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GENERAL SYSTEM

Starlite® Telephone with Internal Ringer

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Figure 1. Starlite telephone with internal ringer can be used alone or as an extension in any part of the house or office. External appearance is unchanged except for dial-light control, which is located on the right rear corner instead of at the front-center of the base.

The Starlite® Telephone, originally designed for use as an extension requiring no signaling device, is now to be equipped with an internal ringer to increase its versatility and simplify installation. The appearance of the new instrument, called the 182A Starlite Telephone, is practically unchanged (Figure 1), but the internal components and the inside of the housing have been redesigned to accommodate the new, compact ringer assembly and a standardized printed-wiring transmission unit.

In 1960, Automatic Electric Company introduced the Starlite® telephone to complement the existing line of residential telephone offerings. The new telephone was designed for use as an extension without an internal ringer, and the designers created a compact instrument with a pleasing appearance. The design was well accepted by customers—so well, in fact, that the Starlite telephone became a universal instrument that is now being used either alone or as an extension in any part of the house. Where a signal was needed, an external ringer box has been provided and screwed to the wall. Now a trend toward pre-wired homes with jacks that allow telephones to be moved from room to room has created a need for an internal signaling device for the Starlite telephone.

Consequently, a straight-line ringer has been designed for mounting inside the Starlite telephone, to increase its versatility, and to simplify installation. This new straight-line ringer (Figure 2) requires about one-third less space than the Type 45 ringer.

Ringer

The single-gong, single-coil ringer responds to ringing frequencies over the range from 20 to 30 cycles. This ringer, working with a resonator, produces a pleasing sound suitable for residential or business use. A bias-spring adjustment is provided to eliminate bell-tapping, and a three-point, rubber grommet mounting absorbs vibration. The ringer is secured to the new molded plastic baseplate by three self-tapping screws. A special, encapsulated, ringer capacitor with two spade-type terminals is screwed to the transmission network.

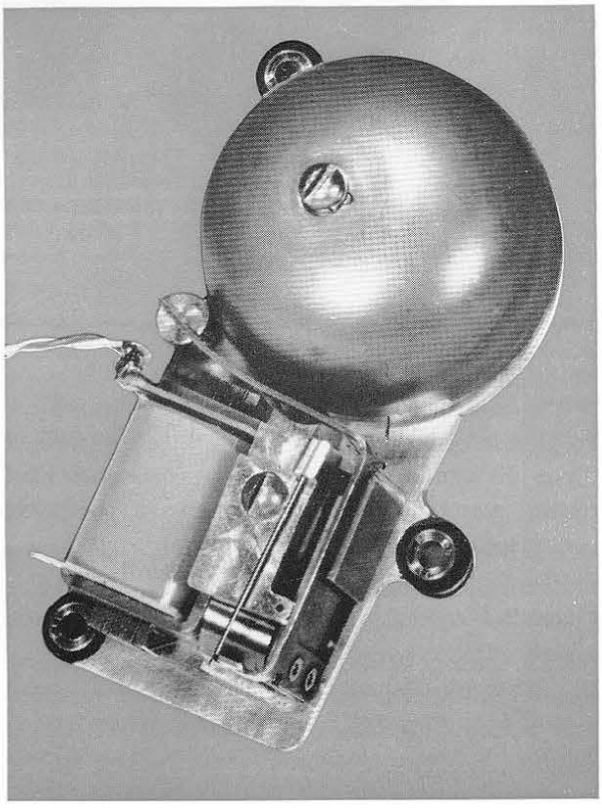
Component Arrangement and Redesign

A complete rearrangement of the internal components of the Starlite telephone has taken place to provide space for the ringer (see Figures 3 and 4). The new design uses a molded plastic baseplate, a printed-wiring transmission network, a spring-loaded hookswitch arm and actuator assembly, a newly designed "split" hookswitch pileup, a three-position slide switch for the dial light, and the miniature straight-line ringer. All components are either secured with self-tapping screws, or simply snapped into position.

Transmission Unit

The new printed-wiring transmission network requires less space than a "potted" unit. It employs resistors, capacitors, and varistors that can be replaced with a side-cutter and a soldering iron, whereas potted transmission units must be discarded if defective.

Figure 2. Single-gong, single-coil ringer requires about one-third less space than the Type 45 ringer used in most Automatic Electric telephones.



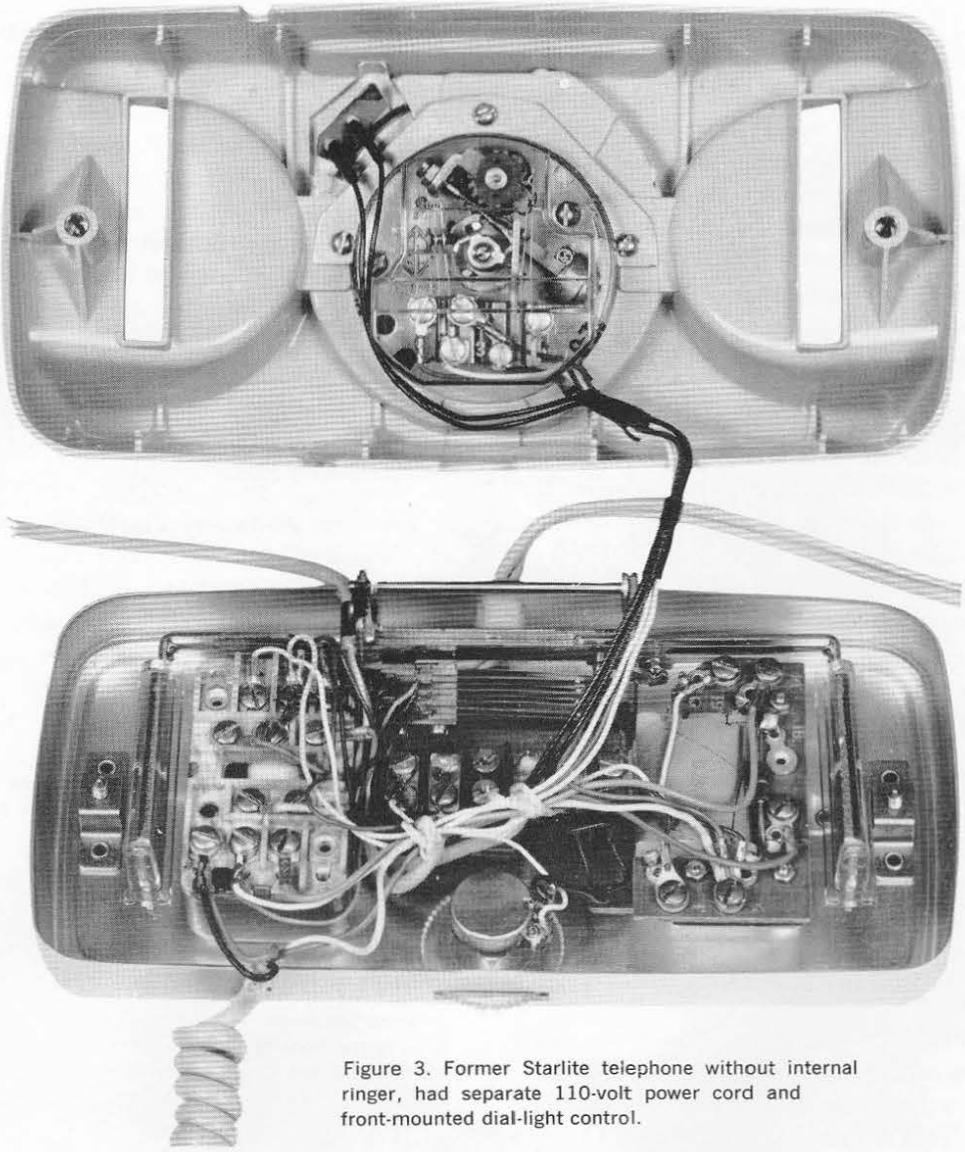


Figure 3. Former Starlite telephone without internal ringer, had separate 110-volt power cord and front-mounted dial-light control.

The new network is also standard in our Type 80 desk telephone, Type 90-M wall telephone and Type 95 panel telephone. This is another step toward standardization of components to enable operating companies to reduce inventories.

Current-Limiting Resistor Block

The current-limiting resistor block, formerly located within the telephone, has been removed and placed in a plug at the 110-volt AC outlet (Figure 5); two insulated wires tacked to the baseboard supply current to the telephone terminal block. A new five-conductor line cord replaces both the three-conductor line cord and the six-foot 110-volt power cord formerly used.

The new plug consists of two special 47,000-ohm resistors and two 1-amp. fuses, potted in an epoxy material. One resistor and one fuse, wired in series, are placed across each side of the 110-volt AC line. With this method, the current output of the plug cannot, under any circumstances, exceed five milliamps, even if the two plug terminals are shorted together. This limitation of current insures complete safety to all telephone

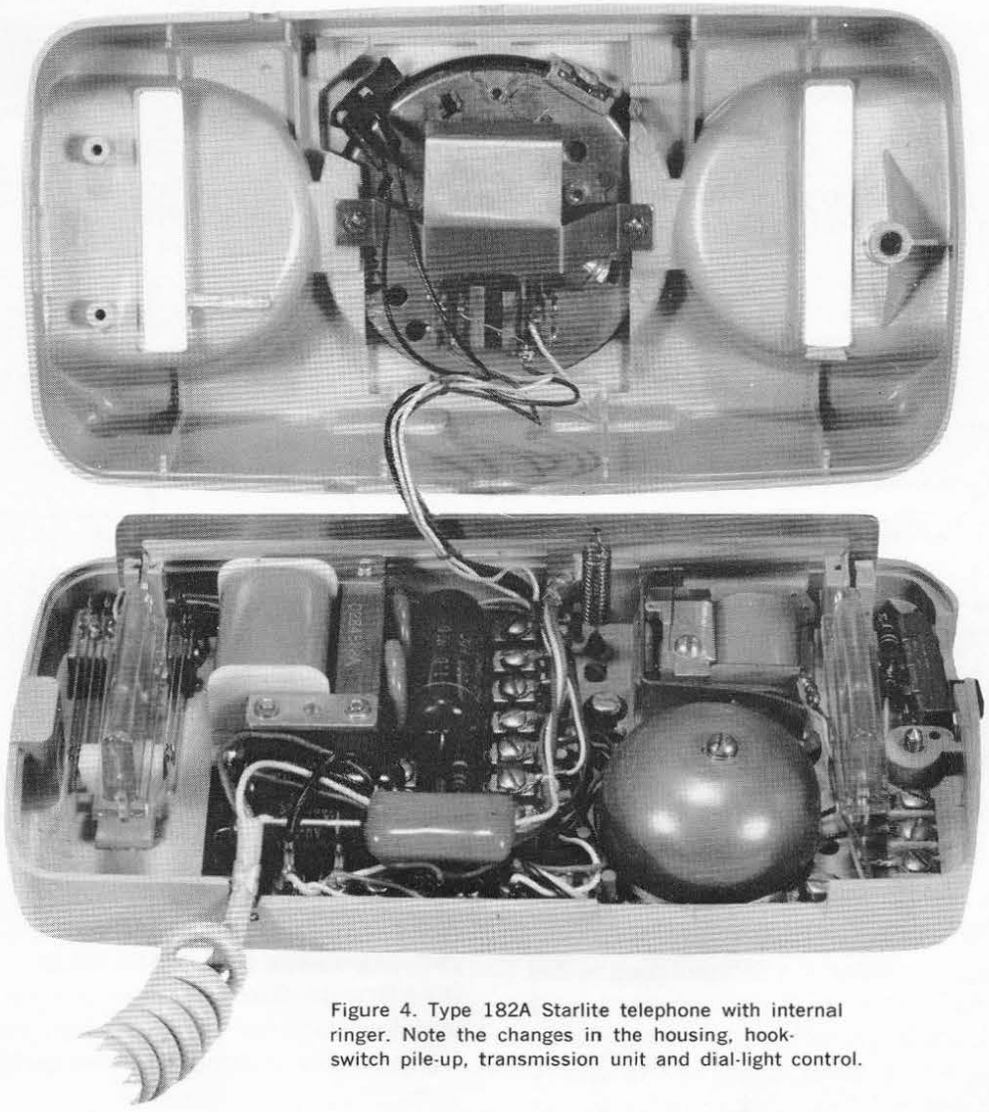


Figure 4. Type 182A Starlite telephone with internal ringer. Note the changes in the housing, hook-switch pile-up, transmission unit and dial-light control.

subscribers. It is possible to power more than one Starlite telephone dial-light from one current-limiting resistor plug by wiring the light leads in parallel.

Lighted Dial

The Type 54 dial, square number plate, and light assembly used on the original Starlite telephone are retained. The plastic dust-cover and wire shield formerly used is replaced with a metal stamping which acts both as a wire-shield and a dial mounting bracket.

The rheostat control for the dial light is replaced with a three-position slide switch, providing off, dim, and bright positions.

Rotary or Touch-Calling Dial

The new Starlite design accepts either the conventional rotary dial or the new touch-calling unit; field conversion of a rotary dial version to touch-calling can be accomplished readily at any time, thus allowing the operating company to minimize its inventory of parts and telephones. Provision is also made for the incorporation of "message waiting" features.

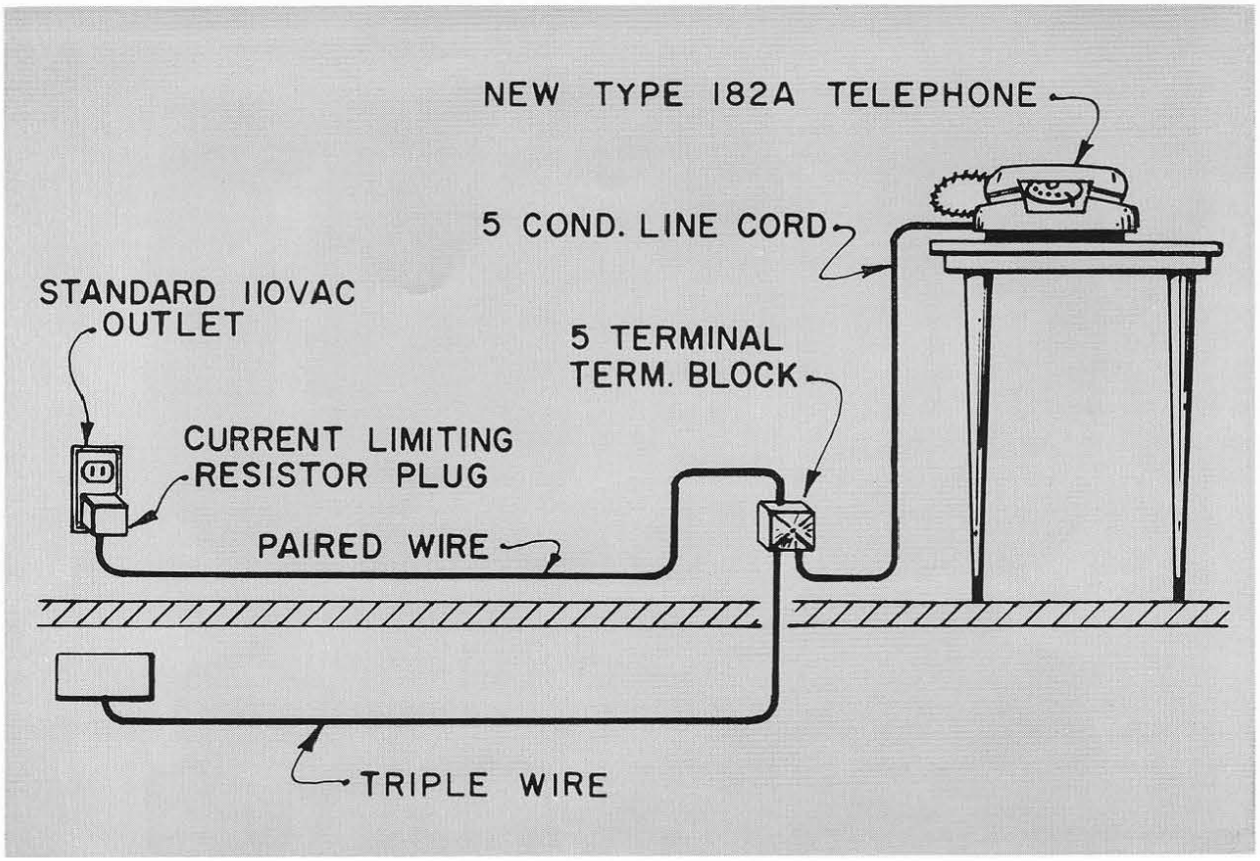


Figure 5. Installation diagram for Starlite telephone with internal ringer. The current-limiting resistor plug placed at the 110-volt AC outlet permits use of a single cord from terminal block to telephone.

Hookswitch

To provide space for the internal ringer, the hookswitch has been relocated from its former central position. By providing a two-stack pile-up and a wedge-type actuator, the necessary operating force is reduced from that required for the previous one-stack pile-up. With the present trend toward lighter handsets to reduce subscriber fatigue, the problem of off-hook conditions has been on the increase. The decrease in operating force needed to actuate the hookswitch is expected to reduce the posibility of ROH (receiver off-hook) trouble. The two-stack pile-up arrangement also substantially reduces the amount of adjustment required, because a two-surface actuating cam provides an inherent make-before-break sequence.

The hookswitch bracket is supported by a molded post which is an integral part of the plastic baseplate. The split post is designed to accurately position the hookswitch bracket and actuator with reference to the hookswitch pile-up. A similar post on the opposite side of the baseplate eliminates hookswitch binding, by providing adequate clearance to compensate for dimensional variations in the plastic baseplate resulting from changes in temperature or moisture conditions.

The split hookswitch pile-up straddles the split plastic post and is secured to the baseplate by means of one self-tapping screw. Two brass pins keyed to the plastic posts provide bearing surface for the hookswitch bracket and prevent wear of the plastic.

The hookswitch bracket assembly is spring-loaded and is held in position by the centrally exerted tension of the hookswitch return spring. Removal of the hookswitch bracket assembly is accomplished by removing the return spring.

Plastic buffers, which project through the housing for actuation of the hookswitch by the handset, were formerly pinned to the hookswitch arm; this made replacement of these buffers

difficult if damage occured. The new hookswitch bracket is designed so that the plastic buffers can be snapped into position and removed easily.

The spring pile-up actuator, made from an acetal material possessing good wear characteristics and dimensional stability, is press-fitted to the hookswitch bracket. A notch in the bracket locates the actuator in position by compressing its plastic material when it is being assembled and then allowing the plastic to expand after it has been located.

This new hookswitch arrangement has been thoroughly life-tested in our laboratories; no appreciable wear was found after 1.5 million operations.

Baseplate

The baseplate of the new Starlite telephone is molded ABS (acrylonitrile-butadiene-styrene-copolymer), a high-impact-strength plastic. The new Starlite telephone is, in fact, the first telephone manufactured in the United States that utilizes plastic for the baseplate and component mounting. The hard, smooth surface of ABS material is highly resistant to scratches and stains, as proved by past experience with this material on our telephone housings.

A new method of attaching the Starlite telephone housing to the baseplate saves the service man's time, and takes less internal space. A projecting tongue on one end of the housing fits into a hole on the top rim of the baseplate. One screw at the opposite end of the baseplate replaces the two screws formerly required.

To effect a standardization of parts, all of the plastic baseplates are a neutral gray color, simulating the anodized aluminum baseplate previously used.

The one-piece cork pad which formerly covered a large portion of the aluminum baseplate is replaced by two narrow cork strips positioned at each end of the new molded baseplate. The new Starlite is more stable than the former design, because the reduced area of the pad increases the force exerted per square inch of its surface.

Housing

The Starlite telephone housing retains its outward styling, but incorporates several internal changes. A projection is provided to accommodate the new latch-in feature. To facilitate the assembly of the new housing to the baseplate, a special cam in the housing depresses the hookswitch. The dial opening is enlarged to provide the clearance necessary for the new touch-calling unit. Two mounting pads are added to adapt the new housing to Starlite telephones with aluminum baseplates; an adapter bracket, and three screws, will also be provided.

Design Features

The 182A Starlite telephone retains all features offered by the previous design, such as:

1. Light weight for easy lifting — yet enough weight for stability.
2. Projecting edges on the dial plate for easy gripping.
3. A unique electroluminescent dial light that provides a soft and pleasing greenish light over the entire face of the dial.
4. Adjustable dial brightness; a three-position switch provides off, dim, and bright positions.
5. "Walking handset" that returns easily to the correct position on the cradle.

The main reason for the development of the 182A was the requirement for a Starlite telephone with an internal ringer. As a by-product, however, several features benefit the telephone operating company:

1. The handset assembly and printed-wiring transmission network are the same as those used on the Types 80, 90M, and 95 telephones. This allows operating companies to standardize on replacement parts. The transmission network and a separate induction coil were formerly special components used only in the Starlite and Type 880 telephones.

2. Internal components that can be easily replaced are provided. Components are secured with self-tapping screws; they were formerly eyeletted to the base.

3. Marred or damaged housings can be replaced easily. Housing replacement formerly required the removal of all dial leads connected to the transmission network. The new design, because of an enlarged dial opening, allows the repair-

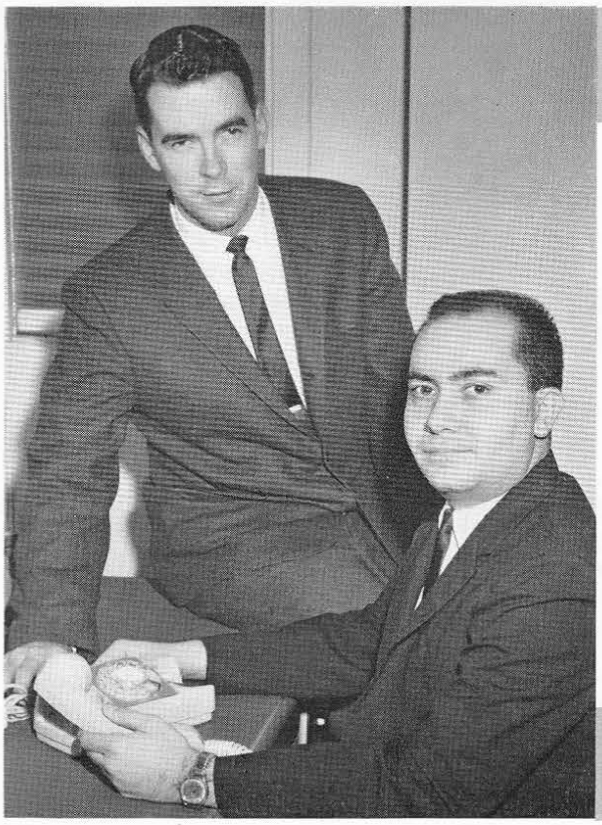
man to remove the dial mounting screws, slide the dial through the housing opening, substitute the new housing, and remount the dial. Dial leads need not be disconnected from the transmission network.

4. A new, internal, miniature, straight-line ringer eliminates the cost involved in installing the external ringer box and ringer for one- and two-party service. The new miniature ringer offers a melodious ring suitable for both residential and business use.

5. The new housing has been designed to accept either the conventional rotary dial presently used, or the newly designed touch-calling unit. Conversion requires only the removal of the rotary dial and the substitution of the new touch-calling unit and its associated adapter plate.

Summary

The new Starlite telephone reflects the continuing effort of Automatic Electric to offer its customers the utmost in telephone design and service as the state of the art advances. The new unit can be adapted to provide the "message waiting" feature, or Touch-Calling; field conversion of the telephone to touch-calling may be accomplished readily at any time. The full versatility of this design has not yet been utilized; we can look for continued expansion of its capabilities in the future.



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