

**Monotype**  
REG. U.S. PAT. OFF.  
**Standardized  
Switchboards**

**MONOTYPE 150-M**  
*A Magneto Switchboard with an  
Ultimate Capacity of 150 Lines*

Bulletin 101-E

**THE AUTOMATIC ELECTRIC COMPANY, LIMITED**  
CHICAGO, U. S. A.

# *The Monotype Series*

A Standardized Line of Switchboards  
Covering the Entire Field of Requirements  
in Manual Telephone Operation.

## **MONOTYPE SENIOR**

Unit position common battery multiple.

## **MONOTYPE SENIOR M**

Unit position magneto multiple.

## **MONOTYPE JUNIOR**

600 line common battery multiple.

## **MONOTYPE CONVERTIBLE**

400 line magneto convertible to C. B.

## **MONOTYPE 150-M**

150 line magneto.

## **MONOTYPE 30-M**

30 line magneto.

## **MONOTYPE 15-M**

15 line magneto.

## **MONOTYPE PBX-100**

100 line P. B. X.

## **MONOTYPE PBX-50**

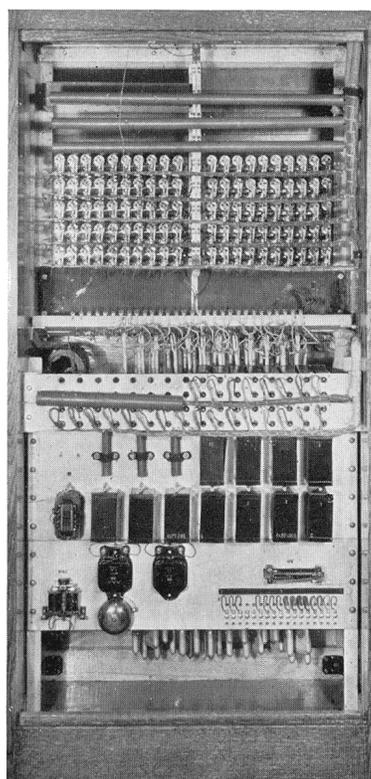
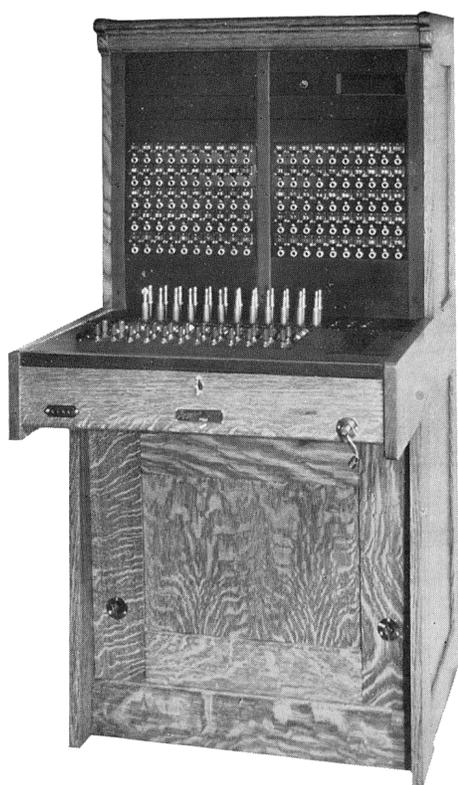
50 line P. B. X.

# Monotype Standardized Switchboards

## Monotype 150-M

The profitable operation of rural telephone systems, and the rendering of a satisfactory grade of service to rural subscribers, are problems which necessitate the greatest care in management and the most careful selection of apparatus and material. To render a high quality of service, especially over long and heavily-loaded rural lines requires switchboards having carefully designed transmission equipment and capable of high operating efficiency. Such a board is the Monotype 150-M switchboard.

*Based on  
Rural Needs*



*Fine  
Appearance*

*Compact  
Design*

Front and Rear Views of Monotype 150-M

This is a board of 150-line maximum capacity, adapted for use on all types of magneto lines, and equipped with key-shelf double supervision. With this type of supervision the keys, clearing-out signals, and plugs of each cord circuit are in alignment directly before the operator, and the clearing-out signals are always visible and are restored automatically by the operation of the listening keys. These advantages make possible an operating efficiency almost as great as that of central-battery operation.

*Advantages*

# Monotype Standardized Switchboards

## Simplicity

Simplification of design has reduced the number of parts used in this board, and has resulted in a rugged type of construction in which all parts are readily accessible. All wearing parts can be quickly and easily replaced.

The parts used in this board are standardized, and, whenever practical, are interchangeable with parts of other Monotype boards, not only of the magneto, but of the central-battery type as well. This degree of standardization simplifies stock-keeping, reducing stockroom expenses and the investment in replacement parts. It also enables us to build these boards and keep them in stock, ready for immediate shipment.

The Monotype 150-M switchboard is made in the following stock sizes:

## Stock Sizes

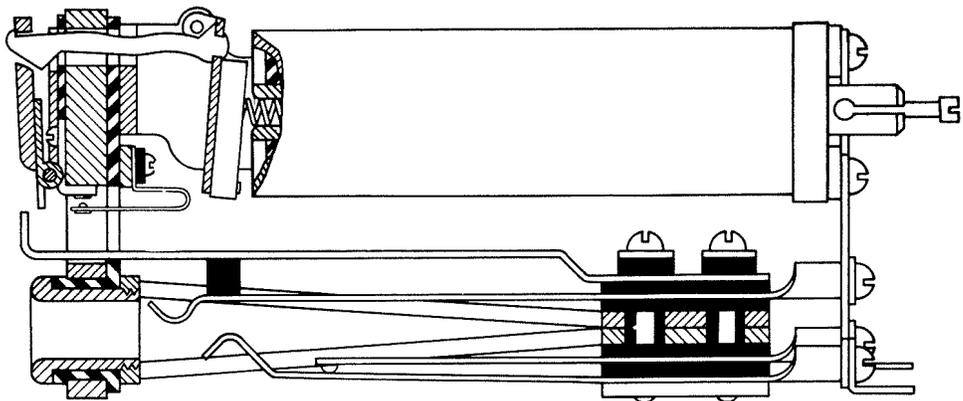
| Code No. | Lines |          | Cords |          |
|----------|-------|----------|-------|----------|
|          | Wired | Equipped | Wired | Equipped |
| 151      | 50    | 30       | 15    | 6        |
| 152      | 100   | 60       | 15    | 10       |
| 153      | 150   | 100      | 15    | 12       |
| 154      | 150   | 120      | 15    | 15       |

## Line Equipment

## Positive Operation

The drop-and-jack equipment of the Monotype 150-M switchboard is unusually sensitive and positive in operation; the catch is so designed that it not only releases the shutter but actually forces it down. The drop is of the self-restoring type, as shown in the accompanying figure. Its armature is permanently mounted on the front of the coil shell, so the coil can be quickly removed or replaced from the back of the board without disturbing the armature adjustment. The drop and the jack are separately mounted and as there are no soldered connections between them, either part can be easily removed.

## Drop-and-Jack



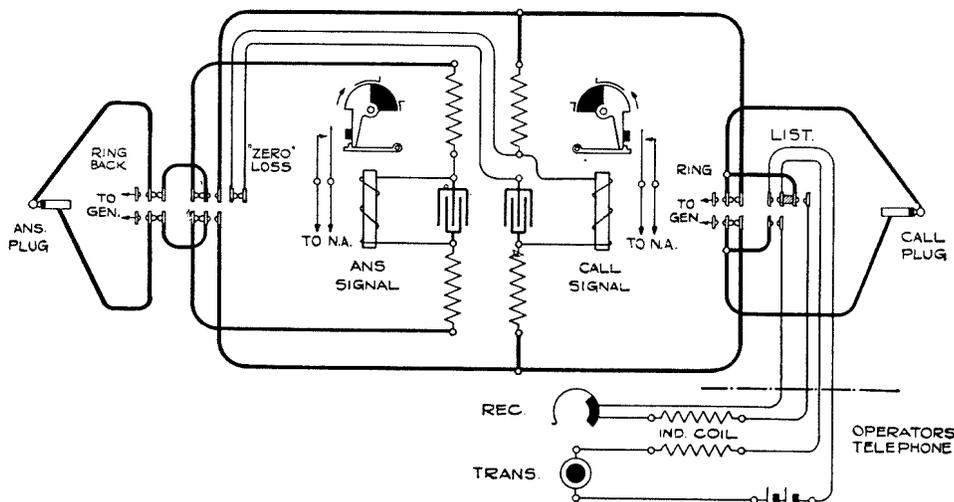
Cross-section of the Drop-and-Jack

# Monotype Standardized Switchboards

## Cord Circuit Equipment

The standard local cord circuit is of high efficiency, both for supervision and for transmission. It has a clearing-out signal associated with each cord, so that the operator knows if either party neglects to ring off. This circuit is provided with a repeating-coil, providing such efficiency that the transmission loss of the cord circuit is equal to only one-half mile of standard cable.

*Local Cord Circuit*



"Zero Loss" Toll Cord Circuit of Monotype 150-M

*Toll Cord Circuit*

There are two toll cord circuits, mounted on the left end of the shelf. These differ from the local circuits only in having an additional, "zero-loss," position on the rear key. When the key is thrown to this position, one clearing-out signal, one half of the repeating coil, and both condensers are removed from the circuit, and the transmission loss is thus reduced to a minimum. Ring-off of either party is indicated by the clearing-out signal of the called line.

*"Zero-loss" Position*

The cord circuit equipment of the Monotype 150-M switchboard is designed to aid in securing rapid, reliable operating. It comprises two clearing-out signals, the ringing-listening key, and the ring-back key, all assembled in a single unit. The two clearing-out signals are mechanically linked to the ringing-listening key, so that when this key is thrown into the listening position, the signals are automatically restored, thus saving operating time and speeding up service.

The clearing-out signals are hemispherical, half of their outer surface black and the other half, white. They are covered with dustproof caps with two celluloid windows large enough to permit the signals to be seen from a considerable distance. Because of their shell-type construction, which confines the magnetic field, these signals are extremely sensitive, their operating efficiency far

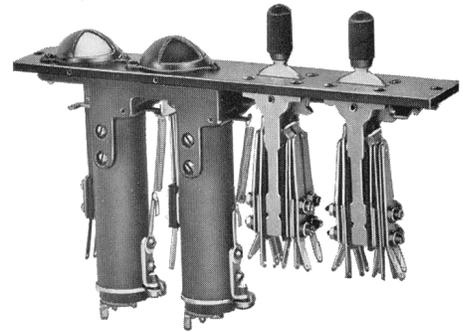
*Self-restoring Signals*

# Monotype Standardized Switchboards

exceeding that of a drop or ring-up relay. This is a most desirable feature in the operation of heavily-loaded rural lines. These signals operate on the slightest impulse from the telephone circuit, throwing the signal from the black to the white position, which stands out in strong contrast to the solid black of the key-shelf.

## Keys

The lever-type listening and ringback keys are of our standard design. The frame is of one-piece brass insulated from the springs by phenol-fiber insulators. The springs are nickel-silver, with silver-alloy ball contacts. They are operated by hard rubber rollers on the lever cam, which is pivoted, on steel bearings, on a rod of hard-drawn phosphor-bronze. The bearing thus produced is easy-running and very durable, and requires no lubrication. The cam will not become loose, even after years of service.

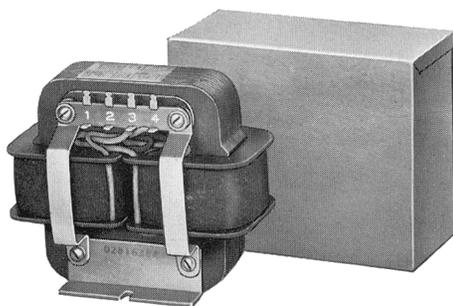


Key-shelf Supervisory Equipment

## Cords

Uniform efficiency of the cord circuits of the Monotype 150-M switchboard is maintained by the design of the cords used. Each conductor consists of 21 strands of fine-quality copper tinsel, and is heavily insulated and reinforced, being covered with two wrappings of Tussah silk, and an outside braiding of Sea-Island cotton, with 18 inches at the plug end reinforced. These cords can be relied upon to stand hard continuous wear. They are ended on terminal racks so placed that the terminals are in plain view and easily reached.

## Repeating Coils



"Non-Ring-through" Repeating Coil  
Benefits. All terminals of the repeating coils are plainly marked, to simplify maintenance.

Because of the design of the repeating coils used, the cord circuits of the Monotype 150-M switchboard are positively "non-ring-through." This eliminates confusion between subscribers and operator, as a subscriber's "ring-off" cannot pass through the cord circuit to the other line. The use of repeating coils insures maximum talking-efficiency with a minimum of noise from inductive disturbances.

## Condensers

The condensers used in Monotype 150-M are made of a high grade of tin-foil and a special condenser paper. They are hermetically sealed, to guard against dampness, and are tested under a potential of five-hundred volts, direct current. Condenser mounting plates are of steel, heavily plated to prevent rust, and so arranged that the condensers can be easily inspected or changed.



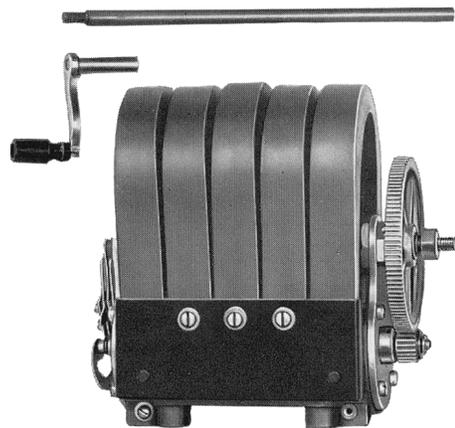
## Night-alarm Equipment

The night-alarm equipment consists of a night-alarm switching key and a bell. The key is equipped with extra contact-springs, so wired that an extension bell may be connected to it and switched in and out of the circuit as desired. The alarm circuit gives a continuous ring as long as a drop shutter or a clearing-out signal remains down. The night-alarm contacts on the drops are so arranged that when a shutter falls it engages a "U"-shaped phosphor-bronze spring which closes the contacts. No current is required to flow through the hinges.

*Extension Bell*

## Ringling Equipment

The ringing equipment consists of a hand generator, a turn-key on the key shelf, for switching the ringing circuit to a power-driven generator as desired, and a key for cutting-out the generator-buzzer.



Generator

The hand generator provided is a powerful, carefully wound, five-bar generator. Long life and smooth operation of this generator are insured by making the gear of brass and the pinion of steel. The generator-buzzer is placed in its output lead, so that when the ringing current is applied, the buzzer operates. This buzzer indicates that the ringing circuit is functioning properly, and is also used to verify the sending of code impulses, and thus aid the operator in sending such codes.

*Hand Generator*

*Buzzer*

Keyboard space is provided at the right end of the key shelf for mounting a master key, so the board may be readily converted for divided-circuit, pulsating or harmonic ringing.

*Master Key*

## Operator's Equipment

The operator's equipment may consist of either a suspended-type transmitter with separate receiver, or a breast-type operator's set, whichever is desired. The suspended-type transmitter is hung from an arm which is adjustable for height and length. The receiver used with it is mounted on an easily-adjusted headband, which is very light in weight and has no surfaces to collect dust or absorb moisture. A light and flexible six-foot cord fitted with a cut-in plug is furnished. The quickly-removable headset and the handy cut-in plug make this

*Suspended Type*

# Monotype Standardized Switchboards

## Breast Type

arrangement especially convenient for the operator who has other duties to attend to, and who, therefore, must frequently leave the board.

The breast-type operator's set includes the breastplate with transmitter and adjustable elastic neckband, the receiver and headband, and a transmitter and receiver cord with cut-in plug. It is sanitary and light in weight.

## Position Transfer Key

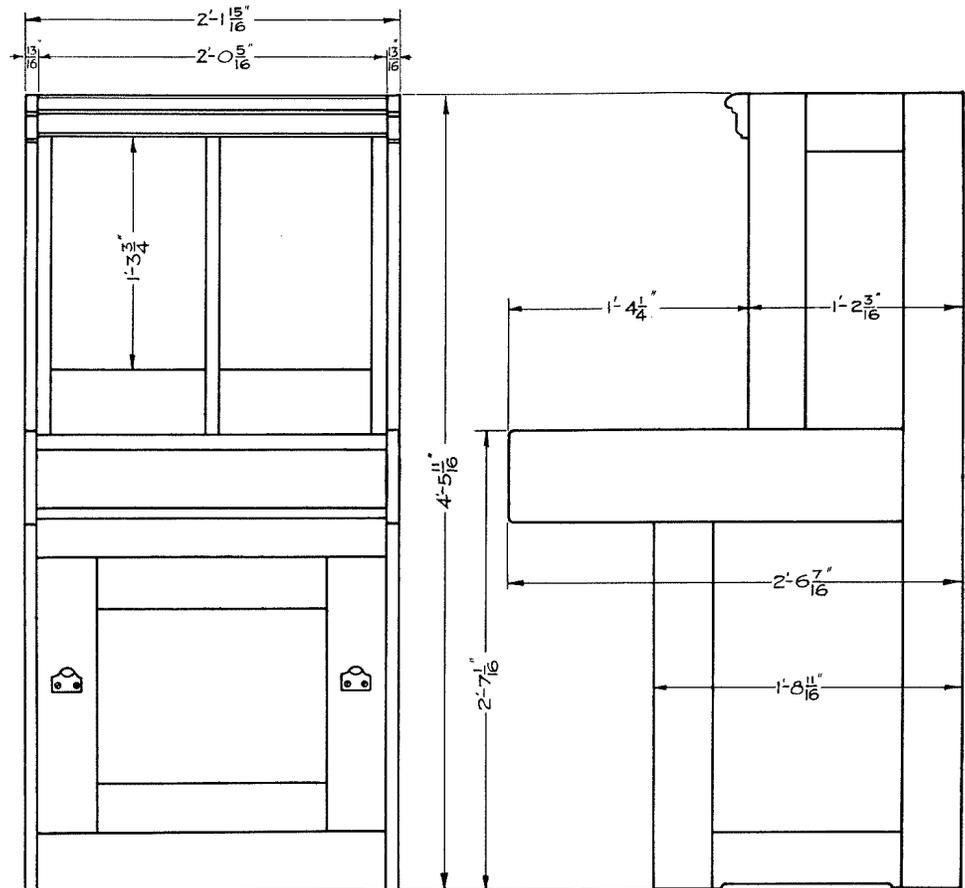
Wiring and a blank spacer are provided so that a position-transfer key may be installed if two positions are to be placed by side and handled by one operator.

## The Cabinet

The cabinet of the Monotype 150-M switchboard is of quarter-sawed oak, with all exposed parts given a golden-oak finish, which gives it a very pleasing appearance. It is built to provide ease of maintenance and remarkable durability. The front panel below the shelf, and the entire back panel of the cabinet are removable, providing easy access to all equipment.

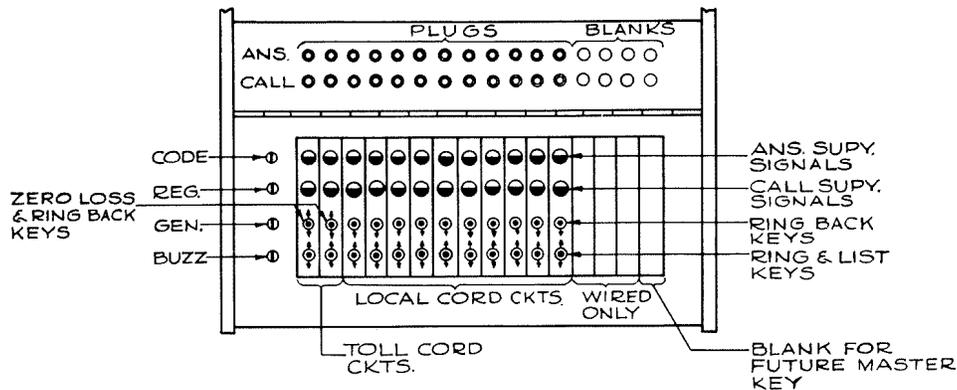
## Small Size

## Comfortable Height



Dimensions of the Cabinet of Monotype 150-M

# Monotype Standardized Switchboards



## Equipment

The shelf is arranged for fifteen cord-equipments and four turn-keys (code and night-alarms, ringing generator, and generator-buzzer). A blank space is provided so that a master key may be added at any time. The operator's comfort is insured by the unusual width of the shelf, and by its height, which is the same as that of an office desk, permitting the use of an ordinary chair. The shelf is covered with black phenol-fiber, which is very durable and retains its color. The key-shelf is attached with a full-length piano-hinge, and can be easily raised for inspection of the equipment mounted beneath. It is fitted with a lock to prevent tampering by unauthorized persons.

The key-shelf cabling is so designed as to make it possible to lift each visual-signal and key unit off the shelf, so that the contacts can be inspected and the springs adjusted without raising the shelf and interrupting operation. The cord circuits furnished are of two types—one for local, the other for toll calls.

## Cabling

## Wiring and Cabling

All wires and cables are neatly formed and arranged, and are thoroughly tested before leaving the factory. The cord circuit cables are hand-made, of No. 22 B. and S. gauge wire, insulated with two wrappings of silk and a reverse wrapping of cotton. The generator-circuit wiring is of heavily-insulated No. 22 B. and S. gauge wire, and is separated from the cabling to prevent trouble from induction. Wiring for batteries, power generator circuit, test taps, etc., is ended on connecting terminals on the lower mounting-panel in the rear of the cabinet.

## Interior Wiring

Fifty-pair cables are used to connect the switchboards to the arresters; one, two, or three cables being furnished, as required. These cables extend twelve feet from the top of the switchboard, so it should not be necessary to splice to them. The cable is made of No. 22 B. and S. gauge wire, insulated with two wrappings of silk, and a reverse wrapping of cotton. Each cable is covered with a heavy cotton braiding and is saturated with beeswax to exclude moisture.

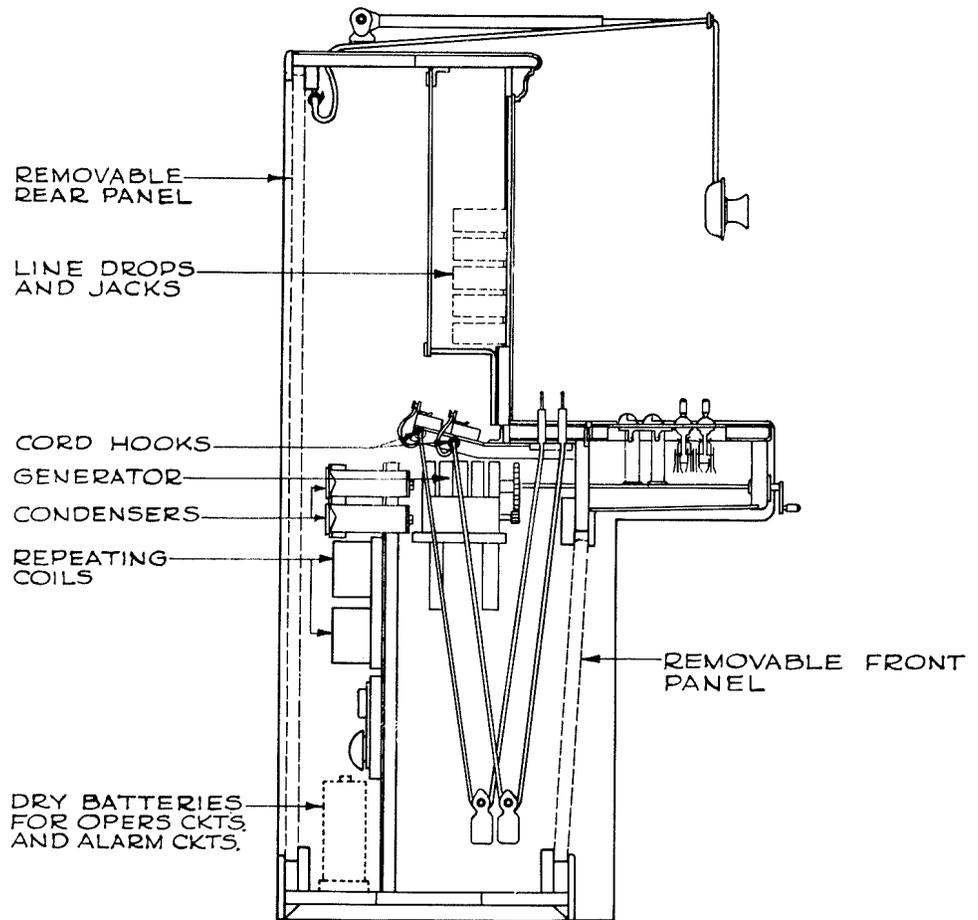
## Line Cables

# Monotype Standardized Switchboards



Line  
Equipment

Cord  
Equipment



Section, Showing Simple Arrangement of Parts

Arrangement of  
Equipment

The arrangement of equipment in the Monotype 150-M switchboard is planned with special attention to simplicity and ease of access to the working parts.

The drops and jacks may be easily removed individually, without the use of a soldering-iron, and the armature adjustment is not disturbed by the removal or replacement of the coils.

The cord terminals are in plain view and easily reached, as there is plenty of room between them and the adjacent equipment.

The condenser mounting plates are so arranged that the condenser terminals are readily accessible for inspection. The condensers are so mounted as to be easily and quickly tested or changed.

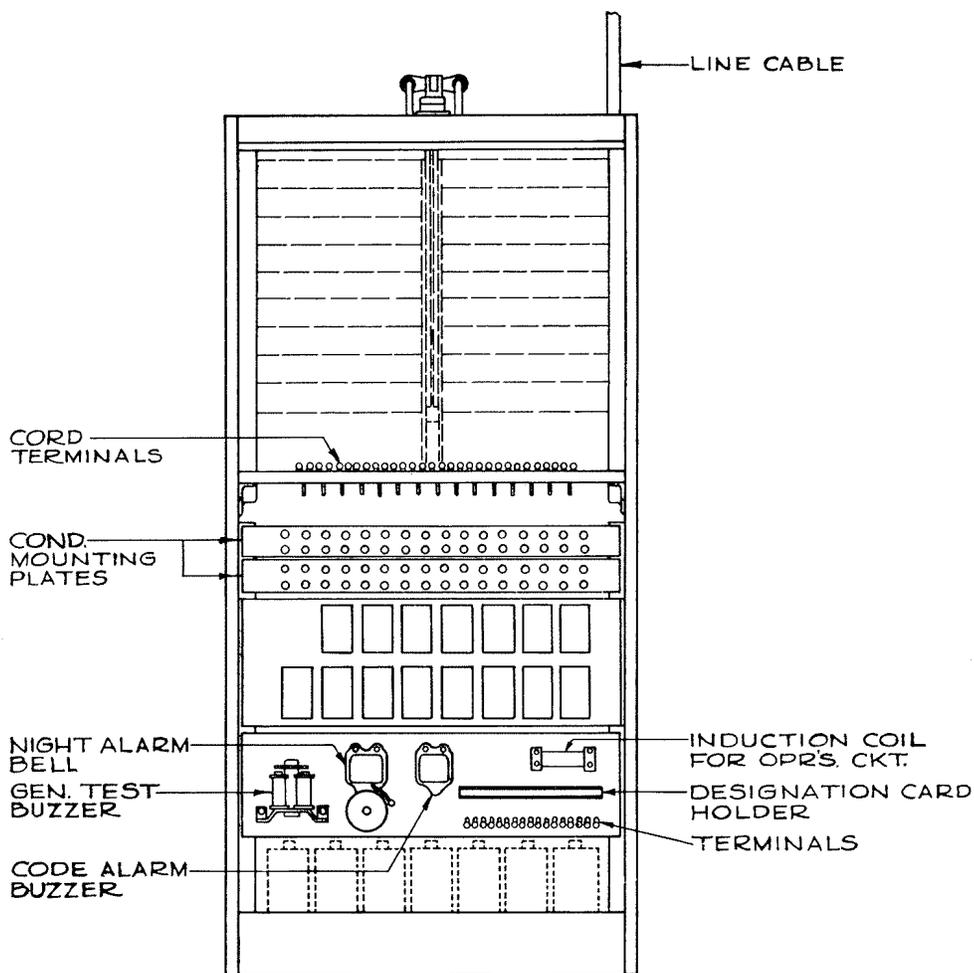
The repeating coils are conveniently arranged, and their terminals are plainly numbered to conform to circuit prints. The simple, handy arrangement makes maintenance a simple matter.

The night-alarm bell and the operator's-circuit equipment are on a panel, so that all terminal connections are in plain view. The generator and code-alarm buzzers are also mounted on this panel, and connecting-terminals are provided for batteries, a power generator, test-taps, etc. Above these terminals is a designation strip showing connecting markings.

Space is provided, in the bottom of the cabinet, for the dry batteries for the operators' and alarm circuits.

Connecting  
Terminals

# Monotype Standardized Switchboards



Rear View, Showing Accessibility of Equipment

*Accessibility*

*Terminal Panel*

## For Your Old Board

It may be possible to replace the key and shelf of an old switchboard with a new shelf providing double, key shelf supervision. Our engineers will be glad to furnish information or detailed plans at your request.

*Key-shelf Supervision*

## Arrester Equipment

The Monotype 150-M switchboard is not supplied with arrester equipment, but we are prepared to furnish this equipment, if desired. The type which we recommend is made in sections, each of which can accommodate five metallic or ten grounded lines. It was especially designed for use in small exchanges.

*Arresters*

To mount this type of arrester, we can furnish a frame capable of accommodating the equipment for two-hundred lines. This can be supplied with a channel-iron cable-support for carrying the cables between the switchboard and the frame.

## ***A Complete Service to Telephone Companies***

American Electric Company, Inc. manufactures or distributes everything necessary for public telephone systems. This equipment includes:

### ***Central Office Apparatus***

Monotype series of standardized switchboards—toll boards—power plants—power panels—Chief Operator's desks—Wire Chief's desks — distributing frames — arrester equipment and interior cabling.

### ***Subscriber Station Equipment***

Central Battery Telephones, Local Battery telephones and auxiliary equipment.

### ***Outside Equipment***

Poles—cable—cross arms—line wire—drop wires—strand—construction materials—tools—supplies—everything for either overhead or underground construction.

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**MONOTYPE MAGNETO SWITCHBOARD**

**SEE BULLETIN #101**

**50-LINE CABINET COMPLETE**, WIRED FOR ULTIMATE CAPACITY AND INCLUDING NIGHT ALARM CIRCUIT, RINGING CIRCUIT, SWITCHING CIRCUIT, OPERATOR'S TELEPHONE CIRCUIT, COMBINED PIGEON HOLE, AND CASH DRAWER, AND ONE 51-PR. CABLE EXTENDING 12 FT. FROM TOP OF CABINET. ULTIMATE CAPACITY IS 50 LINES. DROP AND JACK TYPE, 15 CORD CIRCUITS REPEATING COIL TYPE. \$200.00

**100-LINE CABINET COMPLETE**, WIRED FOR ULTIMATE CAPACITY AND INCLUDING NIGHT ALARM CIRCUIT, RINGING CIRCUIT, SWITCHING CIRCUIT, OPERATOR'S TELEPHONE CIRCUIT, COMBINED PIGEON HOLE, AND CASH DRAWER, AND 2- 51-PR. CABLE EXTENDING 12 FT. FROM TOP OF CABINET. ULTIMATE CAPACITY IS 100 LINES. DROP AND JACK TYPE, 15 CORD CIRCUITS REPEATING COIL TYPE. \$215.00

**150-LINE CABINET COMPLETE**, WIRED FOR ULTIMATE CAPACITY AND INCLUDING NIGHT ALARM CIRCUIT, RINGING CIRCUIT, SWITCHING CIRCUIT, OPERATOR'S TELEPHONE CIRCUIT, COMBINED PIGEON HOLE, AND CASH DRAWER, AND 3- 51-PR. CABLE EXTENDING 12 FT. FROM TOP OF CABINET. ULTIMATE CAPACITY IS 150 LINES. DROP AND JACK TYPE, 15 CORD CIRCUITS REPEATING COIL TYPE. \$230.00

**LINE CIRCUITS** – REGULAR BRIDGING \$2.85

**CORD CIRCUITS** (ZERO LOSS) WITH REPEATING COIL \$19.75

“ “ (REGULAR) “ \$19.25

SPECIFY TYPE OF OPERATOR'S SET TO BE USED -  
BREAST PLATE OF SUSPENDED TYPE.

ALL STOCK CABINETS OAK – GOLDEN OAK FINISH

THESE PRICES APPLY TO EQUIPMENT INSTALLED IN SWITCHBOARDS IN AMERICAN FACTORY ONLY.

ALL PRICES NET F.O.B. CHICAGO