPERATOR'S TYPE

Code No.	Res. (ohms)	Head Band	Fits Cord	Used On
87-A	56	No. 14	Nos. 708 to 713, inclusive	Operators' sets

RECTIFIERS

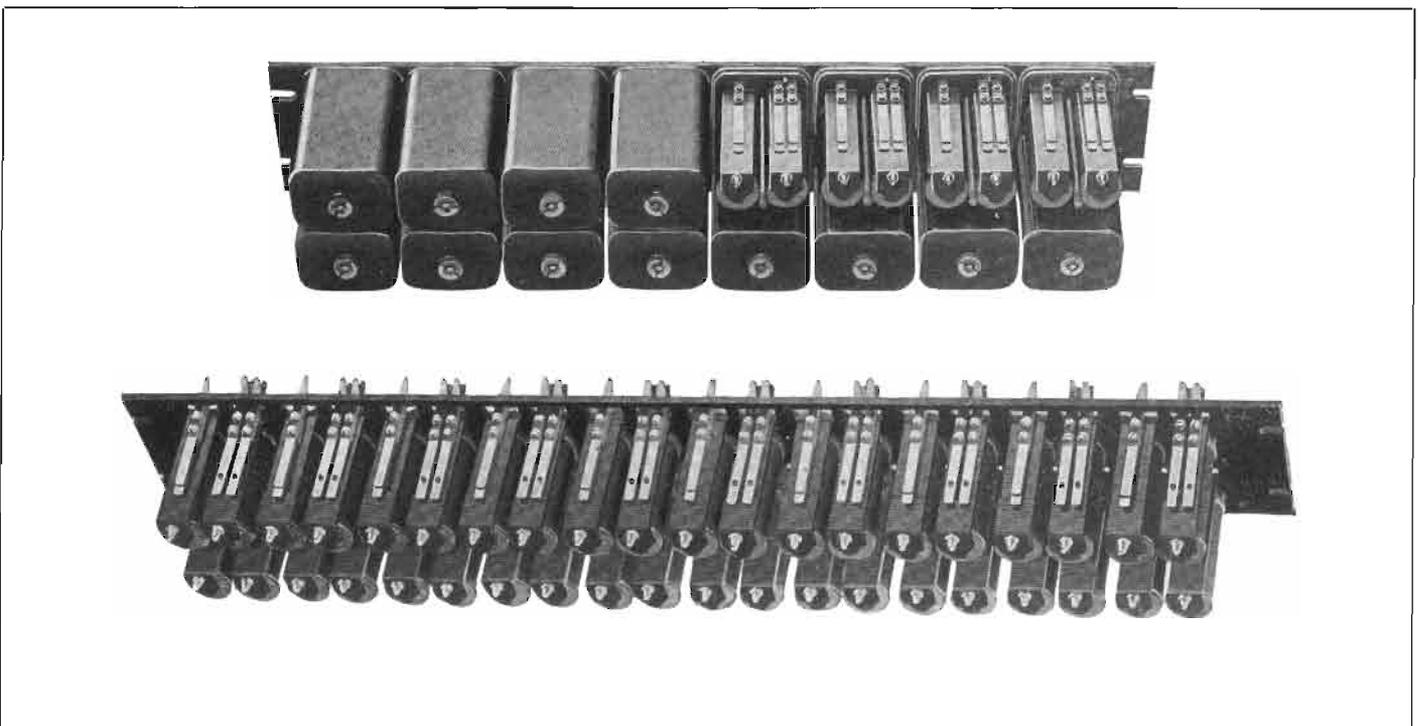


The rectifiers listed below are used to operate a D.C. relay on A.C. dialing trunk circuit applications to replace the A.C. relays formerly used. The rectifiers are of the selenium type and are provided with the proper mounting details so they will mount in either a 700-800 or 1700-1800 type relay mounting space depending upon the code.

The use of these rectifiers in conjunction with a standard relay, provides more reliable operation than the A.C. relay as formerly used on A.C. dialing trunk circuits. Order rectifiers by code number to obtain the proper mounting details.

Code No.	Description
1-A	Mounts in space of 1700-1800 type relay.
1-B	Mounts in space of 700- 800 type relay.

RELAYS



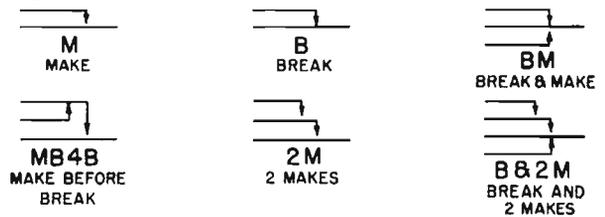
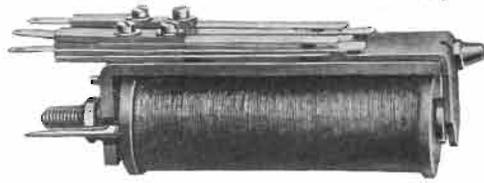
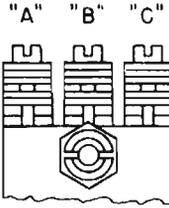
Kellogg relays are simple in design and are sturdily constructed. The angle type armature and simple adjustment assure reliable operation under the conditions which relays must meet in telephone service. Kellogg manufactures several different types of relays. Each type is listed on succeeding pages in a separate

chart with a brief description of the respective codes in that group.

For tools used with relays see code numbers 44, 13, 57, 43, 76, 11, 78, 1, 2, 58, 60, 75, and 79 shown under Tools in this section.

RELAYS

No. 2000 Type Relays



Kellogg No. 2000 type relays are standard for use on manual type switchboards. They are designed for mounting on No. 1000 type relay mountings. The relays generally are mounted in pairs under a steel shell supplied with the mounting strip. Coils are not supplied as part of the relays.

In ordering specify the code of the relay having the desired spring combination and also state the voltage at which the relay is to operate or the operating current value required. The Kellogg engineering department will select a coil to meet the specific requirements.

On replacement orders code numbers should be available and the complete relay can be ordered. For example, if a No. 2028 S-FY relay is ordered a No. 2028 relay and No. S-FY coil will be supplied.

Charts of the standard 2000 type relay spring combinations are shown below and on succeeding pages. The combinations are listed as they actually appear on the heel iron, reading from the bottom or heel iron surface to the top of the respective stackup.

Code No.	Contact Arrangement			No. of Sets of Following Springs						Remarks
	POS. "A"	POS. "B"	POS. "C"	MAKE	BREAK	BREAK & MAKE	MAKE BEFORE BREAK	TWO MAKE	BREAK & TWO MAKE	
2000										Buzzer Relay
2001		BM				1				
2002	BM		BM			2				
2003	BM		BM			3				
2004	BM		BM			4				
2005	B		B							
2006	BM		BM	2	2					
2007		MB4B				1				
2008	MB4B		MB4B			2				
2009	MB4B		MB4B			3				
2019	MB4B		BM			4				
2020	BM		BM	2	1					
2021	MB4B		MB4B	1	2					
2022	MB4B		BM							
2022		BM		2	2					2 Rel's. yoked at Armature Sprgs. on Right facing Arm.
2023	M		M	5						
2025	MB4B		BM	1	1					Used with #25 Pole Changer. Heavy Plat. Contacts.
2026	M	B	M	2	1	2				
2027	BM		BM	1	4					

Code No.	Contact Arrangement			No. of Sets of Following Springs						Remarks
	POS. "A"	POS. "B"	POS. "C"	MAKE	BREAK	BREAK & MAKE	MAKE BEFORE BREAK	TWO MAKE	BREAK & TWO MAKE	
2028	M		M							
2029	B	MB4B	B	2	2	1				
2030		M		1						For Pilot Relays
2030		B			1					For Supv. Relays
2031	M		M	2	3					
2032	BM		BM	4	1					
2034	M		M	1	1					Interrupter Relay. Special Tension Spring.
2035		B2M							1	
2036		M		1				1		
2037	M	MB4B	M	2						
2038		BM			1					With screw adj. on Arm. Interrupter Rel.
2039	BM		BM		3					With screw Adj. on Arm.
2042		Tension Spring Trouble Tone. B			1					Tone buzzer rel. Ratchet arm. adj.
2043		M		1						Uses S-FL or S-DZ Rel. Coil. For Pilot Relay. Has light armature.
2044		BM			1					Has light armature.

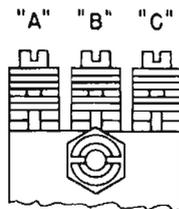
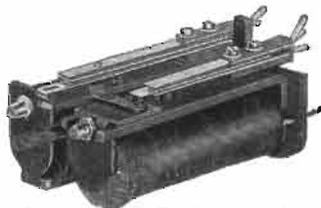
RELAYS

No. 2000 Type Relays (Cont'd)

Code No.	Contact Arrangement			No. of Sets of Following Springs						Remarks
	POS. "A"	POS. "B"	POS. "C"	MAKE	BREAK	BREAK & MAKE	MAKE BEFORE BREAK	TWO MAKE	BREAK & TWO MAKE	
2045		B			1					Has dead terminal. Has light armature.
2046	BM BM	MB4B	BM BM			4	1			
2048	B		B		2					
2049		B								Has light armature.
2053										Consists of Heel Iron and Armature.
2056		M M		2						Has light armature.
2058	Dialing	M		1						Ratchet Arm. Adj. Uses S-FL or S-DZ Coil.
2059	B	B	B		3					
2063	MB4B MB4B	MB4B	BM BM			2	3			
2065	MB4B		2M				1	1		
2075	B-2M		BM			1			1	
2076	M MB4B		M BM	2		1	1			
2077	M M		M M	4						
2078		M B		1	1					
2079	M BM		B BM	1	1	2				
2080	M BM		M M	3		1				
2081	BM		M M	2		1				

Code No.	Contact Arrangement			No. of Sets of Following Springs						Remarks
	POS. "A"	POS. "B"	POS. "C"	MAKE	BREAK	BREAK & MAKE	MAKE BEFORE BREAK	TWO MAKE	BREAK & TWO MAKE	
2087	B		B M	1	2					Spec. Tension Springs & extra heavy Plat. contacts.
2088	M		M	2						Same as #2037 rel. but has extra heavy Plat contacts.
2089	MB4B		BM			1	1			
2090		M		1						For a.c. tel. only.
2091	M BM		M BM	2		2				
2093		2M						1		
2094	2M	1	2M	1				2		
2099	M BM	2M	M BM	2		2		1		
2108	MB4B MB4B	M	B B M M	2	2		2			
2109	M		M M			3				
2111	MB4B MB4B	M	MB4B MB4B	1				4		
2112	BM		B B		2	1				
2113	BM		M BM	1		2				
2114		B M			1	1				
2116	2M B		B B			3			1	
2118	M MB4B		M MB4B	1				2		
2119	M MB4B		M MB4B	2				2		
2120	M MB4B	M	M MB4B	3				2		

No. 2060 Type Restoring Relays



This group of relays is always used with a No. 2061 trip type relay. The restoring arm relay is on the right side when facing the armature. These relays use standard relay coils. The combinations are listed as they actually appear on the heel iron reading from the bottom or heel iron surface to the top of the respective stackup.

Code No.	Contact Arrangement			No. of Sets of Following Springs				Remarks
	POS. "A"	POS. "B"	POS. "C"	MAKE	BREAK	BREAK & MAKE	MAKE BEFORE BREAK	
2060	BM BM		BM BM			4		
2064	BM		BM			2		
2066								No contact springs.

FOR SCHEMATIC DRAWING OF CONTACT ARRANGEMENT SEE PAGE 83

RELAYS

No. 2060 Type Restoring Relays (Cont'd)

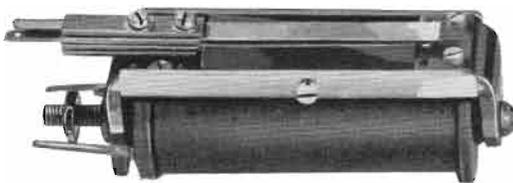
Code No.	Contact Arrangement			No. of Sets of Following Springs				Remarks
	POS. "A"	POS. "B"	POS. "C"	MAKE	BREAK	BREAK & MAKE	MAKE BEFORE BREAK	
2067		BM				1		
2068	BM		BM BM			3		
2074	MB4B		BM			1	1	
2082	MB4B		MB4B				2	

No. 2061 Trip Type Relays

This group of relays is always used with a restoring type relay from the group listed above. The trip is on the left side when facing the armature. This group of relays can only be used with Nos. S-FS, F-FU, S-GM, S-GN, or S-RC relay coils.

Code No.	Contact Arrangement			No. of Sets of Following Springs				Remarks
	POS. "A"	POS. "B"	POS. "C"	MAKE	BREAK	BREAK & MAKE		
2061	B		M	1	1			
2062			M	1				
2083	BM		M	1		1		
2086			M	2				
2098	BM						1	

No. 2017 Type A.C. Relays

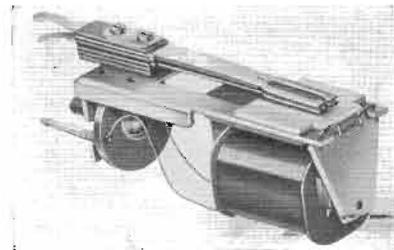


This group of alternating current relays requires special coils having the end of the core tapped. (See A.C. Relay Coils.) These relays mount on standard 1000 type mounting strips.

Code No.	Contact Arrangement			No. of Sets of Following Springs		Remarks
	POS. "A"	POS. "B"	POS. "C"	MAKE	BREAK	
2017		M		1		
2018		B			1	
2040	M		M	2		
2052	B		M	1	1	Composite Ring
2057			M	1		Has extra Adj. Spring.
2085	M		M	2		Tension Adj. Spring.

FOR SCHEMATIC DRAWING OF CONTACT ARRANGEMENT SEE PAGE 83

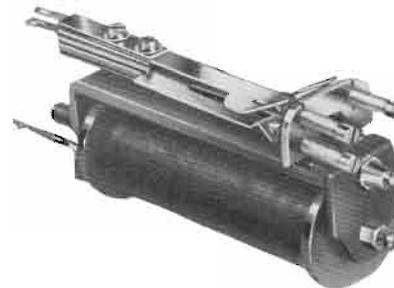
No. 2103 Type A.C. Relays



The No. 2103 type alternating current relays mount on standard 1000 type relay mountings. A laminated core is used for the coil and special coils similar to the S-JD coil. (See A.C. Relay Coils.) These relays have largely been supplanted by the use of a standard 2000 type relay and a selenium rectifier. The spring combinations are listed as they appear on the heel iron, reading from the bottom or heel iron surface to the top of the respective spring stackup.

Code No.	Contact Arrangement			No. of Sets of Following Springs			Remarks
	POS. "A"	POS. "B"	POS. "C"	MAKE	BREAK	BREAK & MAKE	
2103		B			1		These relays are for mounting on standard 1000 type mountings with 200 type relays.
2104		M		1			
2105		BM				1	
2106	BM		BM			2	
2107	BM BM		BM BM			4	These relays are for mounting on mtg. strips with 1700-1800 type relays.
2203		B			1		
2204		M		1			
2205		BM				1	
2206		BM BM				2	

No. 2100 Type Micrometer Adjustment Relays



Kellogg No. 2100 type micrometer adjustment relays allow positive and precise adjustment. The No. 2102 relay with an S-HG coil (code number for complete assembly is No. 2102, S-HG) is the standard pilot relay used on Kellogg switchboards. The No. 2102, S-HG relay replaces the No. 2043, S-HQ relay formerly used for this application. The spring stackup of these relays is always in the "B" or center position on the heel iron. With the exception of the No. 2207 relay all codes listed below mount on No. 1000 type mounting strips. The No. 2207 relay is a special pendulum relay for mounting on No. 1700-1800 type relay mounting strips.

RELAYS

No. 2100 Micrometer Adjustment Relays (Cont'd)

Code No.	Contact Arrangement			No. of Sets of Following Springs			Remarks
	POS. "A"	POS. "B"	POS. "C"	MAKE	BREAK & MAKE	TWO MAKE	
2100		BM			1		Used only with S-HH or S-HG Rel. Coils. Is supplied with a cover for single relay.
2102		BM			1		Used with any 2000 type rel. coil. Replaces W.E. B-42 but not interchangeable.
2110		2M				1	Used only with S-HH or S-HG Rel. Coils. Is supplied with a cover for single relay.
2115		M			2		Used with any 2000 type rel. coil.
2207		M			1		Uses A. C. Rel. coils such as S-BX with tapped core. Mts. on 1700-1800 type rel. mtgs.

No. 3000 Type Relays

The No. 3000 type relay is used where a cover is necessary for protection against dust and dirt. The cover is of two-piece construction. The armature is of the same type as used on No. 1700-1800 type relays utilizing the spring clip to hold the armature in position and a clip type residual plate. The relay is designed for mounting on 1³/₄-inch mounting strips. The coil is not supplied as part of the relay and will be specified by the Kellogg engineering department to meet any desired specifications.

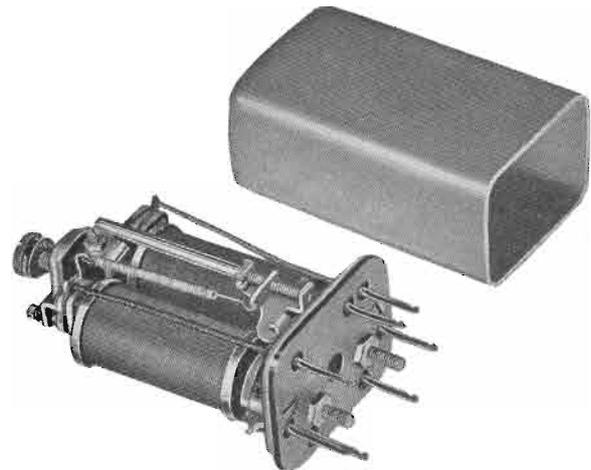
Code No.	Contact Arrangement			No. of Sets of Following Springs		
	POS. "A"	POS. "B"	POS. "C"	MAKE	BREAK	BREAK & MAKE
3001		BM				1
3002	BM		BM			2
3027	BM	M	BM	1		4
3037	M		M	2		
3109	M		M	3		
3112	BM		B		2	1
3113	BM		M	1		2
3091	M		M			
3053	BM		BM	2		2
	No Springs					

No. 440 Type Relays

The No. 440 type relays are primarily used as line or cutoff relays on older manual exchanges depending upon the code number selected. These relays are similar to the standard No. 2000 type relays but will not mount on the same mounting strips. These relays mount on No. 346 mounting strips (see Mountings—this section). Coils are furnished as a part of the relay for the code numbers listed below. Relays should be ordered by code number.

Code No.	Contact Arrangement			No. of Sets of Following Springs		Coil Res. (Ohms)	Remarks
	POS. "A"	POS. "B"	POS. "C"	MAKE	BREAK		
441-A	B		B		2	200	Used as cut-off relay.
441-B	B		B		2	500	Used as cut-off relay.
441-C	B		B		2	300	Used as cut-off relay
442-A		M		1		1000	Used as Line Relay.

No. 546 Type Polarized Relays



The No. 546 type relay is the polarized relay used for reversing the polarity for supervision. The coils are adjustable. The relay is enclosed in a brass shell to eliminate any interference from alternating currents. Precious metal contacts are used and the relay is designed for fine adjustments as the armature is controlled by a biasing spring with a micrometer screw adjustment. These relays mount on No. 1000 type mountings. Order by code number for the resistance desired.

Code No.	Contact Arrangement	No. of Sets of Springs	Coil Res. (Ohms)	
			L. COIL	R. COIL
			BREAK & MAKE	
546-A	BM	1	40	40
546-B	BM	1	200	200
546-C	BM	1	1600	1600
546-D	BM	1	2500	2500
546-E	BM	1	7500	7500
546-F	BM	1	750	750
546-G	BM	1	1600	60
546-H	BM	1	100	100
546-J	BM	1	40	30,000

FOR SCHEMATIC DRAWING OF CONTACT ARRANGEMENT SEE PAGE 83

RELAYS

No. 10 Type Relays

These relays are similar in construction to the No. 2000 type relays but are somewhat smaller in over-all dimensions. These relays mount only on mounting strips for No. 10 type relays (see Mountings in this section). These relays are not cross-talk proof as they have no shell cover.

Code No.	Contact Arrangement Left to Right Facing Armature			No. of Sets of Springs				Coil Res. (Ohms)	Remarks
	POS. "A"	POS. "B"	POS. "C"	MAKE	BREAK	BREAK & MAKE	TWO MAKE		
21-A	B		B	2				250	
21-B	B		B	2				300	
21-C	B		B	2				500	
25-A		BM				1		250	
25-B		BM				1		1000	
26-A		M		1				250	
26-B		M		1				90	
26-C		M		1				600	
26-D		M		1				500	
26-E		M		1				100	
26-F		M		1				250	500 N.S. mult. with 500 C.E.
26-G		M		1				6	
26-H		M		1				500	1000 N.S. mult. with 1000 C.E.
26-J		M		1				1000	
26-K		M		1				1000	500 N.S. in series 500 C.E.
561-A	M		M	2				500	Two Dead Terminals in "B" Position.
561-B	M		M	2				300	
561-C	M		M	2				1000	
561-D	M		M	2				500	
567-A	B		B	2				300 1640	Concentric Coil.
567-B	B		B	2				47 900	Concentric Coil.
569-A		M		1				500	Four dead terms. (Pos. A & C).
569-B		M		1				300	
579-A	M		M	2				100 200	Concentric Coil.
579-B	M		M	2				1000 2000	Concentric Coil.
579-C	M		M	2				500 2000	Concentric Coil.
579-D	M		M	2				500 2000	Concentric Coil.
579-E	M		M	2				500	1000 mult. with 1000.
580-D		2M					1	500	
580-E		2M					1	1000	

RELAYMATIC SWITCHBOARD RELAYS



NO. 1700-1800 TYPE

The relays listed below are those used on the Kellogg Relaymatic switchboard.

Nos. 1700-1800 Type Relays

This type relay is standard for all new Relaymatic switchboards. Twin contacts of precious metal are used on all contact springs. A new "clip on" type anti-residual plate is used which eliminates the difficulty of hammering down of anti-residual pins. The new clip type can be changed easily should a thicker or thinner clip be desired.

Spring stackups are clamped under pressure in a special fixture. High tensile strength screws are used to prevent loose spring stackups.

The coil is not included as part of the relay. In ordering specify the code number of the relay having the desired spring combination and also state the voltage at which the relay is to operate. A coil will be selected by the Kellogg engineering department to meet the requirements specified. Mounting strips for these relays will be furnished on application.

The spring combinations in the following listings are shown as they actually appear on the heel iron, reading from the bottom or heel iron surface to the tip of the spring combination of the respective stackup.

Code No.	Contact Arrangement			No. of Sets of Following Springs						
	POS. "A"	POS. "B"	POS. "C"	MAKE	BREAK	BREAK & MAKE	TWO MAKE	BREAK & TWO MAKE	MAKE BEFORE BREAK	BREAK & MAKE BEFORE BREAK
1700										
1701		M		1						
1702		M		2						
1703		M		3						
1704	M		M	4						
1705	M		M	5						
1706	M		M	6						
1707		M		2		1				
1708	M		M	3		1				

FOR SCHEMATIC DRAWING OF CONTACT ARRANGEMENT SEE PAGE 83

RELAYS
Nos. 1700 - 1800 Type Relaymatic Switchboard Relays

Code No.	Contact Arrangement			No. of Sets of Following Springs						
	POS. "A"	POS. "B"	POS. "C"	MAKE	BREAK	BREAK & MAKE	TWO MAKE	BREAK & TWO MAKE	MAKE BEFORE BREAK	BREAK & MAKE BEFORE BREAK
1709	M M M		M BM	4		1				
1710		M B		1	1					
1711		B B			1					
1712		B B			2					
1713		B B B			3					
1714	B B B		BM B	4	1					
1715	M B B B		M B B	2	4					
1716	B B B		B B B		6					
1717		M B B		1	2					
1718	M B		M BM	2	1	1				
1719	BM B		BM B		2	2				
1720		M BM		1		1				
1721		BM				1				
1722		BM BM				2				
1723	BM BM		BM			3				
1724	BM BM		BM BM			4				
1725		M BM B		1	1	1				
1726	2M B		BM BM	2	1	2				
1727	M BM		BM B	1	1	2				
1728	M BM		M BM	2		2				
1729	M M M		BM BM	3		2				
1730		BM B			1	1				
1731		2M					1			
1732		2M 2M					2			
1733		2M M		1			1			

Code No.	Contact Arrangement			No. of Sets of Following Springs						
	POS. "A"	POS. "B"	POS. "C"	MAKE	BREAK	BREAK & MAKE	TWO MAKE	BREAK & TWO MAKE	MAKE BEFORE BREAK	BREAK & MAKE BEFORE BREAK
1734	M M		2M	2			1			
1735	M M		2M M	3			1			
1736	2M M		2M M	2			2			
1737	2M M		2M	1			2			
1738	2M		B2M				1	1		
1739		2M B			1		1			
1740		2M BM				1	1			
1741		B2M						1		
1742	B2M		B2M					2		
1743		M B2M		1				1		
1744	M M		B2M	2				1		
1745	M M M		B2M	3				1		
1746		B2M B			1			1		
1747		B2M BM				1		1		
1748		B2M M B		1	1			1		
1749	B2M		MB4B					1	1	
1750	BM		B2M			1		1		
1751	B2M		BMB4B					1		1
1752		M BM BM		1		2				
1753		BM BM B			1	2				
1754	M M BM		BM BM	2		3				
1755		BM B B			2	1				
1756		M M B		2	1					
1757	B B		M BM	1	2	1				
1758	M M B		BM B	2	2	1				
1759	M BM B		BM BM	1	1	3				

FOR SCHEMATIC DRAWING OF CONTACT ARRANGEMENT SEE PAGE 83

RELAYS

Nos. 1700 - 1800 Type Relaymatic Switchboard Relays

Code No.	Contact Arrangement			No. of Sets of Following Springs						
	POS. "A"	POS. "B"	POS. "C"	MAKE	BREAK	BREAK & MAKE	TWO MAKE	BREAK & TWO MAKE	MAKE BEFORE BREAK	BREAK & MAKE BEFORE BREAK
1760	M M M		BM B	3	1	1				
1761	M B B		BM BM	1	2	2				
1762	M BM		BM BM	1		3				
1763	M M M		M B	4	1					
1764	M BM BM		BM BM	1		4				
1765	M BM BM		M BM BM	2		4				
1766	B B B		BM BM		3	2				
1767	M M		M B	3	1					
1768	M M M		M B	5	1					
1769	M M M		B B	3	2					
1770	M B		M B	2	2					
1771		MB4B								1
1772		MB4B MB4B								2
1773	MB4B MB4B		MB4B							3
1774	MB4B MB4B		MB4B MB4B							4
1775		MB4B M		1						1
1776		MB4B M M		2						1
1777	M M		MB4B M	3						1
1778	MB4B M		MB4B	1						2
1779	MB4B M		MB4B M	2						2
1780	MB4B M M		MB4B M	3						2
1781	MB4B M M		MB4B M M	4						2
1782		MB4B BM				1				1

Code No.	Contact Arrangement			No. of Sets of Following Springs						
	POS. "A"	POS. "B"	POS. "C"	MAKE	BREAK	BREAK & MAKE	TWO MAKE	BREAK & TWO MAKE	MAKE BEFORE BREAK	BREAK & MAKE BEFORE BREAK
1783		MB4B BM BM						2		1
1784	MB4B BM		MB4B BM					2		2
1785	MB4B BM		MB4B					1		2
1786	MB4B BM BM		MB4B MB4B					2		3
1787	MB4B BM BM		BM BM					4		1
1788	M BM		MB4B	1		1				1
1789	MB4B M		BM	1		2				1
1790	M BM		MB4B M	2		1				1
1791	MB4B M M		MB4B BM	2		1				2
1792	M BM BM		MB4B BM	1		3				1
1793	MB4B M		MB4B B	1	1					2
1794	M B		MB4B M	2	1					1
1795	M M B		MB4B B	2	2					1
1796	M B		MB4B	1	1					1
1797	BM BM B		MB4B BM			1	3			1
1798	MB4B B		BM BM			1	2			1
1799	M M B		MB4B 2M	2	1		1			1
1800		MB4B 2M						1		1
1801		MB4B B B						2		1
1802		MB4B B						1		1
1803	M B B		MB4B BM	1	2	1				1
1804	M BM B		MB4B BM	1	1	2				1

FOR SCHEMATIC DRAWING OF CONTACT ARRANGEMENT SEE PAGE 83

RELAYS

Nos. 1700 - 1800 Type Relaymatic Switchboard Relays

Code No.	Contact Arrangement			No. of Sets of Following Springs						
	POS. "A"	POS. "B"	POS. "C"	MAKE	BREAK	BREAK & MAKE	TWO MAKE	BREAK & TWO MAKE	MAKE BEFORE BREAK	BREAK & MAKE BEFORE BREAK
1805	MB4B M M		BM B	2	1	1			1	
1806	MB4B		BMB4B						1	1
1807		BMB4B								1
1808		BMB4B M		1						1
1809		BMB4B BM				1				1
1810	M M BM		M M BM	4		2				
1811	M M M M		M M B	6	1					
1812	M M BM		M M M	5		1				
1813	M BM B		M M BM	3	1	2				
1814	M BM B		M BM B	2	2	2				
1815	BM BM BM		BM BM BM			6				
1816	M M B		MB4B M M	4	1				1	
1817	M BM BM		MB4B MB4B	1		2			2	
1818	M M M M		M M BM	6		1				
1819	M M M M		M M M M	8						
1820	M M M M		M M M M	7						
1821	M M M B		M M M M	7	1					
1822	M BM B		M BM BM	2	1	3				
1823	M B		2M	1	1		1			

Code No.	Contact Arrangement			No. of Sets of Following Springs						
	POS. "A"	POS. "B"	POS. "C"	MAKE	BREAK	BREAK & MAKE	TWO MAKE	BREAK & TWO MAKE	MAKE BEFORE BREAK	BREAK & MAKE BEFORE BREAK
1824	M B B		2M BM	1	2	1	1			
1825	M BM BM		M M BM	3		3				
1826	M B B		MB4B MB4B	1	2					2
1827	MB4B M M		M BM B	3	1	1				1
1828	M M M B		M BM BM	4	1	2				
1829	MB4B M BM		M M M M	5		1				1
1830	MB4B BM		M M M M	4		1				1
1831	MB4B B B		BM BM		2	2				1
1832	2M M		M B	2	1		1			
1833	MB4B M M M		MB4B M M M	6						2
1834	MB4B M B		MB4B M B	2	2					2
1835	BM BM BM		BM BM			5				
1836	BM BM B		M BM BM	1	1	4				
1837	MB4B M BM		MB4B M BM	2		2				2
1838	M BM BM		M M BM	4		3				
1839	M M M M		M M M M	9						

FOR SCHEMATIC DRAWING OF CONTACT ARRANGEMENT SEE PAGE 83

RELAYS

Nos. 1700-1800 Type Relaymatic Switchboard Relays

Code No.	Contact Arrangement			No. of Sets of Following Springs						
	POS. "A"	POS. "B"	POS. "C"	MAKE	BREAK	BREAK & MAKE	TWO MAKE	BREAK & TWO MAKE	MAKE BEFORE BREAK	BREAK & MAKE BEFORE BREAK
1840	M M M M M		M M M M M	10						
1841	M M B		M M B	6	2					
1842	M M B		M M BM	6	1	1				
1843	M BM B		MB4B M BM	2	1	2			1	
1844	M M M		MB4B M M	5					1	
1845	M M M BM		M M M M	7		1				
1846	M M M M		M BM BM	6		2				
1847	M M B		M M B	4	2					
1848	BM BM B		MB4B B B		3	2			1	
1849	B B		B B		4					
1850	M M M M		BM BM B	5	1	2				
1851	MB4B M BM		MB4B M M B	3	1	1			2	
1852	M M M M		MB4B M M M	7					1	
1853	M M M M		M BM BM	5		2				

Code No.	Contact Arrangement			No. of Sets of Following Springs						
	POS. "A"	POS. "B"	POS. "C"	MAKE	BREAK	BREAK & MAKE	TWO MAKE	BREAK & TWO MAKE	MAKE BEFORE BREAK	BREAK & MAKE BEFORE BREAK
1854	M M M M		M B B B	5	3					
1855	MB4B B B		MB4B B B		4					2
1856	MB4B M BM		MB4B B B	1	2	1				2
1857		BM BM M		1		2				
1858	M M B		M B B	3	3					
1859	B B		M B	1	3					
1860	MB4B M M		BM BM	2		2				1
1861	MB4B BM B		MB4B B B		3	1				2
1862	M M BM B		M M BM B	4	2	2				
1863	M BM BM		M M BM B	3	1	3				
1864	M M M BM		BM BM BM	3		4				
1865	M M M M M		M M M B	8	1					
1866	M M M BM		BM B B B	3	3	2				
1867	M B B		BM B B	1	4	1				
1868	M		M	2						
1869	B		B		2					
1870	BM		BM			2				
1871	M M M B		MB4B BM BM	3	1	2				1

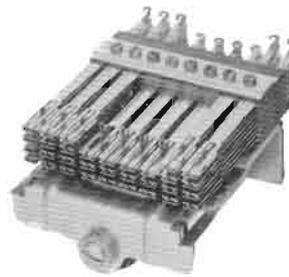
FOR SCHEMATIC DRAWING OF CONTACT ARRANGEMENT SEE PAGE 83

RELAYS

**Nos. 1700-1800 Type
Relaymatic Switchboard Relays**

Code No.	Contact Arrangement			No. of Sets of Following Springs						
	POS. "A"	POS. "B"	POS. "C"	MAKE	BREAK	BREAK & MAKE	TWO MAKE	BREAK & TWO MAKE	MAKE BEFORE BREAK	BREAK & MAKE BEFORE BREAK
1872	M M M M M		BM BM BM	5		3				
1873	MB4B M M B		MB4B M B B	3	3				2	
1875	M B B B		M BM B	2	4	1				
1876	BM B B B		M BM B B	1	5	2				
1878	BM BM B		M M BM B	2	2	3				
1879	MB4B B		MB4B B		2				2	
1880	M M BM B		2M BM BM	2	1	3	1			
1881	BM BM BM		MB4B M BM	1		4			1	
1882	2M B		3M B	5	2					
1883	M M M BM		MB4B M M M	6		1			1	
1884	M BM BM		B B B	1	3	2				
1885	MB4B M M		BM BM BM	2		3			1	
1886	BM BM B		M B B B	1	4	2				
1887	BM		2M			1	1			
1888	M M BM B		BM BM BM	2	1	4				
1889	M M		BM	2		1				

No. 7007 Type Gang Relays

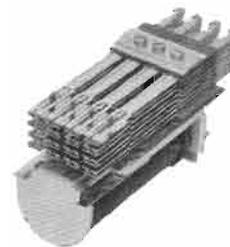


The Kellogg No. 7007 type gang relays are new style gang relays used on Kellogg Relaymatic switchboards. Ladder type spring separators are used and a special adjustment feature provided to hold any field maintenance work to a minimum. The spring stack-up is clamped in a pressure

fixture and held by high tensile strength screws to prevent loose stackups from occurring. Twin contacts of precious metal are used on all contact springs. Standard relay coils are used for these relays. Coils are furnished to meet specification requirements. These relays mount on No. 1700-1800 relay mounting strips per application.

Code No.	Spring Stackups Left to Right Facing Armature										Remarks
	A	B	C	D	E	F	G	H	J		
7007	4M	4M	4M	3M	3M	3M	3M	4M	4M		Screw Type Adj. Arm. Total 32 Makes
7008	4M	4M	4M	3M	3M	3M	4M	4M	4M		Screw Type Adj. Arm. Total 33 Makes
7009	4M	4M	4M	3M	3M	3M	3M	3M	4M		Screw Type Adj. Arm. Total 31 Makes
7010	4M	4M	4M	2M	2M	2M	3M	3M	4M		Screw Type Adj. Arm. Total 28 Makes 3 Breaks

No. 7100 Type Gang Unit Relays



The Kellogg No. 7100 Type Gang Unit Relays are new style gang unit relays used in the finder circuit of the Kellogg Relaymatic. The same adjustment features and method of construction have been applied to this relay as on the No. 7007 type gang relay.

Twin contacts of precious metal are used on all contact springs. Coils are not supplied as part of the relay but are furnished to meet specific requirements. These relays mount on No. 1700-1800 relay mounting strips per application.

Code No.	Spring Stackups Left to Right Facing Armature				Remarks
	A	B	C	D	
7100	4M	4M	4M	4M	Total 16 Make Contacts
7101	3M	3M	3M	3M	Total 12 Make Contacts
7102	3M	3M	3M	1B	Total 11 Makes and 1 Break on top in "D" stackup
7103	5M	5M	5M	5M	Total 20 Make Contacts

FOR SCHEMATIC DRAWING OF CONTACT ARRANGEMENT SEE PAGE 83

RELAYS

Nos. 7300 and 7400 Type Line and Cut-Off Relays

The Nos. 7300 and 7400 type relays are the line and cut-off relays used on Kellogg Relaymatic switchboards. Clip type residual plates are used and the armature is held in place with a special armature clip. Replacement of either armature or residual plate has been made as simple as possible. The spring stackups are clamped in a pressure fixture and held in position with high tensile strength screws to eliminate loose stackups in service. The line relay is to the left of the cut-off relay as viewed from the armature end. Coils are supplied with the codes listed below as part of the relay. These relays mount on No. 1700-1800 type relay mounting strips per application. Twin contacts of precious metal are used on all contact springs.

Code No.	Contact Arrangement				Coil Res. (Ohms)	
	Line	Cutoff	Line Side	Cutoff Side	Line	Cutoff
7300	3M	2B	500	500		

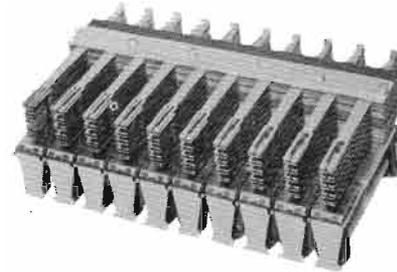
Code No.	Contact Arrangement										Total	Coil Res. (Ohms)		
	A	B	C	D	E	F	G	H	J	K		Line	Cutoff	Line Side A, C, E, G, J
7400	3M	2B	3M	2B	3M	2B	3M	2B	3M	2B	15M	10B	500(ea. coil)	500(ea. coil)

Relays, Harmonic

Kellogg harmonic relays consist of standard harmonic ringer movements fitted with auxiliary contacts for the operation of lamp signals or other relays.

Code No.	Party	Freq. (Cycles)	Resistance (2 coils)
20570-A-1	1	20	2500 ohms
20570-A-2	2	60	500 ohms
20575-A-1	1	33½	2500 ohms
20575-A-2	2	50	500 ohms
20575-A-3	3	66⅔	500 ohms
20575-A-4	4	16⅔	500 ohms
20576-A-1	1	30	1600 ohms
20576-A-2	2	42	1600 ohms
20576-A-3	3	54	1600 ohms
20576-A-4	4	66	1600 ohms
20577-A-1	1	25	2500 ohms

No. 7200 Type Gang Unit Relays



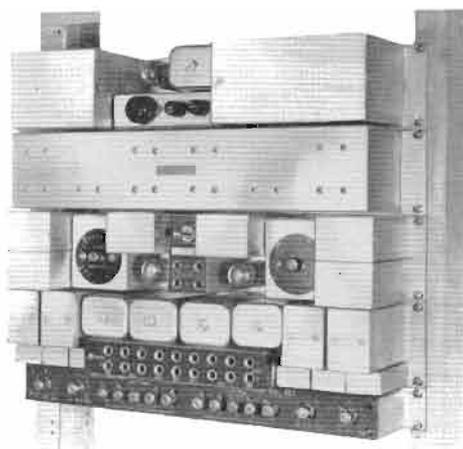
The No. 7200 type relays are new style gang unit relays used on Kellogg Relaymatic switchboards. These are special purpose relays having ten separate coils, armature and spring stackups assembled to one heel iron. Common strapping between the respective make contacts of the spring stackups allows the connection of ten lines by the operation of any one armature. Each individual armature has the same clip type residual as used on the No. 1700-1800 type relays. Coils are supplied with these relays. The spring combinations are the same. The only difference between the two is the coil windings as may be seen in the listing below. These relays mount on No. 1700-1800 type relay mounting strips per application. Twin contacts of precious metal are used on all contact springs.

Code No.	Contact Arrangement										Coil Res. (Ohms)		Remarks
	A	B	C	D	E	F	G	H	J	K	Pos. A	Pos. B, C, D, E, F, G, H, J, K	
7200	4M	4M	4M	4M	4M	4M	4M	4M	4M	4M	1200	1200 (each coil)	Total 40 Makes—10 Breaks (for 48 volts)
7201	4M	4M	4M	4M	4M	4M	4M	4M	4M	4M	500	500 (each coil)	Total 40 Makes—10 Breaks (for 24 volts)

Resistor, Variable Subset

This resistor has three windings of non-inductively wound nickel silver resistance wire, No. 32 gauge. It is used in repeaters for railroad dispatching circuits.

Code No.	Terminal No.	Resistance (ohms)
1-A	1—2	200
	2—3	400
	3—4	800



NO. 4 REPEATER EQUIPMENT

REPEATER, TELEPHONE

The Kellogg voice frequency telephone repeater is used to increase the transmission level on long or highly attenuated telephone circuits. It can be used on any circuit which will carry regular telephone transmission.

This equipment may be used as a terminal or as an intermediate repeater without circuit changes.

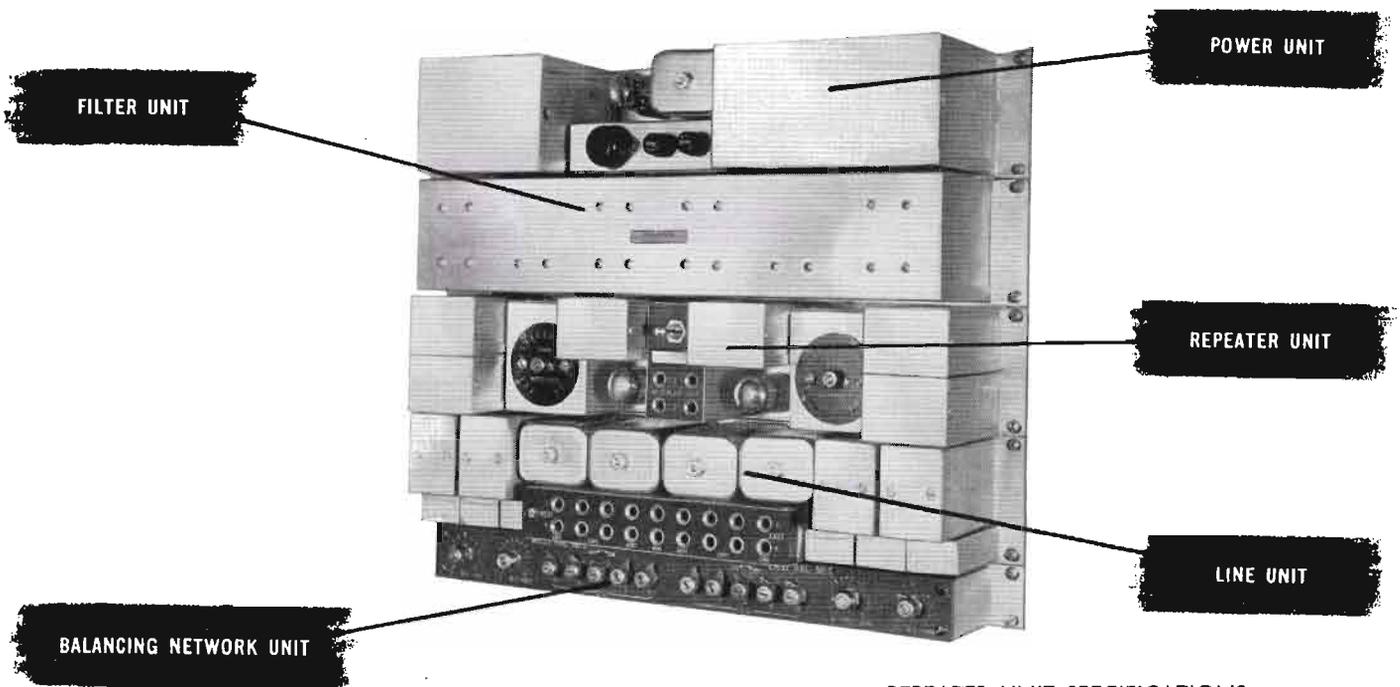
A repeater consists essentially of two vacuum tube amplifiers so arranged that voice frequency signals may be amplified in both directions in a two-wire telephone circuit without interaction between the two sides of the conversation in the circuit.

REPEATER, TELEPHONE

The Kellogg repeater consists of 1) a repeater unit for amplifying the voice level in each direction; 2) a filter unit which, by limiting the frequencies to be amplified, makes possible a greater degree of balance and consequently a greater usable gain from the repeater; 3) a balancing network unit which provides the necessary impedance balance between the line side and the network side of each hybrid coil; 4) a line unit which acts as a connecting link between the line and the repeater unit and provides a means of by-passing signalling current around the repeater unit; and 5) a power unit used only with A.C. operated repeaters to furnish plate and heater voltages for the amplifier tubes in the repeater unit.

Kellogg repeaters are assembled and wired on a unit basis to provide the flexibility necessary to satisfy the requirements of various types of lines and circuit applications. Each of the five components listed above is assembled individually on a panel suitable for mounting on a standard 19-inch relay rack or in cabinets.

After installation the Kellogg repeater can be balanced rapidly and adjusted for maximum gain through the simple adjustment of accurately calibrated dial controls on the balancing network and repeater units. The use of these calibrated dial controls eliminates strapping to control the gain of the repeater unit or the balance of the balancing network.



BALANCING NETWORK UNIT

The function of the balancing network unit is to create an artificial line whose impedance at all frequencies in the voice range approximates that of the physical line in which the repeater is installed. When this condition is satisfied the repeater is balanced and maximum gain can be obtained without singing.

The balance network unit consists of two identical networks of variable resistance units and a decade condenser unit so designed that a wide range of line impedances may be rapidly balanced by the simple adjustment of accurately calibrated dial controls. Thus should line impedances change due to unusual weather conditions balance may be easily and rapidly restored without the necessity of reducing the repeater gain to prevent singing.

REPEATER UNIT

The repeater units consist primarily of two vacuum tube amplifiers, two hybrid coils, and two gain controls. To simplify maintenance a series jack is provided in each plate circuit to permit measuring the plate current without taking the repeater out of service. This provision makes it possible to check the operation of the repeater without turning down the circuit.

Each amplifier section of the repeater unit is equipped with a dual purpose tube operated at conservative voltages as a push-pull amplifier. The amplification of the repeater in each direction is governed by a variable gain control pad accurately calibrated in one db steps indicating the actual gain of the repeater unit itself.

Three different types of repeater units can be furnished for operation on 1) 24 volt exchange battery; 2) 48 volt exchange battery; or 3) 110-120 volt 60 cycle, A.C. power source.

REPEATER UNIT SPECIFICATIONS

	CODE NO. 3A	CODE NO. 3B	CODE NO. 4
	20-28 v. D.C. Exchange Battery	40-56 v. DC Exchange Battery	A.C. Power Unit
Power Supply			
Type of Tube	28D7	28D7	6SL7
Maximum gain in each direction	20 db	20 db	20 db
Maximum Output level	+ 13 dbm*	+ 17 dbm*	+ 13 dbm*
Plate Voltage	20-28 volts	40-56 volts	200 volts
Total Plate Current	.046 amps.	.080 amps.	.008 amps.
Heater Voltage Supply	20-28 volts	40-56 volts	6.3 volts
Total Heater Current	.72 amps.	.36 amps.	.6 amps.

*0 dbm—one milliwatt in 600 ohms.

REPEATER, TELEPHONE**FILTER UNITS**

The filter unit in the repeater system is used to limit the band of frequencies which must be amplified and passed by the repeater unit, thus permitting a high degree of balance between the line and network side of the repeater hybrid coil. This balance is necessary to insure a high and uniform gain from the repeater. Two filters are provided on each filter unit—one for each direction of transmission.

No. 204-2 Filter Unit

This filter is a sharp cut-off, 300 to 2700 c.p.s., band-pass filter. It is assembled on a 1¾ by 19 inch panel.

The No. 204-2 filter is recommended where maximum repeater gain is required, especially where the repeater is to be installed on a circuit with heavily loaded cable lines or in circuits upon which a carrier system is superimposed.

No. 200-2 Filter Unit

The No. 200-2 filter unit is a general purpose filter suitable for use where the impedance characteristic of the line is smooth and the cut-off frequency of the line is fairly high.

LINE UNITS

The line unit is the connecting link between the line and the repeater unit and between the repeater unit and the balancing network. It provides the terminating apparatus for the line as well as the means for signalling or ringing around the repeater unit.

Each line unit is equipped with a power failure relay which by-passes the wire circuit around the repeater unit should the latter become inoperative because of a power failure or when it may be desirable to take the repeater unit out of service temporarily. This feature makes it unnecessary to turn down the circuit when a repeater unit must be removed for maintenance.

No. 400-Type Line Unit

The No. 400-type line unit is a relay by-pass line unit using relays either to by-pass the signalling current around the repeater or to apply a new source of signalling current when repeat ringing is desired. The change from by-pass signalling to repeat ringing is accomplished by changing straps on the terminal strip. When repeat ringing is used, the source of ringing power must be supplied.

The No. 400 line unit is available in four different operating voltages: No. 400-A for 24-volt operation; No. 400-B for 48 volts; No. 400-C for 200 volts, and No. 400-D for 6 volts. The A and B types operate from exchange battery, the C type from the 200 volt, dc repeater power supply and the D type from a 6 volt, dc, power supply.

No. 401-Type Line Unit

The No. 401-type line unit is a filter by-pass unit designed

to by-pass all frequencies from 3 c.p.s. to 150 c.p.s. It is used on railway dispatching circuits as well as for by-passing any signalling current within the specified frequency range. The No. 401 line unit may be used on any phantom or simplex circuit although such circuits cannot be terminated at the repeater location.

No. 402-Type Line Unit

The No. 402-type line unit is a filter by-pass unit designed to by-pass frequencies from 15 to 150 c.p.s. It is a general purpose unit which may be used on any line, metallic or phantom, simplex or composite, and is arranged to terminate both simplex and composite circuits. With these exceptions the No. 402 line unit is the same as the No. 401 unit described above.

No. 403-Type Line Unit

The No. 403-type line unit is designed for use in circuits where the signalling is accomplished by means of a simplex or composite leg.

POWER SUPPLY UNIT

The No. 104 power supply unit, required only with the No. 4 voice repeater unit, supplies the proper plate and heater voltages for the amplifier tubes in the repeater unit. It will supply from one to six No. 4 repeater units. It operates directly from the regular 105-125 volt, 60 cycle A.C. power or lighting circuit. It uses a choke-input filter.

The power unit is provided with local protection by a fuse in each side of the A.C. input supply. It is also equipped with a power failure relay wired to release the power failure relays in all associated line units. This relay may also be used to operate an alarm circuit.

APPLICATION AND ORDERING INFORMATION

In ordering Kellogg telephone repeater equipment the following information must be included with the order.

1. Operating voltage. Indicate whether the equipment is to be operated from (a) 24 volt exchange battery, (b) 48 volt battery, or (c) 105-125 volt, 60 cycle, commercial power supply.

2. Type of signalling.

a. Ringdown signalling. Specify if relay by-pass, repeat ring, or filter by-pass type line unit is desired. (If repeat ring is required a source of ringing power must be provided at the repeater location.) Specify frequency of ringing power used.

b. Composite or simplex signalling. If an intermediate repeater is desired in a composited circuit, specify whether composite equipment is available to carry the CX legs around the repeater.

c. 3½ cps dispatcher signalling.

d. Loop dialing signalling, or C.B. subscriber's loop.

3. Circuit information. Complete details of the wire facilities involved in the circuits to be repeated must be provided as shown in paragraph "B" under Telephone Carrier Systems ordering information on page 14.

4. Equipment racks. Kellogg Telephone Repeater equipment mounts on any standard 19-inch equipment rack. If there is no 19-inch space available see page 14 under Telephone Carrier Systems for ordering information for these racks.

RINGERS

Kellogg ringers are available in: Biased, Straight Line, and Frequency Selective types for ringing applications as follows:

Biased Ringers—for common battery manual, dial, or magneto when future conversion to common battery service is

contemplated. Use for bridged or divided ringing, where desirable to prevent bell tapping, or where necessary that the ringers respond to a single polarity; also for two and four party selective, code, and other semi-selective pulsating and superimposed ringing employing Vincent Rare Gas Relay for noise reduction, or Western Electric 333-A Tube for selective ringing.

Straight Line Ringers—for magneto, bridged or divided ringing where bell tapping is not objectionable, and where maximum sensitivity to a broad range of ringing frequencies is desired.

Frequency Selective Ringers—for common battery manual, dial, bridged or divided frequency selective ringing in Harmonic, Synchronomic, and Decimonic frequencies.

RINGERS

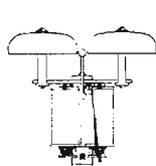
BIASED RINGERS

FOR 1000 SERIES DESK AND 1100 SERIES WALL MASTERPHONES

Code No.	Resistance (ohms)	Impedance	Gong Diam.	Type	Armature Type
120-BA	4000	High	1 3/4 in.	Small	Adjustable
120-BB	2500	Medium	1 3/4 in.	Small	Adjustable
120-BC	1000	Low	1 3/4 in.	Small	Adjustable

Note: 120-BA ringers should be used on all dial and heavily loaded manual lines. Do not mix on same line with other ringers having resistance less than 2500 ohms. Use 120-BB ringers if present ringers on line have a resistance of over 1500 ohms and under 3000 ohms. Use 120-BC ringers if present ringers on line have a resistance of over 500 ohms to 1500 ohms. For ringer adjustment tool, order No. 85 tool.

FOR EXTENSION BELLS AND C.B. DESK SET BOXES



Code No.	Resistance (ohms)	Gong Diam.	Type	Type Armature	Remarks
79-A	1000	2 1/2"	Large	Adj.	For #37 Extension Bells F605,
79-D	1600	2 1/2"	Large	Adj.	F602, 610 Desk Set Boxes, F817,
79-G	2500	2 1/2"	Large	Adj.	9817 Telephones

STRAIGHT LINE RINGERS

FOR 1000 SERIES DESK AND 1100 SERIES WALL TELEPHONES

Code No.	Resistance (ohms)	Impedance	Gong Diam.	Type	Armature Type
123-SA	4000	High	1 3/4 in.	Small	Adjustable
123-SB	2500	Medium	1 3/4 in.	Small	Adjustable
123-SC	1000	Low	1 3/4 in.	Small	Adjustable

Note: 123-SA ringers should be used on all heavily loaded magneto lines. Do not mix on same line with other ringers having resistance less than 2500 ohms. Use 123-SB ringers if present ringers on line have a resistance of over 1500 ohms and under 3000 ohms. Use 123-SC ringers if present ringers on line have a resistance of over 500 ohms to 1500 ohms. For ringer adjustment tool, order No. 85 tool.

FOR 4800 AND 5800 SERIES WALL TELEPHONES, EXTENSION BELLS AND LOCAL BATTERY DESK SET BOXES

Code No.	Resistance (ohms)	Gong Diam.	Type	Armature Type	Remarks
78-A	1000	2 1/2 in.	Lge.	Non-Adj.	For #37 Extension
78-D	1600	2 1/2 in.	Lge.	Non-Adj.	Bells, F2300, 3300,
78-G	2500	2 1/2 in.	Lge.	Non-Adj.	3400, 3500 Desk Set Boxes, & 4800 5800 Telephones

FOR LOUDRINGING EXTENSION BELLS

Code No.	Resistance (ohms)	Gong Diam.	Type	Armature Type	Remarks
107-A	1000	*	Large	Adjus.	for #65 Extension Bells
107-D	1600	*	Large	Adjus.	
107-G	2500	*	Large	Adjus.	

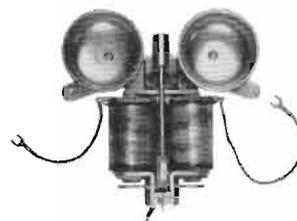
*Six-inch diameter ringers are mounted on extension bell frame and not supplied with ringer.

FOR 3000-3001 PORTABLE TELEPHONES

109-G	2500	1 3/8 in.	Large	Non-Adj.	
FOR 1016 TEST SET					
18-C	1600	1 3/4 in.	Large	Adjustable	
FOR NO. 6886					
55-G	2500	3 in.	Large	Non-Adjus.	

FREQUENCY SELECTIVE RINGERS

FOR 1000 SERIES DESK, 1100 SERIES WALL MASTERPHONES For Harmonic, Synchronomic, Decimonic Ringing Applications



Kellogg No. 124 Ringer

This is a standard low impedance ringer furnished in 1000 series desk and 1100 series wall Masterphones. For bridged selective ringing five to ten telephones equipped with the 124 ringer can be used on a line. However, the use of ten bridged telephones using 124 ringers on long rural lines is

not recommended. For divided selective ringing applications ten telephones equipped with this ringer can be used on a line.



Kellogg No. 122 Ringer

This is a high impedance ringer which can be furnished in 1000 series desk and 1100 series wall Masterphones if requested on your order. For bridged ringing applications ten telephones equipped with the 122 ringer can be used on a line. For divided ringing applications twenty telephones equipped with this ringer can be used on a line.

FOR WESTERN ELECTRIC & STROMBERG CARLSON TELEPHONES

Kellogg W-125 Ringer—This is the same style ringer as the Kellogg No. 124 type but specially designed for installation in Western Electric No. 302 desk telephones. Can be furnished in all frequencies.

Kellogg S-125 Ringer—Same style as the 124 type but for use in Stromberg Carlson No. 1243 desk and No. 1250 wall telephones. Available in all frequencies.

Above ringers are available in the following frequencies. In ordering, specify code number of ringer and designate frequency desired. Example—124-HB1—30 cycle.

HARMONIC FREQUENCIES

Code No.	Frequency (cycles)	Resistance (ohms)
HA-1	33 1/3	1000
HA-2	50	1000
HA-3	66 2/3	1000
HA-4	16 2/3	2500
HA-5	25	2500

SYNCHROMONIC FREQUENCIES

HB-1	30	2500
HB-2	42	1000
HB-3	54	1000
HB-4	66	1000
HB-5	16	2500

DECIMONIC FREQUENCIES

HC-1	20	2500
HC-2	60	1000
HC-3	30	2500
HC-4	40	1000
HC-5	50	1000

RINGERS

RINGERS FOR USE WITH NO. 65 EXTENSION BELL

Six-inch diameter gongs for this ringer are mounted on an extension bell frame. This ringer is a large type with adjustable armature.

Code No.	Frequency (cycles)	Resistance (ohms)
105-A-1	33 1/3	500
105-A-2	50	500
105-A-3	66 2/3	500
105-A-4	16 2/3	2500
106-A-1	30	1000
106-A-2	42	1000
106-A-3	54	1000
106-A-4	66	1000
121-A	25	2500



105 TYPE RINGER



72 TYPE RINGER

RINGERS FOR NOS. F-817 AND F-9817 TELEPHONES AND NOS. 602, 605, 610 DESK SET BOXES

Code No.	Frequency (cycles)	Resistance (ohms)	Gong Diam.	Type	Armature Type
72-A-1	33 1/3	500	2 1/2 in.	Large	Adjustable
72-A-2	50	500	2 1/2 in.	Large	Adjustable
72-A-3	66 2/3	500	2 1/2 in.	Large	Adjustable
72-A-4	16 2/3	2500	2 1/2 in.	Large	Adjustable
73-A-1	30	1000	2 1/2 in.	Large	Adjustable
73-A-2	42	1000	2 1/2 in.	Large	Adjustable
73-A-3	54	1000	2 1/2 in.	Large	Adjustable
73-A-4	66	1000	2 1/2 in.	Large	Adjustable
74-A-1	20	2500	2 1/2 in.	Large	Adjustable
74-A-2	60	500	2 1/2 in.	Large	Adjustable
101-A	25	2500	2 1/2 in.	Large	Adjustable

SEATS, PLUG

Plug seats in strip types cannot be accurately drilled unless they are fitted to the plug shelf and drillings made with the old plug holes as a guide. Strips are shipped undrilled and, if desired, necessary tools for drilling are furnished. For tools used for drilling plug seats see tool kits Nos. 65 and 66.

NO. 9 INDIVIDUAL TYPE

The No. 9 plug seat consists of two parts, a leather washer and a red fibre seat which may be fastened to the plug shelf by two wood screws which are furnished. The leather washer is 5/32 inch thick and has an outside diameter of 11/16 inch. The dimensions of the 1/8 inch red fibre strip are 1 by 3/4 inch. The cord hold is .368 inch in diameter.



STRIP TYPE

Code No.	Length	Width	Thickness	Material
14	12 3/8 in.	2 1/8 in.	1/8 in.	Red fibre
15	19 3/8 in.	2 1/8 in.	1/8 in.	Red fibre
22	20 3/8 in.	2 1/8 in.	1/8 in.	Red fibre
25	21 3/8 in.	2 1/8 in.	1/8 in.	Red fibre

NOTE: Order No. 65 tool kit for drilling plug seats for Nos. 42 and 106 plugs. Order No. 66 tool kit for drilling plug seats for No. 201 plugs.

SIGNALS, MECHANICAL



Kellogg mechanical signals are of the same rugged construction as Kellogg drops. The most commonly used types are shown below with the respective resistance value of each code.

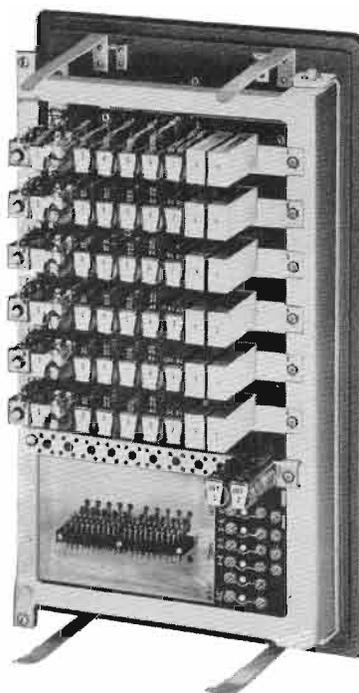
The No. 7 type signal has gridiron type shutter. Equipped with night alarm. This signal is used for attendant station busy signal.

The No. 12 type signal has target shutter. Used for busy test on toll boards.

Code No.	Coil Res. (ohms)	Mounting Centers
7-A	500	1 in.
7-B	50	1 in.
7-C	200	1 in.
12-A	160	1/2 in.
12-B	100	1/2 in.
12-C	1600	1/2 in.
12-D	2750	1/2 in.

STATIONS, RELAY EQUIPMENT CABINET

FOR KEY-BX SYSTEMS

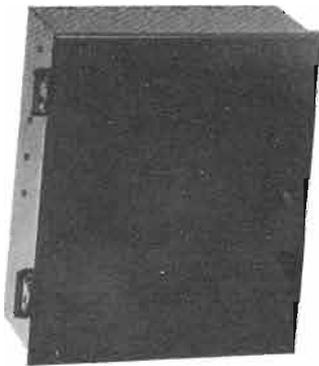


Designed for wall mounting in any convenient location. Provided with side swinging relay gate for mounting trunk relays, condensers, battery feed coils and other apparatus associated with Key-BX system. Dimensions are as follows: width, 16 inches; height, 28 inches; depth, 9 1/4 inches. Trunk relays and associated apparatus for each trunk are all mounted and wired in the factory on individual trunk mounting plates. "Plug-in" type trunks permit quick installation and maintenance of trunk circuits. Trunk relays have twin

contacts of precious metal on all springs. The switching equipment is protected from dust and dirt with a slip-on wood cabinet cover finished in olive green.

Code No.	Description
25-A	For Key-BX systems. Wired for 6 trunks and 2 intercommunication circuits.
25-B	For Key-BX systems. Wired for 3 trunks and 2 intercommunications circuits.

STATIONS, ATTENDANT



Kellogg attendant stations are for use with intercommunication systems. The Nos. 20 and 22 attendant stations are of the 11 station type, providing for 2 trunks and 9 local stations. By eliminating the trunks all 11 key units can be used for local intercommunication use.

The Nos. 21 and 23 attendant stations are of the 23 station type, providing for 4 trunks and 19 local stations. By eliminating

the trunks all 23 key units can be used for local intercommunication.

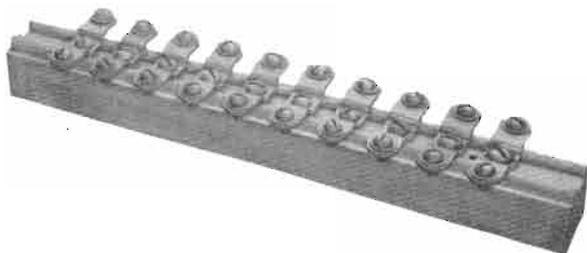
The attendant stations listed above have a black enamel finished steel cover. The Nos. 4, 5, 24, and 25 attendant stations are housed in attractively finished wooden covers. The features of these types are listed below.

The standard operating voltage for all these systems, except the No. 25, is 12 volts. The No. 25 operating voltage is 24 volts. Modification of these voltages can be made for operation on other voltages if desired.

For more complete information on attendant stations see "Intercommunication Systems" pages 43 through 46 in this section.

Code No.	Description
4	One trunk to magneto exchange.
5	Two trunks to magneto exchange.
20	11 station capacity or 2 trunks to common battery manual exchange and 9 local stations.
21	23 station capacity or 4 trunks to common battery manual exchange and 19 local stations.
22	11 station capacity or 4 trunks to common battery dial exchange and 9 local stations.
23	23 station capacity or 4 trunks to common battery dial exchange and 19 local stations.
24	1 trunk Relaymatic intercommunication to common battery (manual or dial) main exchange.

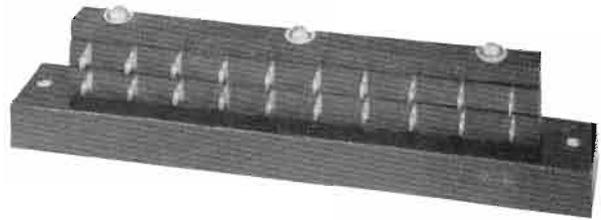
**STRIPS, TERMINAL
 WITH SCREW CONNECTORS**



The connectors are made of steel, hot tin plated, and are mounted on a hard maple strip, finished with shellac.

Code No.	No. of Lines	No. of Connectors	Length of Strip
41	5	10	7½ in.
43	25	50	32½ in.

**STRIPS, TERMINAL
 WITH SOLDER CONNECTORS**



Code No.	No. of Connectors	No. of Connectors per Row	No. of Rows High	Over-all Length of Strip
32	20	10	2	6⅞ in.
31	30	10	3	6⅞ in.
49	40	10	4	6⅞ in.

STRIPS, DESIGNATION

Kellogg designation strip holders are made of brass with a heavy black enamel finish. White paper inserts are used under a clear celluloid cover. Type No. 7 strips shown below are 17/32-inch wide and can be furnished in the lengths listed. Mounting screws are not furnished unless specified. No. 4 flat head wood screws (P-5964) should be specified if screws are desired.

TYPE NO. 7—UNMOUNTED



Code No.	Over-all Length	No. Mtg. Screws
10	10¼ in.	3
15	10 in.	3
16	9½ in.	3
17	5½ in.	2
26	15½ in.	5
28	8-3/16 in.	3
30	17 in.	4
33	11½ in.	5

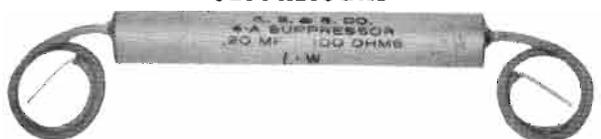
TYPE NO. 13—MOUNTED



Type No. 13 designation strips are similar to type No. 7 in general construction except they are mounted on jack panels for mounting on switchboard stile strip.

Code No.	Mounting Centers	Width of Panel	Dimensions
13	11-5/32 in.	½ in.	10 x 7/16 in.
20	11-5/32 in.	7/16 in.	10 x 7/16 in.
23	8-9/32 in.	¾ in.	7-9/16 x 23/64 in.
31	8-9/32 in.	½ in.	7-9/16 x 7/16 in.

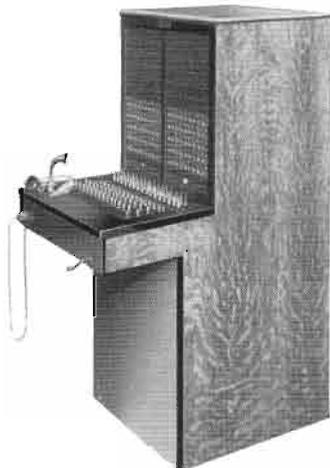
SUPPRESSORS



The Kellogg No. 4-A suppressor is designed as a spark suppressor for Relaymatic switchboards. Its function is to prevent burning of contacts on dialing relays and similar applications. A flash test voltage of 500 volts, DC, is given every suppressor.

Code No.	Capacity (Mfd.)	Working Voltage	Size
4-A	.20 - .25	250 volts	3¼ x ½ in. diam.

MAGNETO MASTERBUILT SWITCHBOARDS



The Magneto switchboard is ideally suited for the small exchange having many long rural subscribers' loops and where operating conditions require an installation which is simple in operation and maintenance.

Three major features are part of every magneto switchboard. (1) "Magneto" is the simplest form of telephony; (2) local battery transmission, at its best, is the best transmission so far de-

vised by telephone engineers; (3) magneto equipment will operate over distances and conditions of outside plant which prevent the use of any other type of switchboard.

The magneto switchboard must be such that it will give satisfactory service to patrons. Its maintenance expense must be extremely low. Replacements must be negligible. The apparatus itself must be so simple that it can be handled perfectly by persons of very limited training and experience. Every Kellogg magneto switchboard is designed and engineered to meet these requirements. The quality of material, design, and workmanship of Kellogg switchboards assures complete satisfaction on the part of the subscriber and the operating company.

SELECTING A MAGNETO SWITCHBOARD

The selection of the proper magneto switchboard depends upon the number of subscribers to be served, the type of line construction, the length of the lines, the number of telephones on each line, and the probability of station growth. These facts permit the selection of the proper size switchboard with a sufficient number of drops and jacks and cord circuit capacity to adequately care for the needs of the community.

The complete line of Kellogg magneto switchboards includes a board for every need, from a 10-line wall switchboard to a 200-line floor type board.

Construction Features



FRAMEWORK. The framework of the Masterbuilt magneto switchboard is of all steel construction, fabricated into one complete interlocking unit. Rivets and spot welding fasten each piece permanently in position. This construction not only provides ample strength to support the equipment and cabinet woodwork but adds permanence to the installation.



SHELVES AND PANELS. The keyshelf and face equipment are made of black phenol fibre. This material is used because of its permanent lustre and its unusual wearing qualities. It contrasts with the equipment and sets off the cords, plugs, keys, drops and lamps. The keyshelf is hinged with a full length piano hinge and can be raised to provide easy access to the key equipment.



FACE EQUIPMENT. The face equipment of the Masterbuilt magneto switchboard has been arranged for simplicity and ease of operation. The black bakelite background prevents fatiguing glare. Jack thimbles are of bright nickel for visibility. Plugs have red or black fibre sleeves for quick identification and are positioned and spaced for maximum convenience.

Cam keys have colored handles—miscellaneous keys are red and white and contrast with black mountings.

Each plug space in the Masterbuilt magneto switchboard has a plug well bushing to take up plug seat wear and prevent the wearing of holes around the plug seats. These bushings are replaceable.



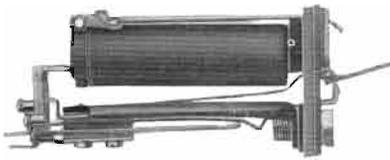
SWINGING GATE. All cord circuit repeating coils and condensers, and in the case of lamp supervision switchboards, all supervisory relays, are mounted on a swinging gate at the back of the switchboard. Below this steel gate is a maple panel which mounts the operator's telephone circuit and night alarm equipment, terminals for ringing current, battery supply, telephone switching circuits; and

in the case of lamp supervision switchboards, the fuses. This panel is conveniently located for easy access. Swinging the gate open exposes the line equipment, cords, and both sides of the gate for inspection and cleaning.



CABINET. The cabinet of the Masterbuilt Magneto switchboard is made of medium golden oak side panels and top. The cabinet has been modernized with old style trim and overlapping sides eliminated to present a smooth beveled top and flush sides. The kickboard is completely covered with a solid color battleship linoleum panel.

MAGNETO MASTERBUILT SWITCHBOARDS



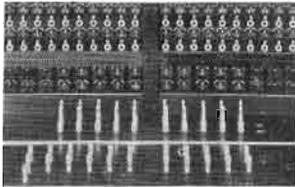
DROPS AND JACKS. The Kellogg drop and jack is designed to insure positive operation. The armature

which operates the latch is at the back end of the coil. This permits the use of a longer latch rod, with more positive action because the armature can be set closer and be pulled up easier by weaker currents. A slight movement of the armature will cause full movement of the latch. The latch, as it is constructed, not only releases the shutter but kicks it down at the same time. Because of this feature the operation of these drops is positive, even on heavily loaded lines where the ringing current is weak.

Jacks with the necessary spring assemblies, are mounted on a rigid frame. The jack thimbles into which the plugs are inserted are designed to insure long life and to protect the plugs from excessive wear. When necessary, jack thimbles may be easily and inexpensively replaced.

SUPERVISION. Two types of supervision are available on Kellogg Masterbuilt magneto switchboards—drop and lamp types.

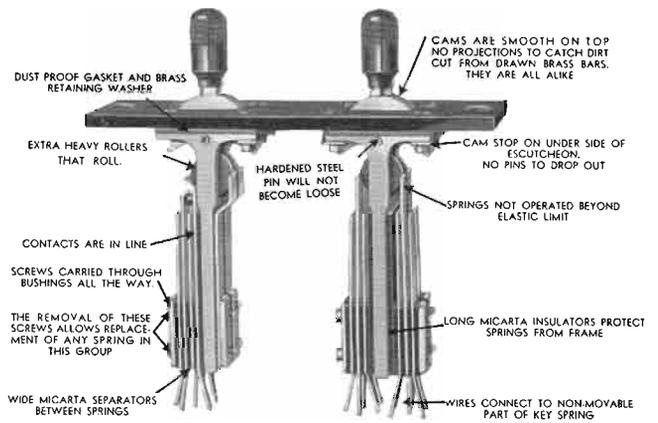
Drop Supervision



Kellogg drop supervision magneto switchboards employ the same type drop for supervision as is used for each line. These drops are mounted on the face of the board. When the subscriber rings off the shutter falls. The "kick" of the Kellogg latch gives added assurance of operation.

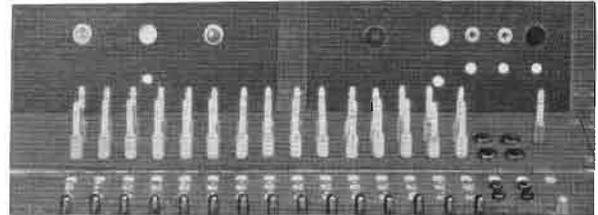
Two types of drop supervision are available. The double drop type provides non-ring-through supervision in which the subscriber ringing off signals only the operator and not the party with whom he was connected. Single drop supervision permits ringing through.

Two types of drop supervision are available. The double drop type provides non-ring-through supervision in which the subscriber ringing off signals only the operator and not the party with whom he was connected. Single drop supervision permits ringing through.



KEYS. The keys used in the Masterbuilt magneto switchboard are strong and simple in construction, designed to withstand years of hard service. The contact springs are of nickel silver, long, heavy, evenly shaped and accurately tempered. Contacts are of precious metal to insure positive, low-resistance circuits. Springs are rigidly mounted in a heavy "T" shaped brass frame, protecting the key against misalignment or damage.

Lamp Supervision



On lamp supervision switchboards a lamp immediately lights, when the subscriber "rings off," and continues to glow until the operator takes down the connection. In lamp supervision there are no moving parts on the keyshelf; the only maintenance required is the occasional replacement of the lamps.

LINE AND CORD CAPACITY

DROP SUPERVISION					LAMP SUPERVISION				
Cabinet Code No.	Maximum Lines	Capacity Cords	Wired for		Cabinet Code No.	Maximum Lines	Capacity Cords	Wired for	
			Lines	Cords				Lines	Cords
50	50	10	50	10	150-EL	150	15	100	15
150-E	150	15	100	15	150-FL	150	15	150	15
150-F	150	15	150	15	200-EL	200	15	100	15
200-E	200	15	100	15	200-FL	200	15	150	15
200-F	200	15	150	15	200-GL	200	15	200	15
200-G	200	15	200	15					

CORD CIRCUITS

DROP SUPERVISION

DR Double Drop—Same as type LR except drop instead of lamp supervision.

DRK Double Drop—Same as type LRK except drop instead of lamp supervision.

D Double Drop—Same as type L except drop instead of lamp supervision.

SR Single Drop—Includes repeating coil and is not non-ring through.

S Single Drop—Same as type SR less repeating coil.

LAMP SUPERVISION

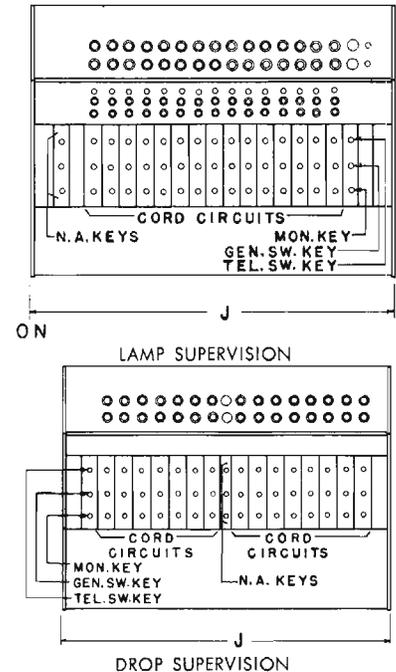
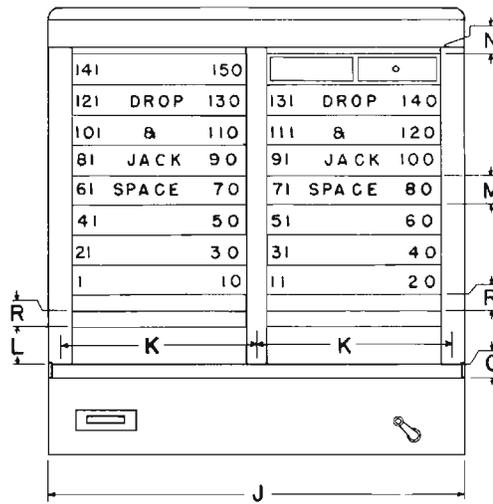
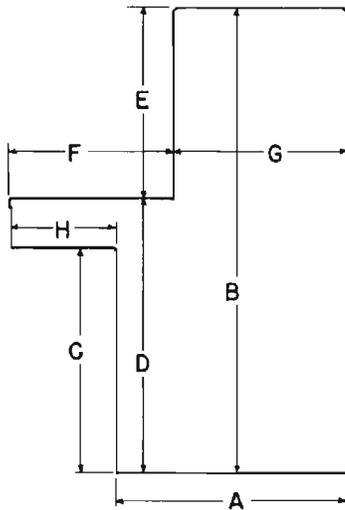
LR Double Lamp—Includes repeating coil and should be used for inter-connecting metallic and grounded lines. Permits either the calling or answering party to signal the operator for a recall without ringing the other party.

LRK Double Lamp—Same as type LR but also equipped with repeating coil cut-out key. Used for through toll connections on metallic toll lines.

L Double Lamp—Same as LR less repeating coil. Used with either all metallic or all grounded lines.

MAGNETO MASTERBUILT SWITCHBOARDS

Cabinet Dimensions



CODE NO.	DIMENSIONS (All dimensions are in inches)															
	A	B	C	D	E	F	G	H	J	K	L	M	N	O	R	
50	22 ³ / ₄	46-9/16	24 ³ / ₄	30	16-9/16	18	16 ³ / ₄	11 ⁷ / ₈	23-15/16	11-5/32	1-29/32	1 ³ / ₄	5/8	7/8	1	
150-E	24 ³ / ₄	50-9/16	24 ³ / ₄	30	20-9/16	18	18 ³ / ₄	11 ⁷ / ₈	23-15/16	11-5/32	1-29/32	1 ³ / ₄	3/8	7/8	1	
150-EL																
150-F																
150-FL																
200-E	26 ¹ / ₄	58-5/16	27 ³ / ₄	33	25-5/16	18	20 ¹ / ₄	11 ⁷ / ₈	23-15/16	11-5/32	1-29/32	1 ³ / ₄	5/8	7/8	1	
200-EL																
200-F																
200-FL																
200-G																
200-GL																

Equipment

CABINET—Three sizes are available. See table for dimensions.

OPERATOR'S SET—Suspended or breastplate type non-positional transmitter, and featherweight, watchcase type, head band receiver.

LINE DROPS—Code and regular alarm—resistance as specified.

DROPS AND CORDS—May be equipped as desired, up to ultimate capacity.

GENERATOR—5-bar, hand generator, wired to a switching key for switching to power generator.

CABLE—12 feet of line cable furnished, extended from top or bottom of switchboard cabinet and from the right or left hand side.

NIGHT ALARM—With bell and control key. An additional alarm with buzzer and key is furnished when line drops are equipped with armature contacts for indicating code rings on party lines.

WALL TYPE MAGNETO SWITCHBOARDS

The Kellogg wall type magneto switchboard is ideally suited for the installation where only a few telephone lines are to be connected together. These switchboards are small and compact and can be installed in almost any convenient location. Three sizes are available, a 10, a 15, and a 30-line unit.

It is usually best to select a switchboard that has sufficient extra capacity to allow for future growth. All of

these switchboards are completely wired at the factory for the maximum equipment, but, with the exception of the Type 9-B, they can be furnished with just enough equipment to handle present requirements. As more lines are needed it is easy to install the additional equipment. When ordering or requesting information on these switchboards it is important that information on the number of lines the switchboard is required to handle at present be included.

WALL TYPE MAGNETO SWITCHBOARDS

Type 9-B—10 Lines



This 10-line switchboard is the smallest of the Kellogg wall types. Its operation is just as positive and just as dependable as the largest magneto switchboard and is recommended for use where requirements do not exceed 10 lines. It can be used for either grounded or metallic lines.

EQUIPMENT AND CONSTRUCTION. The line wires connect to binding posts on the top of the cabinet and terminate on combined drops and jacks in the face of the switchboard. The binding posts are specially arranged with air gap lightning arresters. Two pairs of connecting cords provide for

two complete conversations at the same time between different lines; and in addition, the operator can also answer calls on other lines. A listening-in jack, associated with each pair of cords, enables the operator to supervise the connection without interference. A drop shutter falls when any connected subscriber rings off or makes a recall.

NIGHT ALARM. A night alarm buzzer and a switch come with this switchboard and can be mounted wherever convenient. They connect to two binding posts located on the side of the cabinet and operate from two dry cell batteries connected in series. When the switch is closed the buzzer operates every time a drop on the board falls.

Code ringing night alarm can be furnished extra. This feature, on party lines using code ringing, permits the attendant to go about other duties and still be able to distinguish between calls for the operator and calls for someone else on the same line.

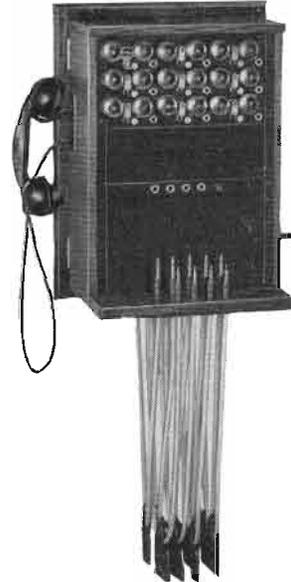
OPERATOR'S SET. Any standard magneto telephone with hand generator and a ringer can be used for the operator's set, and connects to the switchboard through a cord attached to a switchboard plug. A suitable operator's set can be furnished with the switchboard when specified. Shipping weight is approximately 25 pounds.

Type 48—15 Lines

This switchboard is designed specially for rural switching centers where the operator is not always close to the switchboard and a loud signal is desired. A double gong bell is wired across each line and operates similar to a telephone bell. These bells are located in the face of the switchboard, and through their code rings, the operator can tell at a distance whether a party line subscriber is signalling the operator or a subscriber on the same line.

CAPACITY. This switchboard has a capacity for 15 lines and 4 connecting cord circuits. Each line terminates on a combined drop-jack-bell unit and is arranged for either grounded or metallic systems. The board can be partially equipped for 3, 6, 9, 12, or 15 lines as desired and additional drop-jack-bell units can be installed up to full capacity at any time more lines are needed.

Type 48—15 Lines (Cont'd)



OPERATOR'S SET. An all-bakelite Masterphone handset is furnished for the operator. It contains a capsule type non-positional transmitter unit and a self contained capsule type receiver. This handset is supported on a standard Kellogg hookswitch and is wired to an operator's answering cord and plug.

EQUIPMENT AND CONSTRUCTION. All of the plugs are conveniently located on an oak plug shelf in front of the face panel. A hand generator is mounted inside with the crank extending from the right of the cabinet. Also located inside is a night alarm bell, and

a button type night alarm control key is mounted in the front of the cabinet in line with the cord circuit jacks. This board comes completely wired with the line wires brought out to binding posts on the back to which is connected an 8-foot cable. Shipping weight is approximately 125 pounds.

HOW TO ORDER

When ordering or requesting information on the Type 48 switchboard the following information should be furnished:

1. Number of lines to be equipped at present.
2. Resistance of drop coils.
3. Whether the 8 feet of line cable supplied is sufficient.

Type 30—30 Lines

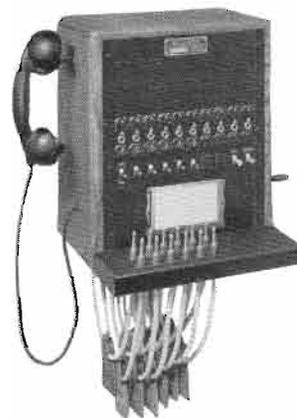
This switchboard fits most cases where a wall board is required because it can handle up to its full capacity of 30 lines. This allows for sufficient expansion for those systems where less than 30 lines are now used.

CAPACITY. Ten drops and jacks are mounted in a row and space is available for three of these rows or a total of 30 lines. There is capacity

for 6 cord circuits. It can be equipped with as few as 10 drops and jacks and 4 cord circuits, depending upon the number of lines needed and the amount of traffic handled at present. Additional equipment can be added as more lines are required.

OPERATOR'S SET. This switchboard comes equipped with an all-bakelite Masterphone handset, containing capsule type, non-positional transmitter and receiver units, supported by a hookswitch mounted on the cabinet.

HAND GENERATOR. A heavy duty hand generator is located inside the cabinet with the generator crank extending from the right side. If power ringing is to be used a generator switching key can be furnished to switch from the power ringing machine to the hand generator in an emergency.



WALL TYPE MAGNETO SWITCHBOARDS

Type 30—30 Lines (Cont'd)

CORD CIRCUITS. The cord circuits are of the single supervision type, equipped with a "clear out" drop and combined ringing and listening key. The supervisory drops and keys are located on the face of the board. The first pair of cords may be equipped with a repeating coil for connections between metallic and grounded lines.

NIGHT ALARM. The night alarm bell is mounted inside the cabinet and is furnished with a control key to turn it on or off. The bell will ring as long as the drop signal is down.

If desired any strip of line drops can be equipped with a code alarm. This circuit has a buzzer and control key and is entirely separate from the night alarm. The code operates in unison with the ring from the subscriber's telephone so the operator can distinguish between a station-to-station call on any one line or a call for the operator.

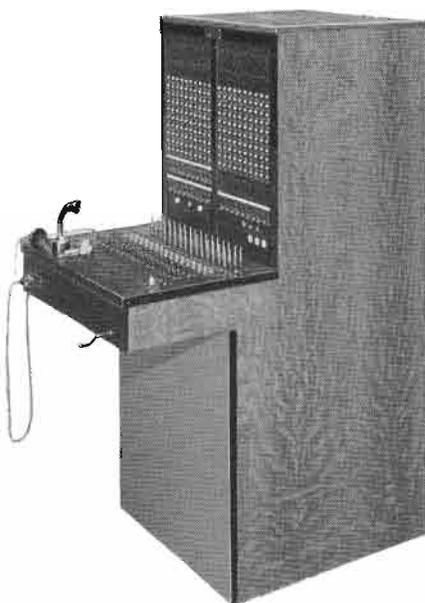
This switchboard is designed for use with either metallic or grounded lines. Shipping weight is 65 pounds.

HOW TO ORDER

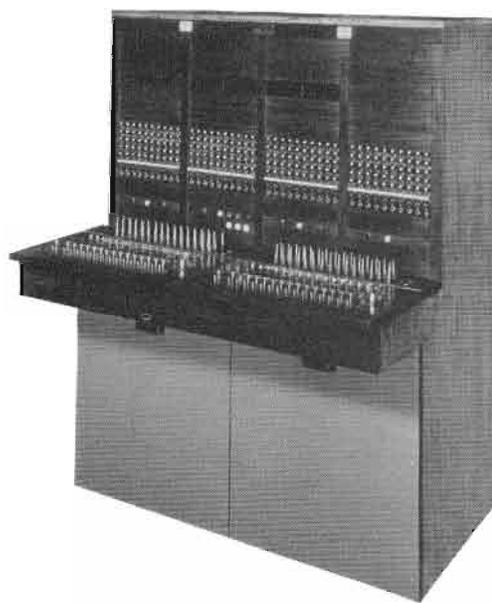
When ordering or requesting information on the No. 30 switchboard the following information should be furnished:

1. Number of lines to be equipped at present.
2. Number to be equipped with code alarm.
3. Number of cord circuits to be equipped at present: should the first pair be equipped with repeating coil?
4. Should the 8-foot line cable which comes with the switchboard extend from the top or the bottom of the cabinet? Whether the 8 feet of line cable furnished is a sufficient amount.

MASTERBUILT JUNIOR SWITCHBOARDS



SINGLE POSITION



TWO POSITION

The Masterbuilt Junior switchboard is of the non-multiple type, equipped with universal cord and line circuits designed to provide either common battery or magneto service or a combination of the two. These switchboards are available in single position units up to 200 lines and in two position units with capacities up to 400 lines.

The Masterbuilt Junior is adapted to the installation where the anticipated growth will not require a multiple type switchboard. It provides modern manual service and the initial cost is only slightly more than for magneto equipment. Both magneto and common battery subscribers may be served with one switchboard and as subscribers are changed from magneto to common battery service the transfer is made by switching only two wires on the line relay.

The universal line and cord circuits of these switchboards permit both magneto and common battery subscriber service without special equipment. This feature makes it possible to convert subscriber service from magneto to common battery on a one-line-at-a-time basis, thus avoiding large purchases of telephone instruments at one time.

Each Masterbuilt Junior position has a capacity of 200 local lines, either magneto or common battery, and 40 drop signal or 30 lamp signal magneto rural or toll lines, 15 universal cord circuits with either manual or machine ringing and any type of party line service. The sections are complete individual units. Two sections may be placed together which provides double the capacity of one section. This also may be accomplished by using a two-position cabinet switchboard.

The cord circuits may be equipped with either manual or machine ringing and with any type of party line service desired. Pilot lamps, fuse alarm, cord and wire chief's tests, generator switching key, operator's telephone switching key, and night alarm key are all standard equipment. Code alarm and hand generator will be furnished when specified.

Operating Features

COMMON BATTERY OPERATION. Lamp lights when subscriber removes telephone from hookswitch.

MAGNETO OPERATION. Hand generator at subscriber's telephone provides means of signalling operator.

MASTERBUILT JUNIOR SWITCHBOARDS

Operating Features (Cont'd)

FULL UNIVERSAL LINE CIRCUITS. These circuits handle all types of local lines, magneto or common battery. To convert from local battery to common battery change just two connections on the line relay. No additional switchboard wiring or equipment is required to change to common battery.

RURAL OR TOLL LINE CIRCUITS. These are magneto, with either drop or lamp signal.

FULL UNIVERSAL CORD CIRCUITS. Adapt instantly to the line in which the plug is inserted, regardless of whether it is common battery or magneto. Nine different circuits are available to meet specific operating conditions.

PILOT CIRCUITS. Line pilots and supervisory pilots are provided for both common battery and magneto lines.

PARTY LINE RINGING. Code, two-party divided, or five-party harmonic ringing may be furnished as specified.

MANUAL RINGING OR MACHINE RINGING. Machine ringing is recommended for common battery lines because of great saving of operator's time. Revertive ringing tone is recommended with machine ringing only. The switchboard may be wired for machine ringing and the actual equipment added later to meet future needs. Single party, two-party divided, or five frequency harmonic ringing may be furnished as desired.

REVERTIVE RINGING TONE. Revertive ringing tone is audible to the calling subscriber when the called subscriber is being rung on a common battery line. Available when machine ringing is specified.

POSITIVE NIGHT ALARM. Controlled by a night alarm key.

CODE ALARM. Repeats code rings on rural or toll lines. It is used when the operator leaves the board. When code calls are made the operator does not need to answer. Subsequent calls will not be prevented from coming through. (This feature is optional.)

FUSE ALARM. The fuse alarm sounds whenever a switchboard circuit fuse "blows."

LINE JACKS. Masterbuilt Junior switchboards have only ten jacks per strip. This permits the operator to handle the plugs easily and efficiently. Congestion is eliminated, the operator's view is not obstructed and wear on cords is lessened.

POSITIVE LAMP SUPERVISION. Individual supervisory lamps with pilots to attract the operator's attention insure prompt recalls. On common battery connections supervisory signals automatically appear when the receiver is placed on the hook. On magneto connections it is necessary for the subscriber to ring off after placing the receiver on the hook.

REPEATING COILS. Repeating coils are necessary to provide the best universal cord circuits and are recommended under all conditions.

CAPACITY. The ultimate capacity per position is 200 local lines and 40 magneto lines. Two-position switchboards have an ultimate capacity of 400 non-multiple local lines and 80 magneto lines.

Construction Features

FRAMEWORK. The framework of the Junior Masterbuilt is of rigid, all-steel construction. Rivets and spot-welding fasten each piece firmly in place.

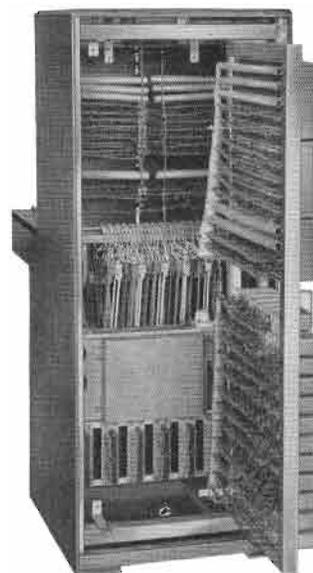
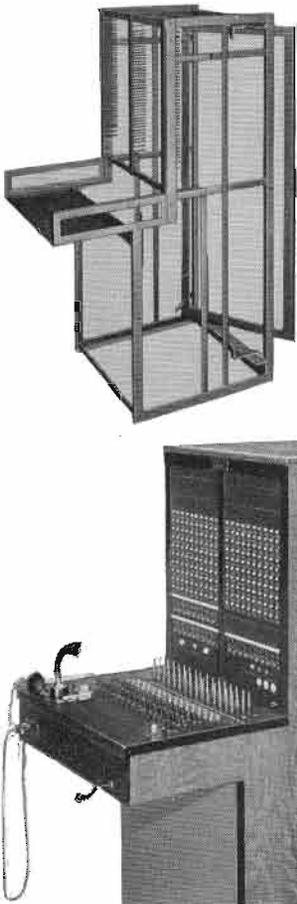
FACE EQUIPMENT. The face equipment of the Junior Masterbuilt has been arranged for simplicity and ease of operation. The black bakelite background prevents fatiguing glare. Jack thimbles are of bright nickel for visibility. Plugs have red or black fibre sleeves for quick identification and are positioned and spaced for maximum convenience. Cam keys have colored handles—miscellaneous keys are red and white and contrast with black mountings.

Each plug space in the Masterbuilt Junior switchboard has a plug well bushing to take up plug seat wear and prevent the wearing of holes around the plug seats. These bushings are replaceable.

SHELVES AND PANELS. The keyshelf and face equipment are made of black bakelite. This material is used because of its permanent lustre and its unusual wearing qualities. It contrasts with the equipment and sets off the cords, plugs, keys, jacks, and lamps. The keyshelf is hinged with a full length piano hinge and can be raised to provide easy access to the key equipment.

SWINGING GATE. All repeating coils, condensers, relays, etc., are mounted on the swinging gate of the Masterbuilt Junior. A maple panel which mounts night alarm equipment, terminals for ringing current, battery supply, fuses, and telephone switching circuits is located at the back of the switchboard. This panel is conveniently located for easy access. Swinging the gate open exposes the line equipment, cords, line, trunk terminal blocks, and both sides of gate for inspection and cleaning.

CABINET. The cabinet of the Masterbuilt Junior switchboard is made of medium golden oak side panels and top. The cabinet has been modernized with old style trim and overlapping sides eliminated to present a smooth beveled top and flush sides. The kickboard is completely covered with a solid color battleship linoleum panel.



MASTERBUILT JUNIOR SWITCHBOARDS

How to Order

In ordering or requesting information on the Masterbuilt Junior the following information should be included:

1. Number of universal lines to be equipped. Any number of these universal lines may be wired for common battery operation as specified.
2. Number of rural lines to be equipped and whether they are to be equipped with drop and jack or lamp signals.

3. Number of cord circuits to be equipped. State whether manual or machine ringing is to be furnished and type of party line service. If ringing machine is to be furnished specify type.

4. If power equipment is to be furnished specify voltage and frequency of commercial current available.

5. Specify length of cable runs from switchboard to main distributing frame.

Equipment

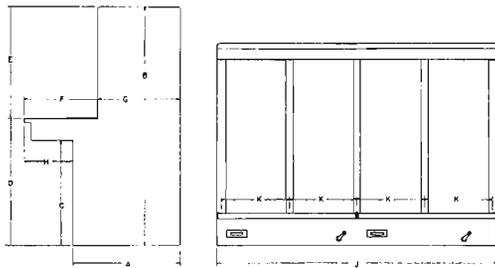
OPERATOR'S SET. Suspended or breastplate type operator's sets are available.

CABLE. Cable to the switchboard is terminated on terminal blocks provided at the back of the switchboard. Cable must be ordered separately.

GENERATOR. Switchboard may be furnished with or without 5-bar hand generator.

BLUE PRINTS. Two complete sets of blue prints covering all circuits used in the Masterbuilt Junior are furnished with each installation.

Cabinet Dimensions



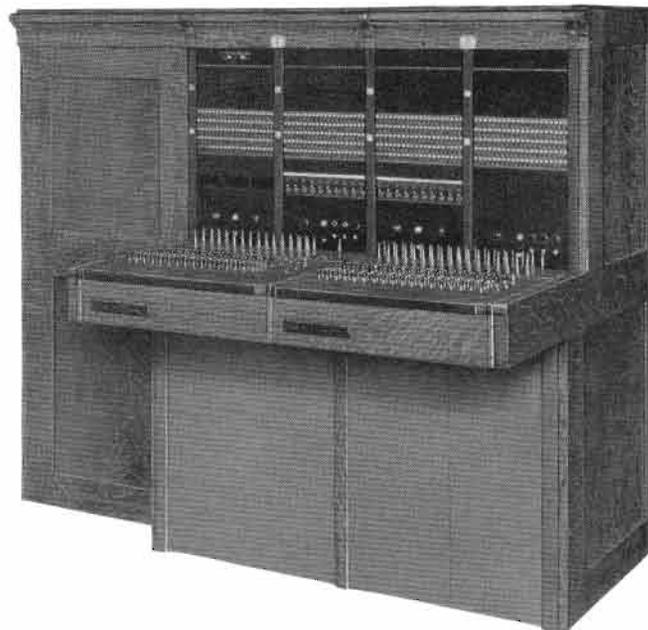
The side view of a Masterbuilt Junior Switchboard is shown at the left. On the right is the front view of the Masterbuilt Junior face plate. The drawing shown is of the two position board.

All dimensions are in inches.

A	B	C	D	E
26 1/4	58-5/16	27 3/4	30	25-5/16
F	G	H	J	K
18	20 1/4	11 7/8	*23-15/16	11-5/32
			**47	

*One position **Two position

MASTERBUILT SWITCHBOARDS (MULTIPLE TYPE)



Multiple-type Masterbuilt Switchboards are available in sizes to meet requirements of any exchange of from 300 lines to thousands of lines. They are soundly engineered, built by skilled craftsmen and made of the highest quality material throughout.

The Masterbuilt Switchboard is especially designed to include operating features which will provide the basic elements of good telephone service desired by subscribers. These features include 1) a quick answer; 2) a fast connection; 3) a satisfactory conversation; 4) instantaneous disconnect; and 5) a prompt recall.

Masterbuilt switchboards do not demand large investment in

surplus idle equipment. In planning for future needs, either small or large, Masterbuilt users can be sure that their switchboards will have the flexibility to meet those needs economically and efficiently.

The positional equipment of any section or operator's position in a Masterbuilt switchboard may be removed and reinstalled where needed. All of the operator's equipment and cord equipment is installed in the keyshelf and relay gate in one demountable unit. This feature enables any Masterbuilt position, whether local, toll, or universal to be converted over night.

MASTERBUILT SWITCHBOARDS (MULTIPLE TYPE)

A steel framework is the foundation of every Masterbuilt switchboard. This framework is one fabricated unit, complete and interlocking from end to end. Framework for the Masterbuilt switchboard is shipped separately from the electrical equipment to take advantage of lower freight rates. In assembling the framework on the job bolts and machine screws are used, no riveting or welding is required.

Service Features of Masterbuilt Switchboards

MULTIPLE LINE LAMP CALL DISTRIBUTION

Multiple line lamp call distribution consists of the association of a line lamp with each multiple appearance on switchboards up to 1600 lines and as many appearances as may be necessary on larger installations. In this way every call is made available to every operator so it is unnecessary for the subscriber to wait on one or two particular operators to answer his signal. Switchboard operation is placed on a competitive basis between operators and their performance may be graded in terms of actual calls handled. This feature not only tends to shorten answering time, but it materially reduces traffic expense. Multiple line lamp makes each operator's position a complete unit in itself.

KEYLESS LISTENING

Keyless listening automatically connects the operator to the calling party upon the insertion of the answering cord, without the necessity of operating manual listening key. This feature saves time for the operator who is spared the manual work of key operation, and for the subscriber, whose call is answered more promptly.

After the operator has answered a call, she can only free her telephone circuit of that call by inserting the calling plug and starting the machine ringing. Therefore it is impossible for her to accidentally abandon a calling subscriber without completing the desired connection.

This feature also prevents "overlapping" which consists of an operator inserting two or more answering plugs at one time and answering the call on the second plug as soon as she completes the first connection. This abuse results in delaying the second call unnecessarily when it might have been completed by an idle operator.

DARK KEYSHELF

Dark keyshelf is that feature which consists of all keyshelf supervisory lamps remaining unlighted after the ringing has been started and until one or the other of the parties hangs up his receiver. The answering supervisory lamp is lighted only when the calling party desires to disconnect or recall. The calling supervisory lamp is lighted when the calling plug is first inserted and serves as a guard lamp until the automatic ringing has been started. As soon as the ringing is started, the calling supervisory lamp is extinguished and does not light again until the called subscriber restores his receiver to the switchhook, or, if the called subscriber fails to answer, the calling subscriber abandons the call. With this method of supervision any lighted supervisory lamp means that the dark lamp of the cord pair needs attention. There are no flashing signals to irritate the operator nor is perfect supervision dependent upon the operator's understanding the differentiation between the full or partial illumination of the lamps.

Installation of Masterbuilt switchboards is made easy by the "knock-down" method of shipment which means smaller parcels, easier and cheaper handling, and no hoists or special openings in central office telephone buildings.

The positional units are factory wired. The cord equipment is completely wired, assembled, and tested at the factory. Assembling and wiring relay gates on the job is eliminated.

NON-INTERFERENCE

Non-interference is that feature which prevents two operators from answering the same call. This feature is specially recommended for large exchanges to prevent the confusion arising from more than one operator trying to handle any one call.

AUTOMATIC ANSWERED-CALL PEG COUNT

Automatic answered-call peg count automatically registers every call the operator answers. This provides the chief operator or supervisor with an accurate measure of the traffic handled by hours, days, or months. It furnishes the most satisfactory information from which schedules and payrolls may be computed. As mentioned above, it forms an accurate rating for operative performance.

SECRET SERVICE

Secret service is that feature, associated with automatic listening, which prevents the operators from listening on a completed connection. As soon as the calling cord is inserted and the machine ringing started, the operator is automatically excluded from the circuit. Machine ringing and dark keyshelf definitely take care of all supervision, and the operator has no further duty except to take down the cords when supervisory lights appear.

AUDIBLE MULTIPLE BUSY TEST

Audible multiple busy test provides an audible indication to the operator that the line to which she wishes to complete a connection is busy. This test consists of a slight click in the operator's receiver when the tip of the calling plug touches the thimble of a busy jack. With non-interference features, however, the operator, as well as the calling party, is automatically excluded from the busy line even though the operator may actually insert the calling plug.

MACHINE RINGING

Machine ringing provides an intermittent, automatic ringing of the called subscriber's bell. This ringing continues until the called subscriber answers or the calling party abandons the call and hangs up his receiver. If the switchboard is arranged for individual lines only, the automatic ringing may be keyless, so that it is only necessary for the operator to insert the calling plug into the line of the party called for, whereupon the ringing circuit starts immediately. However, with party line systems it is necessary for the operator to start the ringing, after the calling plug has been inserted, by depressing the ringing button which selects the code, or frequency, to be rung and automatically sets the machine ringing mechanism in motion.

Machine ringing will reduce the cord holding time in any exchange now equipped with manual ringing. The reduction in cord holding time means fewer cords and fewer operator positions are necessary. Reducing the holding time on the calling and called subscribers circuits materially reduces the number of busy reports and unavoidable second calls.

MASTERBUILT SWITCHBOARDS (MULTIPLE TYPE)**Service Features of Masterbuilt Switchboards (Cont'd)****REVERTIVE RINGING TONE**

Revertive ringing tone is that feature which provides to the calling party a tone each time the bell of the called party is rung. This tone indicates to the calling party that the operator has performed every possible function in connection with the call and the desired conversation is then dependent only on the answering of the telephone by the party called. This feature entirely does away with reports that the operator refuses to ring, and relieves the operator of all necessity for re-ringing on established connections.

INSTANTANEOUS DISCONNECT

Instantaneous disconnect entirely disassociates the cord circuit from the subscriber's line circuit the instant he restores his receiver to the switchhook. This connection applied not only to the talking conductors of the cord but also to the busy test so that after the completion of a call or the abandonment of an uncompleted call the line of either party or both parties is immediately available for either an outgoing or an incoming call.

This feature materially reduces the cord holding time since the cord may immediately be used for another connection. The disconnect indication on the supervisory lamps is complete and unmistakable; however, in the event that the operator has other idle cords, it is not necessary for her to take down a disconnected cord pair immediately because the cords, if left in the subscribers line jack, can in no way interfere with the subscribers service. This feature results in a saving of operators time and subsequent calls. The number of busy tests is reduced by making both subscribers lines immediately available for incoming service.

Instantaneous disconnect may be furnished on both cords or on the answering cord only. Traffic studies show that the majority of recalls come from the party who originates the first call. For

this reason some traffic authorities believe that disconnect on the answering cord is sufficient. However, in some cases it has been proved that the savings in the number of busy tests and consequent second calls was more than enough to justify the installation of instantaneous disconnect on the calling cord as well.

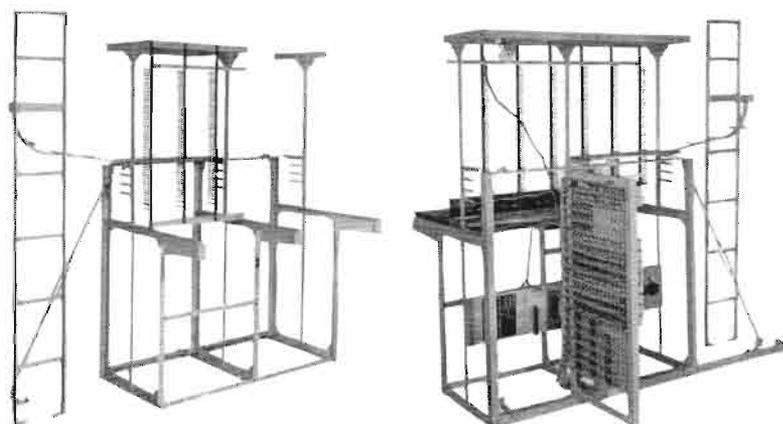
LINE LAMP RECALL

Line lamp recall is that feature associated with instantaneous disconnect which permits a subscriber's recall to appear in the line lamp instead of on the cord supervisory lamp as would be the case without instantaneous disconnect in the cord circuits. The recall appearing in the line lamps is just as available to every operator as was the original call, and the subscriber receives the same prompt answer on all classes of calls.

BUSY LINE LOCK-OUT

Busy line lock-out positively prevents a second call from being completed to a busy line so long as ringing or a conversation is in progress. With this feature, the operator gets the audible multiple busy test on a busy line, but even though she may plug into the jack, the cord is half open and the operator cannot start the machine ringing nor release her telephone set from the calling party until she withdraws the incorrectly inserted plug and reports the line as "busy." Under this condition the calling supervisory lamp remains burning as a visible indication of her error until rectified.

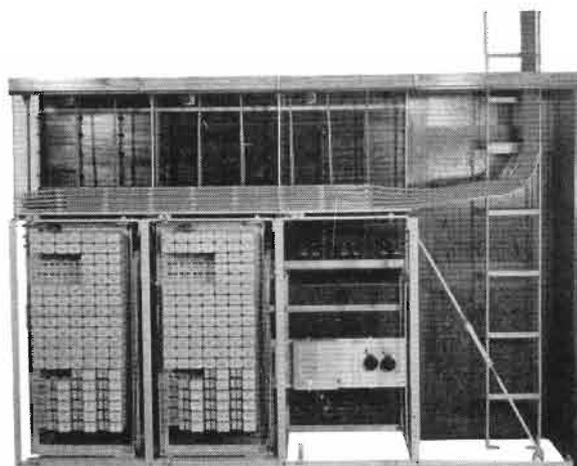
This feature may be considered as the last step in perfecting secret service. "Busy Line Lock-Out" prevents a third party from being connected into an established connection and prevents a second operator from listening in on any multiple appearance of a busy line. This feature also prevents careless operators from ringing on established connections in case a busy test is disregarded.

Construction Features**RIGID STEEL FRAME**

The complete switchboard is built upon the spot where it is to stand. The installer handles one piece of framework at a time, interlocking and bolting together the members. No riveting is necessary.

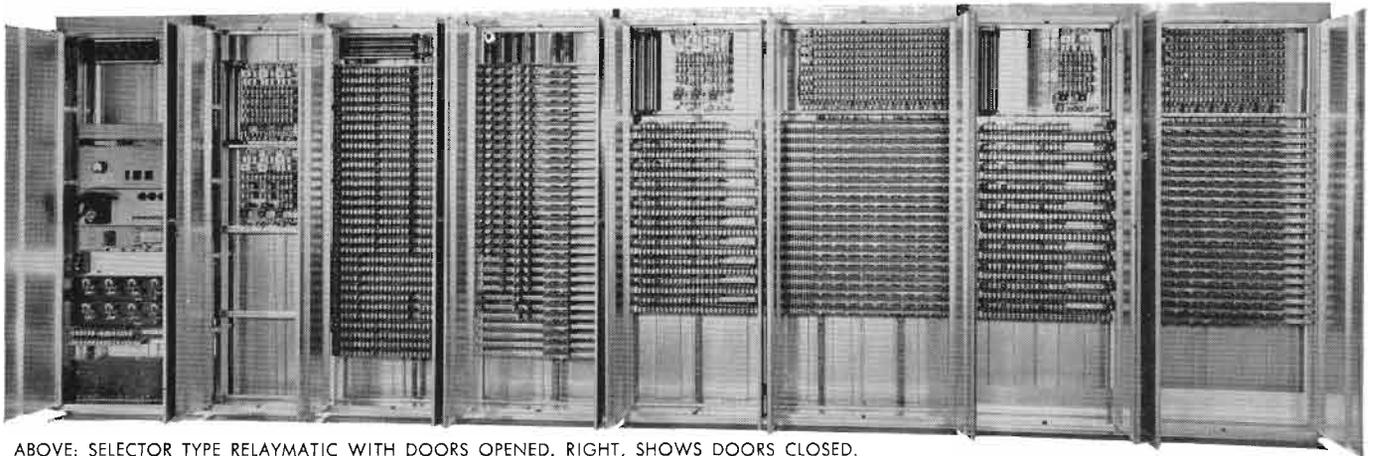
CORD EQUIPMENT

The cord equipment shipped completely, wired, assembled, and tested. The only work for the installer is to slide the key shelf, connecting rack and cord rack into place, hang the gate, connect the power and hang and connect the cords to the operator's jack.

**CONSTRUCTION AND ASSEMBLY**

The swinging gate carries cord circuit relays, condensers, repeaters and coils. Merely swing open the gate and the line equipment, cords, and both sides of the gate are accessible. Nothing obstructs the wiring.

RELAYMATIC SWITCHBOARDS

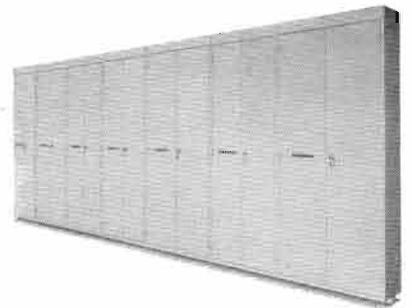


ABOVE: SELECTOR TYPE RELAYMATIC WITH DOORS OPENED. RIGHT, SHOWS DOORS CLOSED.

The Kellogg Relaymatic switchboard is an automatic switching unit providing attended or unattended service for central offices, private branch exchanges, and inter-communication systems. It provides all the operational features of manual operation, utilizing line circuits, connecting circuits, and auxiliary circuits, without operator supervision.

All switching functions of the Relaymatic are performed by relays—no cams, shafts, plungers, or other mechanical moving parts are required. No complicated mechanical maintenance is necessary with the Relaymatic.

The relays of the Relaymatic are of the highest quality. Precious metal is used on all spring contacts, assuring quiet operation and increased dialing range. Twin contacts are used in all Relaymatic relays, providing a broad margin of safety because the extra contact eliminates almost all contact failures.



Operating Features of the Relaymatic

- Local line circuits are all of the metallic type.
- Line adapters are used for grounded lines.
- Any line circuit can be converted into a trunk by the addition of a trunk repeater.
- A station dialing the trunk number is automatically connected to an idle trunk.
- Incoming trunk or long-distance calls get first use of links.
- Trunks from toll board are arranged for operator verification.
- Calls are assigned to links in rotation. This distributes the load equally among all links.
- Links are automatically freed from any line which may be in trouble due to incorrect dialing, receiver off the hook, shorts, grounds, wet cables, etc.
- All local calls are dialed in the same manner, using the directory number, including revertive calls on the same line.
- Links on revertive calls are instantly released when the called party answers.
- A dial tone tells the subscriber when to begin dialing.
- Dial start supervision is given toll operation.
- Busy tone indicates that a called line is in use.
- Flash busy of 60 I.P.M. for line busy and of 120 I.P.M. for all paths busy is provided.
- Revertive ringing tone is heard by the calling subscriber at each ringing interval.
- A time cut-off feature, if desired, limits conversations to a predetermined talking period.
- Maximum transmission is assured.
- Adequate transmitter battery is supplied to the subscriber's line on all types of connections.
- The calling subscriber releases all equipment instantly by restoring his receiver on "don't answer" calls.
- All connections are secret and cannot be intruded upon by subscribers on other lines.
- Each answered call is automatically counted.
- All connections are made through relay spring contacts.
- All relays are of the angle armature type having springs equipped with contacts of precious metal.
- Relay armatures and spring contacts are at the front of the relay for easy cleaning and inspection.
- Relay springs are of the sufficient length and proper gauge to give ample tension and cleaning action without causing unnecessary wear or pitting.
- Precious metal is used exclusively on all relay contacts. No base metal contacts or wipers are used.
- Circuits and relays are designed throughout to give positive operation with minimum current consumption.

Classes of Service

The line circuits of the Relaymatic may be assigned for common battery local and rural, trunk, or pay station service. Local lines provide single-party or multi-party service up to 10-party selective or 20-party semi-selective ringing per line. Adapters are available for grounded rural lines.

Wiring

The circuits of the Relaymatic units are all wired, connected, and tested at the factory. All lines are wired to terminal strips at the top of the bays to facilitate cabling to the main distributing frame and protection equipment.

RELAYMATIC SWITCHBOARDS

Trunks to Manual Exchanges

The Relaymatic may be arranged to operate with any type of trunk line. The trunk lines may be provided singly or in groups, with not more than 10 trunks equipped in each group of broadspan or groups of more than 10 in selector type. When more than one trunk is equipped in a group they are arranged for progressive allotment so an idle trunk is automatically selected when the number assigned to the group is dialed. A busy signal indicates that all trunks are busy.

Trunk lines, as required, for connecting Broadspan type switchboards to other exchanges may be obtained by adding trunk repeaters to certain local lines. The repeater provides supervision and signalling features required for trunk operation and the type of repeater depends upon the kind of outside plant to be used.

Main Distributing Frame

Any standard main distributing frame may be used in connection with a Relaymatic. Protectors having carbons and heat coils are usually recommended. Wall type frames can be used

in small exchange buildings where it is desired to conserve floor space.

Auxiliary Equipment

A machine type automatic ringing interrupter is used to provide clear and distinct codes and tones. The same type interrupter with different interruptions is used on harmonic ringing. This machine also is arranged for timing calls and furnishes the out-of-order, dial, and busy tones.

The dial tone generator produces a pleasing tone without radio interference.

The busy back tone is obtained from the tone generator with interruptions provided by the interrupter.

The ringing current is derived from standard pole changer equipment or from another suitable ringing machine.

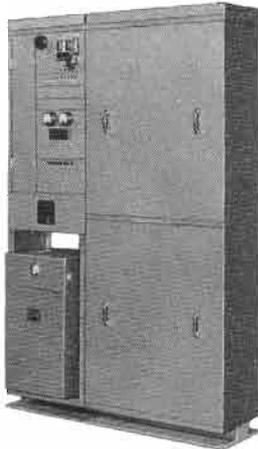
The tone generators, timer, and ringing equipment may or may not operate only while there is a call in progress in the exchange.

Revertive ringing tone is taken from the ringing supply through a suitable filter.

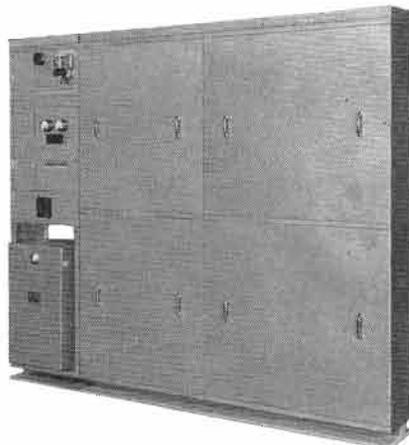
RELAYMATIC SWITCHBOARD EQUIPMENT

The Kellogg Relaymatic switchboard is available in two types. The "Broadspan" type switchboard has a maximum line capacity of 200 lines including trunks and uses only finder and connector circuits. The "Selector" type switchboard is available in any size up to many thousand lines and uses selector circuits in addition to finder and connector circuits.

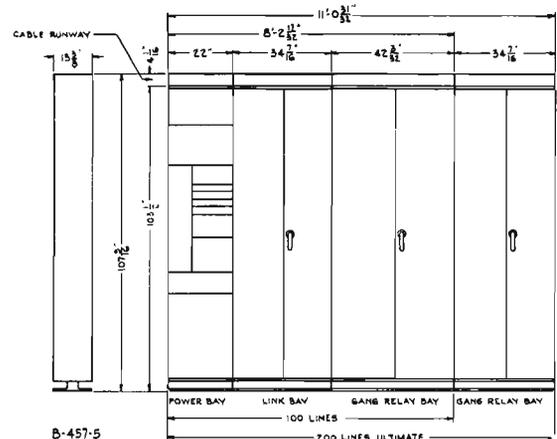
Broadspan Type Relaymatic



30-LINE, 6 LINK RELAYMATIC WITH POWER BAY. SEPARATE FROM BROADSPAN.



BROADSPAN RELAYMATIC FRAMEWORK FOR 100-LINE, 12 LINKS, 6 TRUNKS AND POWER BAY



DRAWING SHOWING DIMENSIONS OF BROADSPAN RELAYMATIC, 200 LINES CAPACITY—17 LINKS ULTIMATE.

Standard Broadspan Relaymatic has a 200-line ultimate capacity. Any number of lines less than the maximum (in groups of 10) may be equipped, with provision made for expansion as future growth demands.

30-LINE, 6 LINK RELAYMATIC—WITH POWER BAY

This switchboard has an ultimate capacity of 30 lines and 6 links. Any line may be converted into a trunk.

The line and connecting equipment is mounted in one bay, occupying a space 34-7/16 inches wide, 13 inches deep, and 81 inches high. This Relaymatic may be equipped with any number of lines in groups of 10 and links up to the ultimate capacity. The power equipment may be located in a 22-inch cabinet attached to the relay bay or in a separate floor or wall rack if desired.

Exchanges requiring more than 200 lines are served by Relaymatic switchboards having relay type selectors to complete connections between the "hundreds" and "thousands" groups. All apparatus used in these larger switchboards is of Kellogg standard design, and, with the exception of the selectors, is fundamentally the same as that used in Relaymatics of lesser capacity. With selectors, these larger Relaymatic switchboards are available for any size installation. See next page.

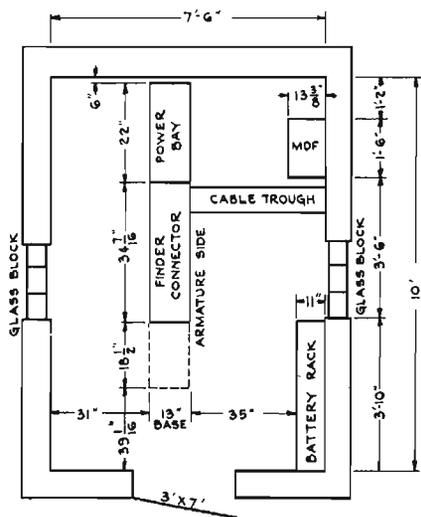
200-LINE CAPACITY

The ultimate capacity of this Relaymatic is 200 lines with 12, 15, or 17 links as desired. It may be equipped with as many lines and links as are immediately required. Any line in the 7, 8, 9, and 0 group of the first hundred group may be converted into trunks as needed.

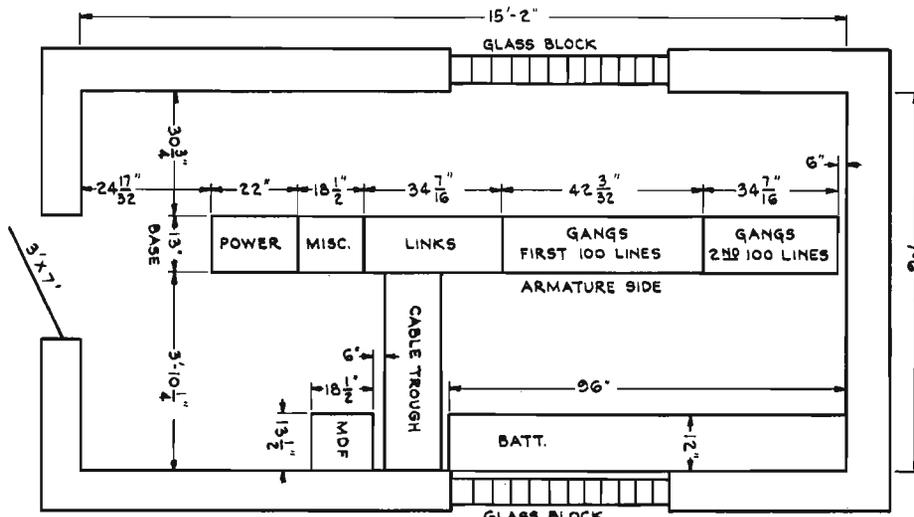
The dimensions of the 200-line capacity Relaymatic depend upon the arrangement of the equipment specified, the number of links required, and other engineering factors. A variety of cabinet sizes is available.

RELAYMATIC SWITCHBOARDS

Typical Broadspan System Floor Plans

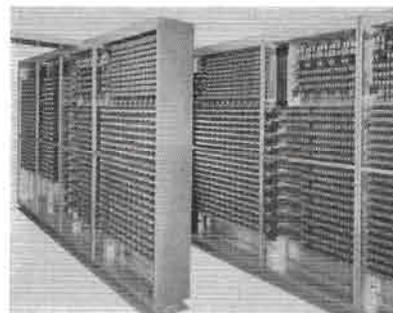
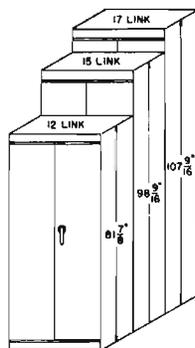
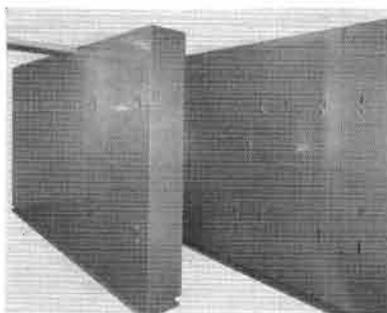


30-LINE, 6 LINKS, 3 TRUNKS ULTIMATE . . . WITH SPACE FOR ADDITIONAL BAY FOR CX SETS, ETC.



200-LINE ULTIMATE . . . CODE RINGING. 6 TRUNKS WITH ADDITIONAL MISCELLANEOUS BAY.

Selector Type Relaymatic



The number of lines and the number of trunks to toll and other exchanges determine the use of the selector type Relaymatic.

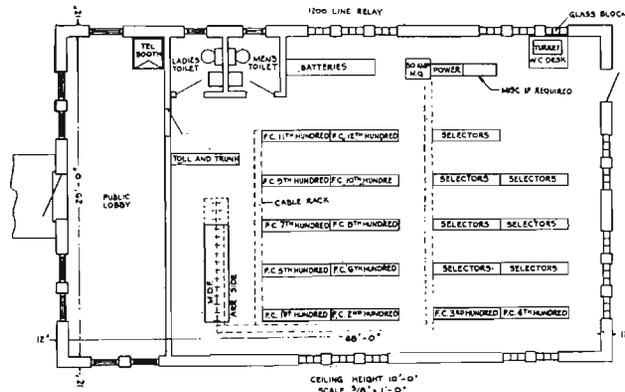
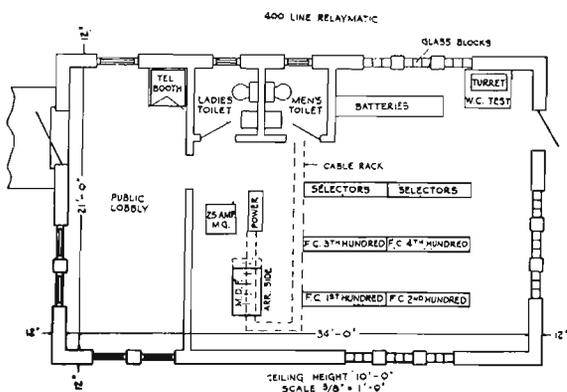
Illustrated below are the three sizes of frames employed to give the required trunking capacities.

The 81-inch line bay has a capacity of 100 line equipments, 12 finders, and 12 connectors. The selector bay will accommodate 30 selectors. These bays have 2 lift-out type doors, front and rear. The 98-inch line bay has a capacity of 100 line equip-

ments, 15 finders, and 15 connectors. The selector bay has a capacity of 36 selectors.

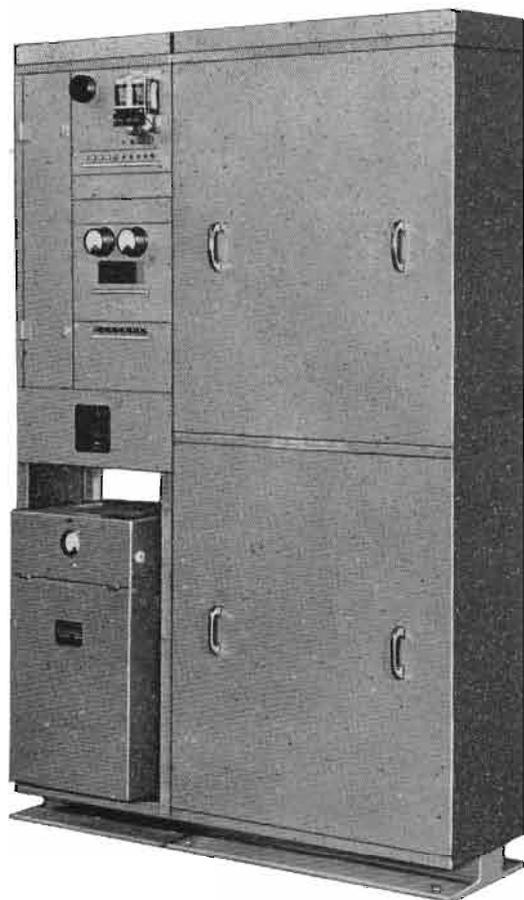
The 108-inch line bay has a capacity of 100 line equipments, 17 finders, and 17 connectors. The selector bay has a capacity of 40 selectors.

The 98 and 108-inch frames have two side-swinging doors, front and rear.



RELAYMATIC PABX

PRIVATE AUTOMATIC BRANCH EXCHANGE SWITCHBOARD —WITH TRUNKS



The Kellogg Relaymatic PABX can be adapted to provide any type of PABX or inter-communication service, or any combination of the two.

Standard Relaymatic PABX equipment is arranged to provide inter-connection between the PABX stations with unrestricted direct access to the main exchange trunks. If desired, certain predetermined stations, in specific ten-line groups, can be restricted from using the trunk circuits.

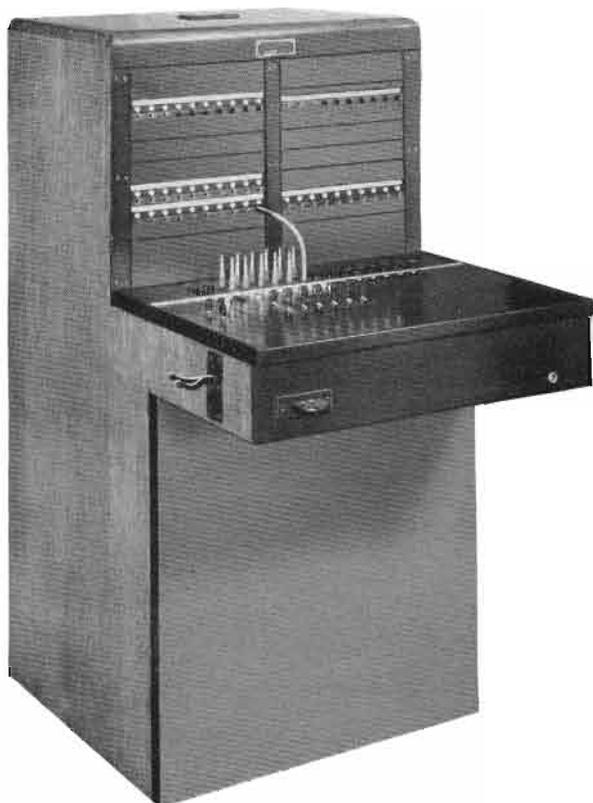
Auxiliary features available with these switchboards include code call and signal equipment, watchman's recording and supervising circuits, and various type of conference circuits.

Incoming trunk calls may be supervised at either a turret or floor type switchboard, depending upon the size of the installation. Trunk calls from restricted stations may be routed through this switchboard for interception. Standard attendant stations include switching arrangements for connecting predetermined stations for direct service to the main exchange when the attendant is off duty.

NON-ATTENDANT TYPE

Where an attendant is not desired to distribute incoming trunk calls or to supervise outgoing calls, Relaymatic PABX equipment with an annunciator unit is available to provide intercommunication service and trunking to either a manual or a dial main exchange. An annunciator unit is used to signal all incoming calls. Such calls can be answered from any station and can be transferred to any other station. All stations have access to all trunks and through supervision is provided to the main exchange.

MASTERBUILT PBX SWITCHBOARDS



Kellogg Masterbuilt PBX switchboards are available in two types, each offering the maximum in dependability and flexibility of operation. The "K" type switchboard is designed for universal service and is adaptable for use in many different types of installation. The "J" type switchboard is designed to meet special demands of given installations, providing special service features and types of operation.

"K" Type PBX Switchboard

The type "K" is an all-purpose PBX switchboard. It furnishes whatever services are required by the subscriber and is so designed that it can connect to any type of central office equipment. It employs the same cord and trunk circuits whether for manual or dial operation. When connected to a common battery manual or dial central office this PBX provides in a jack-ended trunk all the advantages of through battery feed.

The supervision of this switchboard is under control of the PBX telephone, not the PBX operator, and all trunks, cords, and subscriber's lines are immediately available for other use as soon as each party hangs up, eliminating "false busies" and false ringing.

When connected to a dial exchange the PBX provides both through and attendant dialing. The central office connectors and the PBX trunks are released as soon as the calling PBX subscriber hangs up. The toll operator also gets standard supervision on connections to PBX stations.

MASTERBUILT PBX SWITCHBOARDS

Operating Features of "K" Type PBX Switchboards Operates with Common Battery Manual or Dial or Magneto Exchanges

Jack-ended trunk circuits and cord circuits will operate with either a manual or dial main exchange. Two relays and a dial are added for dial operation, no wiring changes are required. A simple line adapter is required for each trunk in the central office when the PBX is connected to a magneto main exchange.

THROUGH BATTERY FEED ON JACK-ENDED TRUNKS. This feature insures excellent transmission on both toll and local connections.

THROUGH TRUNK SUPERVISION. The toll operator receives a disconnect when the PBX station hangs up, insuring correct timing on toll calls. PBX stations may also place sequence calls to main exchange without the assistance of the PBX operator. Local main exchange operator receives double-lamp disconnect signals on connections from completed trunks. False rings and extra waiting are eliminated.

TRUNK RE-RING. As soon as the PBX station hangs up, the trunk circuit is available for incoming calls, whether or not the connection at the PBX has been removed.

THROUGH OR ATTENDANT DIALING. When the PBX is served by a dial main exchange PBX stations equipped with dial can dial their own numbers without assistance of the PBX attendant.

TRUNK SEIZURE BUSY SIGNAL. When the trunk at the main exchange (C.B. manual or dial) is seized it becomes "busy" at the PBX immediately, even though the line lamp is not yet lighted.

BALANCED BATTERY FEED. Connections between any two PBX stations are made with individual high impedance, bridged type battery feed relays for each line, permitting double lamp supervision.

AUTOMATIC TRUNK HOLDING. Trunk calls are held automatically until PBX station answers and hangs up—it is not possible to lose the trunk connection at the main exchange while the attendant is handling the call.

LOW CURRENT CONSUMPTION. All circuits consume the minimum amount of current. A battery cut-off key further prevents current drain when the board is unattended.

POSITIVE SUPERVISION. Positive lamp supervision is provided for all types of connections.

SINGLE NIGHT CONNECTIONS. Regular cord circuits can be connected to night trunk jacks with the "through" key operated—one PBX station may be connected to each PBX trunk for two-way main exchange service while PBX is unattended.

MULTIPLE NIGHT CONNECTIONS. Spider patching cords make it possible to connect up to five stations with each trunk for two-way service to main exchange when PBX is unattended. Battery cut-off key removes possibility of battery drain during this period.

Capacities of Type "K" PBX Switchboards

Code No.	Lines	Line Relays	Trunks	Cords
K-50	50	up to 50	10	10
K-100	100	up to 100	10	15
K-200	200	up to 200	10	15

Each cabinet is wired to full capacity and may be equipped as desired.

Equipment

Each type "K" PBX board is furnished with the following common equipment: one battery cut-off key, one hand generator with switching key, one night alarm and control key, one dial (if required), and one operator's telephone set.

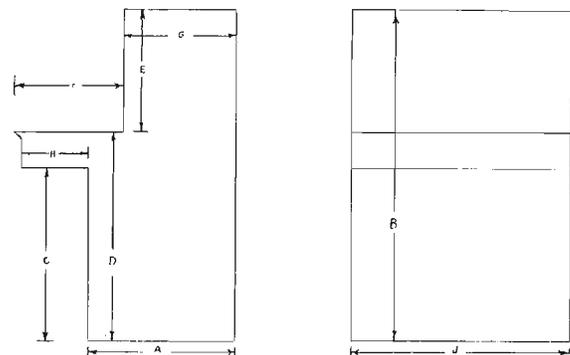
The operator's telephone set may consist of: a suspended transmitter and lightweight headband receiver; a bakelite Masterphone handset which mounts on the side of the cabinet; or a breastplate with transmitter and lightweight headband receiver.

Cabinet Finishes

The following cabinet finishes are furnished as standard: medium dark oak or birch-walnut (medium).

The following special cabinet finishes are available: birch-mahogany (light); birch-mahogany (dark); oak (light); other special finishes as desired.

Cabinet Dimensions and Weights



All dimensions are in inches

Code	A	B	C	D	E	F	G	H	J
K-50	22 3/4	46-9/16	24 3/4	30	16-9/16	18	16 3/4	11 7/8	23-15/16
1055-1	Approximate shipping weight 400 lbs.								
K-100	22 3/4	46-9/16	24 3/4	30	16-9/16	18	16 3/4	11 7/8	23-15/16
1055-1	Approximate shipping weight 500 lbs.								
K-200	26 1/4	58-5/16	27 3/4	33	25-5/16	18	20 1/4	11 7/8	23-15/16
	Approximate shipping weight 600 lbs.								

Ordering Information

In ordering the type "K" Masterbuilt PBK the following information should be provided:

Code number of the size switchboard desired, the cabinet finish, the number of lines to be equipped with and without relays.

Whether the board should be equipped with designation strips.

Number of cord circuits.

Number of trunk circuits.

Type of operator's set.

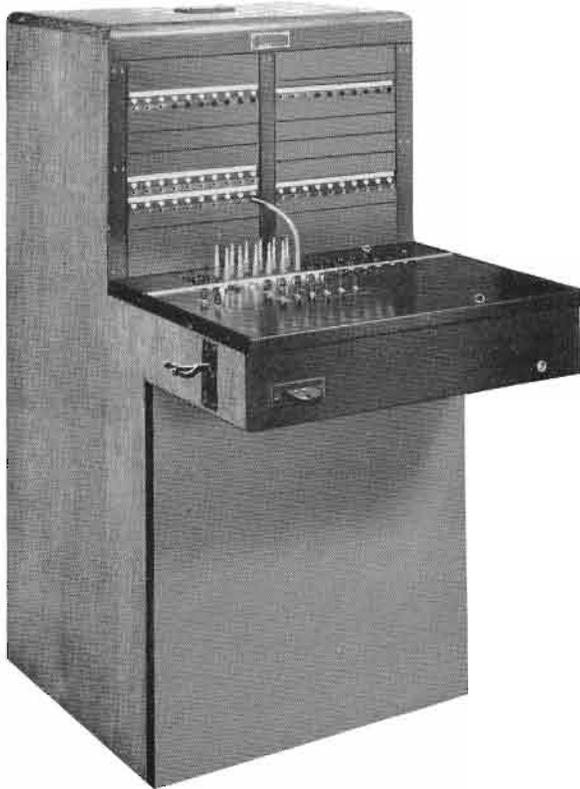
With or without dial and mounting.

Number of patching cords to connect one trunk to local lines (number of local lines).

Lines number from bottom up, left to right across the face of the board. Patching cords can be furnished to connect one trunk to either 2, 3, 4, or 5 PBX lines as desired.

MASTERBUILT PBX SWITCHBOARDS

"J" TYPE PBX Switchboard



The Kellogg "J" type PBX switchboard offers all standard PBX switchboard operating features in addition to providing special trunk and cord circuit arrangements as desired. Any type of trunk circuit, for common battery dial or manual or for magneto service, can be provided.

This switchboard is housed in the same type cabinet and has the same construction features as the "K" type switchboard covered on pages 111 and 112.

Standard Operating Features of the "J" PBX Switchboard

TRUNK RE-RING. When a conversation is completed on a trunk connection another trunk call may come in on the same trunk even though the PBX operator has not removed the plug from the jack of the trunk for the first connection.

BALANCED BATTERY FEED. Connections between any two PBX stations or between a PBX station and a trunk are completed through the balanced windings of "battery feed" relay coils.

LOW CURRENT CONSUMPTION. All circuits are designed to consume a minimum amount of current. A battery cut-off key is provided to eliminate current drain when the switchboard is unattended.

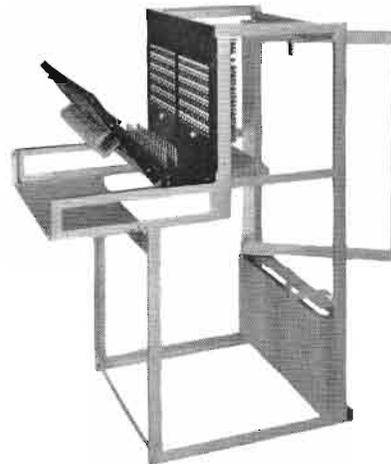
POSITIVE SUPERVISION. On all "local-to-local" or "local-to-trunk" connections positive supervision is provided.

SINGLE NIGHT CONNECTIONS. Single night connections are made by using a "patching cord" with a plug on each end to connect the night jack of the trunk with the line jack of the desired line.

MULTIPLE NIGHT CONNECTIONS. Multiple night connections are obtained by means of "spider" cords with a plug on each of the several ends. One plug is inserted in the trunk night jack and one plug in each line jack of the stations when it is desired

to furnish night service or when the PBX is unattended. It is recommended that the number of stations per trunk be limited to five for this service.

TRUNK SEIZURE BUSY SIGNAL. When the trunk at the main exchange (C.B. manual or dial) is seized it becomes busy at the PBX immediately, even though the line lamp is not yet lighted.



STEEL FRAMEWORK. Welded steel framework forms the foundation of Kellogg Masterbuilt PBX switchboards, rigid and sturdy, this steel structure supports all the weight of the equipment and cabinet woodwork.

The keyshelf provides high visibility for the convenience of the operators. Bakelite is used for keyshelf and face equipment because

of its lustre and permanence and because it sets off the cords, plugs, keys and lamps.

The keyshelf, hinged with a full length piano hinge, can be raised to provide free and easy access to the key equipment.

Capacities of "J" Type PBX Switchboards

Code No.	Lines	Line Relays	Trunks	Cord Circuits
1055-JM	50	50	10	10
1055-JMR	50	50	8	10
1055-JCBR	50	50	10	10
1055-JA	50	50	10	10
1110-JM	100	100	10	15
1110-JMR	100	100	7	15
1110-JCBR	100	100	10	15
1110-JA	100	100	10	15
1210-JM*	200	100	10	15
1210-JMR*	200	100	10	15
1210-JCBR*	200	100	10	15
1210-JA*	200	100	10	15

*Cord circuits can be increased to 17 and trunks to 15 on special order. Trunks on JMR model are limited to 10.

NOTE: The above switchboards are available with four different types of trunks which are indicated by the code number suffix and which are explained below:

JM trunks—for service to magneto exchange.

JMR trunks— for service to magneto exchange with re-ring feature.

JCBR trunks—for service to common battery manual exchange with re-ring feature.

JA trunks—for service to dial exchange with re-ring feature.

MASTERBUILT CORDLESS PBX SWITCHBOARDS



Kellogg Masterbuilt cordless PBX switchboards can be operated in connection with either a common battery manual, dial, or magneto main exchange, or one or more at the same time, without modification of circuits.

These switchboards are compact and modern in appearance. Cabinets can be furnished as standard in either oak or walnut, or special in any wood or finish.

All equipment in these switchboards is easily accessible. The cabinet can be lifted off as one piece, giving full access to relays, condensers, fuse panel, and connecting rack, mounted on a steel frame chassis which is fastened to the base board. The face panel is hinged at the bottom with a full length piano hinge and can be dropped forward to expose all keys and lamps.

Operating Features of Cordless PBX Switchboards

OPERATES WITH C.B. MANUAL OR DIAL OR MAGNETO EXCHANGES. The trunk and connecting circuits are arranged for operation with all types of main exchanges. (When connected to a magneto main exchange a line adapter is required for each trunk in the central office.)

THROUGH BATTERY FEED ON TRUNKS. The circuits are arranged to provide talking battery to the PBX stations from the main exchange.

THROUGH OR ATTENDANT DIALING. These switchboards provide for through dialing from PBX stations or for attendant dialing for manual telephones when this service is desired.

BALANCED BATTERY FEED. Connections between any two PBX stations are made with a high impedance bridged type battery feed coil permitting lamp supervision.

TRUNK HOLDING. Trunk calls are held with trunk answering keys with the disconnect lamp serving as a holding signal.

LOW CURRENT CONSUMPTION. All circuits are designed to consume a minimum amount of current. A battery cut-off key is provided to conserve current when the switchboard is unattended.

POSITIVE SUPERVISION. Positive supervision is provided for answering, calling, and disconnect supervision.

NIGHT CONNECTIONS. Night connections are made to stations as desired with connecting circuits and battery cut-off key.

THROUGH TRUNK SUPERVISION. The through battery feed trunks provide through supervision to the main exchange from the PBX station, permitting prompt recall or disconnect at the main exchange.

Cordless Switchboard Trunk Circuits

Four types of trunk circuits are available with cordless PBX switchboards.

CXF type. Designed to operate in connection with a common battery, manual type central office with through battery feed on trunk connections.

CX type. Designed to operate in connection with a common battery, manual type central office with local battery feed on trunk connections.

AX type. Designed to operate in connection with a dial or manual type central office with through battery feed on trunk connections.

MX type. Designed to operate in connection with a magneto type central office.

Capacities of Cordless PBX Switchboards

	NO. 1007-CC	Wired	Equipped
Lines (less relays)		12	10
Trunks to Main Exchange (AX type)		3	2
Connecting Circuits		5	5
Cabinet Finish: Oak or Walnut			
	NO. 1007-CCX		
Lines (with relays)		12	12
Trunks to Main Exchange (AX type)		5	5
Connecting Circuits		5	5
Cabinet Finish: Walnut (Oak on special order)			
	NO. 2007-II		
Lines (less relays)		20	15
Trunks to Main Exchange (AX type)		5	3
Connecting Circuits		5	5
Cabinet Finish: Oak or Walnut			

NOTE: Other capacities are available; however, those switchboards listed above are available for more prompt delivery than special switchboards.

Operator's Set

All Kellogg cordless PBX switchboards are supplied with a 1000 series Masterphone with dial or dial blank, as specified, for the operator.

Code No.	CABINET DIMENSIONS AND WEIGHTS			Shipping Weight
	Height	Length	Depth	
1007-CC	12 in.	23 in.	12 in.	120 lbs.
1007-CCX	12 in.	24-13/16 in.	12 in.	135 lbs.
2007-II	12 in.	30 in.	12 in.	140 lbs.



EASY ACCESSIBILITY—All equipment is freely exposed upon dropping the Bakelite faced panel forward. Keys, lamps, and wiring are readily available as are the generator, condenser, induction coils, relays, etc. Roominess, neatness and convenience are paramount features.



CHASSIS CONSTRUCTION—All equipment, such as relays, condensers, fuse panel, connecting rack and buzzer is mounted on a steel frame chassis which is fastened to the base board. Front panel hinged at the bottom. Cabinet lifts off in one piece.

TOLL SWITCHBOARDS



Kellogg toll switchboards are designed to provide the utmost in service and flexibility. They can be arranged for use in alignment with the local switchboard or in a separate line-up, and for use with either manual or dial exchanges.

Either universal-type cord circuits or cord circuits requiring that most of the relays be associated with the line and trunk circuits can be furnished. Any circuit requirement or special arrangements can be provided in these switchboards.

Shown above is a 10 position toll installation of Kellogg equipment. This switchboard employs a universal-type cord circuit. With this circuit less equipment and less floor and rack space is needed in the terminal room. The flexible "positional" units are easy to remove and change to meet varying traffic conditions.

The steel frame of these switchboards comes knocked down. Cord circuit equipment comes in complete positional units—factory assembled, wired and tested. No wiring of relay gates and key shelves is required on the job.

Interchangeable positional units permit easy and fast rearrangement of equipment when traffic conditions change. It is not necessary to interrupt service or disturb the multiple.

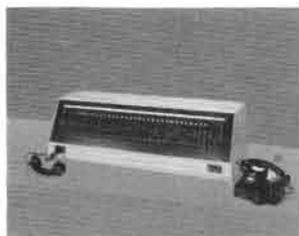
SPECIAL PURPOSE SWITCHBOARDS

Kellogg manufactures, in addition to standard telephone equipment, all types of special purpose switchboards, communication systems, and other equipment. Kellogg's more than 50 years experience in building quality equipment and in designing and engineering special equipment is available to produce any equipment desired in the communications and low voltage, low current category.

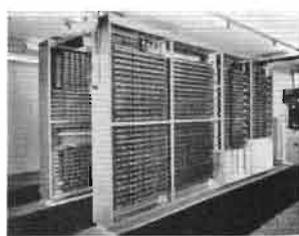
The same ability to engineer telephone equipment is available to engineer any special purpose equipment that incorporates the same degree of precision manufacture. It is this combination of

precision workmanship and ruggedness that is typical of telephone equipment. Examples of the many variations of Kellogg equipment and their uses in all types of businesses are contained in these pages under the general classification of "special purpose switchboards." The illustrations and descriptions contained here convey some idea as to the broad use of telephone type equipment in all sorts of industrial applications. The applications shown here do not represent the entire scope of Kellogg engineering but are shown for the purpose of indicating how telephone type equipment can be engineered for any special purpose or for any specific application.

Credit Authorization Systems



A—MANUAL SYSTEMS



B—RELAYMATIC SYSTEMS



C—FLUSH TYPE



D—SURFACE TYPE

The specialized equipment shown above is designed to enable business houses to rapidly contact central control files for verification of accounts or for credit authorization.

Manual and relaymatic systems are available. Manual systems (photo A) come in 3 standard sizes, 10, 20 and 30 lines. Sales floor station with perforator is shown at the right. Relaymatic systems, (photo B), are available from 10 lines to any number of lines.

Flush type authorizer's position (photo C) or surface type (photo D) are used with the relaymatic system. The type required is dependent upon the type of filing equipment used.

OPERATION. To obtain a credit authorization with a Relaymatic System the sales clerk dials directly to the proper credit authorizing clerk and identifies the account. After the connection

is made the sales clerk submits the information necessary for authorizing the charge and then places the sales slip in the authorizing perforator which lights a red lamp in the authorizer's turret.

The authorizing clerk checks the customer's file and, if the charge is in order, grants the authorization by pressing a button which actuates the perforator on the sales floor. If the charge is not in order, advises the sales clerk how to proceed with the transaction or refer it to a superior. Ten to thirty seconds are usually required to secure a charge approval.

The Manual System is used where the credit files and charge authorization requests do not exceed the capabilities of a single turret, two authorizers and 30 sales floor lines. Further information available upon request.

SPECIAL PURPOSE SWITCHBOARDS

Watchman's Reporting and Recording Systems



Kellogg engineers and builds equipment to meet the varied needs of many users of reporting systems for police departments, watchmen, etc.

This equipment can be arranged for any type of reporting service required for the installation. A typical system used in a penitentiary provides for reporting into the central office by guards, provides for recording the time and origin of these calls and provides for alarm or indication to the central office if the watchman does not make his rounds as prescribed.

Municipal Service Switchboards

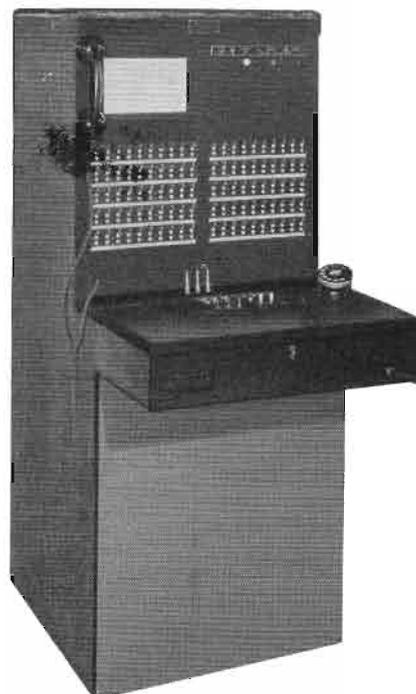


Kellogg switchboards for municipal service installations are available in all types and sizes. In some instances these switchboards require little more than ordinary PBX equipment; in others, many special features are incorporated for services entirely foreign to usual telephone practice. The equipment may vary in size from a 20-line cordless turret, to a board with thousands of lines and many operator's positions.

Municipal Service Switchboards (Cont'd)

The local telephone plant usually offers the logical distribution medium for the police and fire alarm signal system. In many cases the responsibility of furnishing and maintaining even a large network is placed upon the trained personnel of the telephone company. Whether a municipal protection system is part of, or independent of the commercial telephone system the equipment is essentially the same. In engineering the proper facilities for the specific job Kellogg functions in full cooperation with the city engineers.

Emergency Fire Reporting Switchboards



Regular floor type and cordless desk type fire reporting switchboards are specially designed to take care of communications between a large number of outlying stations and an operator. In this respect, fire reporting equipment is similar to watchman's reporting systems.

Standard sizes are 20-line cordless and 100-line floor type switchboards. Other capacities can be furnished wherever needed.

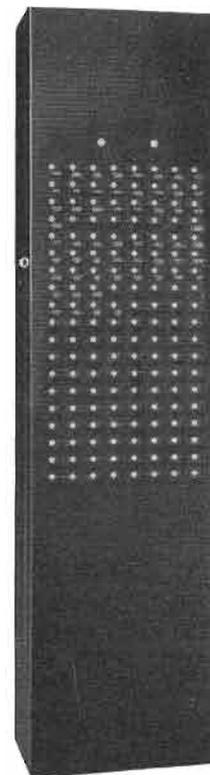
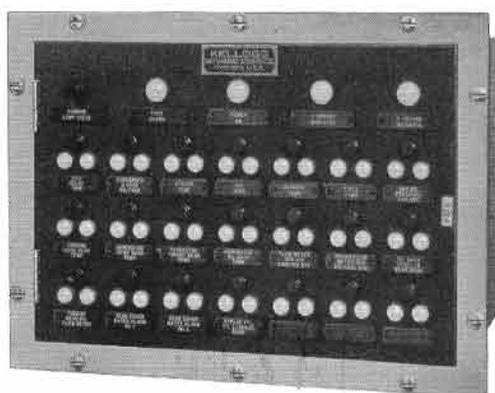
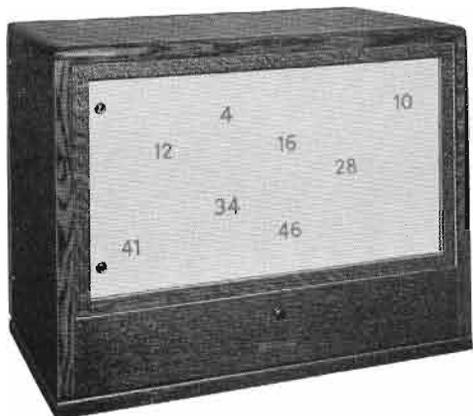
The cordless fire reporting board is equipped with 20 line circuits, a trunk circuit, hand generator, line-out-of-order alarm, and no-voltage alarm. The fire reporting lines terminate on lamp signals and are for communication between station and operator only.

The standard floor type switchboard incorporates many features contained in other commercial Kellogg boards—a swinging relay gate, oak cabinet, bakelite faced lamp and key shelf, etc. The capacity of this standard switchboard is 100 lines, 3 cord circuits, and 2 trunk circuits. It is equipped with an operator's handset, hand generator, night alarm, and power failure lamps.

Fire reporting equipment, in addition to the standard boards mentioned above, is available to meet a wide variety of conditions.

SPECIAL PURPOSE SWITCHBOARDS

Annunciator Units

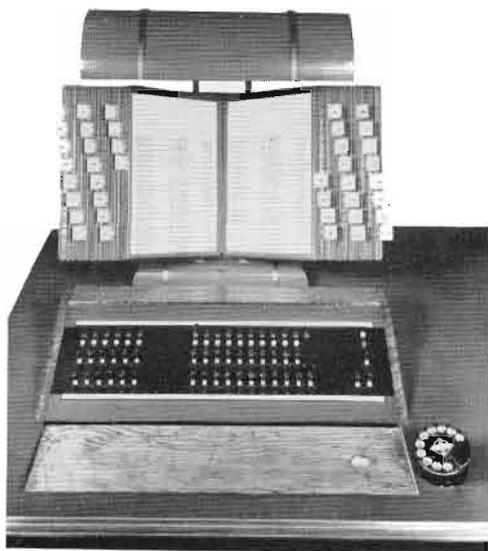


Annunciator equipment is used wherever visual signalling or visual control is required. It may be used in elevators, shops, hotels, fire reporting systems, watchman systems, and has innumerable other applications. Bells or buzzers may be connected in the circuits to provide audible signals.

Kellogg annunciator units ordinarily are designed for specific conditions. Either lamp or drop signals may be used. They may be assembled in steel cabinets for rack mounting, of a type to match existing panels; or may be turret type in metal or wood cabinets for desks or table mounting; or may be mounted in floor type steel or wood cabinets. They may be self-contained, or be designed to fit into existing mounting frames or racks. Complete accessibility is provided and every precaution is taken to make each unit as near fire-proof and dust-proof as the nature of the particular installation requires.

Annunciator units for power plants can be provided for operation with either continuous or momentary alarm with manual, automatic, or remote lamp-reset features. Audible alarms of any size or voltage may be equipped with any of the reset features.

Information and Chief Operator's Equipment



INFORMATION DESK

Kellogg information and chief operator's equipment is designed and engineered specially for particular installations. In general the equipment described below is included with most installations.

A flat top desk with a tier of two drawers and a sliding writing shelf at the right supports a turret type cabinet. The turret may be furnished in any wood or finish to match the switchboard, woodwork, or furniture.

All turrets have wirings, drillings, punchings, etc., for one operator's set, generator master key, night alarm, magneto through trunk to local switchboard, two-way line to wire chief's desk, two-way line to toll switchboard, and a two-way line to the local switchboard. They are wired for 2 service observation lines, 3 incoming desk lines, 10 peg count meters, and 16 listening and monitoring circuits. All circuits are operated with keys which are mounted in the face of the turret.

In requesting information on this equipment information as to the make and type of switchboard should be included.

SWITCHES, FOOT



The Kellogg No. 1 type foot switch is a sturdy, reliable unit covered with a black enameled steel cover. The foot pedal is held in the non-operated position by a durable coil spring. Contact springs and terminals are insulated from the housing and foot pedal. The housing is 6½ inches high, 3 inches wide, and 2⅝ inches deep. Including the pedal the depth is 5⅞ inches. This foot switch is

available in three spring combinations. These combinations with the associated code numbers are listed below.

Code No.	Spring Combination
1-A	One Make contact, 1 Dummy Spring
1-B	One Make and 1 Break and Make contact (2 sets of springs)
1-C	One Break and Make, and 1 Break and 2 Make contacts. (2 sets of springs). On the Break and 2 Make contacts the Make contacts make in sequence.

TELEPHONES—1000 SERIES MASTERPHONES

The Kellogg 1000 series desk and wall Masterphone provides the utmost in style, engineering, and quality performance.

Recognized for such outstanding advantages as ease of installation, low maintenance cost, dependable operation, and subscriber approval, this telephone provides the following features:

ONE base plate for both desk and wall Masterphones. Desk and wall housings interchangeable in a matter of seconds.

ONE universal anti-side tone triad circuit for all service applications. Never necessary to change permanent wiring.

Color codes, physical circuit changes, and complicated servicing completely eliminated.

PLUG-IN type induction coil, condenser, and dial plug. Complete elimination of soldering and unsoldering reduces maintenance costs to a minimum.

INDUCTION coil provides best ratio between side-tone reduction, and transmission and reception. Three way switch permits matching induction coil to long or medium loops, and reduces



transmitter current supply on short loops.

ONE condenser for all circuit applications. Microfarad capacities of 0.5 or 1.0 mfd. provided by means of a simple switching unit.

TRANSMITTER provides greater electrical output and faithful

articulation throughout a wide range of applied voltages. Reliable and dependable under varying temperature and humidity conditions.

CONTROLLED response receiver eliminates objectionable characteristics throughout the voice frequency range. High fidelity voice reproduction is assured.

RINGING circuit selector quickly adapts circuit to metallic or divided ringing. Simply shifting the slide line to the desired position changes the universal circuit to the line installation desired.

RINGER equipped with large two-tone gongs provides maximum sound output of pleasing quality. Micrometer adjustment screw simplifies adjustment for volume and tone control.

Universal Standardization of Major Component Parts

Major components of the 1000 series Masterphone (handset, condenser, induction coils, and the interconnecting block)



HANDSET, NO. 46-C. Standard equipment on all 1000 series common battery and magneto instruments. Designed for increased efficiency, durability, and beauty. Receiver and transmitter are positioned to provide maxi-

mum transmission and reception. A four foot, three conductor straight handset cord is standard equipment.

TRANSMITTER, NO. 66521. Capsule type, designed for improved acoustic control. Provides greater electrical output, good non-positional qualities, and excellent response throughout a wide range of applied voltages.

RECEIVER, NO. 89-A. Capsule type, compact self-contained. Eliminates objectionable peaks or dips in the voice frequency range. A controlled response type which sustains improved high fidelity reproduction and articulation of voice frequencies.

CONDENSER, NO. 225. Plug-in type. Standard for all common battery and magneto services. Furnishes necessary capacity for all circuit applications. A simple slide-link switching unit provides 0.5 or 1.0

microfarad as required for particular ringer application.

are adapted to all classes of common battery or magneto subscriber services in both desk and wall Masterphones.



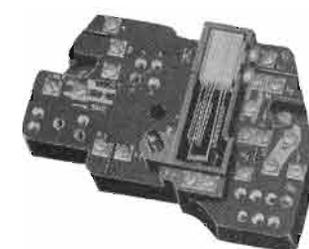
zoned to a particular loop.

INDUCTION COIL, NO. 113-A. For all common battery services. Plug-in type. Provides best ratio between side-tone reduction, transmission, and reception regardless of the subscribers loop used. May be

INDUCTION COIL, NO. 114-A. Plug-in type for magneto service. This induction coil adapts the Kellogg universal triad circuit to any desired local battery application.

INTERCONNECTING BLOCK, NO. 64910. A molded one-piece interconnecting block which encases the "grid" type universal anti-side tone triad circuit and associated hook switch connections. This interconnecting block is standard equipment on all common battery and magneto 1000 series Masterphones. No circuit wiring or soldered connections are visible when interconnecting block is attached to the base plate. Induction coil and condenser plug in to the interconnecting block like radio tubes; no soldering to terminals required. Three slide link adjustments on this block permit zoning of the induction coil, adapting of circuit to metallic or divided ringing, and changing microfarad capacity of condenser as required.

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TELEPHONES—1000 SERIES MASTERPHONES

ORDERING INFORMATION

The number of types of 1000 Series Masterphones which Kellogg manufactures to meet the many requirements of telephone companies, and the many combinations of telephones, ringers, and dials make it impractical to list the code number of each telephone separately.

To simplify the ordering of the 1000 Series Masterphone a listing of each type of telephone, ringer, and dial is provided. The code number of each of these components is selected and all written as a unit to form the complete ordering code number of the telephone.

For example, D-1000-HB1-K is the code number for a standard common battery signalling and talking telephone having a dial with numbers only, a 30 cycle ringer of the synchronomic, frequency selective, type, and a Coiled Kord handset cord.

DIAL	TELEPHONE TYPE	RINGER	HANDSET CORD
D	1000	HB1	K

This chart indicates the manner in which the code number described above is formed. The code number of the telephone type is first determined from the listings below. The type of ringer is selected from the "Ringers" chart and its code number added to that of the telephone type. A dial, with numbers only is specified by prefixing the letter "D" to the telephone code number (Dials with numbers and letters or with the word "Operator" over the number "0" are specified as indicated under "Dials" below.) A Coiled Kord handset cord is specified by adding the letter "K" to the complete code number.

Unless otherwise specified a standard 4-foot straight handset cord and a 6-foot straight base cord on desk Masterphones is furnished with these telephones.

FOR DETAILED INFORMATION ON EACH OF THE PARTS OF THIS CODE NUMBER SEE THE LISTINGS BELOW UNDER THE HEADINGS "DIALS," "RINGERS," AND "TELEPHONES."

DIALS

Three different dials are available for the 1000 Series Masterphone. Code numbers for all telephones which are to be equipped with dial must be prefixed with the letter "D". If a dial other than the standard "number only" dial is desired, special note must be made on the order after the code number of the telephone, as shown below.

10-D dial. This standard dial is faced with the numbers 1 to 0.

10-DO dial. This dial has the numbers 1 to 0 and the word "Operator" faced on the plate along with the "0" digit. To order this dial add the note "with 10-DO dial" to the telephone code number.

10-G dial. This dial is faced with both letters and numbers. To order add the note "with 10-G dial" to the telephone code number. This dial is often referred to as a "Metropolitan Dial."

RINGERS

Ringers for the 1000 Series Masterphone are available in biased or frequency selective types for common battery service, and in biased, or straight line types for magneto service. Kellogg No. 120 type ringers are used for biased ringers, No. 123 type for straight line ringers, and No. 122 or 124 for frequency selective ringers. For detailed information on these ringers see "Ringers" in this section.

In ordering telephones the code number of the correct ringer should be added to the code number of the telephone as described above. **If no ringer is desired add "LR" to the telephone code number.**

SELECTION OF RINGERS. Frequency selective ringers should be selected for their frequency application. Kellogg 124 type ringers are furnished as standard unless order requests our 122 high impedance type. Biased and straight line ringers should be selected for the particular line application. BA ringers are recommended for all dial and heavily loaded manual lines, but should not be mixed with ringers of a resistance less than 2500 ohms. BB ringers are recommended if present ringers on a line have a resistance of over 1500 ohms and under 3000 ohms. BC ringers are recommended if present ringers on a line have a resistance of over 500 ohms to 1500 ohms. SA, SB, and SC ringers for magneto applications are selected in the same manner as indicated for biased ringers.

Frequency Selective Ringers—No. 122 and 124 Types

HARMONIC TYPE		SYNCHROMONIC TYPE	
Code No.	Frequency	Code No.	Frequency
HA1	33½ cycles	HB1	30 cycles
HA2	50 cycles	HB2	42 cycles
HA3	66⅔ cycles	HB3	54 cycles
HA4	16⅔ cycles	HB4	66 cycles
HA5	25 cycles	HB5	16 cycles

DECIMONIC TYPE

A special sub-cycle ringing converter for supplying decimonic type 20, 30, 40, 50, 60 cycles frequency selective ringing systems has been designed by the combined engineering staffs of Kellogg and the Lorain Products Corporation. This converter provides stabilized decimonic frequency voltages conservatively rated at 20 watts per frequency. For detailed information on this converter see "Power" in this section.

Code No.	Frequency	Code No.	Frequency
HC1	20 cycles	HC4	40 cycles
HC2	60 cycles	HC5	50 cycles
HC3	30 cycles		

Straight Line Ringers—No. 123 Type

Code No.	Description	Code No.	Description
BA	High Impedance (4000 ohms)	SA	High Impedance (4000 ohms)
BB	Medium Impedance (2500 ohms)	SB	Medium Impedance (2500 ohms)
BC	Low Impedance (1000 ohms)	SC	Low Impedance (1000 ohms)

TELEPHONES—1000 SERIES COMMON BATTERY MASTERPHONES



1000 TYPE



D1000 TYPE



1100 TYPE



D1100 TYPE

Common Battery Signalling and Talking

1000-1100 UNIT TYPES

Kellogg unit type common battery desk or wall Masterphones can be supplied with or without a dial. Biased and frequency selective ringers are available for any ringing application. The universal anti-side tone triad circuit can be quickly adapted to metallic or grounded ringing, and a three conductor 6-foot base cord is standard on desk Masterphones for this purpose.

Select the type of telephone desired from the following chart. Specify the type of dial, if desired, and the type of ringer needed in accordance with "Ordering Information."

Code No.	Description
1000	Desk Type Masterphone
1001	Desk type Masterphone with "press to talk" switch
1100	Wall type Masterphone
1101	Wall type Masterphone with "press to talk" switch

1060-1160 TWO PIECE TYPES

Kellogg Masterphones in desk (1060 types) or wall (1160 types), with or without a dial, can be supplied with associated common battery triad circuit desk set boxes (610 types). A four conductor base cord is standard on desk Masterphones for this purpose. Induction coil, condenser, and biased or frequency selective ringers are furnished in the 610 desk set box.

Select the particular type of telephone desired from the following chart. Specify if a dial is desired in accordance with "Ordering Information." Refer to "Boxes, Desk Set" and select the code number of the 610 box in accordance with the ringer type desired.

Code No.	Description
1060	Desk type Masterphone
1061	Desk type Masterphone with "press to talk" switch
1160	Wall type Masterphone
1161	Wall type Masterphone with "press to talk" switch

1062-1162 TWO PIECE TYPES

Kellogg Masterphones in desk (1062 types) or wall (1162 types) with or without a dial can be supplied with associated common battery booster circuit desk set boxes (602 types). A three conductor base cord is standard on desk Masterphones for this purpose. Induction coil, condenser, and biased or frequency selective ringers are furnished in the 602 desk set box.

Select the type of telephone wanted from the following chart. Specify if dial is wanted in accordance with "Ordering Information." Refer to "Boxes, Desk Set" and select the code number of 602 box in accordance with ringer type desired.

Code No.	Description
1062	Desk type Masterphone
1063	Desk type Masterphone with "press to talk" switch
1162	Wall type Masterphone
1163	Wall type Masterphone with "press to talk" switch

Common Battery Signalling—Local Battery Talking

1020-1120 UNIT TYPES

Kellogg unit type desk or wall Masterphones with or without a dial can be supplied where advantageous to adapt the telephone to local battery talking and common battery signalling to improve transmission on long subscriber loops. Biased or frequency selective ringers are available for any ringing application. The universal anti-side tone triad circuit can be quickly adapted to metallic or grounded ringing, and a four conductor base cord is standard on desk Masterphones for this purpose.

These telephones come equipped with Kellogg No. 114-A local battery induction coil and a No. 64-A retard coil which is used to hold common battery central office equipment without introducing any appreciable loss in transmission or reception.

Select the particular type of telephone desired from the following chart. Specify if a dial is wanted and the type of ringer in accordance with "Ordering Information."

Code No.	Description
1020	Desk type Masterphone
1021	Desk type Masterphone with "press to talk" switch
1120	Wall type Masterphone
1121	Wall type Masterphone with "press to talk" switch

Simplex Signalling—Local Battery Talking

1081-1181 UNIT TYPES

Kellogg unit type desk or wall Masterphones, with or without a dial, can be supplied where necessary to signal over long subscriber's loops in excess of the standard accepted maximum resistance. Where economical to install the necessary simplex facilities this type of telephone is recommended. Biased or frequency selective ringers are available for any ringing application. The universal anti-side tone triad circuit can be quickly adapted to metallic or grounded ringing, and a four conductor base cord is standard on desk Masterphones for this purpose.

These telephones come equipped with a Kellogg No. 114-A local battery induction coil and a No. 64-B retard coil which is used to hold common battery central office equipment and also to facilitate simplex signalling.

Select the particular type of telephone wanted from the following chart. Specify if a dial is desired and select the ringer needed in accordance with "Ordering Information."

Code No.	Description
1081	Desk type Masterphone
1181	Wall type Masterphone

TELEPHONES—1000 SERIES MAGNETO MASTERPHONES

1070-1170 UNIT TYPES WITH SELF-CONTAINED HAND GENERATOR



1070 TYPE



1170 TYPE

Kellogg unit type magneto desk or wall Masterphones can be supplied in biased or straight line ringer for any ringing application. Biased ringers which prevent bell tapping are recommended where future conversion to dial equipment is contemplated. The universal anti-side tone triad circuit can be quickly adapted to metallic or grounded ringing, and a four conductor base cord is standard on desk Masterphones for this purpose. A self-contained Kellogg No. GN-38-B hand generator is a part of this telephone, and a separate generator box is not needed.

Select the particular type of telephone wanted from the following chart. Specify the type of ringer needed in accordance with "Ordering Information."

Code No.	Description
1070	Desk type Masterphone
1071	Desk type Masterphone with "press to talk" switch
1170	Wall type Masterphone
1171	Wall type Masterphone with "press to talk" switch

1040-1140 UNIT TYPES FOR USE WITH HAND GENERATOR BOXES



1040 - 1050 TYPE



1140 - 1150 TYPE

Kellogg unit type Masterphones in desk (1040-1050 types) or wall (1140-1150 types) can be supplied in biased or straight line ringers. Biased ringers are recommended where future conversion to dial equipment is contemplated. Associated hand generator boxes (1200 types) are available for use with these telephones. Instruments can be adapted readily to metallic or grounded ringing, and a four conductor base cord is standard on desk Masterphones for this purpose.

Select the type of telephone desired from the following chart. Specify the type of ringer needed in accordance with "Ordering Information." Refer to "Boxes, Hand Generator" and select the code number of the 1200 type box required.

Code No.	Description
1040	Desk type Masterphone
1041	Desk type Masterphone with "press to talk" switch
1140	Wall type Masterphone
1141	Wall type Masterphone with "press to talk" switch
1050	Desk type Masterphone less No. 225 condenser
1150	Wall type Masterphone less No. 225 condenser

1062-1162 TWO PIECE TYPES FOR USE WITH DESK SET BOXES



1062 TYPE



1162 TYPE

Kellogg Masterphones in desk (1062 types) or wall (1162 types) can be supplied with associated magneto booster circuit desk set boxes (3300 types). These instruments also may be used with older style 2300 desk set boxes. A three conductor base cord is standard on desk Masterphone for this purpose. Induction coil, hand generator, and straight line ringer are furnished in the 3300 desk set box.

Select the type of telephone desired from the following chart. Refer to "Boxes, Desk Set" and select the code number of the 3300 type box required in accordance with the ringer required.

Code No.	Description
1062	Desk type Masterphone
1063	Desk type Masterphone with "press to talk" switch
1162	Wall type Masterphone
1163	Wall type Masterphone with "press to talk" switch

1040-1140 TWO PIECE TYPES LESS RINGER AND CONDENSER FOR USE WITH DESK SET BOXES



1040 TYPE



1140 TYPE

Kellogg Masterphones in desk (1040-LR) or wall (1140-LR) types can be supplied less ringer and condenser. Also desk (1040-C-LR) or wall (1140-C-LR) types can be supplied less ringer but with condenser. These telephones work with associated magneto desk set boxes (3500 types). They may also be used with older style 2500 type desk set boxes. A four conductor base cord is standard on desk Masterphones for this purpose. Hand generator and straight line ringer are furnished in the 3500 desk set box.

Select the type of telephone desired from the following chart. Refer to "Boxes, Desk Set" and select the code number of the 3500 type desk set box in accordance with the ringer required.

Code No.	Description
1040-LR	Desk type Masterphone less condenser
1040-C-LR	Desk type Masterphone with condenser
1041-C-LR	Desk type Masterphone with condenser and "press to talk" switch
1140-LR	Wall type Masterphone less condenser
1140-C-LR	Wall type Masterphone with condenser
1141-C-LR	Wall type Masterphone with condenser and "press to talk" switch

1000 SERIES MASTERPHONES FOR INTERCOMMUNICATION SYSTEMS



1004 - 1005 - 1007



D-1004 - D-1007 - D-1008



1104 - 1105



D-1104 - D-1107

Kellogg Unit type Masterphones in desk or wall types can be supplied as attendant or extension station telephones for use with Kellogg inter-communication systems having trunks to common battery manual or dial, or magneto central office main exchanges. For additional information refer to section on inter-communication equipment. Select the type of telephone needed from the following information.

ATTENDANT STATION TYPE

Code No.	Type Exchange	Type Telephone
1005-LR	C. B. Manual	Desk
1105-LR	C. B. Manual	Wall
D-1007-LR	C. B. Dial	Desk
D-1107-LR	C. B. Dial	Wall
D-1008-BA*	C. B. Dial	Desk

*For Relaymatic intercommunication systems.

EXTENSION STATION TYPE

Code No.	Type Exchange	Type Telephone
1004-LR	C. B. Manual	Desk
1104-LR	C. B. Manual	Wall
D-1004-LR	C. B. Dial	Desk
D-1104-LR	C. B. Dial	Wall

ATTENDANT OR EXTENSION STATION TYPE

Code No.	Type Exchange	Type Telephone
1004-LR	Magneto	Desk
1104-LR	Magneto	Wall

OTHER KELLOGG COMMON BATTERY TELEPHONES

Wall Type — With Hand Receiver



The Kellogg No. F-817 type telephone is equipped with regular transmitter and receiver. A dial is furnished only when specified. If divided ringing is desired it must be specified on the order.

These telephones are equipped with No. 121-C transmitter, No. F-41-A receiver, No. 39 transmitter arm, No. 103-A induction coil, No. 171 hook switch, and No. 185 condenser. Size: 9 inches high; 6½ inches wide, and 3½ inches deep. Housing is steel cover finished in black enamel.

Code No.	Ringer Code No.	Ringer Frequency
F-817-BA	79-A	(Biased)
F-817-HA-1	72-A-1	33½ cycles
F-817-HA-2	72-A-2	50 cycles
F-817-HA-3	72-A-3	66⅔ cycles
F-817-HA-4	72-A-4	16⅔ cycles
F-817-HB-1	73-A-1	30 cycles
F-817-HB-2	73-A-2	42 cycles
F-817-HB-3	73-A-3	54 cycles
F-817-HB-4	73-A-4	66 cycles
F-817-HC-1	74-A-1	20 cycles
F-817-HC-2	74-A-2	60 cycles
F-817-LR	Less Ringer	

Wall Type — With Handset



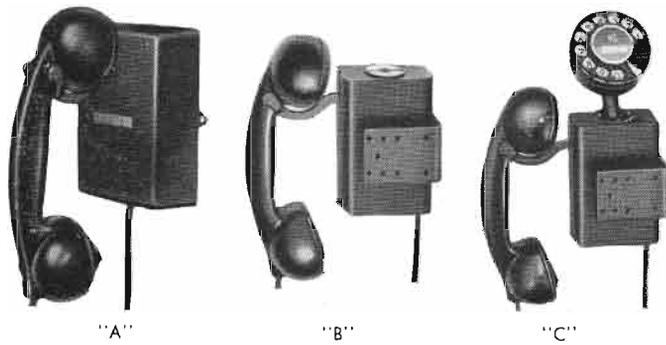
The Kellogg No. 9817 type telephone is the same as the No. 817 type except it is equipped with a handset instead of a separate transmitter and receiver. These telephones may be used for either manual or dial service although a dial is not supplied with the telephone and must be specified when ordering. The housing is a steel cover with a black enamel finish. Size: 9 inches high; 6½ inches wide, and 3½ inches deep.

These telephones are equipped with No. F-27-C handset, No. 103-A induction coil, and No. 157 hook switch, and No. 185 condenser.

Code No.	Ringer Code No.	Ringer Frequency
9817-BA	79-A	(Biased)
9817-HA-1	72-A-1	33½ cycles
9817-HA-2	72-A-2	50 cycles
9817-HA-3	72-A-3	66⅔ cycles
9817-HA-4	72-A-4	16⅔ cycles
9817-HB-1	73-A-1	30 cycles
9817-HB-2	73-A-2	42 cycles
9817-HB-3	73-A-3	54 cycles
9817-HB-4	73-A-4	66 cycles
9817-HC-1	74-A-1	20 cycles
9817-HC-2	74-A-2	60 cycles
9817-LR	Less Ringer	

OTHER KELLOGG COMMON BATTERY TELEPHONES

Bracket Type Telephones



FOR MANUAL SERVICE
NO. 9710

This telephone is used primarily as an extension set but can be used for regular two piece installations with the No. 605 series desk set boxes. Equipped with No. F-27-C handset, No. 158 hook switch, No. 104-A induction coil, and No. 186 condenser. This is a front mounting type telephone. For illustration see photograph "A" above.

NO. 9720

This telephone is arranged for a side mounting handset. Can be used for two piece installations with No. 605 series desk set boxes. Equipped with No. F-27-C handset, No. 164 hook switch, No. 106-A induction coil, and No. 187 condenser. For illustration see photograph "B" above.

NO. 9735

The No. 9735 telephone is adaptable for use with desk set boxes using either two winding booster or three winding anti-side tone induction coils. May also be used with magneto desk set boxes No. 3300 series for local battery service. For common battery desk set boxes for use with this telephone see No. 610 boxes in this section. Equipped with No. F-27-C handset and No. 164 hook switch. For illustration see photograph "B" above.

FOR DIAL SERVICE
NO. 9740

The No. 9740 telephone is used primarily for extension sets but may be used for two piece installations with No. 605 desk set boxes. Equipped with No. F-27-C handset, No. 164 hook switch, No. 106-A induction coil, and No. 187 condenser. For illustration see photograph "C" above.

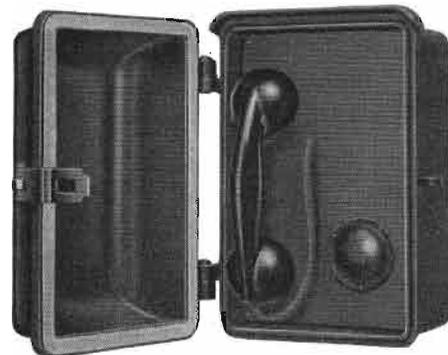
NO. 9741

This telephone is the same as the No. 9735 listed above except it is arranged for dial operation. Equipped with a No. 27C handset and a 164 hookswitch. For illustration see photograph "C" above.

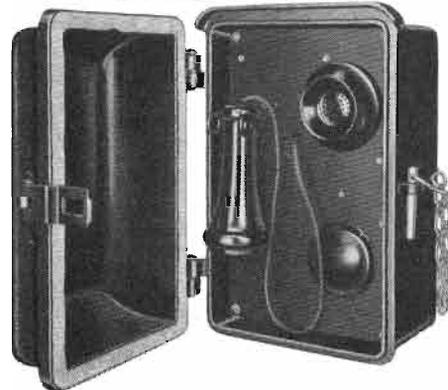
FOR INTER-COMMUNICATION SYSTEMS
NO. 9721

The No. 9721 telephone is designed for use with inter-communication systems. For additional information refer to section on Inter-communication Equipment. It is equipped with No. F-27-C handset, No. 174 hook switch, No. 106-A induction coil, and No. 187 condenser. For illustration of this telephone see photograph "B" above.

Weatherproof Type Telephones



NO. 4900—HANDSET TYPE



NO. 4901-A—HAND RECEIVER TYPE

These Kellogg weatherproof telephones are designed to provide an efficient operating telephone for outdoor applications. The telephones are contained in a ventilated, cast iron housing with facilities provided for locking the door. Ample space is provided in the housing for additional equipment for special applications. The over-all dimensions are 12 1/4 inches high, 9 3/4 inches wide, and 8 inches deep. These telephones are available for either dial or manual service. The dial is supplied only when specified. When these telephones are used in exposed locations on outdoor applications, they should be used with an arrestor for the subscriber's protection.

NO. 4900

This telephone is arranged for dial. Has three-inch gongs on ringer. Equipped with No. 108-GA ringer, No. 170 hook switch, No. 103-GA induction coil, No. 186 condenser, and No. F-35-EC handset.

NO. 4901-A

The No. 4901-A telephone is equipped with No. 108-A ringer, No. 178 hook switch, No. 103-A induction coil, No. 186 condenser, No. 121-C transmitter, and No. F-41-EA receiver.

NO. 4902

The No. 4902 telephone is the same as the No. 4900 except it has a resistor in the circuit. Other components are identical to those of the No. 4900.

NO. 4903

The No. 4903 telephone is similar to the No. 4901 but has a condenser in the ringer circuit. Equipped with No. 108-A ringer, No. 177 hook switch, No. 103-GA induction coil, No. 186 and 67 condensers, P-66528 transmitter assembly, and No. F-41-EA receiver.

OTHER KELLOGG MAGNETO TELEPHONES

Wall Type, with Handset



This anti-side tone telephone is assembled into an attractively finished oak cabinet and is equipped with a handset. The No. 5809-M has a 3-bar generator and is designed for local lines having one or more telephones or for lightly loaded rural lines. The No. 5845 has an extra heavy duty, 6-bar, generator. All other 5800 series telephones, except the No. 5820-M, have 5-bar generators and are for use on long heavily loaded lines. The No. 5820-M telephone has a special pulsating and alternating current generator for secret signalling. The mounting space required for these telephones is 10 by 7½ inches.

Code No.	Ringer No.	Hook Switch	Ind. Coil	Cond.	Handset	Gen.
5809-M	78-A	165	105-A	--	F-27-C	15
5812-M	78-D	165	105-A	--	F-27-C	53
5816-M	78-D	165	105-A	200	F-27-C	53
5820-M*	78-D	165	105-A	200	F-27-C	59
5824-M†	78-D	165	105-A	200	F-27-C	53
5845-M‡	78-G	165	111-A	200	F-43-C	75
5859-M	78-G	165	105-A	--	F-27-C	53
5880-M	78-G	165	105-A	200	F-27-C	53

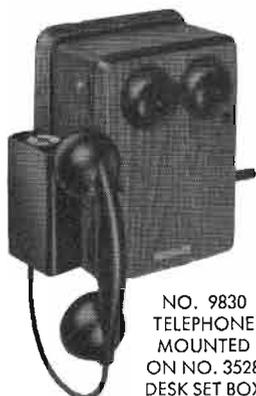
Ringer resistances—78-A, 1000 ohms; 78-D, 1600 ohms; 78-G, 2500 ohms.

*Has No. 5 push button for secret signalling.

†Arranged for calling central secretly by ringing over one side of the line and through the drop to ground. Can be used only on two wire metallic lines which have all telephones equipped with push buttons and with the drop disconnected from one side of the line and wired to ground.

‡Has large woodwork.

Bracket Type NO. 9830

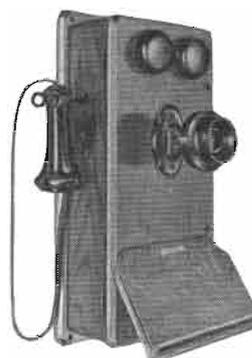


NO. 9830 TELEPHONE MOUNTED ON NO. 3528 DESK SET BOX

This telephone may be used either as an extension set or may be used as a complete telephone when used in conjunction with 3500 or 2500 series desk set boxes containing ringer and generator. The small steel box is furnished with black enamel and is 4 inches wide, 5½ inches high, and 2 inches deep. Condensers for these telephones are supplied only when specified.

Code No.	Handset	Hook Switch	Induction Coil	Condenser
9830	F-27-C	169	109-A	198

Compact Wall Type with Hand Receiver



The Kellogg compact local battery anti-side tone telephones are available with different generators and with ringers of different resistance values. The cabinet is made of oak. The over-all length is 19 inches, depth 9⅜ inches, width of back-board 8¾ inches, and the over-all width including hook switch and crank is 11¼ inches. The three-bar generators are designed for local lines having one or more telephones or for lightly loaded farm lines. The

five-bar generators are designed for long heavily loaded lines. Only the No. 4809 telephone is equipped with the three-bar generator. All other telephones have five-bar generators. The No. 4820 telephone has a special pulsating and alternating current generator for secret signalling.

Code No.	Ringer No.	Hook Switch	Ind. Coil	Cond.	Trans. Arm	Rec.	Gen.
4809	78-A	163	105-A	--	121-C	50	F-41-A 15
4812	78-D	163	105-A	--	121-C	50	F-41-A 53
4816	78-D	163	105-A	200	121-C	50	F-41-A 53
4820*	78-D	163	105-A	200	121-C	50	F-41-A 59
4824†	78-D	163	105-A	200	121-C	50	F-41-A 53
4825-M	78-D	165	105-A	200	Has #F-27-C		handset 53
4880	78-D	163	105-A	200	121-C	50	F-41-A 53
6886‡	55-G	163	105-A	200	121-C	50	F-41-A 53

Ringer resistances—78-A, 1000 ohms; 78-D, 1600 ohms; 55-G, 2500 ohms.

*Has No. 5 push button for secret signalling.

†Arranged for calling central secretly by ringing over one side of the line and through the drop to ground. Can be used only on two wire metallic lines which have all telephones equipped with push buttons and with the drop disconnected from one side of the line and wired to ground.

‡Has 3-inch gongs on ringer. Large woodwork.

WEATHERPROOF TYPE TELEPHONES



Kellogg weatherproof telephones are designed to provide an efficient operating telephone for outdoor applications. The telephones are contained in a ventilated cast iron housing with facilities provided for locking the door. The housing is painted with a heavy black

enamel to resist corrosion. The over-all dimensions are 14⅞ inches high, 11⅝ inches wide, and 10¼ inches deep. When these telephones are used in exposed locations for outdoor applications, they should be used in conjunction with an arrester for the subscriber's protection.

These telephones are equipped with No. 55-G (2500 ohm) ringer, No. 159 hook switch, No. 100-A induction coil, Nos. 28 and 53 condensers, No. 121-L transmitter, No. 81-A receiver, and No. F-744-TR cord. Condensers are supplied only when specified.

Code No.	Generator	Code No.	Generator
4883	No. 53-5-Bar	4888	No. 75-6-Bar

SPECIAL APPLICATION TELEPHONES

Common Battery, Bracket Type with Two-Way Switching Key

NO. 9736



This telephone is equipped with a two-way switching key for switching one line to either of three extension telephones. It is adaptable for use with either two winding booster or three winding anti-side tone induction coil desk set boxes. Can be used with any common battery or magneto desk set box. For common battery desk set boxes for use with this telephone, see No. 610 boxes in this section.

MAGNETO TELEPHONES Hotel Wall Type — Booster Circuit



The telephones listed below are similar in appearance. The F-1983 telephone is of the insulated type with rubber covered wiring and having all metal parts insulated. The over-all dimensions are 10³/₄ inches high, 8¹/₂ inches wide, and 6¹/₄ inches deep. The cabinet of both types is made of oak. Both telephones are equipped with No.

108-A induction coil, No. 121-L transmitter, No. 41 transmitter arm, and No. 53, 5-bar, generator. Other components are listed.

Code No.	Ringer	Hook Switch	Con-denser	Receiver	Description
F-1983	55-G	144	140	F-41-EA	Insulated type. Condenser furnished only when specified.
F-2921	78-A	103	--	F-41-A	Not insulated.

Heavy Duty Wall Type — Anti-Side Tone



The No. 6884 telephone is designed for heavy duty service and is used in oil fields, forestry service and by electric power companies. The primary and secondary windings of the induction coil are insulated from one another. Has 6-bar generator. The 6884 telephone is equipped with No. 78-G ringer, No. 163 hook switch, No. 111-A induction coil, No. 121-C transmitter, No. 50 transmitter arm, No. F-41-A receiver, and No. 75 generator. Has large woodwork for three batteries.

Railroad Telephones

The two telephones shown in next column are both used by railroads but for different applications. The F-2869 is of the composite type for use with composite telephone and telegraph lines. A No. 5 howler is used for signalling purposes but it not part of the telephone and should be ordered separately. The No. F-2945 telephone is of the insulated type to protect the operator from any high potential line current. It is used by trainmen for communication with the dispatcher. The cabinet of each type of telephone listed is made of oak.

Railroad Telephones (Cont'd)

NO. F-2869



This telephone is equipped with No. 99 hook switch, No. 66-A induction coil, two No. 25 and one No. 28 condensers, No. 121-L transmitter, No. 50 transmitter arm, and No. F-41-A receiver. It has No. 16-C retard coil and No. 14 push button for composite signalling. Over-all dimensions: 19 inches long; 8³/₄ inches wide, and 8¹/₂ inches deep.

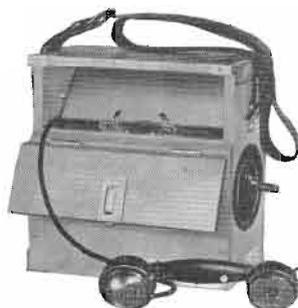
NO. F-2945



This telephone is equipped with No. 109 hook switch, Nos. 97-A and 98-A induction coils, No. 171 condenser, No. 121-L transmitter, No. 50 transmitter arm, No. 80-A receiver, and No. 53, 5-bar generator. The No. 80-A receiver has a No. 2 head band and No. 668-TR cord. Over-all dimensions: 23 inches long, 9³/₄ inches wide, and 5¹/₄ inches deep.

Portable Type Telephones

NO. 3001



This telephone is built to withstand hard usage but is light enough to be carried conveniently. The cabinet is of varnished birch with brass reinforcements.

Equipped with No. 109-G ringer, No. 108-A induction coil, No. 28 condenser, No. 32-L handset, and No. 86 5-bar generator.

NO. EE-8-B



The No. EE-8-B telephone is contained in a metal housing which fits into a heavy leather or canvas case. This instrument is the same as the EE-8 telephone used by the Signal Corps. This telephone has a switch so that it can be used for either local battery or common battery service. The circuit is anti-side tone on local battery and uses straight retard coil for common battery. Has No. C-158 retard coil.

Equipped with No. MC-131 ringer, No. C-105 induction coil, No. CA-355 condenser, and No. GN-38-B generator.

TESTING EQUIPMENT

Junior Test Cabinet



The Kellogg Junior Test Cabinet is a small, compact unit suitable for mounting on or near the switchboard in small exchanges, or on the wire chief's desk in larger offices. This test cabinet may be used for tests for short circuits, grounds on either side of the line, for crosses, or for resistance measurements on line or apparatus.

These tests are made through three trunks, one wired for the main frame test shoe, one for

the switchboard, and one for a pair of test clips. Any or all of these trunks may be equipped as required. Suitable cords, plugs, weights, and other apparatus are furnished to fit standard protectors and switchboard line jacks.

VOLTMETER. The oak turret includes a special Weston type 267 voltmeter with two scales, reading 0 to 30 and 0 to 3 volts. The low scale is calibrated for direct reading in ohms. A single scale voltmeter with one reading of 0 to 30 volts may be supplied when desired.

OPERATOR'S TELEPHONE. A set of terminals is provided for an operator's telephone. No instrument is furnished with the Kellogg junior test cabinet unless specified as it is not always necessary to talk directly to the subscriber through the testing circuits. A standard magneto wall or desk telephone may be used when the cabinet is designed for the magneto exchange. A common battery circuit is furnished in the cabinet for common battery exchanges, and any standard common battery telephone may be used as an operator's set.

KEYS. An order wire key may be furnished when desired. A single frequency ringing key is furnished on all sets, but a four or five frequency master key may be included for ringing on party lines.

SIZE. The cabinet is 10 inches wide, 6 inches deep, and 13½ inches high.

MOUNTING. The turret may be placed near the switchboard, on any desk or table. No drilling is necessary as the junior test cabinet is self contained, except for the batteries.

BATTERIES. Telephone dry cells or radio "B" battery may be used for testing with the junior test cabinet. The operator's telephone uses two dry cells if magneto, or operates from the exchange storage battery if common battery.

ORDERING INFORMATION

The following information should be included when ordering or requesting information on the junior test cabinet:

- Make and type of switchboard (for switchboard trunk).
- Make and type of main frame protection (for MDF trunk).
- Type of ringing system (for master key).

Specify voltmeter scale desired if order wire key should be furnished, and if operator's telephone is desired.

Senior Test Cabinet



The Kellogg senior test cabinet is designed as an aid to the wire chief in the average common battery exchange. With this equipment line, instrument, or exchange troubles may be quickly and easily located. Tests may be made for short circuits, grounds on either side of the line, for crosses, or resistance measurements on lines or apparatus.

VOLTMETER. The senior test cabinet is equipped with a Weston type 24, two-scale voltmeter, reading 0 to 30 and 0 to 150 volts, with resistance of 10,000 and 50,000 ohms.

KEYS. The voltmeter is controlled with a key and shunt, battery and reversing keys and a grounding key. Other keys in the test circuit are arranged for testing in or out from the main frame, connecting test trunks to switchboard order wire, connecting howler or bridge, flash key, key for reading voltage of test battery, ringing key for any ringing system and a listening key.

EQUIPMENT. Standard equipment includes an alarm buzzer, a two-way trunk to local switchboard with audible alarm, two test trunks to switchboard, one trunk to main frame test shoe, binding posts for Wheatstone bridge or howler, and two order wires. No bridge, howler, test shoe, or cords and plugs for local board are included, but may be added when desired. Kellogg engineers will recommend a suitable bridge for use with this cabinet.

MOUNTING. Suggestions on special desks for mounting the turret will be made on request, although any standard office desk is suitable. No drilling is necessary in the desk top as the senior turret is self-contained except for the extension alarm bell, batteries, bridge, and howler, which may be mounted in any convenient location.

BATTERIES. Telephone dry cells or radio "B" batteries are required to furnish the testing voltages of 30 and 150 volts. Current for operating the operator's telephone is obtained from the exchange storage battery.

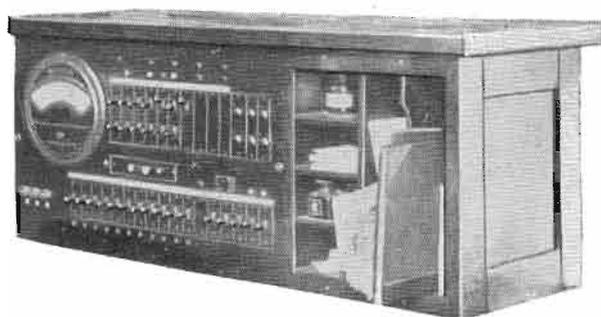
SIZE. The senior test cabinet is 23-3/16 inches wide, 12 inches deep, and 12 inches high.

OPERATOR'S TELEPHONE. A desk Masterphone is included with the senior test cabinet.

ORDERING INFORMATION

The following information should be included when ordering or requesting information on the senior test cabinet:

- Make and type of switchboard.
- Make and type of main frame protection.
- Type of ringing system.
- Whether set is to be equipped with bridge, howler, test shoe, or cords and plugs for local board.
- Detailed specifications will be sent on request.

TESTING EQUIPMENT**Major Type Test Cabinet**

The major type test cabinet is specially designed for use in large central offices. It incorporates all the features of the senior type shown above plus additional cabinet space, line facilities and other refinements.

CABINET. The cabinet is of the turret type, suitable for mounting on a flat top desk or table. It may be furnished in any wood or finish to match the switchboard, woodwork, or furniture. The interior of the cabinet provides ample space to enclose all relays, condensers, coils, and terminal strips. A fuse panel is also located in the back of the cabinet for the protection of all circuits.

VOLTMETER. The turret includes a Weston type 24 voltmeter with two scales reading 0 to 30 volts and 0 to 150 volts.

FACE PANEL. The face panel is of the same material and finish as the other exposed woodwork. Approximately two thirds of this area is occupied by the testing equipment and the lamps and keys associated with the in and out lines and trunks. Pigeon holes and book stalls are provided at the right.

OPERATOR'S TELEPHONE. The operator's telephone equipment may be either a desk Masterphone or a suspended operator's set with a head receiver and suspended or breastplate transmitter. With this equipment the wire chief may talk on any of the desk lines, in and out trunks, or test trunks.

WIRING. Two incoming lines from the local switchboard can be installed. These lines terminate with a line lamp, listening key, holding key, and guard lamp in the wire chief's desk and may be used for trouble reports.

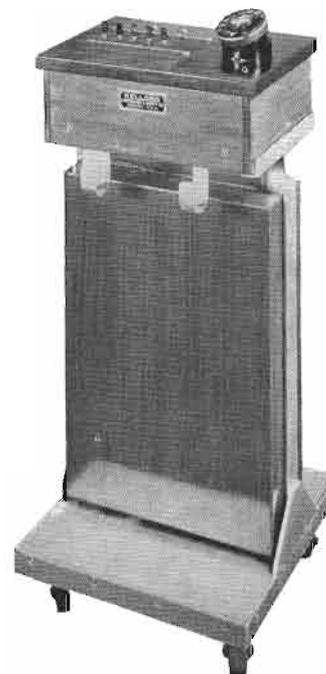
Wiring is provided for four order wires, two common battery test trunks, two magneto test trunks and one testing circuit, one generator circuit, one wire chief's telephone, one howler circuit, and one MDF test trunk.

TRUNKS. Space and drilling for ten combined test and hospital trunks terminating on supervisory lamps, a guard lamp, and a combined testing and reversing key are provided.

WHEATSTONE BRIDGE. Standard models of Wheatstone bridge type testing equipment can be supplied to work in conjunction with this test circuit.

ORDERING INFORMATION

Major type test cabinets ordinarily are specially designed and engineered by the Kellogg engineering staff. Requests for information on this cabinet should include information as to the make and type of switchboard, etc. Detailed specifications and equipment data will be sent on request.

Special Testing Equipment

Illustrated above is an example of special type testing equipment designed by expert Kellogg engineers and manufactured in the Kellogg plant to meet special requirements and applications of operating companies.

All types of special testing equipment can be supplied by Kellogg. Special trunk and line tests can be provided in addition to regular equipment or special arrangements of regularly used testing apparatus.

In requesting information on this equipment specify the type testing for which the equipment is to be used, the type of circuits or equipment to be tested, and all special features required from the equipment.

For small meters and linemen's test sets see the Supply Section of this catalog.

Wire Chief's Test Panels for Rack Mounting**SENIOR TYPE**

The senior type test panel is arranged on a bakelite faced panel for mounting on a relay rack power board. It is wired and equipped with the following circuits:

TESTING CIRCUIT—complete with a Weston No. 24, double-scale voltmeter with readings of 0 to 30 volts, 10,000 ohms resistance, and 0 to 150 volts, 50,000 ohms resistance, and the necessary test keys, etc.

OPERATOR'S TELEPHONE CIRCUIT—with a Masterphone handset.

Two-Way Line Circuit.

Order Wire Circuit.

Ringling Circuit.

Note: This panel will be furnished with single-frequency ringling keys unless otherwise specified. If five-party ringling is used a master key is required. A two-party master key is not required on the senior type panel as a reversing key is provided.

TESTING EQUIPMENT

Wire Chief's Test Panels for Rack Mounting Junior Type R-S-CB Test Panel

The junior type R-S-CB test panel is arranged on a bakelite faced panel for mounting on a relay rack power board. It is wired and equipped with the following circuits:

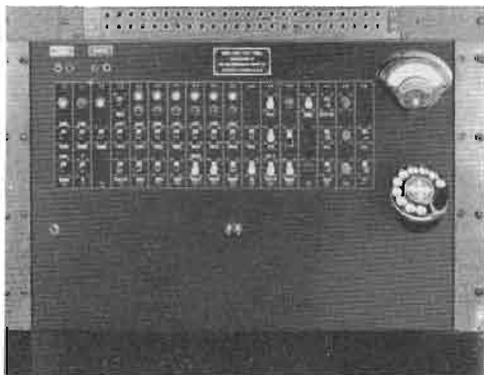
Testing Circuit—complete with a Weston No. 267 single-scale voltmeter with a reading of 0 to 30 volts, 10,000 ohms resistance, and the necessary test keys, etc.

Operator's Telephone Circuits—with a Masterphone handset.

Two Order Wire Circuits—wired but not equipped.
Ringling Circuit.

Note: This panel will be furnished with single-frequency ringling keys unless otherwise specified. If two or five-party ringling is used a master key is required.

Junior Type R-O-CB Test Panel



The junior type R-O-CB test panel is the same as the junior type R-S-CB except it is equipped with a Weston double-scale meter with an 0 to 30 volt reading and an ohm reading.

Test Sets, Lineman's

Kellogg lineman's test sets are supplied in two types: a bridging type for magneto lines and a common battery type for common battery lines. The bridging type is in reality a complete portable magneto telephone including dry cell batteries. The common battery type is a metal handset with test clips on the cord for connecting to the line under test.

NO. 1016 TEST SET (MAGNETO)



The No. 1016 test set is a complete portable telephone, sturdily constructed and designed to talk and ring over long or heavily loaded lines. It is equipped with a five-bar generator, 1600 ohm ringer, transmitter receiver, induction coil, hook-switch, and two dry cell batteries. Overall dimensions: 8 inches high;

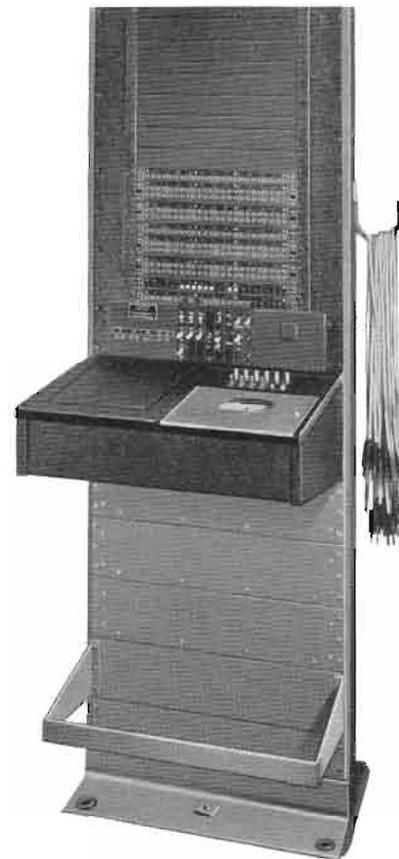
7 inches wide, and 8³/₄ inches deep. Net weight: 15 pounds.

NO. 1025 TEST SET (COMMON BATTERY)



The No. 1025 test set is a compact, easy to carry, metal handset equipped with test cords and two No. 27 universal test clips.

Toll Test Panels



Toll test panels can be furnished for any number of line circuits in either wall or floor type cabinets or for relay rack mounting as requirements demand. Patching cords, circuits, hand generator, and operator's telephone are furnished only as specified.

The toll test panel, in connection with the wire chief's testing equipment described above will permit routine tests and assist in locating line failures. The toll test panel is primarily a series of spring jacks, arranged in groups of 4, 6, 8, 10, 12 and sometimes more for testing, patching, talking, and ringling on toll lines. These jacks also form a rapid and convenient means of opening, shorting, and grounding the lines for test as well as for cutting in or out repeating coils, composite repeaters, or other toll line apparatus.

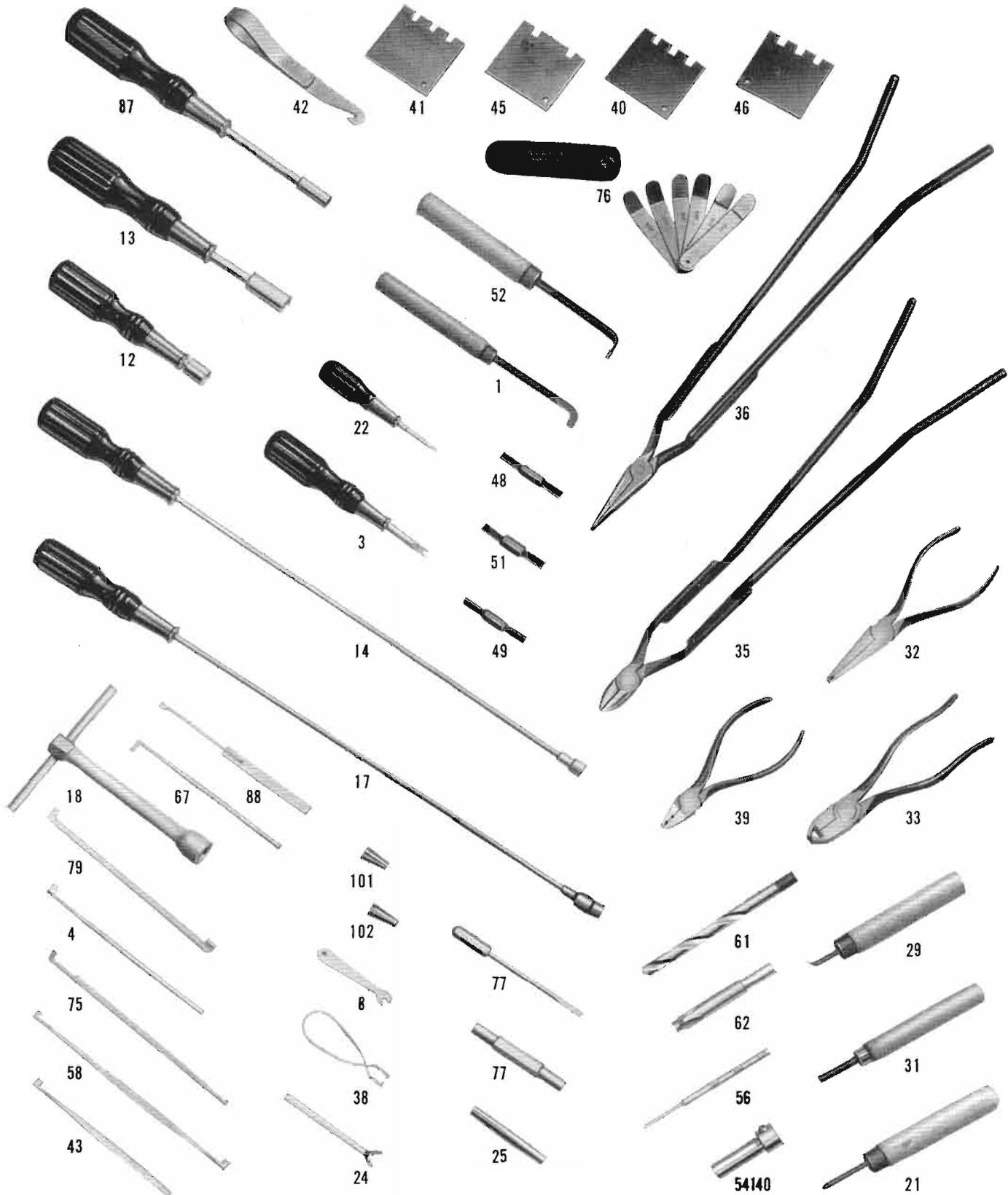
The usual minimum is six jacks to a line, each jack having a single conductor, and the group being arranged with two jacks for bridged listening, two for testing the line (out) and two for testing the drop (in).

Greater facility for patching and testing is accomplished by an increased number of jacks in each line. For the more complex toll circuits with simplex and composite equipment more than six jacks per line are required.

Because of the special nature of toll testing equipment, inquiries should include information on the ultimate line capacity desired, number of lines to be equipped, number of phantom circuits, number of jacks for each line, number of patching cords or cord circuits, and type of operator's set.

A drawing or description of the toll network would also assist Kellogg engineers in writing specifications. Recommendations on toll test equipment will be furnished without obligation.

TOOLS



FOR DESCRIPTION OF THESE TOOLS SEE PAGE 130.

TOOLS

(ILLUSTRATED ON PAGE 129)

Kellogg tools are available for use with all types of Kellogg equipment. These tools are especially designed to fit the job; each operation on telephone equipment can be handled with a Kellogg tool which will exactly fit the conditions required.

ARRESTERS

Socket wrench—No. 11 tool. Same as No. 12 tool.

CABLE Cable skinner—No. 42 tool.

COMBINED DROPS AND JACKS

Socket wrench—No. 12 tool.

Spanner wrench—No. 15 tool. Same as No. 14 tool.

CORDS Pliers—No. 39 tool.

DIALS Retaining ring—No. 86 tool.

Spring adjuster—No. 92 tool. Wrench—No. 3 tool.

DROPS Flat wrench—No. 8 tool.

HEAT COILS Pliers—No. 32 tool.

JACKS

Adjuster—No. 29 tool.

Jack Gauge—for No. 239 jacks No. 48 tool; for No. 258 jack No. 49 tool; for jacks taking No. 42 plug No. 51 tool.

Socket wrench—for fastening jacks in switchboard with Piece No. 989 nuts No. 14 tool; for No. 989 nuts for switchboard jacks, with adjustable feature, No. 17 tool.

Spring adjuster—No. 56 tool.

Wrench—No. 31 tool.

KEYS For contact cleaning and burnished—No. 68 tool.

Pliers—No. 33 tool. Socket wrench—No. 16 tool.

Springs—No. 4 tool. Spring adjuster—No. 67 tool.

LAMPS Lamp extractor—No. 25 tool.

CAPS, LAMP Extractor—for supervisory lamp caps No. 24 tool; for line lamp caps No. 38 tool.

MOUNTING PLATES Installing tool—No. 89 tool.

PLUGS

Gauges—for Nos. 106, 137, and 156 plugs No. 40 tool; for No. 201 plugs No. 41 tool; for No. 152 plugs No. 46 tool; for Nos. 112 and 187 plugs No. 47 tool; for No. 42 plugs No. 50 tool.

PLUGS

Screw driver—for hollow screws on plugs No. 22 tool.

PLUG CUSHIONS

For assembling No. 1-A plug cushions on plugs (sleeve diameter 0.2495 in.) No. 101 tool. For assembling No. 2-A plug cushions on plugs (sleeve diameter 0.2215 in.) No. 102 tool.

PLUG SEATS

Burnishing tool for plug seats for No. 106 plug No. 62 tool.

Drill for plug seats for No. 201 plug No. 63 tool.

Burnishing tool for plug seats for No. 201 plug No. 64 tool.

Tool kit for drilling plug seats for No. 106 plugs No. 65 tool kit.

Tool kit for drilling plug seats for No. 201 plug No. 66 tool kit.

RELAYS

Gauge—No. 76 tool.

Pliers, flat nose—No. 78 tool.

Screw driver wrench for removing No. 72 type major relay shells with round nut—No. 20 tool.

Screw driver wrench for residual pins and Relaymatic relays

The tools listed below are shown under the name of the piece of equipment for which they were designed. The equipment is listed alphabetically. For example, for a tool used to adjust ringers see Ringers, Adjusting.

(similar to Western Electric Co. No. 48 tool) No. 77 tool.

Socket wrench for relay armature nuts No. 11 tool.

Socket wrench for mounting major relays on mounting strip—No. 13 tool.

Spring adjuster (two end spring adjuster for relays—saw slot .023, maximum .025) No. 58 tool. Left half of No. 58 tool is No. 44 tool. Right half of No. 58 tool is No. 43 tool.

Spring adjuster (No. 20 B. & S. saw slot)—No. 1 tool.

Spring adjuster (for No. 700 and 800 type relays; No. 21 B. & S. saw slot on one end and No. 19 B. & S. saw slot on other end)—No. 75 tool.

Spring adjuster (for Nos. 7200 and 7300 type relays)—No. 79 tool.

Spring adjuster (for gang relays)—No. 88 tool.

Wrench for removing No. 22 type major relay shells—No. 19 tool.

Wrench for fastening relay coil to heel iron on Relaymatic relays—No. 91 tool.

RELAYMATICS AND RELAY RACKS

Socket wrench—No. 18 tool.

RINGERS

Adjusters—No. 85 tool.

Flat wrench for adjusting large type ringers—No. 9 tool. One end of No. 9 tool is 17/64 inch, the other end is 25/64 inch.

Flat wrench for adjusting large type ringers—No. 10 tool. One end of No. 10 tool is 1/4 inch, the other end is 41/64 inch.

Wrench for Nos. 72-A and 73-A type ringers—No. 59 tool.

SCREWS, SWITCHBOARD

Screw driver—No. 21 tool.

SOLDERING IRONS

For heavy duty work—No. 2-A soldering iron.

For light work—No. 1-A soldering iron.

TELEPHONE

Each cap and mouthpiece remover—No. 71 tool.

Socket screw wrench—No. 90 tool.

Spring adjuster—No. 52 tool.

TOOL KITS

For drilling leather faced plug shelves and lamp rails for No. 106 plugs and supervisory lamps (includes No. 65 tool kit)—No. 80 tool kit.

For drilling bakelite faced plug shelves and lamp rails for No. 106 plugs and supervisory lamps (includes No. 65 tool kit)—No. 81 tool kit.

For drilling leather faced plug shelves and lamp rails for No. 201 plugs and supervisory lamps (includes No. 66 tool kit)—No. 82 tool kit.

For drilling bakelite faced plug shelves and lamp rails for No. 201 plugs and supervisory lamps (includes No. 66 tool kit)—No. 83 tool kit.

SEE ALSO tool kits No. 65 and 66 under Plug Seats.

WIRE

Cutting pliers—No. 35 tool.

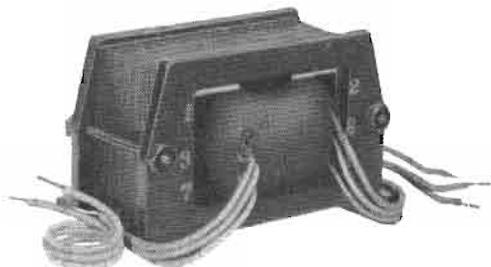
Long nose pliers—No. 36 tool.

TRANSFORMERS

Kellogg transformers are made for power panels, for use in transformer sets, and for insulating transformer applications. Transformers in general are listed in the first group below; insulating transformers are shown separately.

Code No.	Freq. (cycles)	Primary (volts)	Secondary (volts)	Pri. Res. Parallel (ohms)	Sec. Res. Wound (ohms)	Description
1-C	16-20	24	105-115	1.44-1.44	31	Used with Nos. 27-B and 29-A transformer sets and power panels.
2-A	25-42	24	120-135	1.32-1.32	56	Used with No. 29-A transformer set.
3-C	50-66 $\frac{2}{3}$	24	145-155	1.085-1.085	57	Used with Nos. 27-B and 29-A transformer sets.
5-C	16-20	48	105-115	3.9-3.9	26.5	For power panels.
28-B	25-42	48	125-135	6.2-6.2	54	Used with Nos. 30 and 31 transformer sets.
29-B	50-66 $\frac{2}{3}$	48	145-155	5.25-5.25	50	Used with Nos. 30 and 31 transformer sets.

TRANSFORMERS, INSULATING

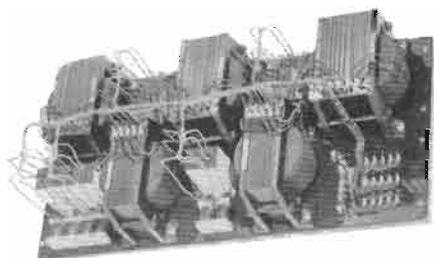


Code No.	Resistance (ohms)				Description
	Terms. 1-2	Terms. 3-4	Terms. 5-6	Terms. 7-8	
19-A	23	23	23	23	Has four single windings. Frame of No. 18-A transformer. 5500 volt breakdown test.

Code No.	Terms. 1-2	Terms. 3-6	Terms. 7-8	Description
19-B	23	46	23	Has three single windings. 7500 volt breakdown test.

TRANSFORMER SETS—WALL TYPE

NO. 27-B



The No. 27-B transformer set is for use with the No. 42 pole changer. For 24-volt operation. 10 ohms resistance. Uses one No. 4 distributing bar; ten No. 66 and five No. 68 condensers; one No. 1-C, two No. 2-A, and two No. 3-C transformers, and ten No. P-65789 resistance coils.

TRANSFORMER SETS—WALL TYPE (Cont'd)

NO. 30

The No. 30 transformer set is the same as the No. 27-B except it is for 48-volt operation. All components are the same except for the transformers. One No. 5-C, two No. 28-B, and two No. 29-B transformers are used in the No. 30 transformer set.

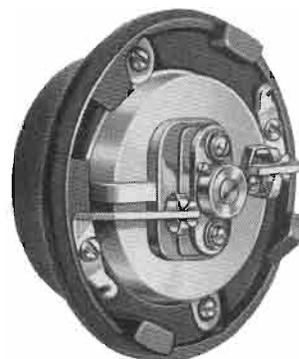
NO. 31

The No. 31 transformer set is the same as the No. 30 except it uses terminal strips in place of distributing bar. Length of panel is 33 $\frac{1}{4}$ inch. Used with No. 45 pole changer. 48-volt operation.

TRANSMITTERS

Kellogg transmitters all use the Kellogg non-positional transmitter. These transmitters are divided into three groups with a separate code for each group. A separate chart for each type is shown below with descriptive information for each group. A suffix letter "C" designates the transmitter designed for common battery application and a suffix letter "L" designates the transmitter designed for local battery application in each case.

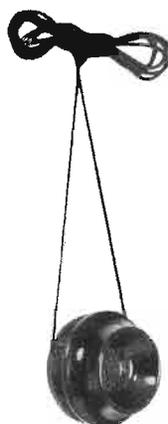
NO. 121 TYPE TRANSMITTER



This transmitter is designed for use with old style desk stand telephones, wall type, and weatherproof telephones. It is arranged with solder type terminals. Furnished less back assembly. The shell of this transmitter is made of bakelite.

Code No.	Transmitter Assembly No.
121-C	P-66521
121-L	P-66522

NO. 157 TYPE TRANSMITTER



This transmitter is designed for use in the operator's suspended type transmitter. It is arranged with solder type terminals and is furnished complete with back assembly. The shell is made of bakelite. Cords must be ordered separately.

Code No.	Transmitter Assembly No.
157-C	P-66521
157-L	P-66522

NO. 178 TYPE TRANSMITTER

(Operator's Type—For illustration see page 44.)

For operator's breast plate head and chest sets. This transmitter has a small diameter mouthpiece. It is especially light in weight and small in size. Shell is made of bakelite. The No. 178-C transmitter is used in the 1C, 2C, 3C operator sets. The No. 178-L transmitter is used in the 1L, 2L, 3L sets.

TUBE KITS

The No. 100 rare gas relay kit and the No. 101 vacuum tube kit are used in conjunction with the Kellogg No. 1000 Series Masterphone for divided ringing applications to isolate the telephone from ground. The No. 100 kit consists of a Vincent rare gas relay (RTC-2) and a mounting bracket (Pc. 64979) and the No. 101 kit consists of a Western Electric Co. No. 333-A vacuum tube and mounting bracket (Pc. 64979). Since the two tubes are different a detailed description is given below. The same mounting bracket is used to mount either tube.

VINCENT RARE GAS RELAY

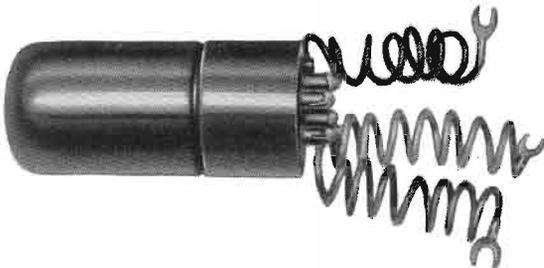


This type of relay is an electronic device having no moving parts and possessing the electrical characteristic of having infinite resistance to the passage of electrical current of potentials below its predetermined breakdown voltage, while above this critical point it functions to pass a current of considerable magnitude. Its action in the telephone circuit is to isolate the telephone from ground until the ringing voltage is applied. The ringing voltage being higher than the 60-volt breakdown point of the tube causes the tube to break down to allow the ringing current to flow and operate the ringer.

The relay itself consists of a small glass tube containing rare inert gases acting in contact with special metal electrodes which allow current to pass above a closely predetermined voltage. The relay is usually mounted in the bell box alongside the ringer. No adjustment is necessary. The relay is connected in series with the ringer.

This relay may be used on magneto or common battery lines with either straight line, harmonic, or biased ringers. The relay cannot be used for selective pulsating or selective superimposed ringing and should not be used with ringers with more than 3000 ohms resistance.

WESTERN ELECTRIC CO. NO. 333-A VACUUM TUBE



This tube is intended for use principally on grounded ringing party line where superimposed or pulsating ringing current is employed for four party selective and eight party semi-selective lines. The tube is a three element type containing two control electrodes and a third electrode called the anode. The gaps between the electrodes are at practically open circuit at potentials below the approximate 70 volt breakdown potential. The

TUBE KITS

WESTERN ELECTRIC CO. NO. 333-A VACUUM TUBE (Cont'd)

control electrodes pass current equally well in either direction but the main gap between a control electrode and the relatively small anode passes current much better when the anode is positive. In the usual operating range for this tube, it will pass only one twentieth as much current when the anode is negative as when the anode is positive. This is the factor which is made use of in conjunction with the No. 1000 Series Kellogg Masterphone. Proper poling of the ringers is necessary, however, to achieve the desired result. The main, or working, gap rectifies alternating currents to provide pulsating direct currents for selective ringing systems which use biased ringers. The Western Electric Co. No. 333-A tube is used with biased ringers having 1000 or 2500 ohms resistance such as the Kellogg Nos. 120-BB or 120-BC. High impedance ringers such as the Kellogg No. 120-BA are not suitable for use in vacuum tube circuits. Space has been provided in the No. 1000 Series Masterphone to mount this tube. Complete instructions for connecting the No. 333-A vacuum tube with the telephone set ringers is supplied with the No. 101 vacuum tube kit.

WIRE, KELLOGG FLEXIBLE—INSULATED—STRANDED

SPECIFICATION G. M. 453

The type "S" Kellogg stranded wire is extensively used in Kellogg desk and wall telephones. Other stranded wire is recommended for general use where increased flexibility is desired.

In the table below the wire size is given in A. W. G. units. The impregnation for these wires consists of either one or two coats of moisture and flame proof lacquer. In the table below only the number of coats of this lacquer is given under "Impregnation."

Specify "Wire per G.M. 453" when ordering.

This wire is available in 24 colors. Specify colors desired when ordering. The colors available are listed below.

RED	GREEN	BLUE RED
RED WHITE	GREEN WHITE	ORANGE RED
BLACK	SLATE	GREEN RED
BLACK WHITE	SLATE WHITE	BLACK RED
BLUE	BROWN	SLATE RED
BLUE WHITE	BROWN WHITE	BLUE ORANGE
ORANGE	ORANGE GREEN	WHITE
ORANGE WHITE	ORANGE BLACK	YELLOW

Kellogg Type	No. of Strands	Wire Size	Insulation	No. of Coats of Impregnation
K	19	27	Rubber cover & single glazed braid. Rubber thickness 0.029 in. Diam. over braid approx. 0.160 in.	None
F	5	30	1/64 in. rubber cover & braid	1
G	5	30	Cotton wrap & braid	2
H	7	30	Single braid	2
J	7	30	Vinylite & braid	1
E	10	30	1/64 in. rubber & braid	1
N	10	30	Single braid	2
S	10	30	Two reverse servings of cellulose acetate yarn & braid	2

WIRE, KELLOGG FLEXIBLE—INSULATED—STRANDED

(Cont'd)

SPECIFICATION G. M. 453

Kellogg Type	No. of Strands	Wire Size	Insulation	No. of Coats of Impregnation
A	16	30	Rubber cover & braid (Approx. O.D. 0.087 in.)	1
B	16	30	One cotton wrap & braid (Approx. O.D. 0.82 in.)	2
D	41	30	One cotton wrap and braid	2
Q	3	35	Two reverse servings of cellulose acetate yarn	2
L	5	35	Two reverse servings of cellulose acetate yarn for white or solid colors. Three servings for two color combinations	2
R	7	36	Braided	2
M	21	36	One cotton wrap & 1/64 in. rubber jacket (max. O.D. 0.070 in.) can be furnished in black, white, or red	None
C	41	36	Rubber covered	None

All of the above wires are furnished in coils.

WIRE, SWITCHBOARD



SINGLE



DUPLEX

Switchboard wire is the tinned or tinned and enameled copper wire used in Kellogg switchboard cables. These wires can be furnished in No. 19, 22, or 24 A. W. G. in all standard colors used for cable conductors. The tip conductor of duplex wires can be furnished as white, red, red-white, brown and brown-white. Specify color desired when ordering.

Two types of insulation are used on these wires. Type "B" insulation consists of three opposite wrappings, two of cellulose acetate yarn next to the wire and one overall cotton wrap.

The type "B" wire is the same as type "D" except for type of impregnation.

Code No.	Impregnation	Conductor Finish	No. of Conductors	Type Wire
B-T-1	Lacquered	Tinned	1	Single
B-T-2	Lacquered	Tinned	2	Duplex
B-TE-1	Lacquered	Tinned-Enameled	1	Single
B-TE-2	Lacquered	Tinned-Enameled	2	Duplex
D-T-1	Waxed	Tinned	1	Single
D-T-2	Waxed	Tinned	2	Duplex
D-TE-1	Waxed	Tinned-Enameled	1	Single
D-TE-2	Waxed	Tinned-Enameled	2	Duplex

NOTE: All of the above wires can be furnished with tropicalized impregnation for extreme humid conditions if specified.

WIRE, PUSH BACK

This wire also is known as telephone cable wire. Push back wire is used for wiring magneto desk set boxes, compact type wall telephones, and used generally for hook up wire.

This wire is furnished in single conductor only, with tinned copper conductors according to Kellogg specification G. M. 245.

Insulation on Push back wire consists of one braid only. Type "L" insulation is finished with wax and Type "M" with lacquer. If a heavier insulation is desired in either single or duplex wire, order generator wire shown below.

Specify "Wire per G.M. 245" in ordering this wire.

This wire is furnished in No. 20 A. W. G. in the following colors:

RED; RED WHITE; BLUE; BLUE WHITE; ORANGE; ORANGE WHITE; GREEN; GREEN WHITE; BLACK; BLACK WHITE; SLATE; SLATE WHITE; BROWN; BROWN WHITE; ORANGE GREEN; ORANGE BLACK.

Code No.	Insulation	Conductor Finish	No. of Conductors	Type Wire
L-T-1	L	Tinned	1	Single
M-T-1	M	Tinned	1	Single

WIRE, GENERATOR



SINGLE



DUPLEX

Generator wire is for use as No. 16 or 20 A. W. G. battery leads in local cables and general wiring where the added protection of tinned-enameled wire and braided covering is necessary. This wire also can be furnished with tinned conductors.

Insulation on this wire consists of two opposite wraps of cellulose acetate yarn over which a close cotton braid is applied. Type "O" wire is finished with wax and Type "P" wire is finished with lacquer.

Specify "Wire per G.M. 245" in ordering this wire.

Generator wire is furnished in the following standard colors:

RED; RED WHITE; BLUE; BLUE WHITE; ORANGE; ORANGE WHITE; GREEN; GREEN WHITE; BLACK; BLACK WHITE; SLATE; SLATE WHITE; BROWN; BROWN WHITE; ORANGE GREEN; ORANGE BLACK.

It is important that the desired colors be specified when ordering generator wire.

Code No.	Impregnation	Conductor Finish	No. of Conductors	Type Wire
O-T-1	Waxed	Tinned	1	Single
O-T-2	Waxed	Tinned	2	Duplex
O-TE-1	Waxed	Tinned-Enameled	1	Single
O-TE-2	Waxed	Tinned-Enameled	2	Duplex
P-T-1	Lacquered	Tinned	1	Single
P-T-2	Lacquered	Tinned	2	Duplex
P-TE-1	Lacquered	Tinned-Enameled	1	Single
P-TE-2	Lacquered	Tinned-Enameled	2	Duplex

NOTE: All of the above wires can be furnished with tropicalized impregnation for extreme humid conditions if specified.

ROTO WIRE FOR RELAYMATIC SWITCHBOARD CABLES

This wire is similar in construction to generator wire except that the overall braid is constructed with a finer cotton thread to hold hand-made cable arms for Relaymatic switchboards to a minimum diameter.

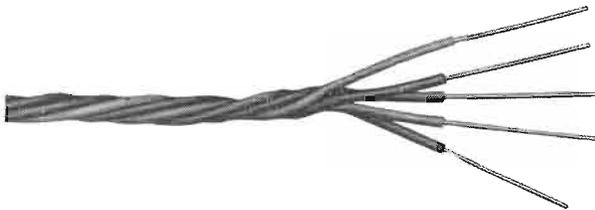
The insulation for these wires consists of two opposite wraps of cellulose acetate yarn, over which a close soft cotton braid is applied. The type "E" wire is finished with wax, the type "F" wire is finished with lacquer, and the type "G" has a tropicalized finish.

These wires are furnished in No. 22 or 24 A. W. G. in the following standard colors:

RED	RED WHITE
BLUE	BLUE WHITE
ORANGE	ORANGE WHITE
GREEN	GREEN WHITE
BLACK	BLACK WHITE
SLATE	SLATE WHITE
BROWN	BROWN WHITE
ORANGE GREEN	ORANGE BLACK

Code No.	Insulation	Conductor Finish	No. of Conductors
E-T-1	E	Tinned	1
E-TE-1	E	Tinned-Enameled	1
E-T-2	E	Tinned	2
E-TE-2	E	Tinned-Enameled	2
F-T-1	F	Tinned	1
F-TE-1	F	Tinned-Enameled	1
F-T-2	F	Tinned	2
F-TE-2	F	Tinned-Enameled	2
G-T-1	G	Tinned	1
G-TE-1	G	Tinned-Enameled	1
G-T-2	G	Tinned	2
G-TE-2	G	Tinned-Enameled	2

WIRE, POWER EQUIPMENT



The types "H", "J", and "K" wires shown in the next column above usually are furnished in a 5, 7, or 9-wire twist as cable and are used for leads from ringing equipment to switchboards.

Single conductor wire of these types can be furnished with standard tracer colors as follows:

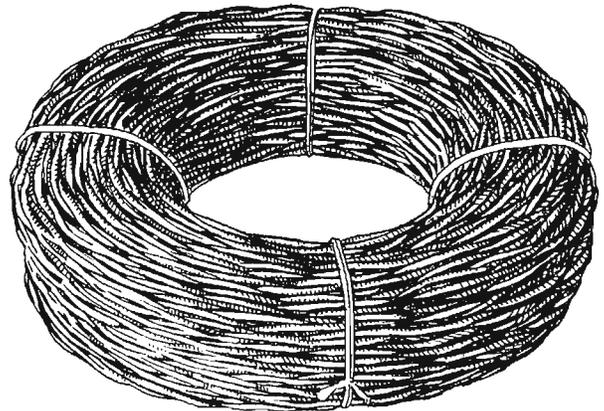
BLUE	BLUE ORANGE
ORANGE	BLUE GREEN
GREEN	BLUE BLACK
BLACK	BLUE SLATE
SLATE	ORANGE WHITE
BLUE WHITE	ORANGE GREEN

WIRE, POWER EQUIPMENT (Cont'd)

These wires are furnished in either No. 14 or No. 18 A. W. G. rubber covered tinned wire. Each type has a close overall cotton braid. When ordering this wire it is necessary to specify the desired wire gauge.

Type Wire	Type Impregnation
H-T-1	None
J-T-1	Lacquered
K-T-1	Tropicalized

Kellogg Flameproof Jumper Wire



This special Kellogg wire was designed to provide a jumper wire of small diameter with high insulation resistance and flame resisting qualities. In addition to these properties the wire is manufactured in bright, easily traced colors. This wire has a low mutual capacity rating and good moisture proof qualities.

This jumper wire is made of No. 22 B. & S. gauge tinned or tinned-enameled copper wire. Three wrappings of cellulose acetate yarn are applied to it in reverse directions and then an outer covering of cotton. These wrappings are then impregnated with a special Kellogg cellulose acetate lacquer, giving the wire a hard, smooth, dust-free finish. This compound resists flame, moisture, and corrosion.

Kellogg flameproof jumper wire is shipped in 500 and 1000 foot coils of one continuous length. This flameproof wire has a lay of approximately two inches, or six twists per foot.

Code No.	Type Wire	No. of Strands	Colors	Weight per 1000 Feet
3002	Tinned	2	Red, White	10 lbs.
3002-E	Tinned-Enameled	2	Red, White	10 lbs.
3003	Tinned	3	Red, White, Blue	15 lbs.
3003-E	Tinned-Enameled	3	Red, White, Blue	15 lbs.

Wire for open line construction and drop, bridle, inside, and other wires sold by Kellogg may be found in the Supply Section of this catalog. Information on lead covered cable for outside plant use also is shown in the Supply Section.

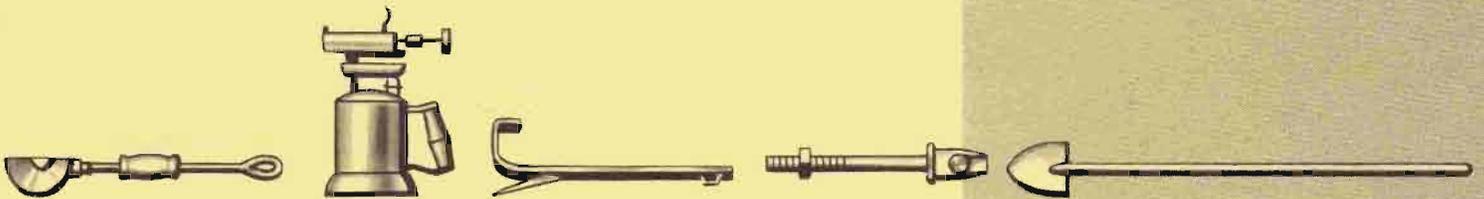
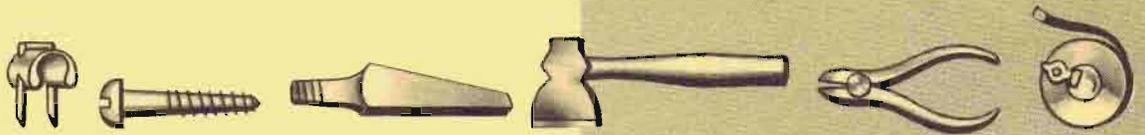
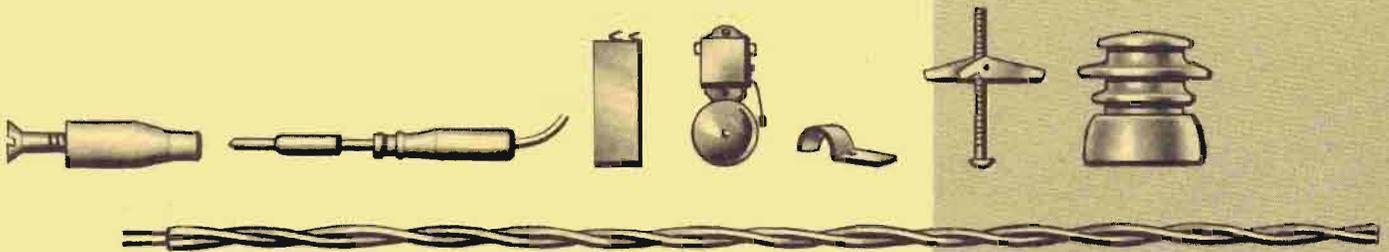
Telephone and switchboard cords of Kellogg manufacture are shown under "Cords" in this section.

NOTE:

So as not to further inflate the already enormous file-size of this scan, and because of its limited interest, the Supplies Section has not been included.

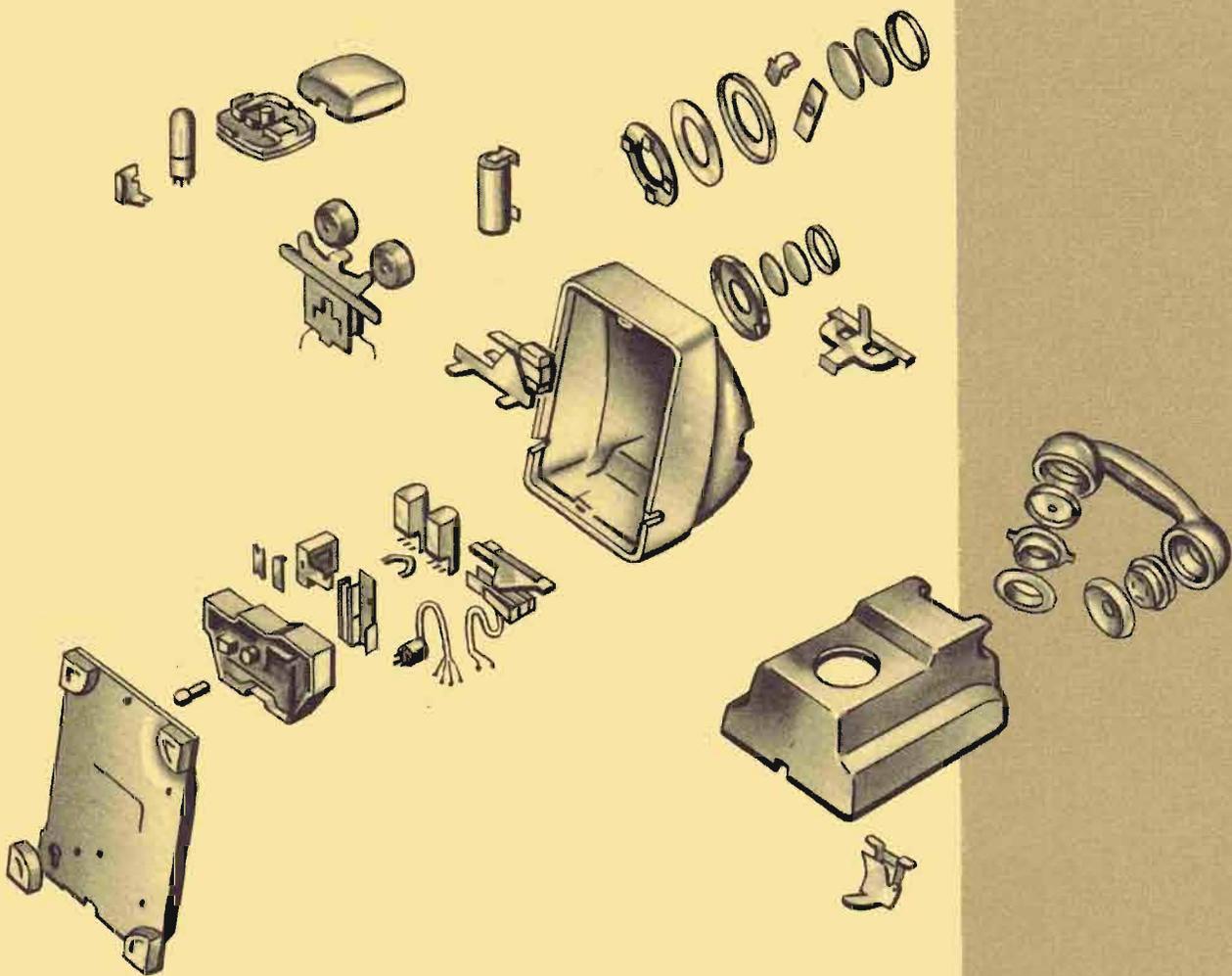
Kellogg

SUPPLIES



Kellogg

PARTS



PIECE PARTS

In this section are shown piece parts for commonly used items of Kellogg apparatus. Every effort has been made to include in this material information on the most commonly needed Kellogg components and piece parts required by telephone companies.

Not all items of coded apparatus will be found in this section as in many cases these units are complete in themselves or do not permit replacement outside the Kellogg factory.

Only non-coded piece parts which make up coded items are shown in this section. For the components of coded items made up of several other coded items, as in the case of telephones, desk set boxes, etc., consult the Apparatus Section of this catalog.

Space does not permit furnishing detailed information for components and piece parts for all Kellogg equipment which may be in service but is not of current manufacture. This informa-

tion may be obtained from previous Kellogg catalogs. If these catalogs are not available the piece parts or components desired can, in most cases, be furnished if adequate descriptive information is provided with the order as indicated below.

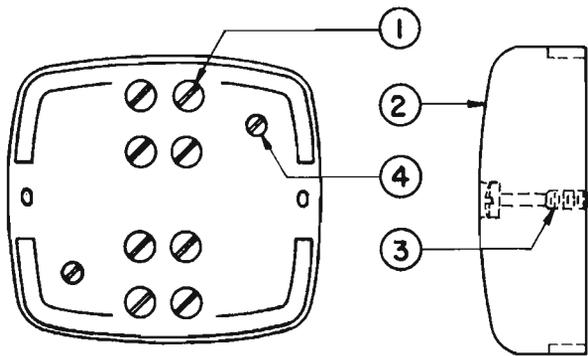
Ordering Information

Orders for piece parts should include the piece part number or code number when available.

When piece part numbers are not available orders should include the following information:

1. Description of the part desired and of the component on which the part is used.
2. Code number of the component on which the part is used.
3. A sample of the part desired, or a sketch, should be furnished if necessary.

BLOCK, CONNECTING



NO. 27

Item No.	Part No.	Description
1	69117	Screw
2	69112	Cover
3	69113	Screw
4	60409	Screw (Mounting)

BOXES, KEY

NOS. 11, 11-13, 23 AND 23-B
General Replaceable Parts

Item No.	Part No.	Description
1	59864	Celluloid
2	59865	Paper
3	58227	Button (Black)
4	58228	Button (Green)
5	58229	Button (Red)

DIALS

Shown below are piece parts for code numbers 10-D, 10-G, 10-DO, 12-D, 12-G, 13-D, and 13-G Dials.

COMMON PARTS

Description	Piece No.
Number Card	64972
Protector	64969
Retaining Ring	69011
Finger Ring	70102

**DIALS (Cont'd)
SPECIALIZED PARTS**



Dial Type	Description	Piece No.
D	Numeral Ring	68985
G	Numeral Ring	69056
DO	Numeral Ring	70336

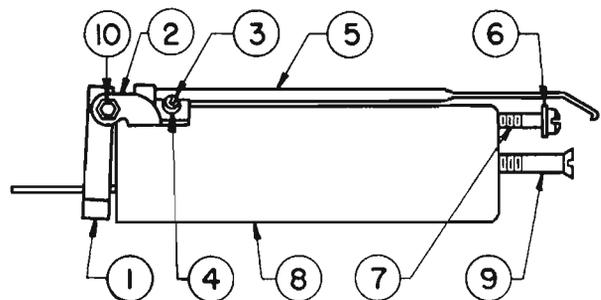
DROPS AND JACKS, COMBINED

500 Type—with Regular Night Alarm Contacts Only
(Replaces 300 Type)

JACK ASSEMBLIES AND DROP ASSEMBLIES

Code No.	Jack Assembly	Drop Assembly
500	P-68336	P-68323
502	P-68589	P-68323
503	P-68604	P-68323
505	P-68607	P-68323
506	P-68723	P-68323
509	P-68337	P-68323
513	P-70395	P-68323

Shown below is an itemized drawing of a No. 500 type combined drop and jack with N.A. contacts only. For piece parts corresponding to the item numbers see the table shown on page 268.



DROPS AND JACKS COMBINED (Cont'd)

PIECE PARTS FOR N.A. CONTACT ONLY TYPE

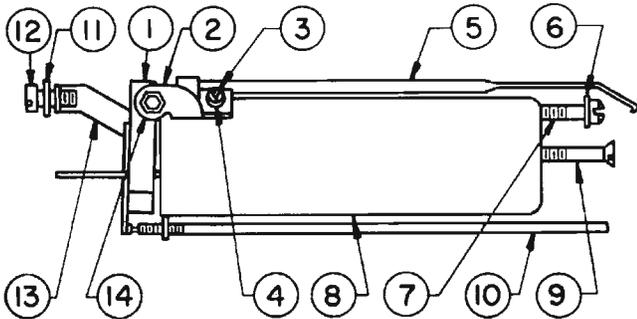
Item No.	Piece No.	Description
1	1086	Armature
2	62503	Armature Support
3	63970	R.H. Mach. Screw
4	59312	Lock Washer
5	2233	Hook
6	54370	Spring Washer
7	68253	Fil. H.M. Screw
8	64025	Shell
9	68102	Spec. F.H. Mach. Screw
10	62502	Pivot Screw Assembly

500 Type—With Code and Regular Night Alarm Contacts

JACK ASSEMBLIES AND DROP ASSEMBLIES

Code No.	Jack Assembly	Drop Assembly
504	P-68607	P-68560
508	P-68337	P-68560

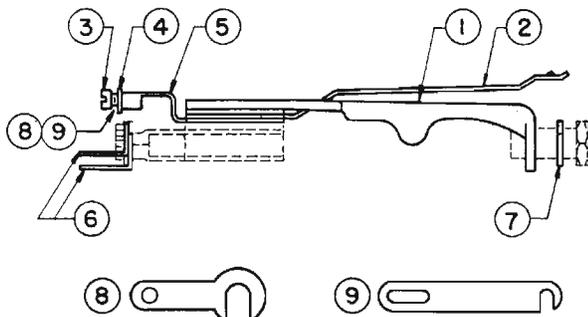
PIECE PARTS FOR CODE AND N.A. CONTACT TYPE



Item No.	Piece No.	Description
1	4813	Armature
2	62503	Armature Support
3	63970	R. Hd. Mach. Screw
4	59312	Lock Washer
5	2233	Hook
6	54370	Spring Washer
7	68253	Fil. H.M. Screw
8	64057	Shell
9	68102	Spec. Fl. Hd. M. Screw
10	68326	Contact Screw Assembly
11	64015	Lock Washer
12	68303	Flat Fil. Hd. M. Screw
13	64058	Terminal
14	62502	Pivot Screw Assembly

Parts Common to All Jack Assemblies

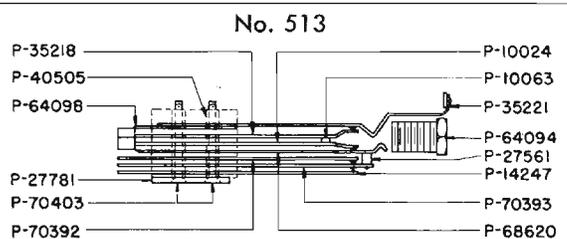
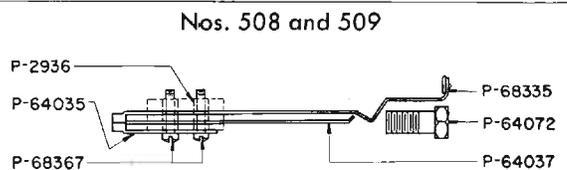
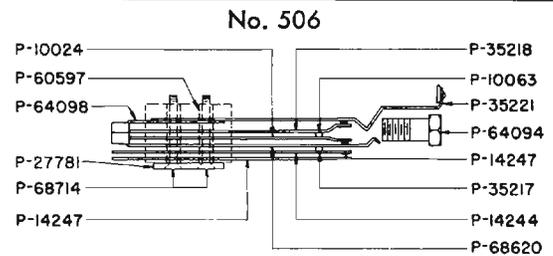
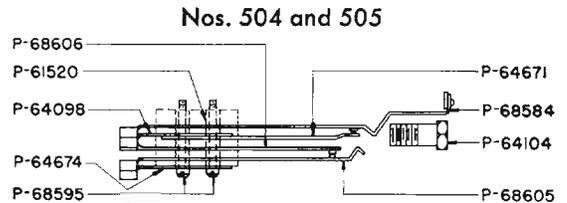
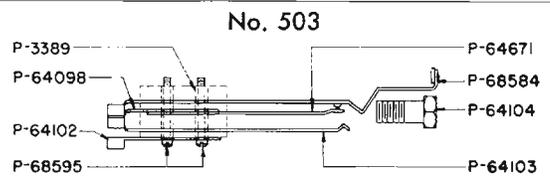
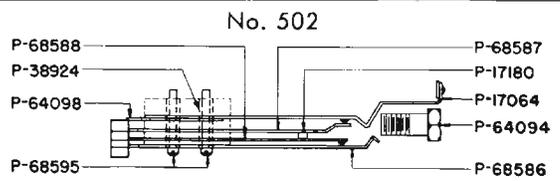
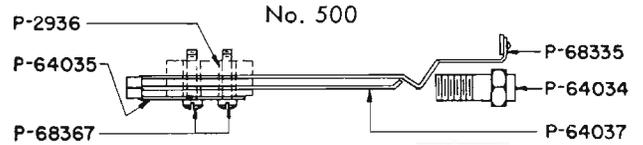
For parts list see next column.



Parts Common to All Jack Assemblies

Item No.	Piece No.	Description
1	64039	Frame
2	39474	Contact Spring Assembly
3	68303	Fil. H.M. Screw
4	64015	Lock Washer
5	64036	Terminal
6	66961	Terminal
7	10001	Washer
8	14154	Terminal
9	30336	Connector

Spring Assembly Parts for Jack Assemblies



GENERATORS

Switchboard Operator's Type

NOS. 63 AND 72

Telephone Subscriber's Type

NOS. 15, 53, AND 75

No. 15

All parts for the No. 15 generator are the same as those shown for the No. 72 except those special parts shown below:

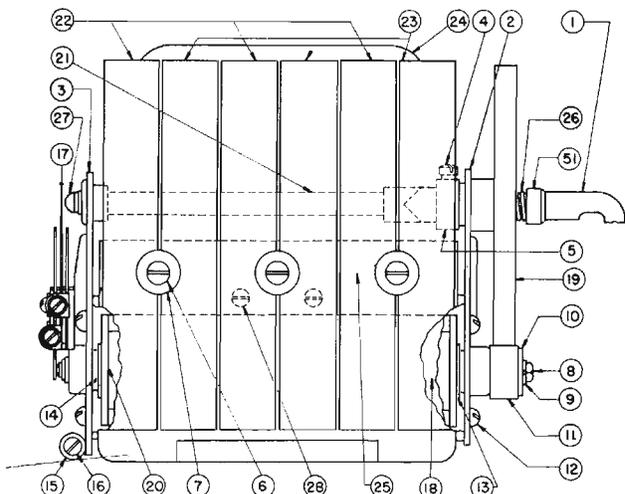
Item No.	Pc. No.	Description
17	42687	Spring Assembly
51	3272	Stop Collar
18	4415	Pole Pieces
20	12973	Armature Assembly
21	51527	Shaft Assembly
23	7732	Shaft Insulation
24	3266	Spring
25	4748	Mounting

No. 53

All parts for the No. 53 generator are the same as those shown for the No. 72 except those special parts shown below:

Item No.	Pc. No.	Description
17	42687	Spring Assembly
51	3272	Stop Collar
19	3267	Gear Assembly
21	51515	Shaft Assembly
25	13461	Mounting Bracket

No. 75 Generator



Item No.	Pc. No.	Description
1	15911	Crank Assembly
2	12172	End Bracket Assembly
3	12175	End Bracket Assembly
4	6021	Fil. H. Mach. Screw
5	3264	Collar
6	16165	F.H.M. Screw
7	39922	Washer
8	28670	Hex. Hd. Mach. Screw
9	54369	Spg. Washer
10	3274	Washer Assembly
11	3273	Pinion
12	14078	R. H. Mach. Screw
13	9893	Washer
14	38400	Washer
15	5019	Washer
16	5026	R. H. Mach. Screw
17	42687	Spring Assembly
51	4630	Stop Collar

Listings continued on page 270

Parts Common to Nos. 63 and 72 Generators

Item No.	Pc. No.	Description
1	15911	Crank Assem.
2	12172	End Bracket Assembly
3	12175	End Bracket Assembly
4	6021	Fil. H. Mach. Screw
5	3264	Collar
6	3668	R. H. Mach. Screw
7	64049	Washer
8	28670	Hex. Hd. Mach. Screw
9	54369	Spg. Washer
10	3274	Washer Assembly
11	3273	Pinion
12	14078	R. H. Mach. Screw
13	9893	Washer
14	38400	Washer
15	5019	Washer
16	5026	R. H. Mach. Screw
17	42679	Spring Assembly
18	13458	Pole Piece Assembly
19	27899	Gear
20	12974	Armature Assembly
21	27900	Shaft Assembly
22	57856	Magnet
	57857	Magnet
	59223	Magnet
51	4630	Stop Collar

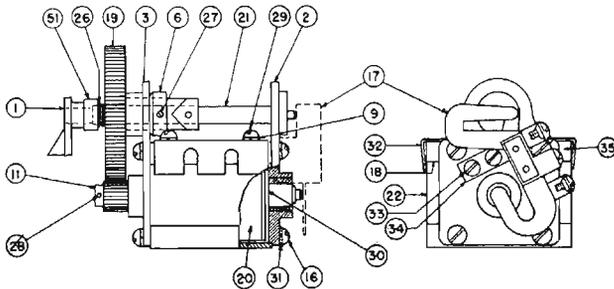
NOTE

Parts for the No. 63 generator are the same as those for the No. 72. The No. 63 generator is the same as the No. 72 except the gear wheels are inverted on the No. 63.

Generators (Cont'd)
No. 75 (Cont'd)

Item No.	Pc. No.	Description
18	39915	Pole Piece Assembly
20	53965	Armature Assembly
21	51525	Shaft Assembly
22	57856	Magnet
23	57857	Magnet
24	39918	Mtg. Bracket
25	39919	Mounting
26	3266	Spring
27	7732	Shaft Insulator
28	15531	F.H.M. Screw

No. GN-38-B (Small Type)



Item No.	Pc. No.	Description
1	GC-9	Crank
2	63695	Bearing Plate Assembly
3	63696	Bearing Plate Assembly
6	63700	Collar
9	54368	Spring Washer
11	63702	Pinion
16	56649	R.H.M. Screw
17	63704	Spring Assembly
51	63699	Spring Retainer
18	63690	Pole Piece
19	63701	Gear
20	63694	Armature Assembly
21	63697	Shaft Assembly
22	63692	Magnet
26	63698	Spring
27	66041	Headless Set Screw
28	63705	Pin
29	66001	R.H.M. Screw
30	63703	Thrust Washer
31	54368	Washer
32	63693	Angle
33	63587	R.H.M. Screw
34	54369	Spring Washer
35	63691	Pole Piece

Handsets

Nos. F-27-C, F-39-C, and F-40-C

Description	Part No.
Mouthpiece	62505
Mouthpiece Ring	55369
Screw (Transmitter)	60788
Handset Body	55367
Ear Cap	58028
Transmitter Assembly	66521
Receiver Assembly	55919
Diaphragm	58015

Handsets (Cont'd)
Nos. 46-C and 47-C

Description	Part No.
Mouthpiece	62505
Mouthpiece Ring	55369
Screw (Transmitter)	60788
Handset Body (46-C, 47-C)	64888
Ear Cap (46-C, 47-C)	69426
Trans. Assembly (46-C, 47-C)	66521
Receiver Assembly (46-C, 47-C)	89-A

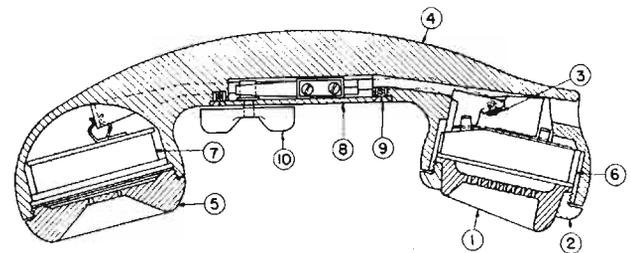
Parts Common to Nos. 32-C and 32-L

Description	Part No.
Handle	44310
Screw	36189
Transmitter Front	36261
Insulator	36262
Transmitter Back Assembly	44407
Transmitter Cup Ins.	36230
Head	44321
Body	44320
Tip	44314
Receiver Assembly	44405

Parts Not Common

Description	Part No.
Transmitter (32-C)	66525
Transmitter (32-L)	66526

No. TS-9



Item No.	Part No.	Description
1	63848	Mouthpiece
2	63849	Ring
3	63850	Screw
4	60942	Handset Body
5	67276	Cap, Ear
6	66523	Transmitter
7	83-B	Receiver
8	67817	Switch Assembly
9	62653	Screw
10	60948	Lever

PIECE PARTS

Every effort has been made to include in this Piece Part Section all piece parts normally required by operating companies. Not all parts available are shown in this section, and these parts are in two groups.

Not shown are components of coded items which are themselves coded items. In other words the code numbers of condensers, handsets, induction coils, etc., used in telephones are not listed but will be found in the Apparatus Section.

Also not shown here are parts which ordinarily are not replaced by operating companies. Included in this group are parts such as rollers, cam assemblies, and frames for cam keys, etc.

KEYS, CAM
NO. 1000 TYPE

Replaceable parts for No. 1000 type cam keys which are common to all keys of this type are shown in the list below.

Description	Piece No.
Cam Handle (Black—Standard)	15171
Cam Handle (Red)	17078
Cam Handle (White)	62607
Cam Handle (Yellow)	63980
Dust Protector Washer (Felt)	32690
Dust Protector Washer (Brass)	47557
Cam Stop	46221
Mounting Screw (long—for cam stop side)	49726
Mounting Screw (short)	49724
Nut (for long mtg. screw)	28872
Nut (for short mtg. screw)	28871
Washer (for spring stack-up nut)	29184
Nut (for spring stack-up)	28985

SPECIAL PARTS FOR MISCELLANEOUS NO. 1000 TYPE KEYS

Due to the large quantity of No. 1000 type cam keys of various spring combinations not commonly used, detailed breakdown of parts has been made. Piece parts for these miscellaneous keys should be ordered as follows.

HEAD SIDE

- 19 ——— 9
- 18 ——— 8
- 17 ——— 7
- 16 ——— 6
- 15 ——— 5
- 14 ——— 4
- 13 ——— 3
- 12 ——— 2
- 11 ——— 1

FRAME

- 31 ——— 21
- 32 ——— 22
- 33 ——— 23
- 34 ——— 24
- 35 ——— 25
- 36 ——— 26
- 37 ——— 27
- 38 ——— 28
- 39 ——— 29

SPRINGS

To order replacement springs locate the desired spring on the drawing at the left and order as follows: "Spring No. _____ for key No. _____." It is important that both the item number of the spring and the code number of the key be specified in ordering spring for these keys.

INSULATORS AND SEPARATORS

To order replacement insulators and separators locate the desired part on the drawing and order as follows: "Insulator (Separator) between Springs No. _____ and _____ for key No. _____."

OTHER PARTS

In ordering other parts for these keys specify the code number of the key for which the part is required and give a complete description of the part.

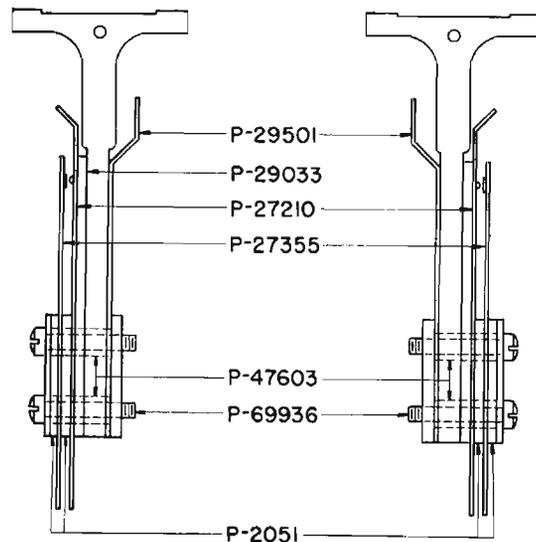
NOTE

NUT SIDE When referring to cam keys "Head Side" indicates the side of the key on which the head of the screw which secures the spring stack-ups appears. The "Nut Side" is the side on which the nut, usually oval or square-shaped, appears.

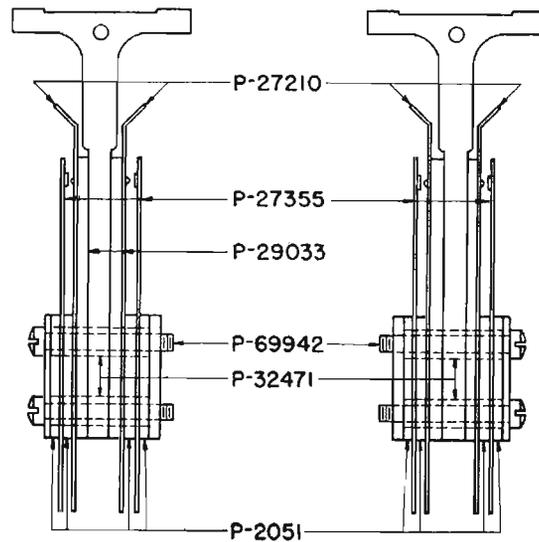
SPECIAL PARTS FOR NO. 1000 TYPE KEYS

Special piece parts for No. 1000 type cam keys most commonly used are shown in the drawings following. For parts for keys not shown in these drawings, see the drawing and description above.

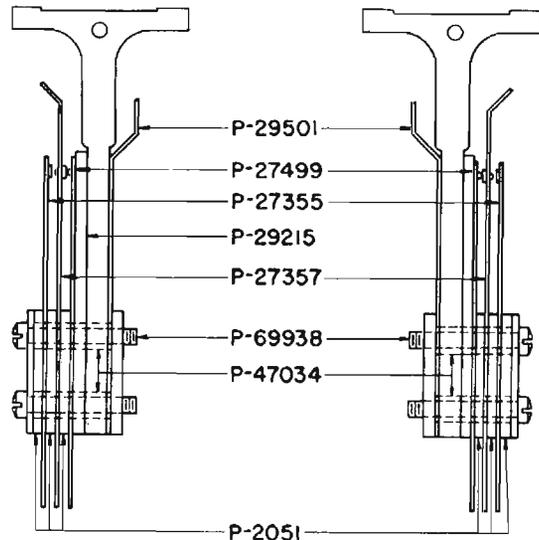
No. 1001



No. 1002

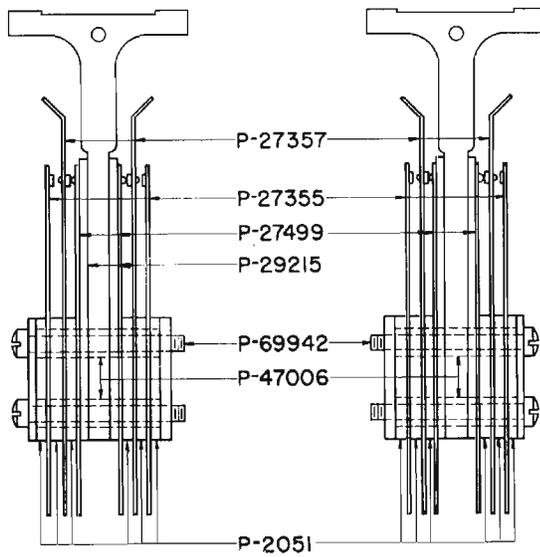


No. 1028

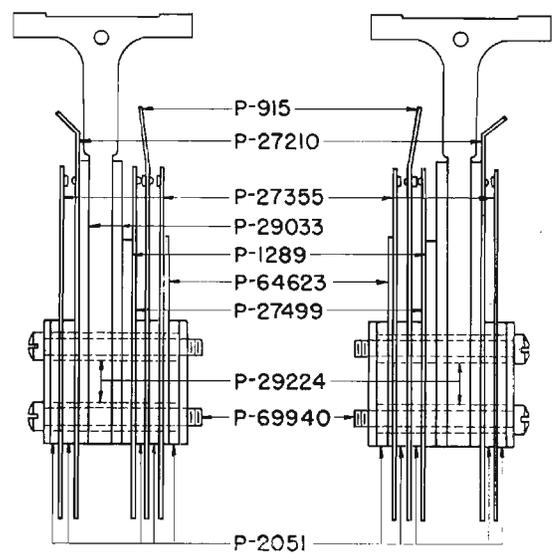


KEYS, CAM (Cont'd)

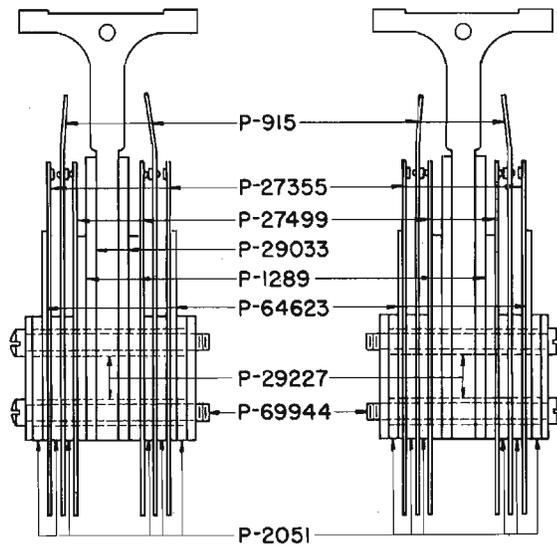
No. 1030



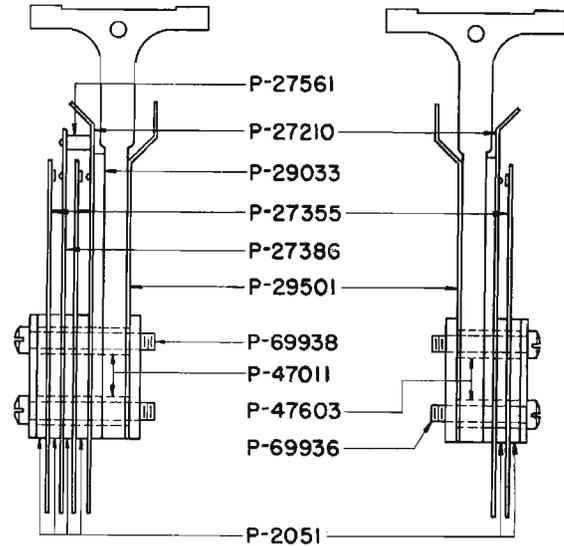
No. 1041



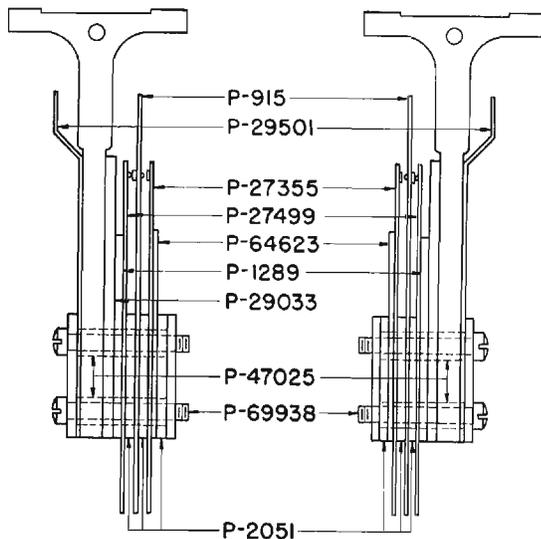
No. 1031



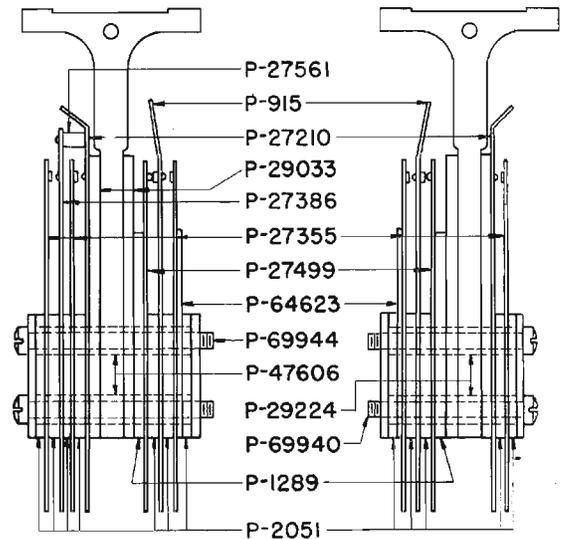
No. 1042



No. 1033



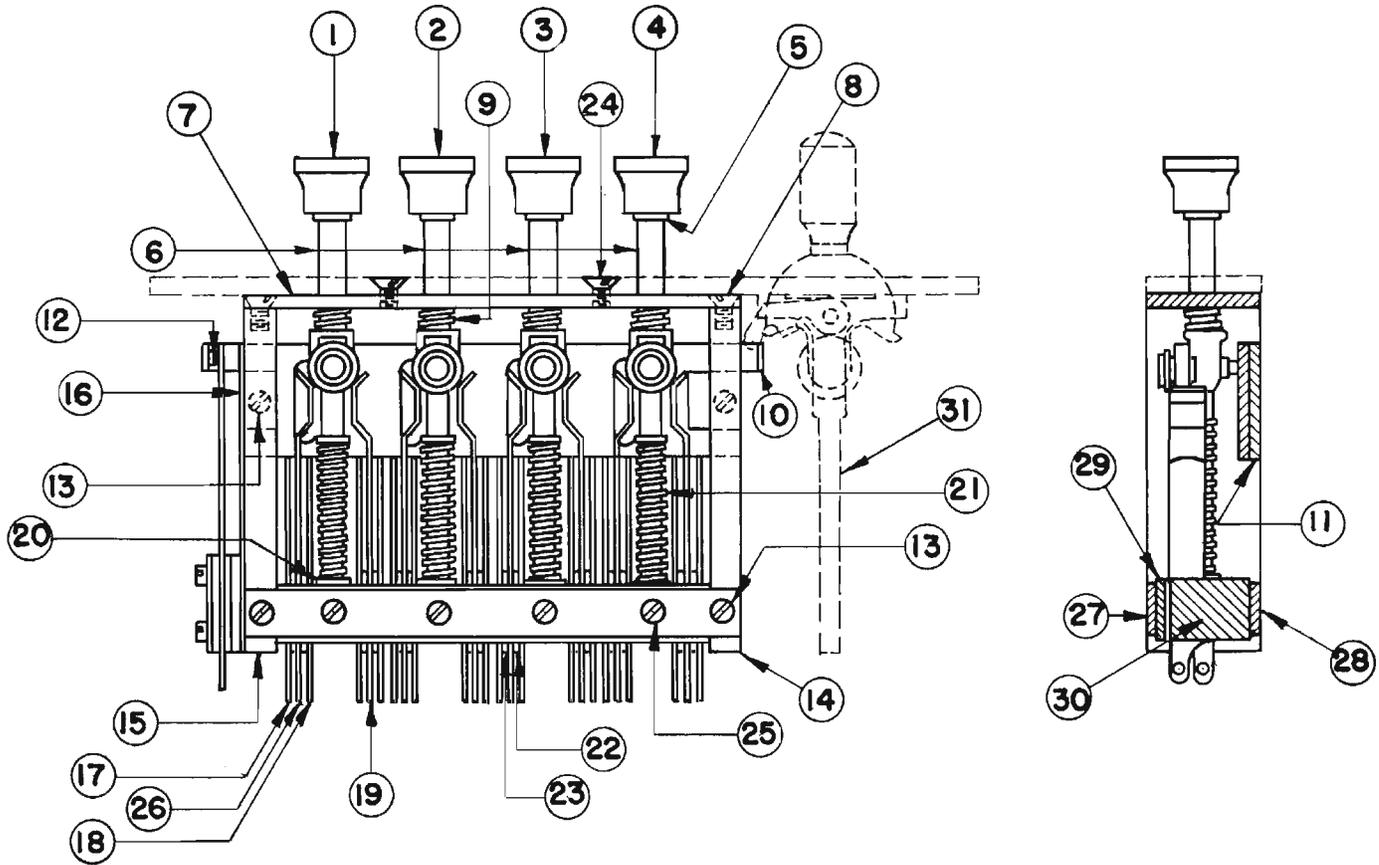
No. 1043



KEYS, PARTY TYPE

Four Party Keys

Code Nos. 265-A, 267-A, and 355-A



COMMON PARTS FOR KEYS
NOS. 265-A, 267-A, AND 355-A

Item No.	Piece No.	Description
1	3992	Button (Black)
2	3993	Button (Green)
3	3994	Button (Red)
4	3995	Button (Blue)
5	55624	Spring Washers
6	27075	Plunger Assembly
7	28769	Mounting Plate
8	6545	Special Screws
9	27052	Spring
10	49757	Release Strip
11	27056	Guide
12	27106	Insulator
13	13238	Special Screw
14	27062	Upright (right)
15	27064	Upright (left)
16	33437	Insulation
17	27079	Spring with Contact
18	27077	Spring with Contact
19	34034	Spring with Contact
20	32275	Washers
21	32276	Springs
22	10200	Insulations
23	3204	Insulations
24	29023	Mounting Screws

PARTS NOT COMMON FOR KEYS
NOS. 265-A, 267-A, AND 355-A

Item No.	For Key Code No.	Piece No.	Description
25	355-A	47169	Special Screw
25	265-A, 267-A	27123	Special Screw
26	355-A	27087	Spring with Contact
27	355-A	34037	Strip (front)
27	265-A, 267-A	27066	Strip (front)
28	355-A	34037	Strip (rear)
28	265-A, 267-A	27068	Strip (rear)
29	355-A	47167	Insulator
29	265-A, 267-A	27069	Insulator
30	355-A	47166	Mounting Block
30	265-A, 267-A	27070	Mounting Block
31			Release key. For parts for these release keys see parts list for cam keys Nos. 1000-A, 1015-A, 1045-A, 1053-A, 1062-A, 1125-A, and 1162-A on pages 275 and 276.

COMMON PARTS FOR KEYS
CODE NOS. 265, 267, AND 355

Common parts for keys Code Nos. 265, 267, and 355 are the same as those for keys Code Nos. 265-A, 267-A, and 355-A above except as shown below.

Item No.	Piece No.	Description
10	32365	Release Strip

Listing Continued on page 274.

KEYS, PARTY TYPE (Cont'd)

**PARTS NOT COMMON FOR KEYS
CODE NOS. 265, 267, AND 355**

Special parts for keys Code Nos. 265, 267, and 355 are the same as those for keys Code Nos. 265-A, 267-A, and 355-A above except as shown below. See Listing, Page 273.

Item No.	Description
31	Release key. For parts for these release keys see parts list for cam keys Nos. 1000, 1044, 1045, 1053, 1062, and 1162 in section following.

**COMMON PARTS FOR KEYS
CODE NOS. 266 AND 310**

Common parts for keys Code Nos. 266 and 310 are the same as those for keys Code Nos. 265-A, 267-A, and 355-A above except as shown below.

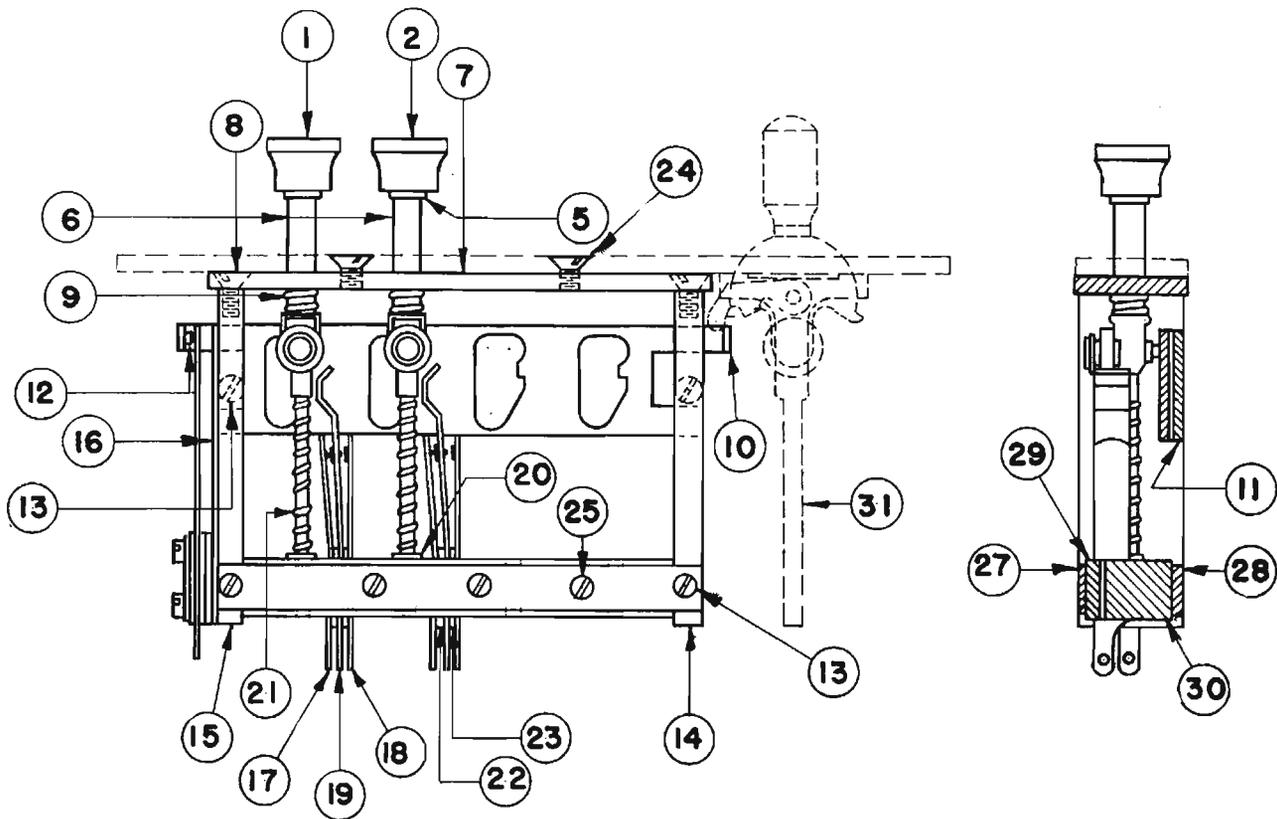
Item No.	Piece No.	Description
10	27126	Release Strip

PARTS NOT COMMON

Special parts for keys Code Nos. 266 and 310 are the same as those for keys Code Nos. 265-A and 267-A listed on page 273 except as shown below.

Item No.	Description
31	Cam key not included

**Two Party Keys
Code Nos. 358-A and 328**



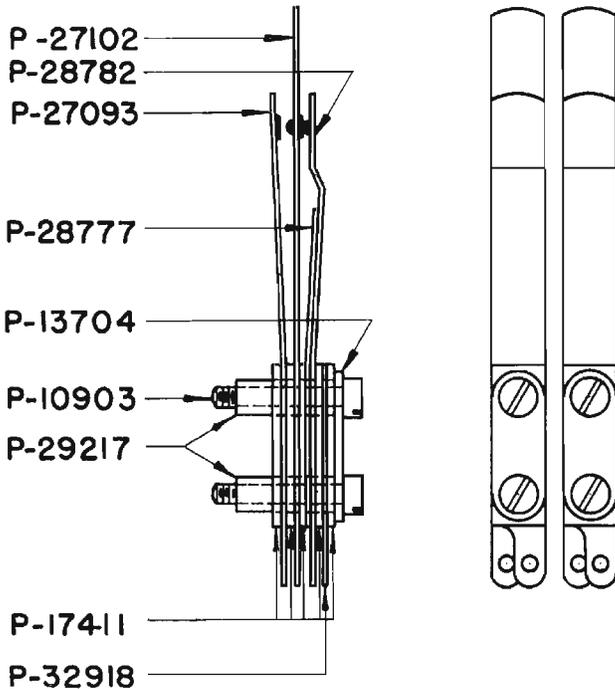
Item No.	For Key Code No.	Piece No.	Description	Item No.	For Key Code No.	Piece No.	Description
1	358-A, 328	3992	Button (Black)	17	358-A, 328	27079	Spring with Contact
2	358-A, 328	3994	Button (Red)	18	358-A, 328	27077	Spring with Contact
5	358-A, 328	55624	Spring Washer	19	358-A, 328	34034	Spring with Contact
6	358-A, 328	27075	Plunger Assembly	20	358-A, 328	32275	Washer
7	358-A, 328	28769	Mounting Plate	21	358-A, 328	32276	Spring
8	358-A, 328	6545	Special Screw	22	358-A, 328	10200	Insulators
9	358-A, 328	27052	Spring	23	358-A, 328	3204	Insulators
10	358-A	49757	Release Strip	24	358-A, 328	29023	Mounting Screws
10	328	27126	Release Strip	25	358-A, 328	27123	Screws
11	358-A, 328	27056	Guide	27	358-A, 328	27066	Strip (front)
12	358-A, 328	27106	Insulator	28	358-A, 328	27068	Strip (rear)
13	358-A, 328	13238	Special Screw	29	358-A, 328	27069	Insulator
14	358-A, 328	27062	Upright (right)	30	358-A, 328	27070	Mounting Block
15	358-A, 328	27064	Upright (left)	31	358-A		All "A" type restoring cam keys.
16	358-A, 328	33437	Insulator	31	328		Not restored by cam key.

KEYS, PARTY TYPE (Cont'd)

End Springs

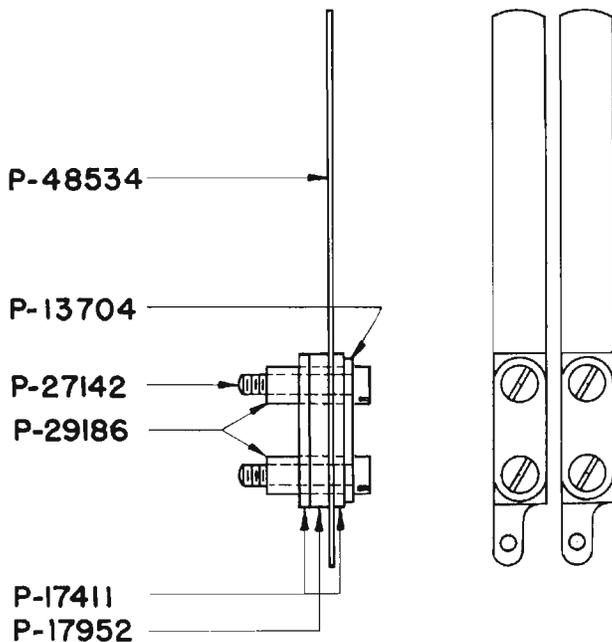
The drawing below shows the piece parts for end springs of the following party type keys.

Code No.	Code No.
265	355
265-A	355-A
266	358-A
328	



The drawing below shows the piece parts for end springs of the following party type keys.

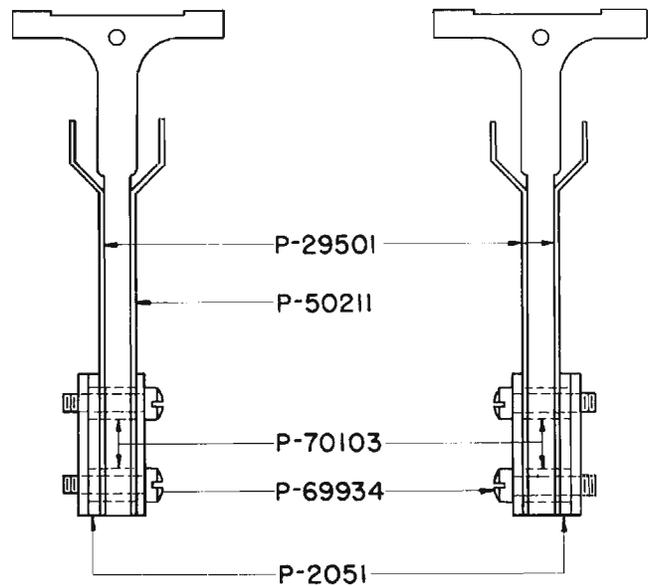
Code No.
267
267-A
310



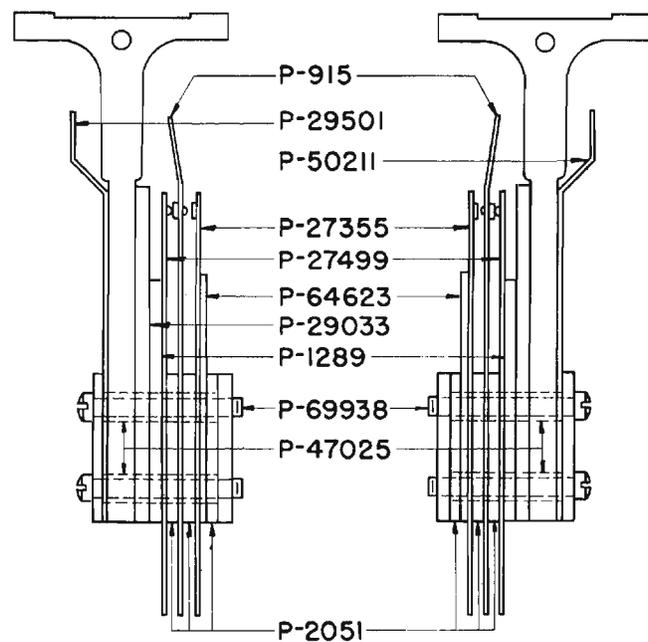
Restoring Cam Keys for Common Parts

Piece No.	Description
15171	Handle
46221	Cam Stop
28871	Nut (for short mounting screws)
49724	Mounting Screw (short)
49726	Mounting Screw (long—for cam stop side)
32690	Dust Protector Washer (felt)
47557	Dust Protector Washer (brass)
28872	Nut (for long mounting screws)

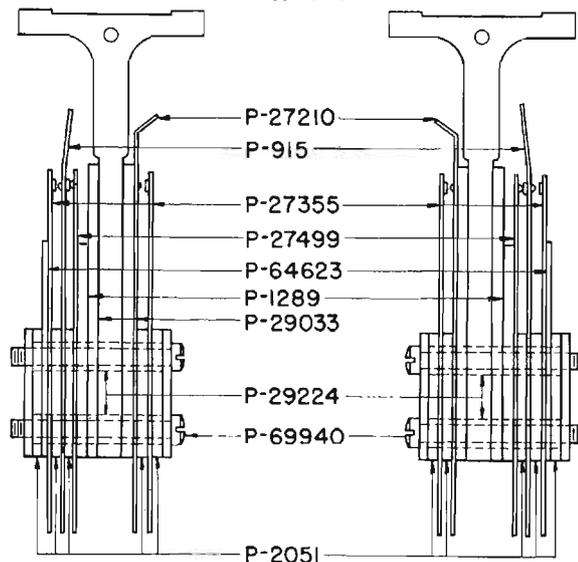
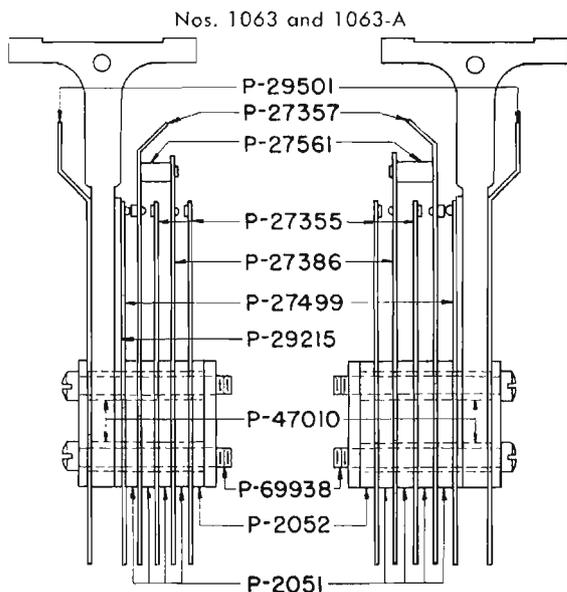
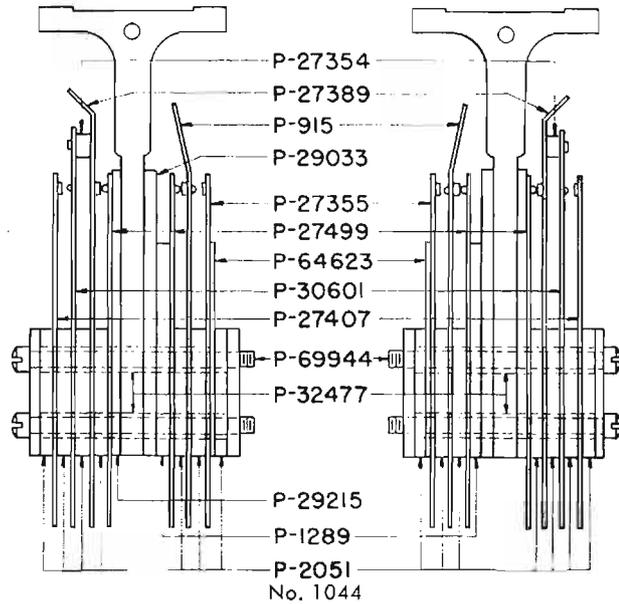
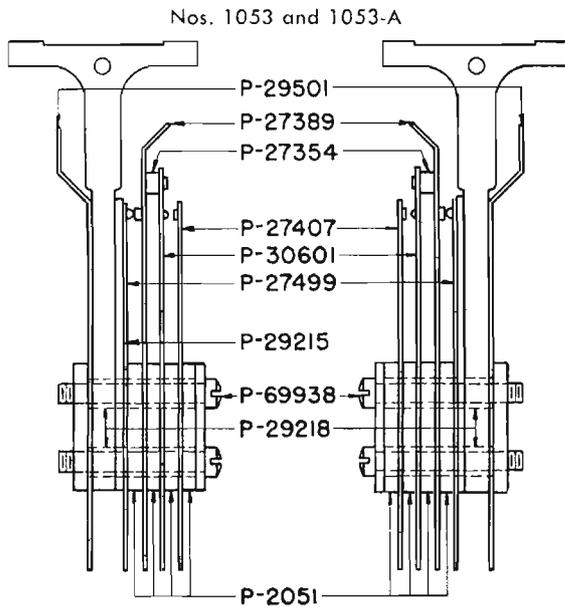
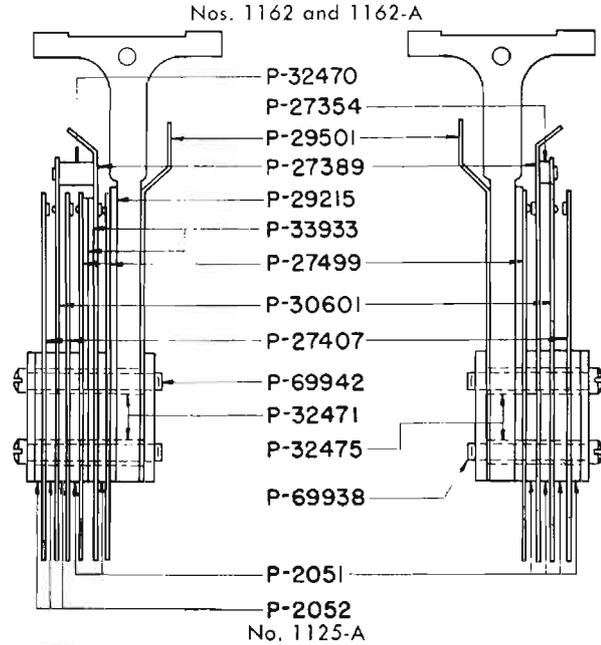
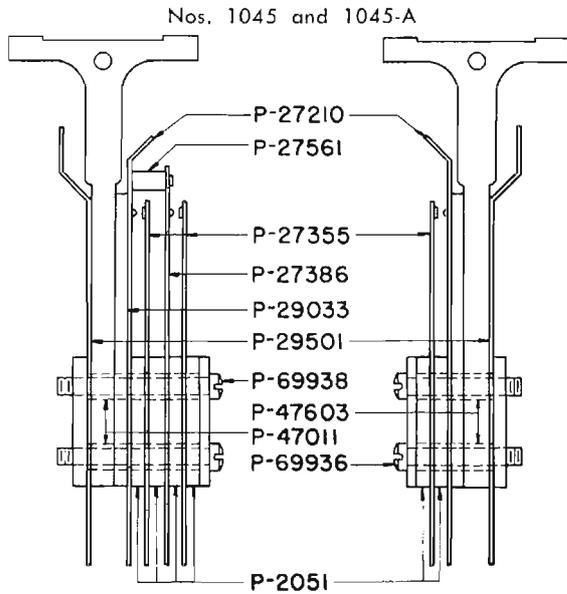
Nos. 1000 and 1000-A



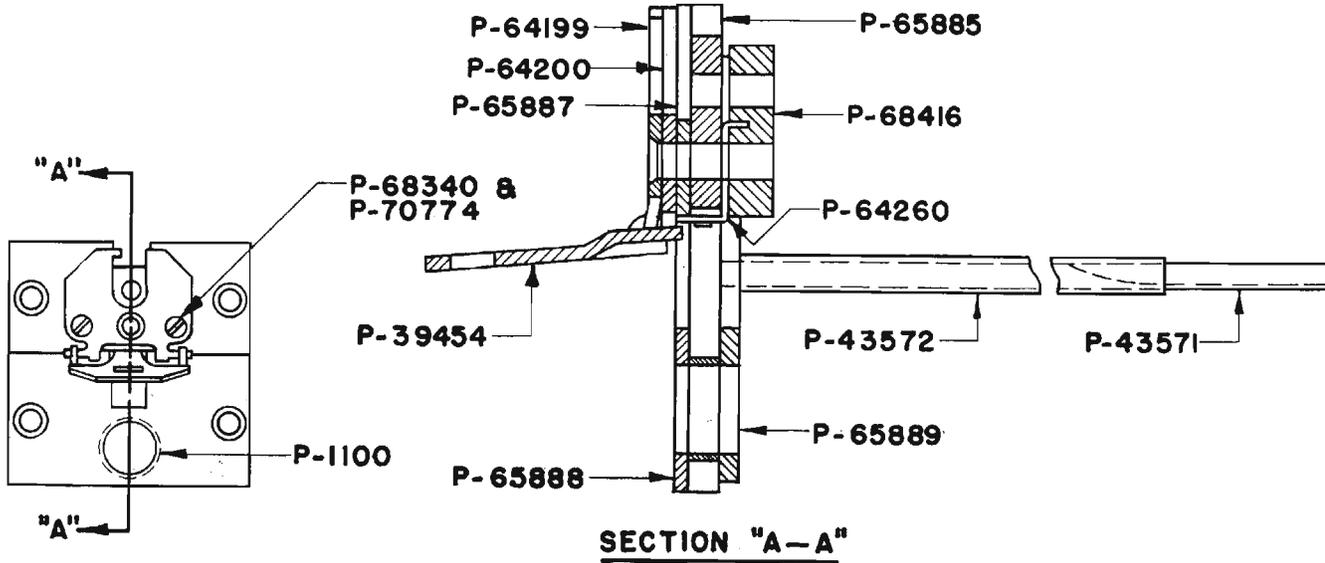
No. 1015-A



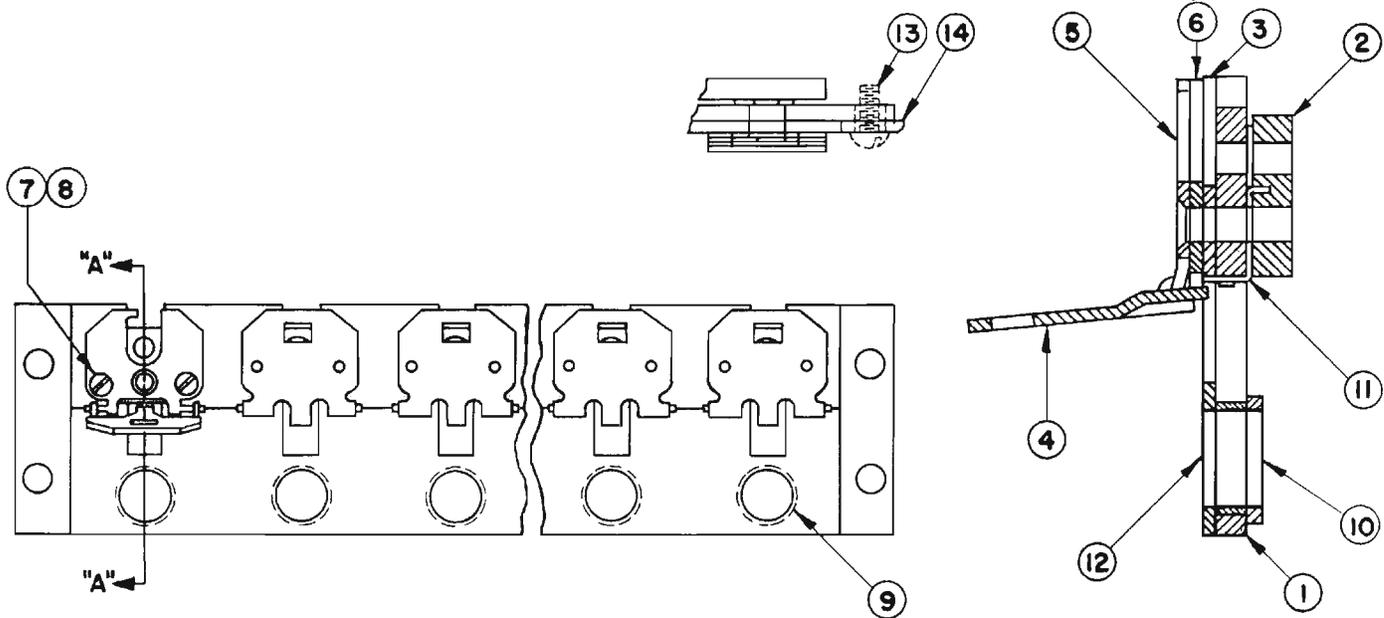
KEYS, PARTY TYPE (Cont'd)
RESTORING CAM KEYS FOR



MOUNTINGS
For Drops and Combined Drops and Jacks
No. 552



Nos. 495, 497, 499, 500, and 502



COMMON PARTS

Item No.	Piece No.	Description
4	39454	Shutter
5	64199	Support
6	64200	Insulator
7	70774	Nut

Item No.	Piece No.	Description
8	68341	F. H. M. Screw
9	1100	Bushing
10	12907	Rear Insulator
11	64260	Contact Terminal Assembly

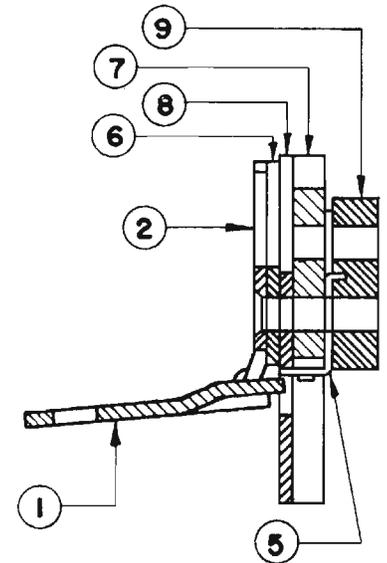
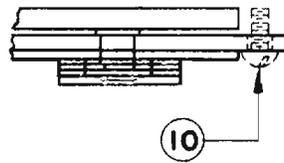
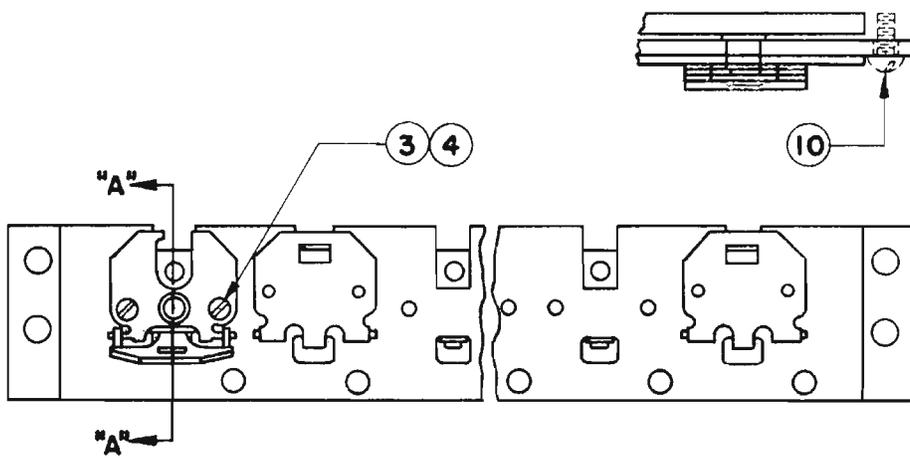
PARTS NOT COMMON

Item No.	Piece No.	Description
1	68003	Mounting Strip
1	68327	Mounting Strip
2	68004	Rear Insulator
2	68328	Rear Insulator
3	64201	Front Insulator
3	64198	Front Insulator
10	12919	Rear Insulator

Mounting Code No.	Item No.	Piece No.	Description	Mounting Code No.
495, 502	12	12928	Front Insulator	495
497, 499, 500	12	29350	Front Insulator	502
495, 502	12	12905	Front Insulator	497, 500
497, 499, 500	12	25858	Front Insulator	499
495, 502	13	37883	R. H. Mach. Screw	500
497, 499, 500	13	58650	R. H. Mach. Screw	495, 497, 499, 502
495, 502	14	28241	Adapter	500

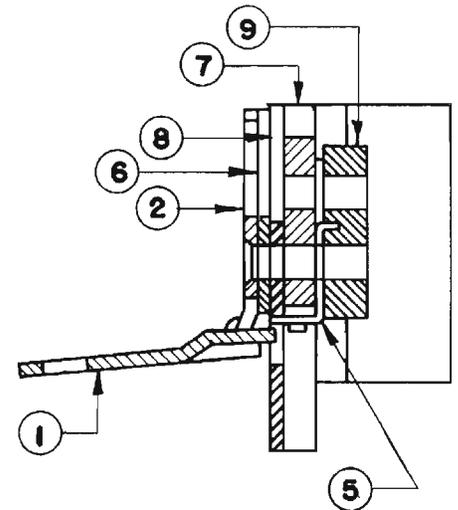
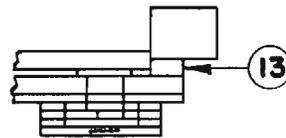
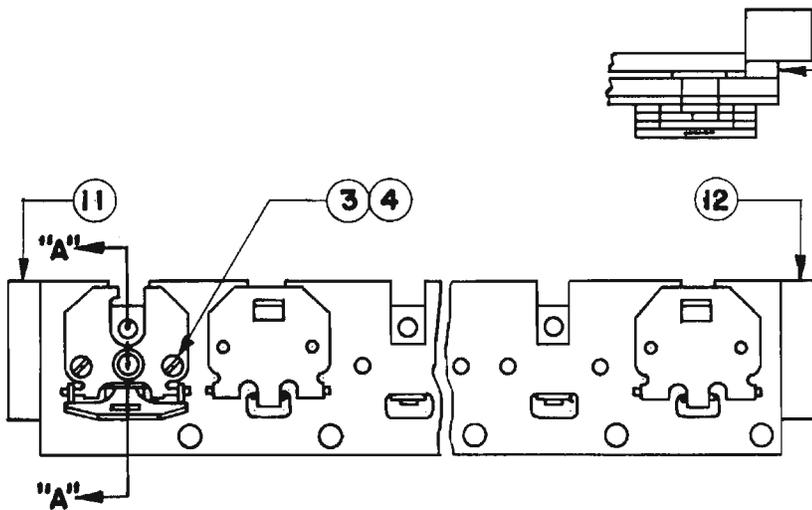
MOUNTINGS (Cont'd)

No. 496



SECTION "A-A"

No. 509



SECTION "A-A"

Nos. 496 and 509

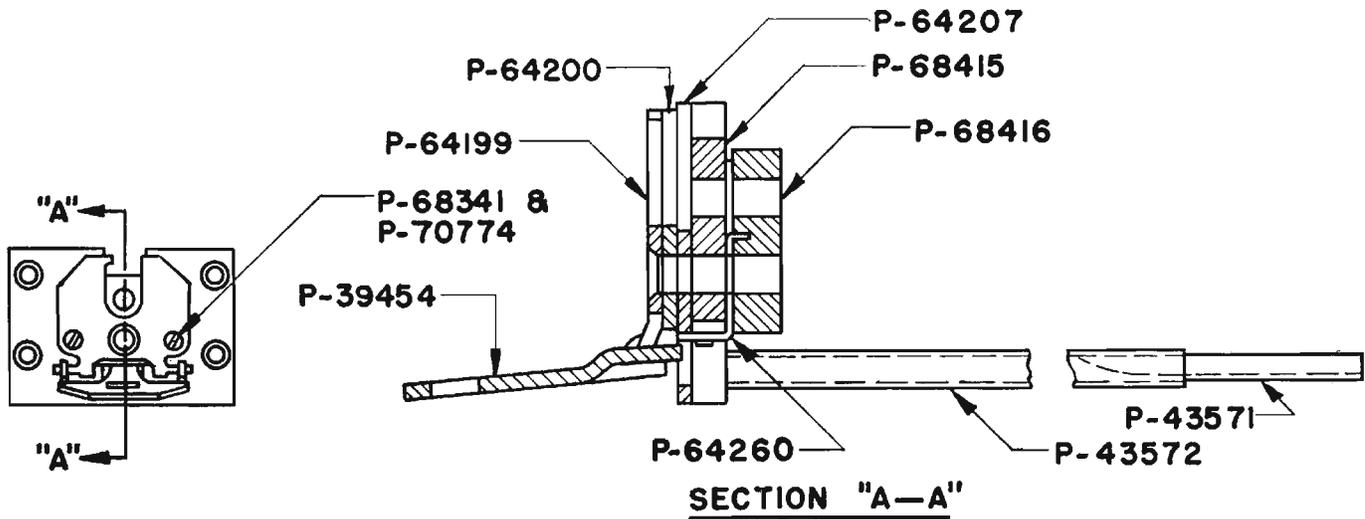
COMMON PARTS

Item No.	Piece No.	Description	Item No.	Piece No.	Description
1	39454	Shutter	4	68341	F. H. M. Screw
2	64199	Support	5	64260	Contact Terminal Assembly
3	70774	Nut	6	64200	Insulator

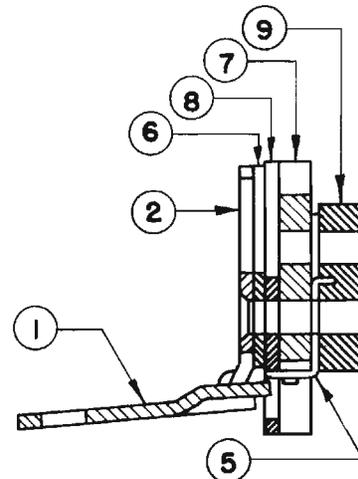
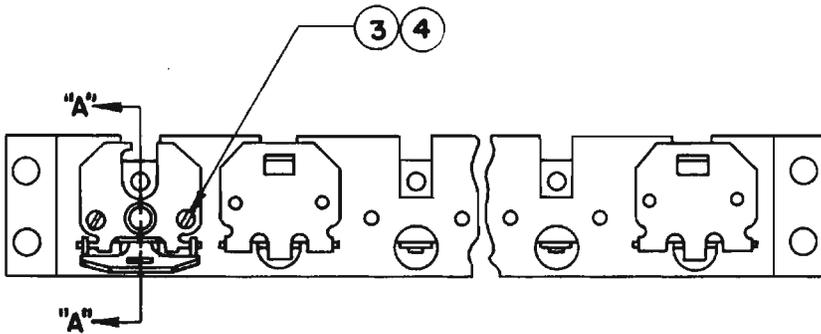
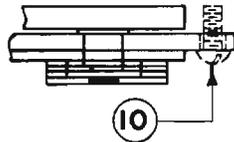
PARTS NOT COMMON

Item No.	Piece No.	Mounting Code No.	Description	Item No.	Piece No.	Mounting Code No.	Description
7	67478	496	Mounting Strip	9	67472	509	Rear Insulator
7	67473	509	Mounting Strip	10	58650	496, 509	R. H. M. Screw
8	64202	496	Front Insulator	11	29336	509	Lug
8	64204	509	Front Insulator	12	29337	509	Lug
9	68379	496	Rear Insulator	13	29177	509	Separator

MOUNTINGS (Cont'd)
No. 506



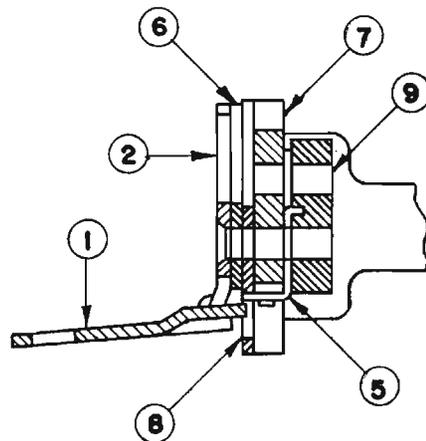
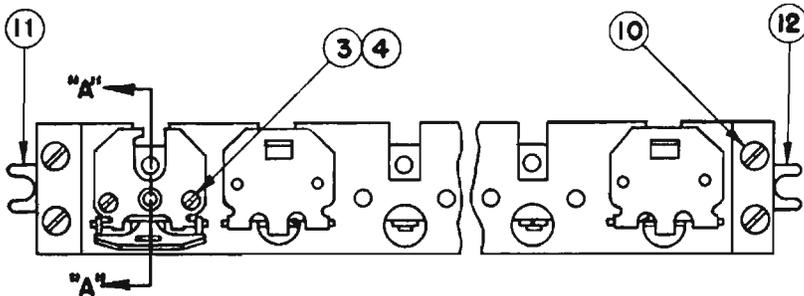
Nos. 494, 504, 507, 508, and 510



SECTION "A-A"

For piece part lists see next page, 280.

No. 505



SECTION "A-A"

For piece part lists see next page, 280.

MOUNTINGS (Cont'd)

Nos. 494, 504, 505, 507, 508, and 510

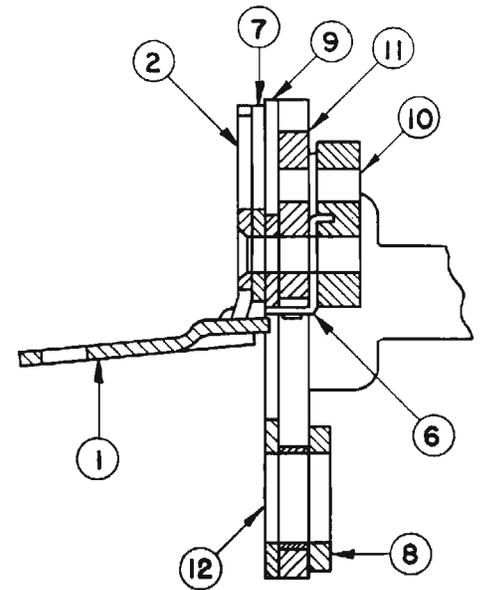
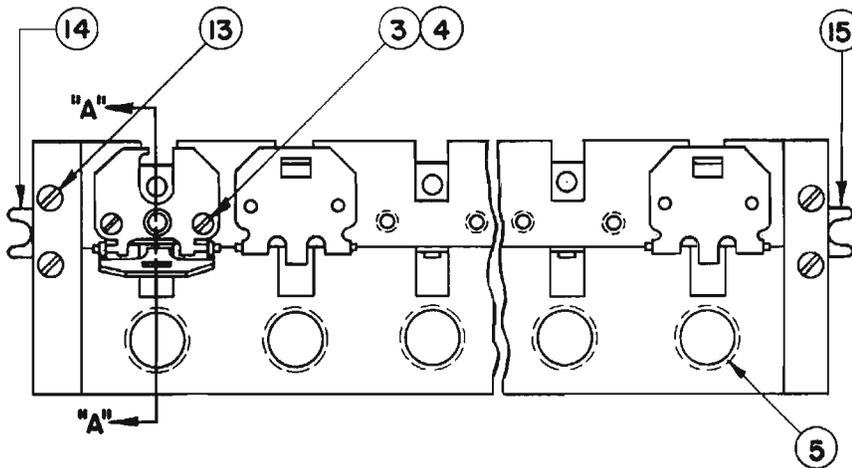
COMMON PARTS

Item No.	Piece No.	Description	Item No.	Piece No.	Description
1	39454	Shutter	4	68341	F. H. M. Screw
2	64199	Support	5	64260	Contact Terminal Assembly
3	70774	Nut	6	64200	Insulator

PARTS NOT COMMON

Item No.	Piece No.	Mounting Code No.	Description	Item No.	Piece No.	Mounting Code No.	Description
7	68377	504, 508	Mounting Strip	9	68328	504, 508	Rear Insulator
7	68412	510	Mounting Strip	9	68413	510	Rear Insulator
7	68313	494	Mounting Strip	9	68004	494, 505	Rear Insulator
7	68378	507	Mounting Strip	9	68379	507	Rear Insulator
7	68409	505	Mounting Strip	10	58650	504, 510, 494, 507, 508	R. H. M. Screw
8	64206	504	Front Insulator	10	69191	505	F. H. M. Screw
8	64209	510	Front Insulator	11	68403	505	Lug (left)
8	64205	494, 505	Front Insulator	12	68404	505	Lug (right)
8	64208	507	Front Insulator				
8	64203	508	Front Insulator				

Nos. 498 and 503



SECTION "A-A"

COMMON PARTS

Item No.	Piece No.	Description	Item No.	Piece No.	Description
1	39454	Shutter	6	64260	Contact Terminal Assembly
2	64199	Support	7	64200	Insulator
3	70774	Nut	8	12919	Rear Insulator
4	68341	F. H. M. Screw	9	64201	Front Insulator
5	1100	Bushing	10	68004	Rear Insulator

PARTS NOT COMMON

Item No.	Piece No.	Mounting Code No.	Description	Item No.	Piece No.	Mounting Code No.	Description
11	68402	498	Mounting Strip	13	69191	498, 503	F.H.Mach.Screw
11	68406	503	Mounting Strip	14	68403	498, 503	Lug (left)
12	12917	498	Front Insulator	15	68404	498, 503	Lug (right)
12	60268	503	Front Insulator				

NOTE

In ordering piece parts for the above mountings for drops and combined drops and jacks the piece part number must be included with the order. Do not order by item number as

shown on the above drawings. Determine the corresponding piece part number from the lists accompanying the drawings and order by that number.

PLUGS

SWITCHBOARD TYPE				OPERATORS' TYPE				
Code No.	Cover	Cover Screw	Terminal Screw	Code No.	Cover	Cover Screw	Terminal Screw	Washer
42	7960	899	1998	201**	71311	71312	27043	
55	7960	899	1998	233	59881	59885	59884	
70	7960	899	1998	235	61872	61874	61873	
109	7960	899	1998	268	62266	---	62235	
112	7960	899	1998	* Old Type				
130	7960	899	1998	**New Type (has over-all shell)				
144	30109	899	1998	OPERATORS' TYPE				
187	32156	899	1998	Code No.	Cover	Cover Screw	Terminal Screw	Washer
247	59769	59790	59791	107	3240	1464	8924	
255	66236	---	62235	136	6209	1464	899	
106*	1807	899	27043 & 899	139	29849	14955	29032	
106**	71310	71312	8924	145			4069	5019
137	1807	899	27043	146			4069	5019
152	1807	899	27043	182			7025	12582
185	59944	59887	62235	236	67209	67239	67229	67211
199	27603	27115	27043	240	49675	14955	27043	
201*	27603	27115	27043	245			56957	5019

POLE CHANGERS

Vibrator assembly piece numbers and contact stud and spring assembly piece numbers are shown below for all Kellogg pole changers shown in the Apparatus Section. For parts other than those listed consult the Kellogg sales department.

Pole Changer Code Number	Position	Frequency	Vibrator Assembly No.
39	1	16 $\frac{2}{3}$ cycles	59267
	2	33 $\frac{1}{3}$ cycles	59266
	4	50 cycles	59264
	5	66 $\frac{2}{3}$ cycles	59265
	41	-	20 cycles
42	1	16 cycles	59267
	2	30 cycles	59266
	3	42 cycles	59265
	4	54 cycles	59264
	5	66 cycles	59263
43	-	60 cycles	59263
44	1	16 cycles	61884
&	2	30 cycles	69541
	3	42 cycles	69542
45	4	54 cycles	69543
	5	66 cycles	69544
	-	16 cycles	61884

**Vibrator Assembly Parts
Piece No. 59263**

Piece No.	No. of Pieces	Description
59253	1	Armature assembly
11962	1	Motor contact stud
67686	1	Transformer contact stud
7437	1	Spring assembly (motor contact)
66604	2	Spring assembly (transformer contact)
59256	2	Coil assembly
59280	1	Weight
53881	1	Screw (weight)
59281	1	Weight (nut)

Piece No. 59264

Piece No.	No. of Pieces	Description
59253	1	Armature assembly
11962	1	Motor contact stud
67686	1	Transformer contact stud
7437	1	Spring assembly (motor contact)
66604	2	Spring assembly (transformer contact)
59257	2	Coil assembly
59282	1	Weight
13241	1	Screw (weight)
59283	1	Weight (nut)

POLE CHANGERS (Cont'd)

Piece No. 59265

Piece No.	No. of Pieces	Description
60274	1	Armature assembly
11962	1	Motor contact stud
67686	1	Transformer contact stud
7437	1	Spring assembly (motor contact)
66604	1	Spring assembly (transformer contact)
59257	2	Coil assembly
59282	2	Weight
8782	1	Screw (weight)
59283	1	Weight (nut)

Piece No. 59266

Piece No.	No. of Pieces	Description
59255	1	Armature assembly
11962	1	Motor contact stud
67686	1	Transformer contact stud
7437	1	Spring assembly (motor contact)
66604	2	Spring assembly (transformer contact)
59258	2	Coil assembly
8807	1	Weight
13699	1	Screw (weight)
8809	1	Weight (nut)

Piece No. 59267

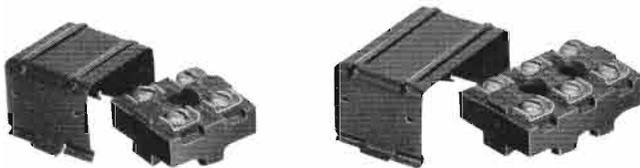
Piece No.	No. of Pieces	Description
59254	1	Armature assembly
11962	1	Motor contact stud
67686	1	Transformer contact stud
7437	1	Spring assembly (motor contact)
66604	2	Spring assembly (transformer contact)
59259	2	Coil assembly
31124	5	Washer (weight)
31126	3	Washer (weight)
31128	5	Washer (weight)
7410	1	Washer (weight)
8807	1	Weight
13699	1	Screw (weight)
48948	1	Weight (nut)

Piece No. 61884

Piece No.	No. of Pieces	Description
59254	1	Armature assembly
11962	1	Motor contact stud
67686	1	Transformer contact stud
7437	1	Spring assembly (motor contact)
66604	2	Spring assembly (transformer contact)
70769	2	Coil assembly
8807	1	Weight
13699	1	Screw (weight)
7409	1	Weight (nut)

RACKS, CONNECTING

Nos. 25-A and 25-B



COMMON PARTS

Description	Part No.
Screw	58885
Clip	58884

PARTS NOT COMMON

For No. 25-A	
Block	58881
Cover	58887
For No. 25-B	
Block	58889
Cover	58882

RECEIVERS

No. F-41-A

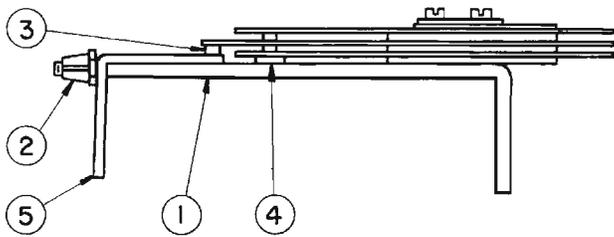


Description	Piece No.
Diaphragm	58015
Shell	27944
Cap	32307
Coil Assembly	45210
Coil Assembly	45211
Cord	F-644-TR

No. 87-A

Description	Piece No.
Cap	59891
Diaphragm	59918
Coil Assembly	66597
Shell Assembly	66290
Screw	59913

RELAYS
2000 Type



Parts Common to All 2000 Type Relays

Item No.	Piece No.	Description
1	28368	Frame Assembly
2	1287	Armature Nut

Special Parts

Item No.	Description
3	Armature Tip Bushing
4	Spring Stop Bushing
5	Armatures (see armature ordering information below)

How to Order

To order special parts for 2000 type relays the order should read as follows:

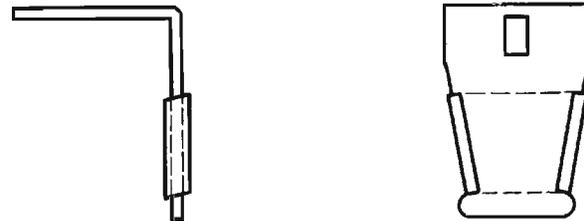
Item 3 (2091 relay)—when armature tip bushing for 2091 relay is desired.

Item 4 (2091 relay)—when spring stop bushing for 2091 relay is desired.

Armature Ordering Information

The armatures shown at the right are interchangeable for all 2000 type relays to conform with various circuit conditions. In ordering specify the type desired.

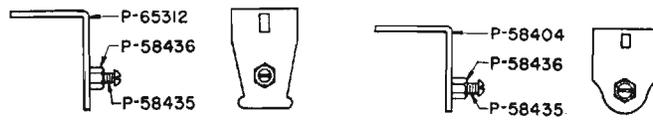
Armature Types
STANDARD, A, B, AND C ARMATURES



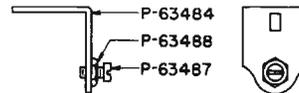
Residual Clip	Thickness	Piece No.
Standard	.010 in.	65319
A	.006 in.	65320
B	.003 in.	65321
C	None	65311

P-65314

P-61364



P-63484



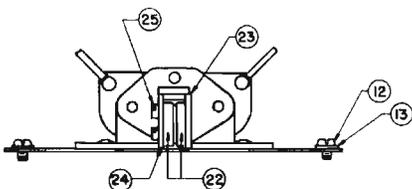
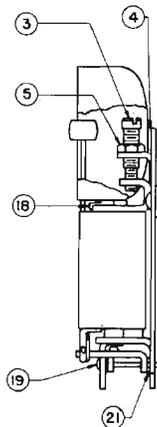
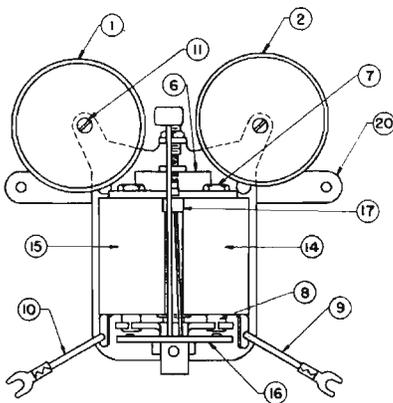
RINGERS
No. 120-Type
Nos. 120, 122 and 123

PARTS COMMON TO ALL 120-TYPE RINGERS

Item No.	Piece No.	Description
1	64935	Gong
2	64934	Gong
3	64936	Adjusting Screw
4	70893	Lock Washer
5	64953	Hex. Nut
6	64919	Magnet & Bracket Assembly
7	70301	Locknut
8	64923	Core
9	64964	Wire Assembly
10	64963	Wire Assembly
11	70892	R.H.M. Screw
12	64871	Screws
13	64965	Lock Washers

OTHER PARTS FOR NO. 120-TYPE BIASED RINGERS

Item No.	Code No.	Piece No.	Description
14	120-BA	64945	Coil Assembly
	120-BB	68841	Coil Assembly
	120-BC	68843	Coil Assembly
15	120-BA	64944	Coil Assembly
	120-BB	68840	Coil Assembly
	120-BC	68842	Coil Assembly
16	120-BA, BB, BC	64927	Armature & Clapper Assembly
17	120-BA, BB, BC	64925	Bias Spring Stud
18	120-BA, BB, BC	64924	Bias Stud Retaining Spring
19	120-BA, BB, BC	64937	Pin
20	120-BA, BB, BC	70487	Base Assembly
21	120-BA, BB, BC	64952	Washer



RINGERS (Cont'd)
120 TYPE (Cont'd)
 For drawing see page 283.

STRAIGHT LINE RINGERS

Item No.	Code No.	Piece No.	Description
14	123-SA	64945	Coil Assembly
	123-SB	68841	Coil Assembly
	123-SC	68843	Coil Assembly
15	123-SA	64944	Coil Assembly
	123-SB	68840	Coil Assembly
	123-SC	68842	Coil Assembly
16	123-SA,SB&SC	68930	Armature & Clapper Assembly
20	123-SA,SB&SC	70487	Base Assembly
21	123-SA,SB&SC	64952	Washer

ARMATURE WITH WEIGHT

Item No.	Code No.	Piece No.	Code No.	Piece No.	Code No.	Piece No.
16	HA-1	71720	HB-1	71725	HC-1	71730
	HA-2	71721	HB-2	71726	HC-2	71731
	HA-3	71722	HB-3	71727	HC-3	71732
	HA-4	71723	HB-4	71728	HC-4	71733
	HA-5	71724	HB-5	71729	HC-5	71734

HARMONIC, SYNCHROMONIC & DECIMONIC RINGERS

Item No.	Code No.	Piece No.	Description
14	122-HA-1, HA-2, HA-3, HB-2, HB-3, HA-4, HC-2	68843	Coil Assembly
	122-HB-5, HA-4	68841	Coil Assembly
	HA-5, HB-1, HC-1		
15	122-HA-1, HA-2, HA-3, HB-2, HB-3, HA-4, HC-2	68841	Coil Assembly
	122-HB-5, HA-4, HA-5, HB-1, HC-1	68840	Coil Assembly

Item No.	Code No.	Piece No.	Description
20	122-HA, HB & HC	64916	Base Assemb.
22	122-HA, HB & HC	65920	Spacer
23	122-HA, HB & HC	65928	Clamping Plate
24	122-HA, HB & HC	65919	Washer
25	122-HA, HB & HC	65935	Spec. Fl. Fil. H.M. Screw

NO. 124 TYPE (with Adjustable Armature)

HARMONIC, SYNCHROMONIC AND DECIMONIC

No. 124

PARTS COMMON TO ALL 124-TYPE RINGERS

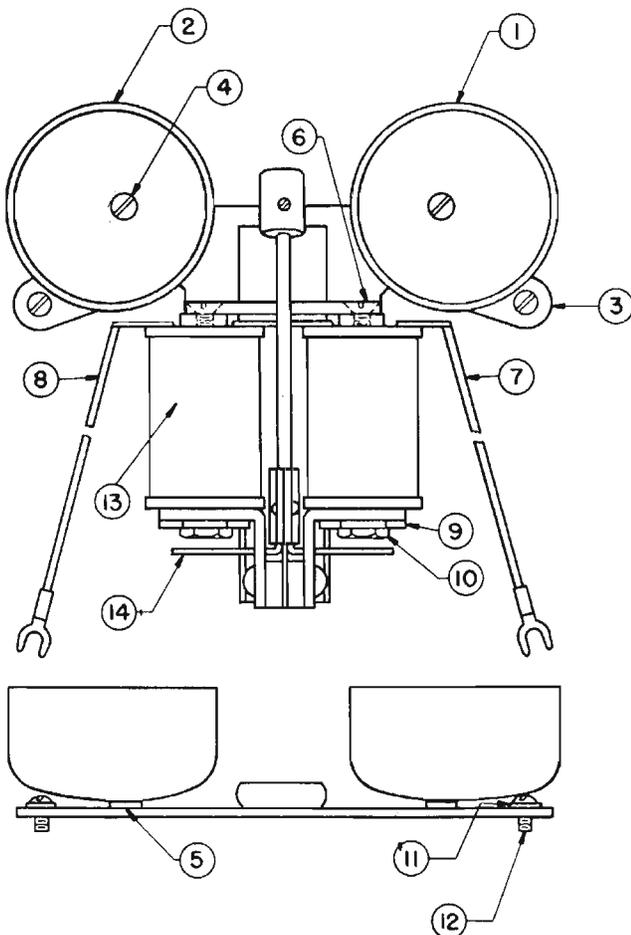
Item No.	Piece No.	Description
1	64934	Gong
2	64935	Gong
3	71163	Magnet and Bracket Assembly
4	70892	R.H.M. Screw
5	70893	Lock Washer
6	56557	F.H.M. Screws
7	71167	Wire Assembly
8	71166	Wire Assembly
9	71129	Spec. Hex. Nut
10	71127	Spec. Hex. H.M. Screw
11	64965	Lock Washers
12	71165	Screws

SPECIAL PARTS FOR 124-TYPE RINGERS

Item No.	Code No.	Piece No.	Description
13	124-HA-1, HA-2, HA-3	71158	Coil Assembly
	124-HB-2, HB-3, HB-4		
	HC-2		
	124-HB-5, HA-5, HB-1,	71159	Coil Assembly and HC-1

PARTS FOR ARMATURE WITH WEIGHT

Item No.	Code No.	Piece No.	Code No.	Piece No.	Code No.	Piece No.
14	HA-1	71383	HB-1	71388	HC-1	71393
	HA-2	71384	HB-2	71389	HC-2	71394
	HA-3	71385	HB-3	71390	HC-3	71395
	HA-4	71386	HB-4	71391	HC-4	71396
	HA-5	71387	HB-5	71392	HC-5	71397



RINGERS (Cont'd)

NO. 125 TYPE (with Adjustable Armatures)

The 125 type ringer is designed to substitute for Stromberg-Carlson and Western Electric ringers. The S-125 ringer is for Stromberg-Carlson ringers in Stromberg-Carlson telephones and the W-125 ringer is for Western Electric No. 302 type ringers in Western Electric telephones.

PARTS COMMON TO ALL 125-TYPE RINGERS

Item No.	Piece No.	Description
1	64934	Gong
2	64935	Gong
3	71238	Magneto and Bracket Assembly
4	70892	R.H.M. Screw
5	70893	Lock Washer
6	71379	F.H.M. Screw
7	71243	Wire Assembly
8	71244	Wire Assembly
9	71129	Spec. Hex. Screw
10	71127	Spec. Hex. H.M. Screw

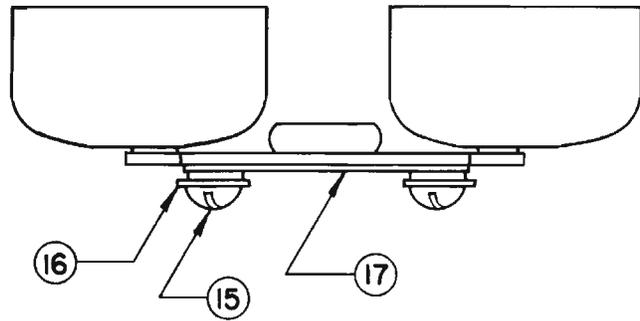
OTHER PARTS FOR S-125 & W-125 RINGER

Item No.	Code No.	Piece No.	Description
13	125-HA-1, HA-2, HA-3 125-HB-2, HB-3, HB-4 HC-2	71158	Coil Assembly
	125-HB-5, HA-5 HB-1, HC-1	71159	Coil Assembly

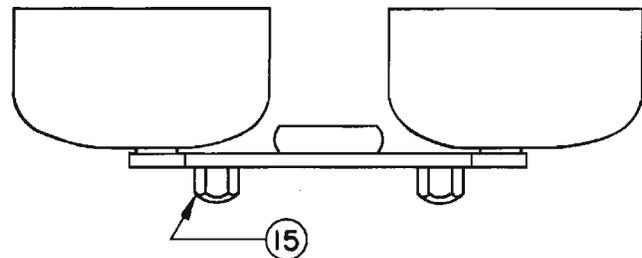
Armature with Weight

Part numbers for armature and weight assemblies for the W-125 ringer are the same as those shown for the 124 ringer on page 284.

No. S-125



No. W-125



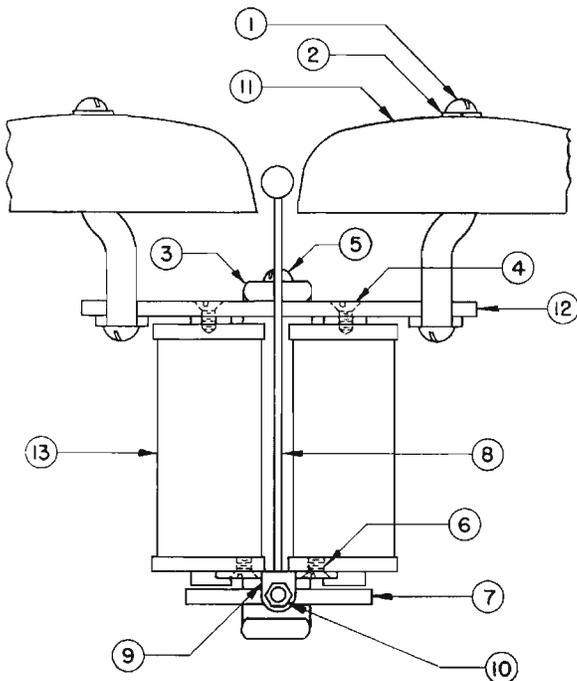
Item No.	Code No.	Piece No.	Code No.	Piece No.	Code No.	Piece No.
14	HA-1	71409	HB-1	71414	HC-1	71419
	HA-2	71410	HB-2	71415	HC-2	71420
	HA-3	71411	HB-3	71416	HC-3	71421
	HA-4	71412	HB-4	71417	HC-4	71422
	HA-5	71413	HB-5	71418	HC-5	71423
15	W-125	71235				Description
15	S-125	56744				Spec. Hex. Hd. M. Screw
16	S-125	71232				R.H.M. Screw
17	S-125	71233				Ext.-Int. Tooth Lockwasher Adapter

**NO. 78 TYPE (with Non-Adjustable Armature)
Nos. 55, 78, and 109**

PARTS COMMON TO ALL NO. 78-TYPE RINGERS

Item No.	Piece No.	Description
1	39400	R.H. Machine Screws
2	46936	Washers
3	12154	Magnet
4	58573	F.H. Machine Screw
5	58572	R.H. Machine Screw
6	12161	F.H. Machine Screw
7	12157	Armature Assembly
8	12195	Clapper Assembly
9	12160	Armature Support Assembly
10	10065	Screw and Nut Assembly

Other parts are shown on page 286.



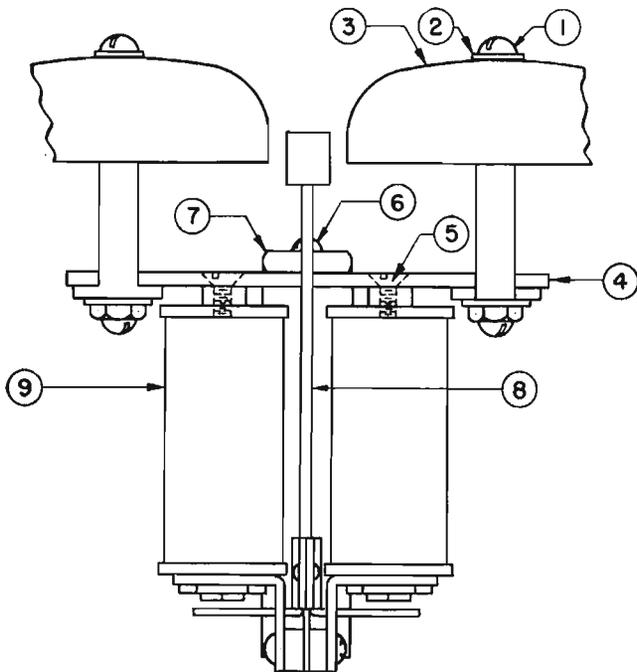
RINGERS (Cont'd)
No. 78 Type

OTHER PARTS FOR NO. 78 TYPE RINGERS

Item No.	Code No.	Piece No.	Description	Item No.	Code No.	Piece No.	Description
11	55-G	53299	Gongs	13	78-A	51098	Coil Assembly
12	55-G	45123	Heel Iron Assembly	13	78-D	51156	Coil Assembly
13	55-G	51140	Coil Assembly	13	78-G	51140	Coil Assembly
11	78-A, 78-D, 78-G	30488	Gongs	11	109-G	2894	Gongs
12	78-A, 78-D, 78-G	50411	Heel Iron Assembly	12	109-G	50412	Heel Iron Assembly
				13	109-G	51140	Coil Assembly

NO. 72 TYPE

Nos. 72, 73, 74, and 101

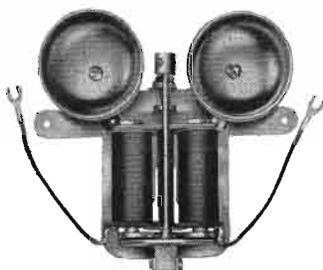


OTHER PARTS FOR NO. 72 TYPE RINGERS

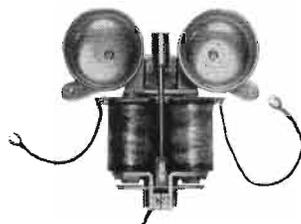
Item No.	Code No.	Piece No.	Description
7	72-A-1, 72-A-4 73-A-1, 73-A-2 73-A-3, 74-A-1 101-A	6705	Magnet
	72-A, 73-A-4 74-A-2	49194	Magnet
8	72-A-1 72-A-2 72-A-3 72-A-4 73-A-1 73-A-2 73-A-3 73-A-4 74-A-1 74-A-2 101-A	6498 6718 6719 6720 15193 15194 15195 15196 15191 15192 43475	Armature Armature Armature Armature Armature Armature Armature Armature Armature Armature Armature
9	72-A-1, 72-A-2 72-A-3, 74-A-2 72-A-4, 74-A-1 101-A 73-A-1, 73-A-2 73-A-3, 73-A-4	61328 61329 51081 51198	Coil Assembly Coil Assembly Coil Assembly Coil Assembly

PARTS COMMON TO ALL NO. 72 TYPE RINGERS

Item No.	Piece No.	Description
1	39400	R.H. Machine Screws
2	46936	Lock Washer
3	30488	Gong
4	42291	Heel Iron Assembly
5	58573	F.H. Machine Screws
6	58572	R.H. Machine Screws



NO. 120 TYPE



NO. 124 TYPE

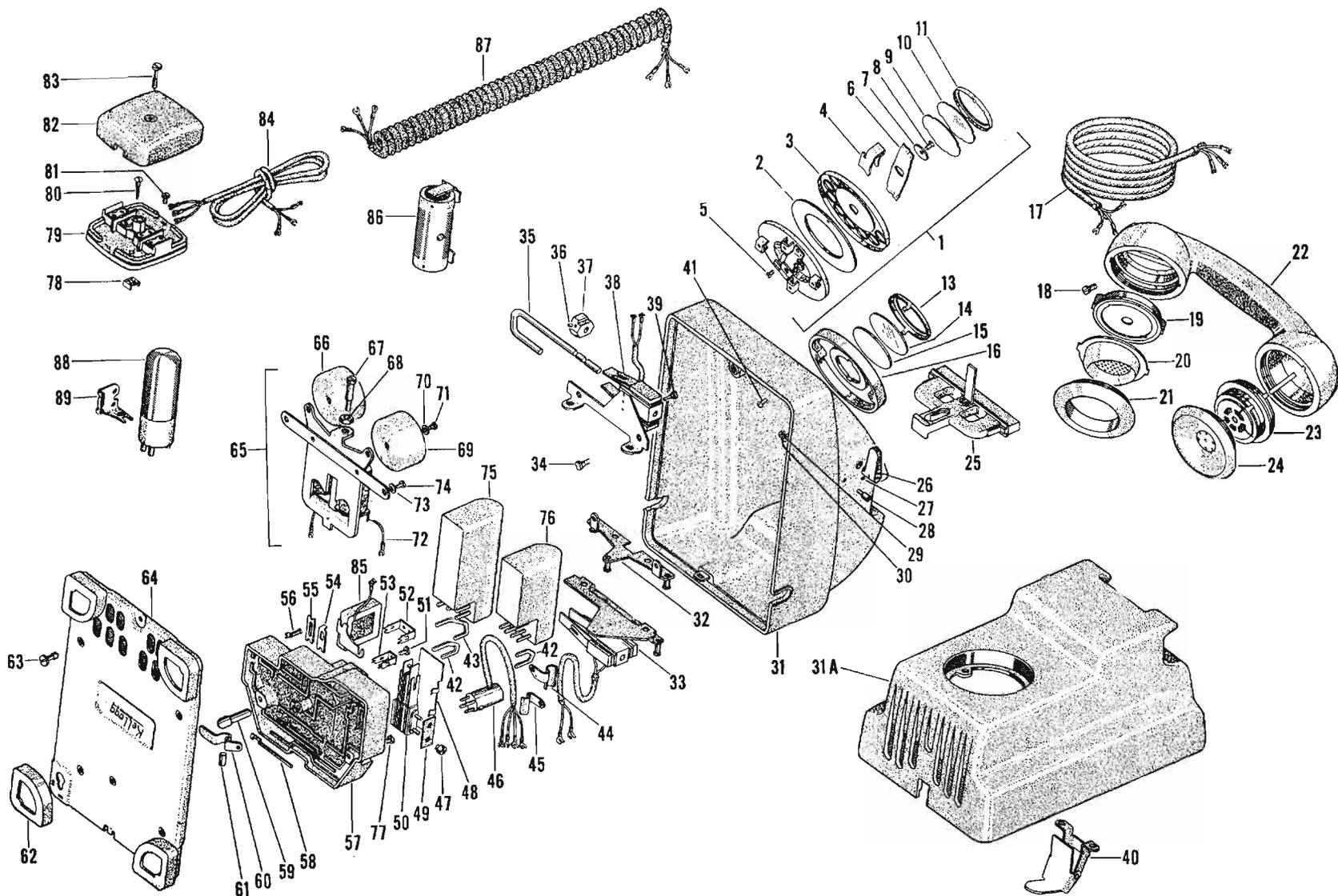


NO. 78 TYPE



NO. 72 TYPE

TELEPHONES
1000 SERIES MASTERPHONES



PARTS LISTINGS SHOWN ON PAGES 288, 289, 290, AND 291.

1000 SERIES MASTERPHONES

How to Order

Piece parts for the 1000 Series Masterphone should be ordered by piece number.

To determine the piece number of any part for these telephones first identify the part by item number from the drawing on page 287. Refer to the charts on the following pages and from the part number lists associated with each item number determine the part number of the part for the particular telephone for which the replacement is required.

Do not order parts by item number. If the piece part number cannot be determined from the following charts the part can be ordered by specifying the item number from the drawing on page 287 and the code number of the telephone for which the part is required. For example, to order a sub-base assembly for a D-1004 Masterphone order as follows: Item No. 57, for D-1004 Masterphone—Sub-Base Assembly.

(The chart below gives the piece number for this item—in this case Piece No. 70720.)

ITEM	DESCRIPTION	USED ON MASTERPHONE CODE NO.	COMPLETE ASSEMBLY NUMBER	REMARKS AND PIECE PART NUMBERS	
1-11	Dials	On all Dial Masterphones	10-D, 10-DO, 10-G	For replaceable parts refer to "Dials" in this section.	
12-16	Dummy Plug		64967	Item 13 Retaining Ring Item 14 Protector for Number Card Item 15 Number Card Item 16 Dummy Plug Item 41 Mounting Screw	
17	Handset Cord, Fabric		770-MFP	For information on fabric and neoprene jacketed cords refer to "Cords" in Apparatus Section.	
17	Handset Cord, Neoprene		3000		
18-24	Handset		46-C	For replaceable parts refer to "Handsets" in this section.	
25	Plunger Bar			For Piece Part Ordering Information refer to "Desk Housing" below.	
26	Thumb Lever		69519		
27	Screw		69521		
28	Stub		69868		
29	Lockwasher		63766		
30	Nut		63952		
31	Desk Housing (Common Battery)	1000 1040 1004 1042 1005 1043 1007 1050 1008 1060 1020 1062 And dial Master- phones with above numbers	64892	Item 25 Plunger Bar Assembly Item 31 Desk Housing Item 32 Support Bracket Assembly Item 34 Screw	64819 71302 64810 64820
31	Desk Housing (Common Battery with Press-to-Talk Switch)	1001 D-1001 1041 D-1041 1061 D-1061 1063 D-1063	69535	Item 25 Plunger Bar Assembly Item 26 Thumb Lever Item 27 Screw Item 28 Stud Item 29 Lockwasher Item 30 Nut Item 31 Desk Housing Item 32 Support Bracket Assembly Item 34 Special Screw Item 35 Actuating Arm Item 36 Screw Item 37 Cam Item 38 Switch Assembly Item 39 Screw	69518 69519 69521 69868 63766 63952 70878 69514 64820 69510 69521 69511 69509 69512
31	Desk Housing (Magneto)	1070	70747	Item 25 Plunger Bar Assembly Item 31 Desk Housing Item 32 Support Bracket Assembly Item 34 Special Screw	64819 70726 64810 64820

1000 SERIES MASTERPHONES (Cont'd)

ITEM	DESCRIPTION	USED ON MASTERPHONE CODE NO.	COMPLETE ASSEMBLY NUMBER	REMARKS AND PIECE PART NUMBERS
31	Desk Housing (Magneto with Press-to-Talk Switch)	1071	71113	Note: This housing same as Housing 69535 except for Item 31 Desk Housing specify 71114 instead of 70878.
31	Desk Housing	D-1081	70350	Note: Housing same as Housing 69535 except Item 38 Switch Assembly for 70350 to be 70344.
31	Desk Housing	1081	70351	Item 38 Switch Assembly for Pc. 70351 to be Pc. 70345.
31	Desk Housing	1021	71189	Item 38 Switch Assembly for Pc. 71189 to be Pc. 71190.
31-A	Wall Housing (Common Battery)	1100 1104 1105 1120 1140	64805	Item 25 Plunger Bar Assembly Item 31A Wall Housing Item 32 Support Bracket Assembly Item 34 Screw Item 40 Switch Arm Assembly
				64819 70879 64810 64820 64814
31-A	Wall Housing (Common battery with Press-to-Talk Switch)	1101 D-1101 1141 D-1141 1161 D-1161 1163 D-1163	69536	Item 25 Plunger Bar Assembly Item 26 Thumb Lever Item 27 Screw Item 28 Stud Item 29 Lockwasher Item 30 Nut Item 31A Wall Housing Item 33 Switch & Support Bracket Assembly Item 34 Special Screw Item 35 Actuating Arm Item 36 Screw Item 37 Cam Item 39 Screw Item 40 Switch Arm Assembly
				64819 69519 69521 69868 63766 63952 70880 69530 64820 69510 69521 69511 69512 64814
31-A	Wall Housing (Magneto)	1170	70748	Same as Wall Housing Pc. 64805 except Item 31-A to be Pc. 70881 instead of Pc. 70879.
31-A	Wall Housing (Magneto with Press-to-Talk Switch)	1171	71153	Same as Wall Housing Pc. 69536 except Item 31-A to be Pc. 71154 instead of Pc. 70880.
31-A	Wall Housing	1121	71192	Item 33 switch and support bracket assembly for Piece No. 71192 is Piece No. 71193.
31-A	Wall Housing	1181	70349	Item 33 switch and support bracket for Piece No. 70349 is Piece No. 70347.
31-A	Wall Housing	D-1181	70348	Item 33 switch and support bracket assembly for Piece No. 70348 is Piece No. 70346.
32	Support Bracket Assembly		64810	For Housings Piece Nos. 64892, 70747, and 64805.
32	Support Bracket Assembly		69514	For Housings Pc. Nos. 69535, 71113, 71192, 70349, and 70348.
33	Support Bracket and Switch Assembly		69530	For Housings Pc. Nos. 69536, 71153, 71192, 70349, and 70348.
34	Screw		64820	
35	Actuating Arm		69510	
36	Screw		69521	

1000 SERIES MASTERPHONES (Cont'd)

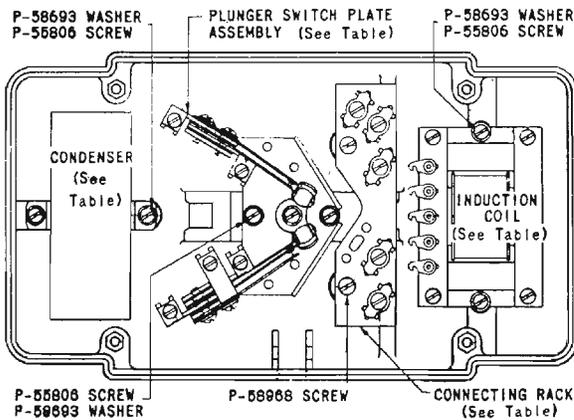
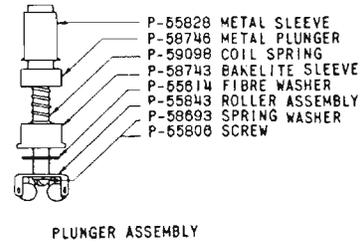
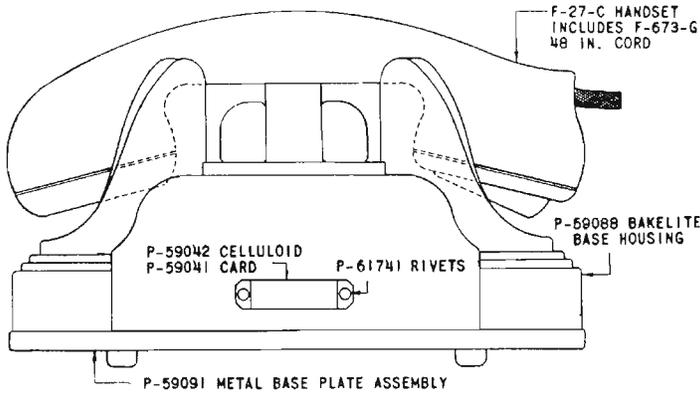
ITEM	DESCRIPTION	USED ON MASTERPHONE CODE NO.	COMPLETE ASSEMBLY NUMBER	REMARKS AND PIECE PART NUMBERS
37	Cam		69511	
38	Switch Assembly		69509	For Piece Part Ordering Information refer to Desk and Wall Housings above.
39	Screw		69512	
40	Switch Arm Assembly		64814	
41	Screw (Dial and Dummy Plug)		64867	
42	Strap		64865	Strap for dial jacks, 2-4, and for stripped telephones.
43	Strap		69559	Strap, used when condenser is not used.
44	Clamp		69585	For holding "Press-to-Talk" switch cord against Desk Housing.
45	Clamp		64864	For holding dial cord against housing. Also for "Press-to-Talk" on wall housing.
46	Dial Cord and Plug	All dial Master-phones except —81	64984	
46	Dial Cord and Plug	D-1081, D-1181	70353	
47	Nut, Spring Assembly		64853	Part of Sub-Base Assembly.
48	Cover, Spring Assembly		64856	Part of Sub-Base Assembly.
49	Plate, Spring Assembly		65890	Part of Sub-Base Assembly.
50	Spring Assembly		64833	Part of Sub-Base Assembly.
51	Screw, Terminal		63262	
52	Terminals, Double Screw		64911	
53	Terminals, Single Screw		64912	
54	Link, Induction Coil		64915	
55	Link, Condenser		64914	
56	Terminal, Pin Plug			Not furnished separately.
				Includes:
				Item 42, Strap
				Item 43, Strap
		1000 1140		Item 47, Nut, Spring Assembly
		1001 1141		Item 48, Cover, Spring Assembly
		1050 1142		Item 49, Plate, Spring Assembly
		1060 1150		Item 50, Spring Assembly
		1061 1160		Item 51, Screw Terminal
57	Sub-Base Assembly	1062 1161	64910	Item 52, Terminal, Double Screw
		1063 1162		Item 53, Terminal, Single Screw
		1070 1163		Item 54, Link, Induction Coil
		1100 1170		Item 55, Link, Condenser
		1101 D-1021		Item 56, Terminal, Pin Plug (not furnished separately)
		1120 D-1104		Item 58, Wire (not furnished separately)
		1121 D-1107		Item 59, Plunger, Switch Hook (not furnished separately)
				Item 60, Switch, Lever Assembly (not furnished separately)
				Item 61, Pivot Pin (not furnished separately)
				Item 77, Screw for Handset Cord

1000 SERIES MASTERPHONES (Cont'd)

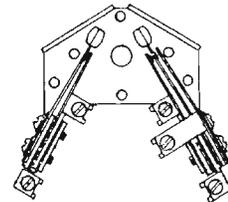
ITEM	DESCRIPTION	USED ON MASTERPHONE CODE NO.	COMPLETE ASSEMBLY NUMBER	REMARKS AND PIECE PART NUMBERS
57	Sub-Base Assembly	1004 1042 1005 1104 1020 1105 1021 D-1004 1040 D-1007 1041 D-1020	70720	See note for Piece No. 64910, Item 57 above.
57	Sub-Base Assembly	1043	71171	See note for Piece No. 64910, Item 57 above.
57	Sub-Base Assembly	1071 D-1181 1081 D-1081 1171 D-1181	70337	See note for Piece No. 64910, Item 57 above.
57	Sub-Base Assembly	D-1008	70722	See note for Piece No. 64910, Item 57 above.
58	Wire			Not furnished separately.
59	Plunger, Switch Hook			Not furnished separately.
60	Switch, Lever Assembly			Not furnished separately.
61	Pivot Pin			Not furnished separately.
62	Rubber Foot Assembly		64882	For Desk Base Plate, Piece No. 64880.
63	Lock Screw, Desk Housing		64868	For Desk Base Plate, Piece No. 64880.
64	Base Plate with Rubber Feet	All Desk Masterphones	64880	
64	Base Plate less Rubber Feet	All Wall Masterphones	64879	
65-74	Ringers		122-124 types	For replaceable parts refer to "Ringers" in this section.
75	Condenser	All Master- phones	No. 225	
76	Induction Coil, Common Battery	All C. B. Masterphones	No. 113-A	
76	Induction Coil, Local Battery	All L. B. Masterphones	No. 114-A	
77	Screw for Handset Cord		64870	See note for Item 57, Piece No. 57, above.
78-83	Line Connecting Block		No. 27	For replaceable parts see "Connecting Blocks" in this section.
84	Base Cord, Fabric Covered		No. 769-MFP	Three Conductor Type.
84	Base Cord, Neoprene Jacketed		No. 3000	Three Conductor Type.
84	Base Cord, Fabric Covered		No. 771-MFP	Four Conductor Type.
85	Retard Coil		No. 64-A	For 1020-1120 Masterphones with or without dial.
85	Retard Coil		No. 64-B	For 1081-1181 Masterphones with or without dial.
86	Vincent Rare Gas Relay		No. RTC-2	For reducing line induction on divided ringing circuits.
87	Koiled Kord		No. 1000	Can be furnished instead of straight cord if desired.
88	Western Electric Tube		No. 333-A	For polarity selective ringing with biased ringers.
89	Bracket		64979	For mounting Gas Relays and Western Electric tubes in Kellogg 1000 Series Masterphones.

No. 900 Type Masterphones

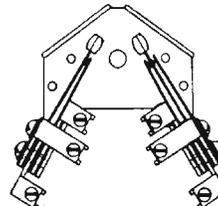
For parts list for these telephones see page 293.



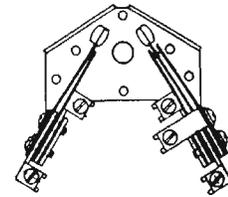
PLUNGER SWITCH PLATE
ASSEMBLY NO. 61211
Used on: 950-LR and
950-C-LR
Same as No. 59105 ex-
cept for stamping of
terminal designations.



PLUNGER SWITCH PLATE
ASSEMBLY NO. 62378
Used on:
900-BAX B-900-HBX
B-900-BAX B-900-HCX
900-HAX B-900-HCX
B-900-HAX B-900-LRX
900-HBX B-900-LRX



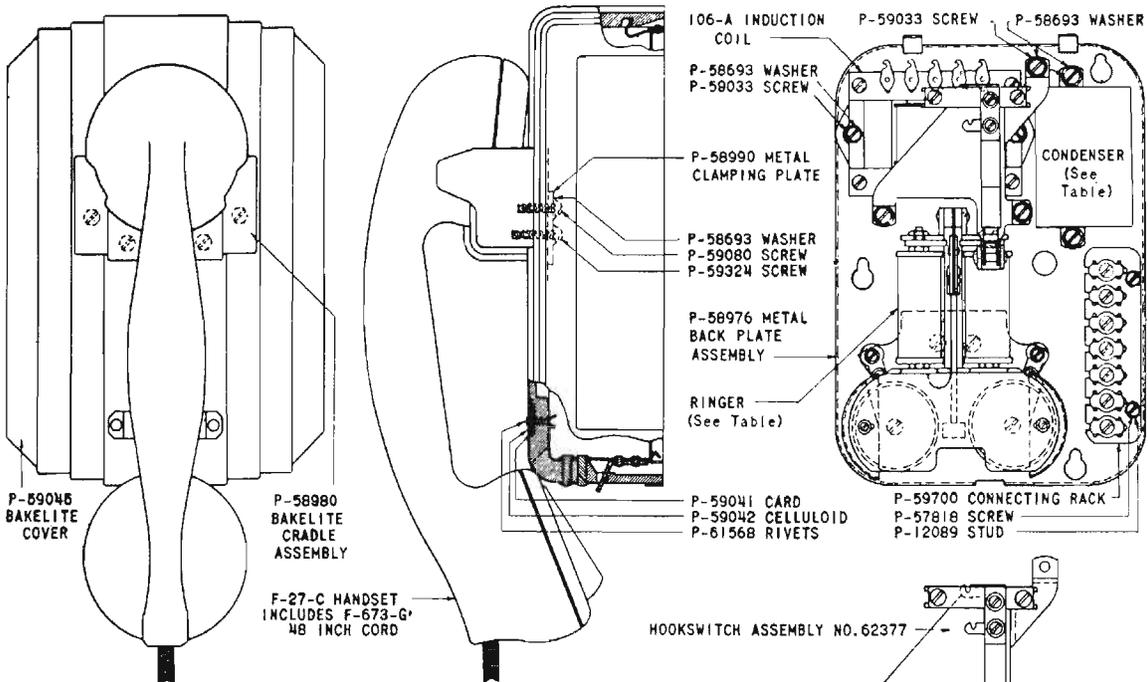
PLUNGER SWITCH PLATE
ASSEMBLY NO. 58700
Used on: 900-A



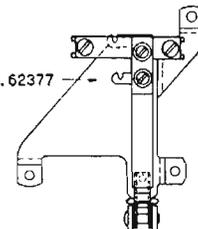
PLUNGER SWITCH PLATE
ASSEMBLY NO. 59105
Used on: 900

No. 9900 Type Masterphones

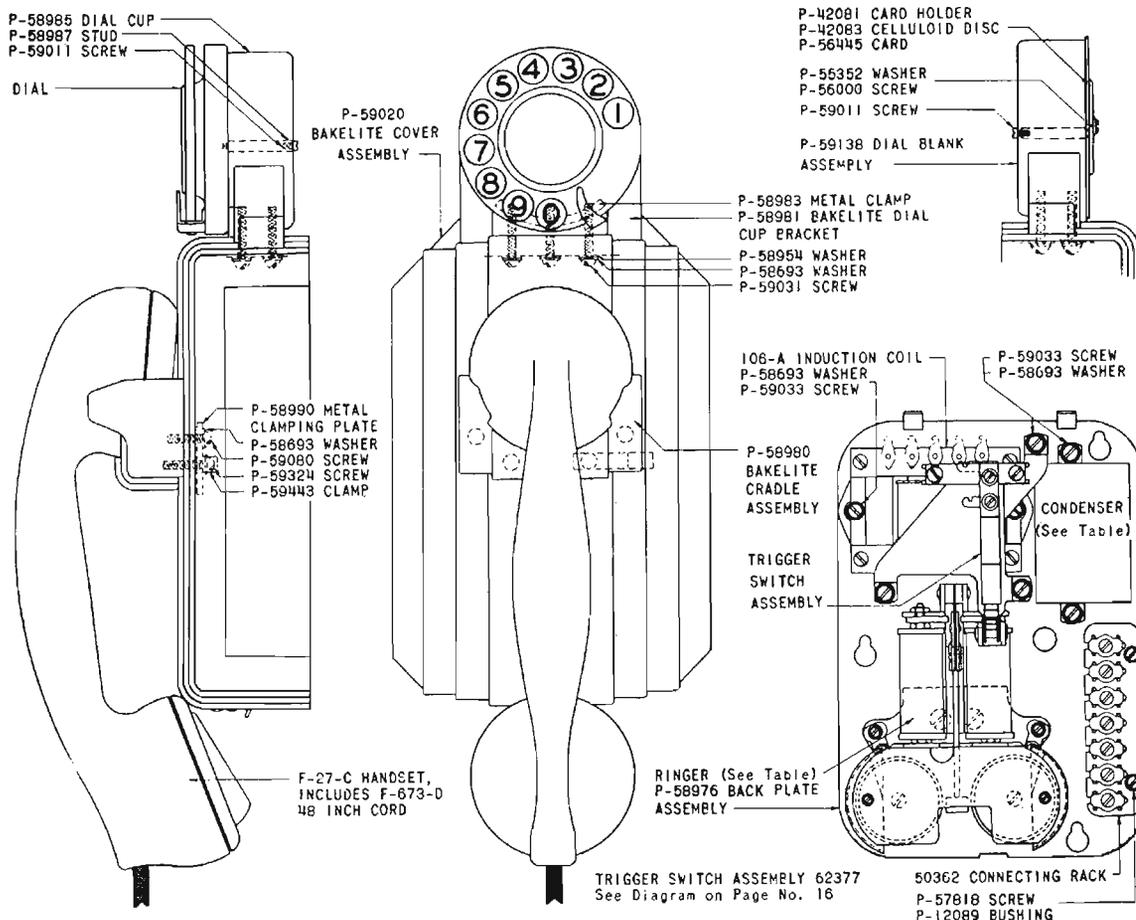
For parts list for these telephones see page 293.



HOOKEYSWITCH ASSEMBLY NO. 62377



No. 9917 Type Masterphones
For parts list for these telephones see page 294.



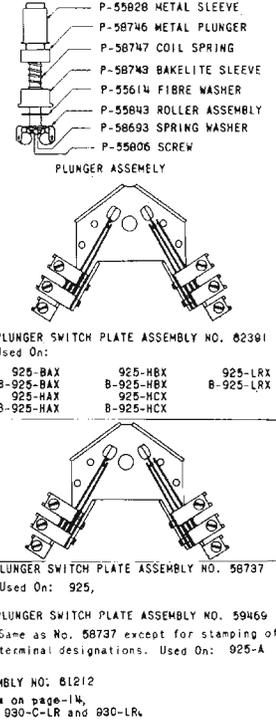
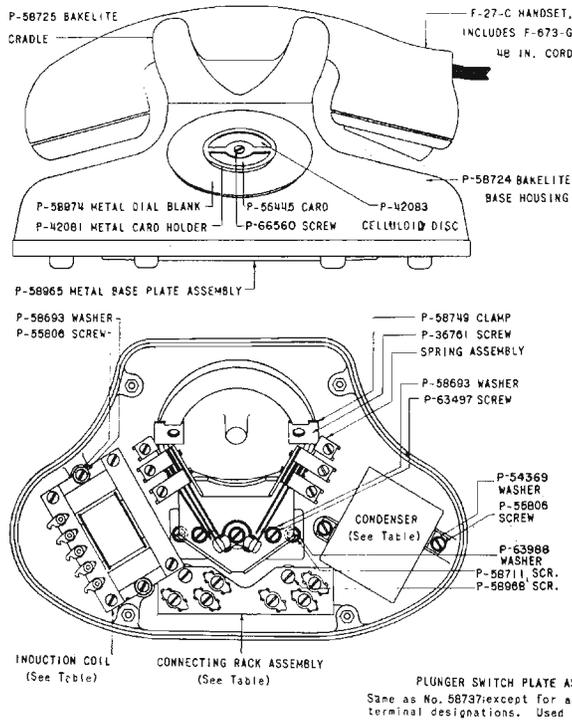
Parts Used in All 900 Type Masterphones

Piece Part or Code No.	Description	Quantity Used
F-27-C	Handset used with all Masterphones.	1
59088	Bakelite Base Housing.	1
59091	Metal Base Plate Assembly with Rubber Feet.	1
58964	Base Plate Retaining Screw.	4
Number Plate Parts		
59042	Celluloid	1
59041	Card	1
61741	Rivet	2
Plunger Switch Parts		
59097	Chromed Metal Plunger.	1
55828	Chromed Metal Sleeve.	1
59098	Coil Spring	1
58743	Bakelite Sleeve	1
55843	Roller Assembly	1
55806	Roller Assembly Screw.	1
55614	Fibre Washer	1
58693	Spring Washer	1
Miscellaneous Mounting Screws and Washers		
55806	Screw to Mount Plunger Switch Assembly.	2
58693	Washer	2
55806	Screw to Mount Condenser.	2
58693	Washer	2
55806	Screw to Mount Induction Coil.	2
58693	Washer	2
58968	Screw to Mount Connecting Rack.	2

Parts Used in All 9900 Type Masterphones

Piece Part or Code No.	Description	Quantity Used
F-27-C	Handset used with all Masterphones.	1
58980	Bakelite Cradle Assembly.	1
59045	Bakelite Cover	1
58976	Back Plate	1
106-A	Induction Coil	1
62377	Trigger Switch Assembly.	1
59700	Connecting Rack	1
Cradle Mounting Parts		
58990	Metal Clamping Plate.	1
59080	Cradle Mounting Screw.	2
59324	Cradle Mounting Screw.	2
58693	Spring Washers	4
Number Plate Parts		
59041	Card	1
59042	Celluloid	1
61568	Rivets	2
Miscellaneous Mounting Screws and Parts		
59033	Screw for Mounting Trigger Switch.	3
58693	Washer	3
59033	Screw for Mounting Condenser.	2
58693	Washer	2
59033	Screw for Mounting Induction Coil.	2
58693	Washer	2
57818	Screw for Mounting Connecting Rack.	2
12089	Connecting Rack Bushing.	2

No. 925 Masterphones



Parts for No. 9917 Masterphones

Piece Part or Code No.	Description	Quantity Used
F-27-C	Handset used with all Masterphones	1
58976	Base Plate	1
50362	Connecting Rack	1
106-A	Induction Coil	1
62377	Trigger Switch Assembly	1
59020	Bakelite Cover	1
58980	Bakelite Cradle Assembly	1
Cradle Mounting Parts		
58990	Metal Clamping Plate	1
59080	Cradle Mounting Screw	2
59324	Cradle Mounting Screw	2
58693	Spring Washer	4
59443	Clamp for Dial Wires	1
Dial Bracket and Number Plate		
58981	Bakelite Dial Cup Bracket	1
58985	Dial Cup	1
58983	Metal Clamp	1
59031	Screw	3
58954	Washer	3
58693	Spring Washer	3

Piece Part or Code No.	Description	Quantity Used
F-27-C	Handset, used with all Masterphones	1
58724	Bakelite Base Housing	1
58725	Bakelite Cradle	1
58965	Metal Base Plate Assembly, Rubber Feet	1
58964	Base Plate Retaining Screws	4
Dial Blank Number Plate		
58974	Metal Dial Blank	1
42081	Metal Card Holder	1
56445	Round Card	1
42083	Round Celluloid Disc	1
66560	Screw	1
55352	Washer	1
Dial Mounting Parts		
58749	Clamp	2
64867	Screw	2
69659	Adapter Ring (for mounting No. 10 type dial)	1
Plunger Switch Parts		
58746	Chromed Metal Plunger	1
55828	Chromed Metal Sleeve	1
58747	Coil Spring	1
58743	Bakelite Sleeve	1
55843	Roller Assembly	1
55806	Roller Assembly Screw	1
55614	Fiber Washer	1
58693	Spring Washer	1
Miscellaneous Mounting Screws and Washers		
58711	Screw to Fasten Cradle to Housing	2
63988	Washer	2
63479	Screw to Mount Plunger Switch Assembly	2
58693	Washer	2
55806	Screw to Mount Condenser	2
54369	Washer	2
55806	Screw to Mount Induction Coil	2
58693	Washer	2
58968	Screw to Mount Connecting Rack	2

Piece Part or Code No.	Description	Quantity Used
59138	Metal Dial Blank	1
56445	Round Card	1
42083	Round Celluloid Disc	1
42081	Metal Card Holder	1
56000	Screw	1
55352	Spring Washer	1
Dial Mounting Parts		
59011	Screw	2
58987	Dial Mounting Stud	2
Miscellaneous Mounting Screws and Washers		
59033	Screw for Trigger Switch	3
58693	Washer	3
59033	Screw for Mounting Condenser	2
58693	Washer	2
59033	Screw for Induction Coil	2
58693	Washer	2
57818	Screw for Connecting Rack	2
12089	Connecting Rack Bushing	2

TRANSMITTERS

Nos. 121-C and 121-L COMMON PARTS		Nos. 157-C and 157-L COMMON PARTS	
Part No.	Description	Part No.	Description
62178	Front	62178	Front
60416	Terminal	60416	Terminal
55806	Screw (Terminal)	55806	Screw (Terminal)
59032	Screw	59032	Screw
45545	Washer	45545	Washer
5396	Screw (Trans. Back)	35623	Screw
OTHER PARTS		39911	Back
66521	Transmitter (121-C)	1916	Weight
66522	Transmitter (121-L)	2875	Nut
		4187	Washer
		OTHER PARTS	
		66521	Transmitter (157-C)
		66522	Transmitter (157-L)

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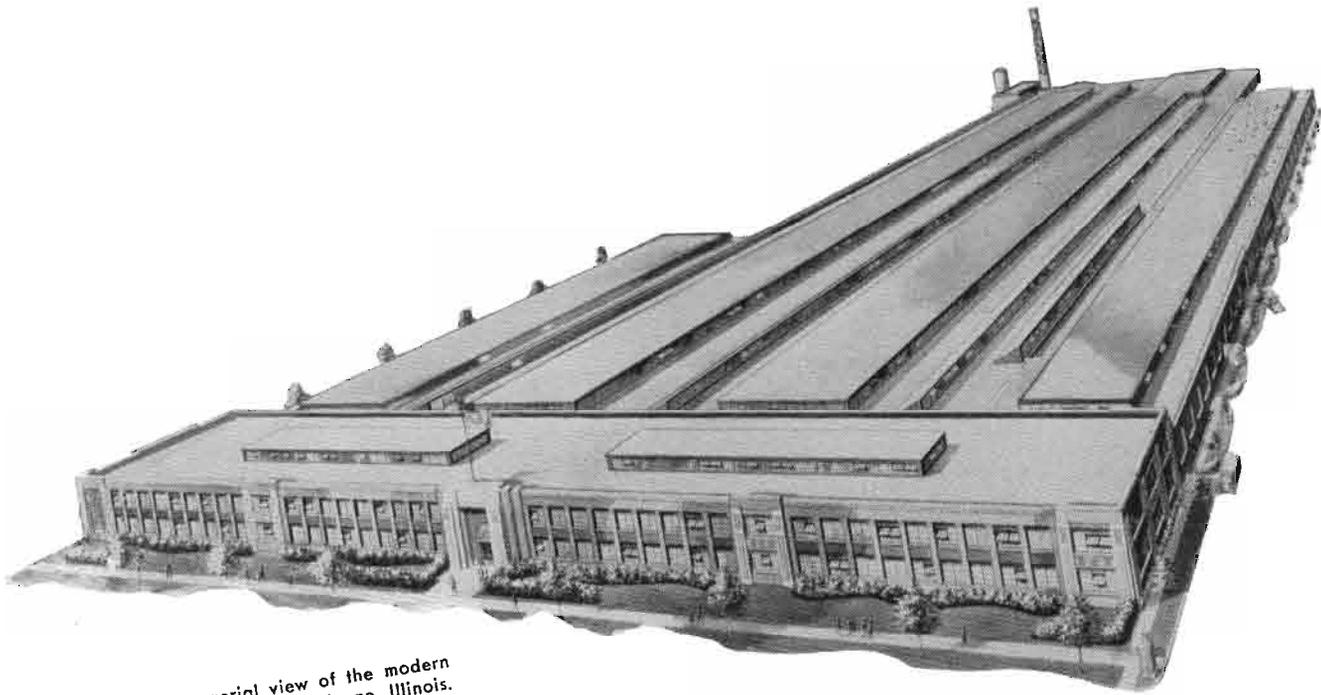
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An aerial view of the modern
Kellogg plant and offices, Chicago, Illinois.