

TYPE 120A SINGLE-SLOT COIN TELEPHONE SET
DESCRIPTION AND INSTALLATION

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1. GENERAL

1.01 This section describes and provides operational information for the Type 120A single-slot coin telephone set, hereafter referred to as the Type 120A. Installation, field maintenance, and test procedures are also presented. The Type 120A supersedes conventional multislot coin

telephone sets and is available in both the rotary dial and Touch Calling Versions. The Type 120A is furnished equipped, and wired for prepay service but can be modified for semipostpay service.

1.02 This section is reissued to incorporate the latest information on the Type 120A. Marginal arrows are used to identify new material. Remove the previous issue of this section from the binder or microfiche file and replace it with this issue.

2. FEATURES

2.01 Besides improved appearance and better operation, the Type 120A (Figure 1) offers operational, design, and circuit advantages as well.

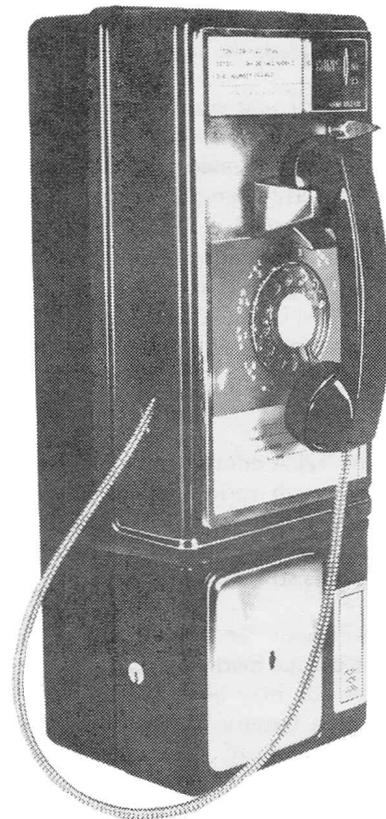


Figure 1. Type 120A Single-Slot Coin Telephone Set.

Operational Features

2.02 The Type 120A has the following operation features:

- (a) Increased resistance to vandalism.
- (b) Economical conversion to revised initial-period calling rates.
- (c) Easy conversion from semipostpay to prepay operation or vice versa.
- (d) Easy conversion from rotary dial to Touch Calling service.
- (e) Near-total elimination of revenue loss from slugs through the use of a sophisticated rejector mechanism.

Design Features

2.03 The following design features are incorporated into the Type 120A:

- (a) All-steel housing construction, except appearance items.
- (b) Extra-heavy-gauge steel cash vault door.
- (c) Tongue-and-groove construction for mating surfaces of upper and lower housings and lower housing and cash vault door.
- (d) Protection of critical security areas, such as the rim around the cash vault door, with hardened steel liners.
- (e) Foolproof latching mechanism and lock for upper housing and cash vault door.
- (f) Provisions for increased cash vault side (50 percent greater capacity than the one used on three-gauge coin telephone sets).
- (g) Provisions for mounting alarm switches.
- (h) Upper housing that accepts either rotary dial or a Touch Calling Unit (TCU).
- (i) Snap-in mounting of covers for instruction cards.

Circuit Features

2.04 The Type 120A comes factory strapped for prepay operation but, through various strappings on the interface and totalizer cards, the Type 120A can be strapped for coin-free emergency calling or for the semipostpay mode. Table 1 contains this strapping information.

2.05 In either mode of prepay service, collection or refund of coins can be made at any time even though the coin relay connection may be held open by the rate relay. Application of coin battery to the line causes the control circuit of the rate relay to release the relay immediately and connect the coin relay to the transmission network.

2.06 The Type 120A will operate with offices that send coin battery over one side of the line only or both sides simultaneously. This feature allows the set to be used in offices that still serve conventional three-gauge

sets (with the older two-coil relay) that require the higher current available from paralleling the loop conductors. It also allows use of the Type 120A from offices that serve other manufacturers' coin telephone sets requiring coin battery to be sent over one side of the line only for proper coin relay operation.

2.07 To permit use of the instrument in either prepay or semipostpay service, zero reset of the totalizer at the end of a call is triggered as the loop is opened on disconnect. Reset occurs after a slight time delay to avoid undesired reset on an accidental hookswitch flash by the user should it occur prior to completion of dialing. The reset delay is short enough, however, to prevent reseizing of a new line before zero reset of the totalizer.

2.08 For semipostpay service or prepay service where normal polarity is maintained to the telephone set, a special TCU prevents generation of single tones by operation of two keys if simulation of coin deposit tones is attempted on operator calls. If reverse battery supervision is returned in prepay service, such as a call being serviced from a TSPS installation, the TCU will be disabled as a further measure to prevent its use in simulating coin deposit tones.

3. DESCRIPTION

Housing

3.01 The housing of the Type 120A is of all-steel construction, except for appearance items, and is 21 inches high, 7-5/8 inches wide and 6 inches deep. The upper and lower housings are formed of deep-drawn steel and contain reinforcing members welded in place. Extra-heavy-gauge steel is used for the cash vault door, which also uses reinforcing members. To reduce the possibility that an unauthorized person will gain access to the interior of the set, a tongue-and-grove-type construction is used at the mating surfaces of the upper and lower housings, and the lower housing and the cash vault door. Critical security areas, such as the rim around the cash vault door, are protected further by hardened steel liners, which retard attempts to drill into the housing at these points.

3.02 Retention of the upper housing (Figure 2) to the lower housing (Figure 3) is effected by a slide-bar latch that secures the two at six points and is actuated by a T-wrench SMC 579246 (Figure 4). The T-wrench is a one-piece unit of hardened, stamped steel. An opening at the upper right side of the upper housing permits entry of the tool to engage the latch, but the latter may be held in the closed position by a studded cam actuated by a cylinder lock of unique design located about midway up the right side of the telephone set, in the upper housing.

3.03 The cash vault door is secured in place by a similar four-point latching mechanism that is engaged by inserting the T-wrench into an opening in the center of the door's

→ Table 1. Strapping Options and Connections.

120A Coin Telephone Options	Used With Loop Start Central Office That:	Coin Telephone Wiring								Rate Register Card HB-1005-A	
		Connect White Lead* To	Connect White Jumper Between	Connect White Jumper							Connect White Jumper G To
				I To	K To	O To	P To	V To	W To		
Prepay (Must Deposit to Dial)	Always attempts refund on abandoned call (with or without coin ground detection)	X**	Y and Z**	** J	** L	** M	** U	** R	** T	P*	
	Does not attempt refund on abandoned call unless coin ground was detected	V									
Emergency Prepay (No Deposit Required to Dial)	Opens ring; tests for coin ground on tip. Tests with -48 volts (20mA maximum)	X**	E and Q	H	J	U	M	T	Y	X	
	Detects coin ground by current unbalance in tip and ring. Tip-to-ground voltage must not exceed 60 volts.		Remove Jumper								
Semipostpay (No Deposit Required to Dial)	Reverses line polarity on answered calls that require coin deposit. No coin return.	X**	P and Q	Lock collect door of coin hopper open with 4-40 x 3/8 machine screw furnished. Disconnect coin relay plug J3.							

NOTES: *The white lead at the chassis grommet; the other end is factory connected through chassis receptacle P3 to the cam relay.
 **Manufactured with these connections.

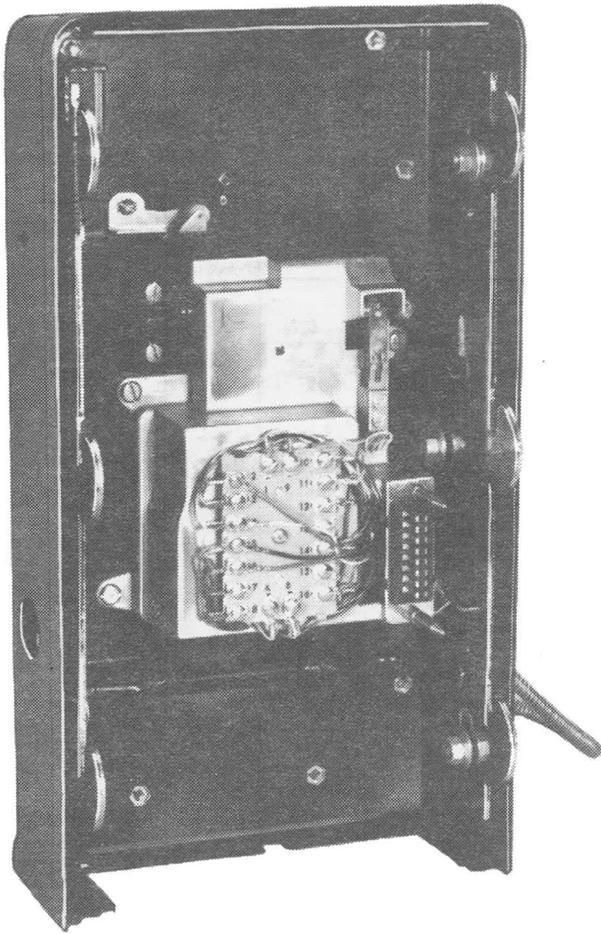


Figure 2. Upper Housing.

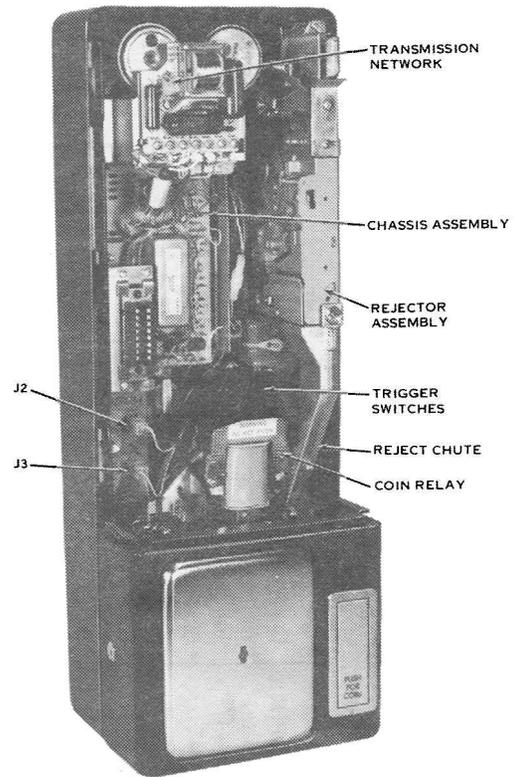


Figure 3. Lower Housing.

surface. In this case, the latch is secured by a four-tumbler cylinder lock, located on the left side of the lower housing.

3.04 The pattern of mounting holes in the lower housing (and the relationship of the wire entry opening to the mounting holes) is the same as that used on present three-gauge coin telephones sets; this permits mounting in the same booths or other predrilled locations. An additional pattern of mounting holes behind the vault area is provided for easier access and may be used when mounting to a metal backboard. Unlike present sets, however, the lower housing has no rear channel to permit top or bottom wire entry in surface-wired installations. For this and other installation requirements, a metal backboard is available for separate ordering. Provision is made for the use of four security studs in mounting.

3.05 The cash vault is furnished with a false floor that covers the support spring for the larger coin receptacle (HD-480019-A). The cash vault provides a separate, higher support spring suitable for use with the standard-sized receptacle. When the larger coin receptacle is used, the false

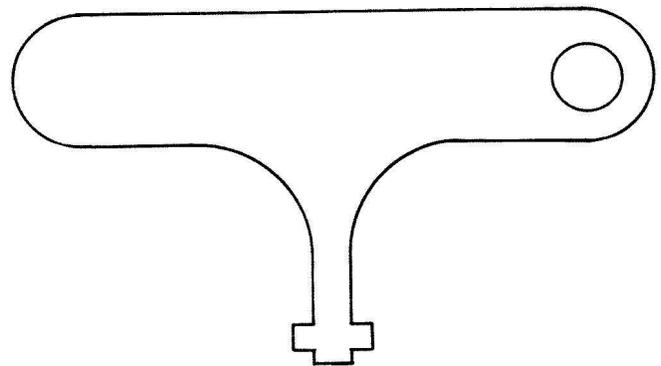


Figure 4. T-Wrench (SMC 579246).

floor should be removed and discarded. To remove the false floor, place a blade screwdriver into the slot at the front of the cash vault. Engage the formed tab, pry it back and up, and the false floor will disengage.

3.06 Provision is made for mounting snap-action micro-switches at two points within the set when required for transmission of alarms in the event of unauthorized entry. When so mounted, one switch is positioned with its actuator bearing on the slide-bar of the upper housing latching mechanism and the other with its actuator bearing on the similar mechanism of the cash vault door. The switches and associated mounting hardware will be made available for field installation.

3.07 Standard finish for the upper and lower housings is chrome or black and beige powder-coated paint that is highly resistant to abrasion and chemical attack. Light texturing of the finish provides a pleasing appearance while it also conceals welding marks where internal parts are anchored to the housings. The coin return receptacle, vault door, faceplate and coin release lever are matte chrome-finished. The handset cradle is bright chrome.

3.08 The coin return receptacle has a top hinged door at the right front of the lower housing. Returned coins enter the receptacle from a passage behind the door and collect just below the bottom of the door. The floor of the receptacle extends to the rear and upward to form a trough for holding coins. When the door is opened, coins are accessible to the customer while the passage by which coins enter the receptacle is blocked off. The rearward extension of the trough appears to be the passage from which coins enter, but it may be stuffed to no avail because the actual passage is protected from stuffing by the opened door.

3.09 The upper housing is designed to accept either a rotary dial or a TCU by proper choice of a porcelain-enamel finished adapter plate and cover. Rotary dial coin telephone sets use on unlighted version of the Type 54 dial with three makes in the off-normal spring assembly, while the Touch Calling instruments are equipped with a special weather-protected TCU arranged with an extra set of frequency-selecting contacts to prevent generation of single tones by simultaneous operation of two keys in the same row or column. A rotary dial coin telephone set can readily be converted in the field to Touch Calling operation by simply replacing the upper housing. The upper housing of a rotary dial set can be converted to Touch Calling service in the repair shop by replacing the adapter plate, cover, and dial with their Touch Calling counterparts.

3.10 On rotary dial coin telephone sets, a clear polycarbonate fingerwheel is mounted to the pawlplate of the main shaft. The fingerwheel lies nearly flush with the faceplate to make it less susceptible to prying. An optional metal fingerwheel kit (H-888450-1) is available for high-risk areas. Refer to the 473-520 subdivision of GTE Practices for installation instructions.

3.11 The upper housing contains a dial housing to which is mounted the rotary dial or TCU switch lever and hook-switch, together with a 16-foot ribbon-contact plug and a terminal board. Leads from the various components and the plug are interconnected at the terminal board. The dial housing plug makes contact with a float mounted receptacle on the chassis in the lower housing as the upper housing is pushed into place, thus eliminating the problem of trying to insert a separate plug while holding the upper housing in position.

3.12 A stationary handset hanger is mounted on the front of the upper housing. The hookswitch is actuated by a lever which projects through an opening in the housing between the support points of the hanger. An armored handset cord is furnished as standard equipment and arranged for entry on the left side of the housing to minimize tangling.

3.13 The faceplate of the upper housing has two openings for recessing instruction cards. An upper instruction card, 2 inches by 2-3/4 inches in size, is located to the left of the coin slot and provides information on how to operate the coin telephone set, while a 2-1/2 inch by 6-1/8 inch lower panel card furnishes service codes and other call data peculiar to a given area. The cards and their clear plastic windows are arranged for snap-in mounting on the faceplate.

Subassemblies

3.14 The lower housing of the Type 120A (Figure 3) consists of three major subassemblies: the rejector mechanism, the coin relay-hopper and chute assembly, and the chassis assembly.

3.15 Rejector Mechanism. The rejector mechanism is fastened to a mounting plate which is held in place by a tab and one captive screw. A reject chute (connecting the rejector mechanism and coin relay return outlets to the coin return receptacle) can also be removed by loosening one captive screw.

3.16 The American rejector mechanism (Figure 5) is a sophisticated coin testing device for accepting a very high percentage of genuine coins and rejecting the majority of slugs encountered in the field. As coins enter the rejector, they are sorted into the three general size categories of a quarter, nickel, or dime. Thereafter, coins are tested in their own individual channel. Each coin is first checked for proper diameter and weight. If it meets these requirements it is checked for a perforation (such as that in a washer) and is released down an inclined rail. As the coin rolls down the rail it is tested for proper thickness and then is guided past by a permanent magnet, on American rejectors. The magnet generates eddy currents within the coin if it is metallic. This tends to retard its travel. If it is not metallic, such as a plastic slug, there is no slowing of the slug as it passes the magnet. The material composition of the coin or slug

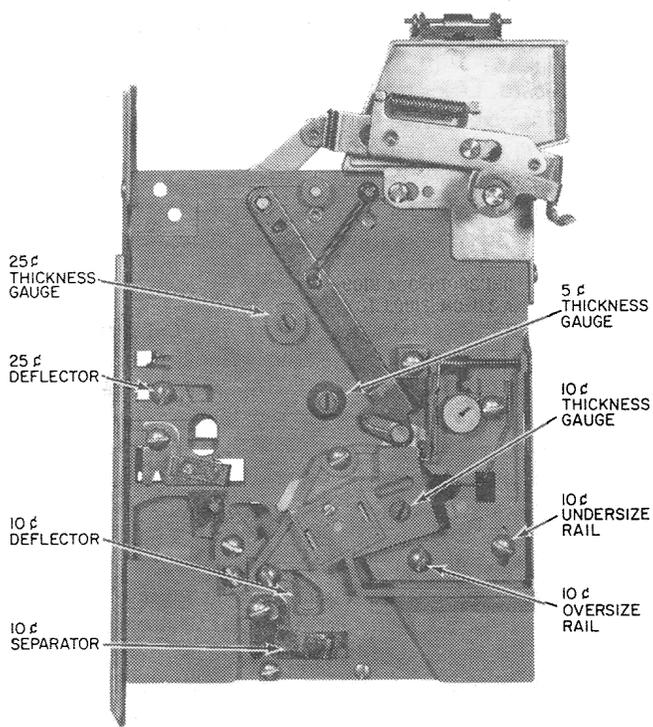


Figure 5. American Rejector Mechanism.

determines the speed with which it leaves the inclined rail. If the coin travels too fast or too slowly, it strikes certain deflectors that cause it to be diverted to the reject outlet. In addition, the nickel is tested for hardness and elasticity to determine whether it will be accepted or rejected.

NOTE: The quarter deflector unit for Canadian rejectors has been removed, but the option of periodically installing these deflectors to accommodate a particular slug is still open to the telephone company. It is not recommended that this deflector be used unless a particular coin telephone is experiencing an abnormal amount of counterfeit quarters.

3.17 Most rejected coins are diverted directly into the reject outlet and terminate in the coin return receptacle of the telephone. Ferrous slugs, oversize coins, and washers become trapped in the rejector but can be released by operation of the coin release lever. As this lever is operated, it causes a separation of the hinged sides of the lead-in chute and rejector. This allows several fingers to extend into the coin channels and dislodge trapped coins. At the same time, wiper blades sweep past the magnets to clear the coin channels, directing the trapped coins to the coin return receptacle.

3.18 Coin Relay-Hopper and Coin Chute Assembly. A coin relay-hopper and coin chute assembly (Figure 6) located below the rejector mechanism is retained near the

top by a tab that drops over an opening in the reinforcing plate at the rear of the lower housing. The collect opening of the hopper extends through the floor above the coin box and is held in place via a movable rail which is locked with three screws.

3.19 Genuine coins leaving the rejector mechanism have been sorted into three channels. As a coin travels through the succeeding chute section, it operates the trigger switch associated with that denomination. Each trigger provides an input to the totalizer. Operation of the first chute trigger in turn actuates the coin relay trigger lever. After passing through the chute section, coins then fall into the coin relay-hopper and are channeled directly into the coin box in semipostpay service or come to rest on a double trap door support in prepay service.

3.20 The coin relay-hopper and coin chute assembly serves to dispose of the coins held suspended on the trap doors of the hopper. A wider hopper design accepts coins from an off-center entry point and retains them in random fashion. This allows a shorter hopper with the same capacity (approximately 20 quarters) as the single-coil coin relay used in three-gauge sets. Similar in operating principle to that relay, the new relay also features a polarized selector mechanism. During operation of the relay, the selector card is influenced by the polarity of the voltage applied to the relay. This causes the card to tilt as it moves downward and opens the proper trap door to collect or refund coins. Release of the relay resets the trigger lever and returns the trap door to the closed position in readiness for another deposit. As the relay operates, it short circuits its own coil and substitutes a resistor in the circuit during the shorted period. The resistor provides circuit continuity and current limiting for the operator's coin lamp while the coil-shortening

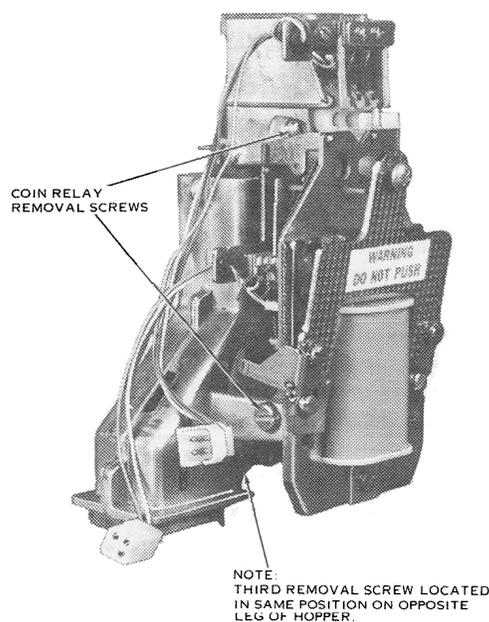


Figure 6. Coin Relay-Hopper and Coin Chute Assembly.

feature allows the relay to operate completely on a 0.2-second pulse. Additionally, a long release time is provided by the shorted coil to ensure complete disposal of coins.

3.21 Chassis Assembly. The chassis assembly (Figure 7) mounted at the left side of the lower housing is retained by a tab and one captive screw. A transmission network, a Type 48 ringer, and three totalizer cards are mounted to the chassis. Electrical interconnection to other assemblies is made via connectors mounted on the chassis assembly. A float mounted 16-ribbon contact chassis connector provides circuit access to the components in the dial housing, a four-pin connector offers connection to the coin chute trigger, a three-pin connector provides connection to the coin relay, and a three-pin connector and terminal block located on the right side of the chassis provides connection to line terminations on the rear of the lower housing.

3.22 The primary function of the totalizer is to count and store the total value of coins deposited. It also performs several other functions. As coins are received, the totalizer simultaneously mutes the coin telephone receiver and applies audio frequency signals to the line corresponding to the value of the coin deposited. On operator-assisted

calls, these tones indicate the value of each coin deposited. The totalizer also controls the coin telephone by restricting either signaling or transmission until the initial rate has been deposited. The initial rate is set at the factory for 10 cents but can be easily revised for any value from 5 cents to 35 cents in 5-cent steps by changing the position of three wiring straps on the rate register card.

3.23 The totalizer is comprised of three printed wiring cards, the coin pulse generator, the rate register, and the interface circuit card. When a deposit is made, signals from the coin triggers are fed into the coin pulse generator where pulses of the proper number and duration are produced corresponding to the value of the coin deposited. These pulses are sent simultaneously to the rate register and the interface circuit. The rate register stores pulses generated by the coin pulse generator while the interface circuit converts the pulses to tone signals and applies them to the telephone line. A continuous output is also sent from the coin pulse generator to the interface circuit during the entire pulsing period to mute the receiver. This minimizes the level of coin tones reaching the user's ear and also reduces the possibility of fraudulent use of these tones. When the total number of pulses stored in the rate register equals the initial rate for which it is set, the rate register signals the interface circuit. The interface circuit responds to this signal to make the telephone operational.

3.24 The interface circuit serves to make the logic section of the totalizer (the coin pulse generator and rate register) compatible with the conventional telephone circuit. Included in the interface circuit is a regulated power supply, operated from line potential, to power all other totalizer circuits: an audio oscillator which the coin pulse generator keys as each coin is deposited a receiver-muting control which is activated during the sending of tones; a unity gain one-way amplifier used to isolate the receiver to prevent its use as a transmitter in semipostpay service; and a rate relay and associated circuit to control the dial or the coin relay, and the transmitter. Three modes of operation are possible by changing the position of several straps on the interface circuit and one strap on the rate register.

3.25 If strapping on the interface card is arranged for prepay operation, the bistable rate relay responds to the presence of loop current and by its operation opens the path over which the coin relay contacts apply ground to the transmission network and disables the rotary dial or TCU closure of the coin relay contacts on deposit of the first coin has no effect upon the loop unless that coin satisfies the initial rate for which the totalizer is strapped. When the total deposit equals that value, the totalizer causes the rate relay to operate, extending coin relay ground to the transmission network and to provide the usual deposit indication to the central office, and enable the rotary dial or TCU. While operated, the rate relay also serves to disable the dial or TCU. If the instrument is to be used for coin-free emergency calling service, strapping on the interface card is rearranged so the dial or TCU is

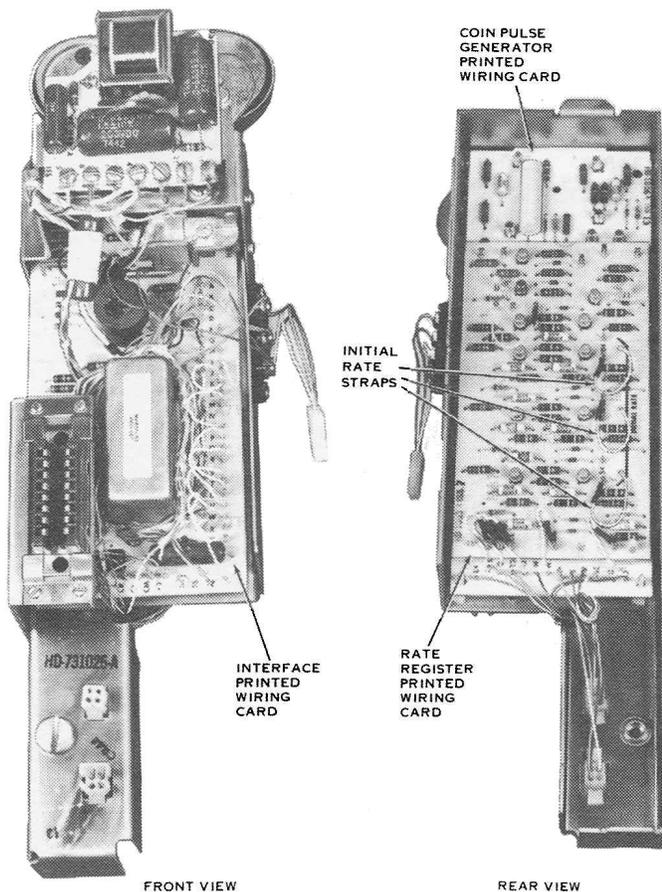


Figure 7. Chassis Assembly (Front and Rear Views).

not disabled and the rate relay does not operate immediately upon initial rate deposit. To check for proper deposit, the central office briefly opens the loop. If the proper amount is registered, this interruption in loop current causes the rate relay to operate, applying coin relay ground to the transmission network but is again removed when loop current resumes. This minimizes the longitudinal current induced in the line from external sources and thereby reduces hum and noise during conversation. The advantages of this type of operation are attained only through the use of the coin line repeater or adapter and associated equipment designed for emergency calling service and described in the 265-150 subdivision of GTE Practices.

3.26 If strapping on the interface printed wiring card is arranged for semipostpay operation, the rate relay responds to the presence of loop current from normal battery and, by its operation, connects the handset transmitter (and, in Touch Calling, sets the TCU) for service. This permits proper operation on calls to free service numbers or to an

operator on which battery feed remains normal. Receipt of reverse battery supervision on a completed call to a local number causes the rate relay to operate, disconnecting the transmitter and (in Touch Calling sets) disabling the TCU to prevent free transmission of coded information via DTMF signals. At this time, the receiver is fully operational, with normal sensitivity, so the called party's answer can be heard without impairment, but a unity-gain amplifier isolating the receiver from the transmission unit induction coil prevents use of the receiver as a transmitter. Deposit of the rate for a local call causes the totalizer to operate the rate relay and reactivate the transmitter and, in Touch Calling sets, the TCU.

3.27 A conductor loop limit table (Table 2) is provided for coin telephone sets used with SxS offices. If the coin telephone is used in areas where its circuits may be affected by high longitudinal voltages, a 108C drainage coil must be used; its installation is described in Section 605-202-200.

→ Table 2. Type 120A Coin Telephone Conductor Loop Limits (Ohms).

TYPE OF CENTRAL OFFICE	PREPAY		SEMIPOSTPAY	
	WITHOUT LOOP EXTENDER	WITH LOOP EXTENDER	WITHOUT LOOP EXTENDER	WITH LOOP EXTENDER
Step-by-Step	1,200	2,600*	1,200	3,200
No. 1 EAX	1,600	3,900	Service not offered	

* Limit is based on 0-Vdc earth potential. With -3-Vdc or greater earth potential, loop extender is not usable due to coin-detection failure.

NOTES:

- Test Conditions – Office battery: 48 Vdc
 Ground resistance: 50 ohms
 Earth potential: 0 Vdc
 Minimum coin battery:

 SxS: 100 Vdc (100 to 120 Vdc)
 No. 1 EAX: 135 Vdc (135-145 Vdc)
- Loop extension equipment by Lorain Products Corp. Model SRM-169 loop extender strapped S-1.
- If an extension telephone is used with the Type 120A telephone, a loop limit of 800 ohms without a loop extender or 2,000 ohms with the Lorain SRM-169 loop extender must be observed to provide a minimum of 10 mA to coin telephone during periods when the coin telephone and extension are off-hook simultaneously. If longer loops are required, a modification to the extension telephone or line may be made by connecting two zener diodes (3.3 volts, 1 watt, No. FD-1029-LD) anode to anode and wiring them in series with either the tip or ring conductor extension. This change will provide the same loop limits shown in this table.

Modifications

3.28 A retrofit deflector kit (HD-780105-A) is available for all sets manufactured after June 14, 1974.

3.29 A directory bracket kit (HH-880035-1) is available for use on the revised backboard (HD-470004-C) or the previous backboard (H-470004-A) (prior to June 1, 1975). This directory bracket is for use in locations where the surface is not substantial enough to withstand the weight of heavy directories.

3.30 A retrofit line wire termination kit (HH-920004-1) is available to provide sets manufactured before the fourth quarter of 1974 with the improved line wire accessibility feature provided on current sets. Refer to paragraph 4.31 for installation of the line-wire termination kit.

3.31 Alarm switch assemblies (HD-720001-A and HD-720002-A) are available and are mounted to the upper right side and lower left side of the lower housing (HD-480023-A).

3.32 A dial hookswitch inhibitor (KH-840401-A20A) is available for protection against fraudulent use of the hookswitch for placing calls. Section 997-256-800 contains installation and mounting information on this dial hookswitch inhibitor.

3.33 A newly designed handset (L-9081) containing the D-51030-B capsule is available on the Type 120A. This new handset is designed for use by the hard-of-hearing. The handset capsule is also impact shockproof. The handset can be identified by the blue grommet located at the point where the armored handset cord enters the receiver.

4. INSTALLATION

4.01 The Type 120A is furnished, equipped and wired for prepay operation, but can easily be modified for semipostpay operation. Refer to paragraphs 4.03 and 4.04 for modification procedures.

Pin Terminal Insertion and Extraction

4.02 Proper pin terminal insertion and extraction techniques must be used when strapping or repairing any of the totalizer's card circuits. The proper mating of the female connector with the male portion is obtained by grasping the barrel portion of the female connector with a tweezer-type extraction tool, SMC-578889, keeping the female portion in line with the male portion (Figure 8). Failure to use this tool can lead to spreading of the female connector resulting in bad or intermittent connections.

Modification for Semipostpay Operation

4.03 Use the following procedure to modify a Type 120A telephone set for semipostpay operation:

- (a) Remove the upper housing by inserting the key into the lock to unlock the upper housing.
- (b) Insert the T-wrench into the upper housing opening and turn it one-eighth turn clockwise.
- (c) Grasp both sides of the upper housing and slide it forward.
- (d) Remove the three mounting screws and the coin relay from the coin hopper and relay coin chute assembly (refer to Figure 6).
- (e) Lock the hopper door in the collect position. This is done by moving the door with the pin located in the left bottom corner of the hopper assembly and locking the door in this position with a 4-40/3/8-inch screw. The screw is inserted into the tapped hole adjacent to the door lever in the lower left-hand corner of the hopper assembly.
- (f) Remove receptacle J3 from the chassis assembly and place the coin relay in stock for future use. Refer to Table 1 for strapping and connection changes.

Modification for Emergency Calling

4.04 To modify the interface card for emergency calling, refer to Table 1.

Location

4.05 The location where the coin telephone set is to be installed is specified on the service order. The location should meet the following criteria:

- (a) Have sufficient light.
- (b) Be free from excessive noise, vibration and dirt.

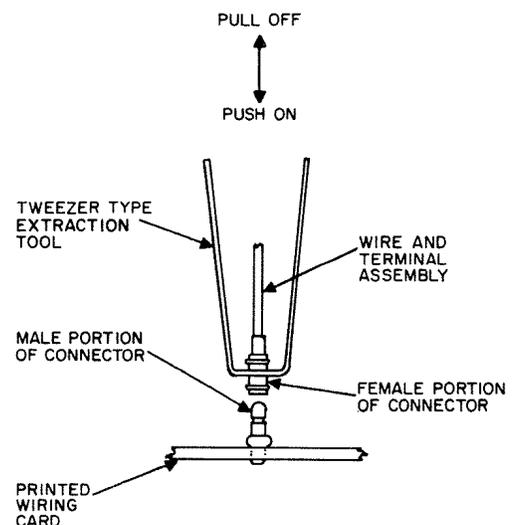


Figure 8. Tweezer-Type Extraction Tool (SMC 578889) and Connector Insertion and Extraction Method.

- (c) Be clear of pedestrian and vehicle traffic.
- (d) Be clear of glass counters, showcases, or other fragile objects.
- (e) Have a 6-inch clearance from fluorescent lights, transforms, and similar apparatus to avoid inductive interference.

Mounting

4.06 The pattern of mounting holes in the lower housing and the relationship of the wire opening to the mounting holes are the same as those used on the three-gauge coin telephone sets, to permit mounting in the same booths or other predrilled location.

4.07 The surface where the backboard (HD-470004-C) is mounted should be sufficiently firm so as not to dislodge the backboard. The surface must also be flat so the backboard and Type 120 cannot be pried loose. The backboard is used only when a predrilled mounting surface is not available.

4.08 If the coin telephone must be located on finishes that would be expensive to repair if the set were removed, obtain instructions from your immediate supervisor before proceeding with the installation. Arrangements should be made to have the customer or building owner drill mounting and wire entrance holes through glazed tile, marble, or other such surfaces. When mounting the single-slot coin telephone, a vertical surface must be provided. A tilt greater than 1-1/2 degrees in any direction will cause malfunction of the coin rejector mechanism. A vertical surface may be determined by performing the following steps:

- (a) Place a spirit level vertically against the mounting surface with the top end of the level at the required height of the coin telephone.
- (b) Move the top or bottom end of the level away from the mounting surface as required to obtain a vertical reading. When a vertical reading is obtained, the end of the level opposite the point of contact shall be no farther from the mounting surface than the distances shown in Table 3.
- (c) Ensure that a vertical surface is obtained in both directions.

4.09 Mounting of the Type 120A in an aluminum booth is described in the 476-500 subdivision of GTE Practices.

4.10 Unlike the backplate of the three-gauge surface mounted coin telephone sets, the lower housing of the single-slot telephone set does not have a rear channel to permit entry of the top or bottom wire in surface-wired installations. For this and other installation requirements, a metal backboard is available for separate ordering. Provision is made for the use of four security studs (HD-190003-A) for mounting. These studs aid in mounting the telephone as well as providing a more secure installation.

Table 3. Dimension Parameters for Determining Vertical Surface.

SPIRIT LEVEL LENGTH (INCHES)	MAXIMUM DISTANCE ALLOWED FROM SPIRIT LEVEL TO MOUNTING SURFACE ON OPPOSITE END FROM POINT OF CONTACT (INCHES)
18	15/32
24	5/8
30	25/32
36	15/16

4.11 When mounting the coin telephone in a wood booth or on a wall, use of the metal backboard (Figure 9) is required. When mounting the backboard observe the following:

- (a) If the seat is used, install the backboard with the top edge approximately 52 inches from the floor.
- (b) If the seat is not used, install the backboard with the top edge approximately 63 inches from the floor.

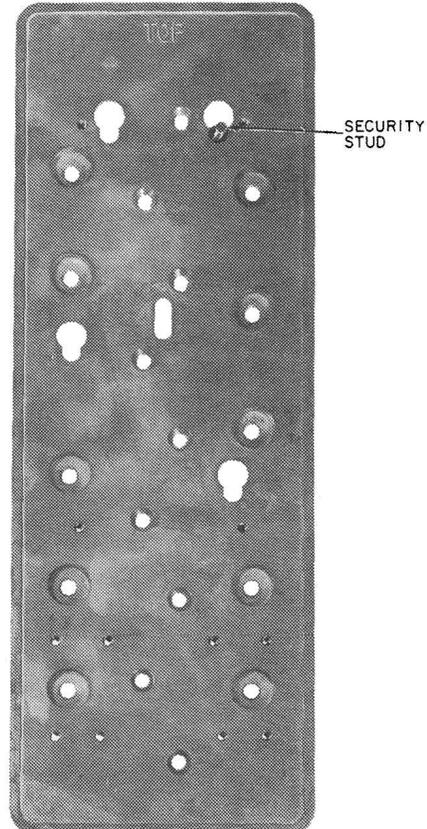


Figure 9. Backboard.

Feed the inside wire through the backboard wire entrance hole.

NOTE: When installing a coin telephone in a wood booth or on a wall. Refer to Section 435-300-100 for grounding procedures.

4.12 Bring the remaining wire either up or down the channel formed by the mounting screw hubs at the rear of the backboard. Dress the wire between channel hubs in such a way that it will not become pinched when the backboard is mounted.

4.13 Secure the backboard to the mounting surface with at least six fasteners.

Lock Installation

4.14 If the locks in the upper and lower housings are installed, disregard these instructions. If, however, the locks are not installed, use the procedures described in paragraphs 4.15 and 4.16 to install them.

4.15 To install the upper housing lock, proceed as follows:

- (a) Remove the upper housing (paragraph 4.03).
- (b) Rotate the key in the lock cylinder one-eighth turn counterclockwise.
- (c) Manipulate the locking bar and cam portion of the lock assembly through the cutout in the upper housing, from the outside.
- (d) Manipulate the mounting nut over the locking bar with the cutout facing toward the inside of the upper housing.
- (e) Lock the cylinder by rotating the key one-eighth turn clockwise. (The locking bar may be adjusted by loosening the locking bar mounting screw, locking the cylinder, and retightening the screw.)
- (f) Tighten the mounting nut.

4.16 To install the lower housing lock, proceed as follows:

- (a) Insert the lock assembly through the inside of the vault compartment through the opening on the left side of the lower housing.
- (b) Secure the lock assembly with the six captive screws furnished and using the special lock installation tool. Make sure even pressure is given to each screw.

NOTE: Do not tighten any one screw completely until all mounting screws have been started. Do not overtorque the screws.

Installation Procedures

4.17 The Type 120A is furnished disassembled in a shipping container having compartments for the various components. The shipping container should be retained and used

if its is necessary to return the Type 120A to the factory for repair.

4.18 Mount the Type 120A to the backboard by positioning the set against the backboard until the security studs line up with the key slots in the backboard. Push the set firmly against the backboard and slide it downward until the security studs seat in the backboard key slots.

4.19 Secure the Type 120A to the backboard with 1/4-20 by 5/8-inch RHM screws in the following locations:

- (a) Two holes near the top of the housing.
- (b) One hole to the left of the coin relay.
- (c) For a metal booth, use the second and fourth set of holes located behind the vault and coin return receptacle. It will be necessary to remove the coin return receptacle. Use the following procedure to remove the coin return receptacle:
 - (1) Remove the coin return receptacle screw located in the mechanism base immediately above the coin return receptacle.
 - (2) Insert a finger in the coin return receptacle and tilt the top forward.
 - (3) Lift the coin return receptacle and pull it out and up.
- (d) On installations with the metal backboard, use the first and third set of holes located behind the vault.

4.20 Line terminations on earlier production units were made with the L1, G, and L2 pileup located on the inside rear of the lower Housing (Figure 10a). Line terminations on current production units are made at the L1, G, L2 terminal block located on the left front of the mechanism (Figure 10b).

NOTE: When terminating the line wires at the terminal block located as in Figure 10b, care must be taken not to route wires under the chassis assembly nor to pinch these wires when installing the chassis assembly.

4.21 Reinstall the coin return receptacle and install the components that were shipped in the packing box. Installation of the various components is described in paragraphs 4.21 through 4.30.

4.22 To install the coin return receptacle use the following procedure:

- (a) Tilt the top of the coin return receptacle toward the set.
- (b) Push the coin return receptacle into the set.
- (c) Push in and down on the bottom of the coin return receptacle until it is flush with the front of the housing.
- (d) Install the coin return receptacle locking screw. Tighten the screw only enough to hold the return

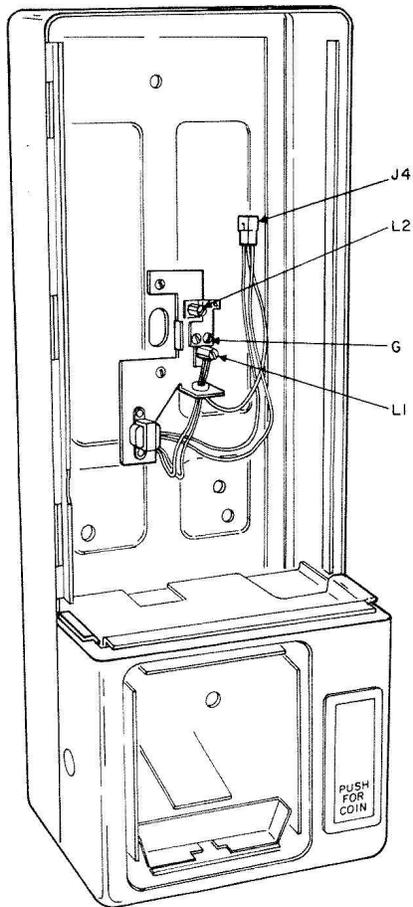


Figure 10a. Earlier Version.

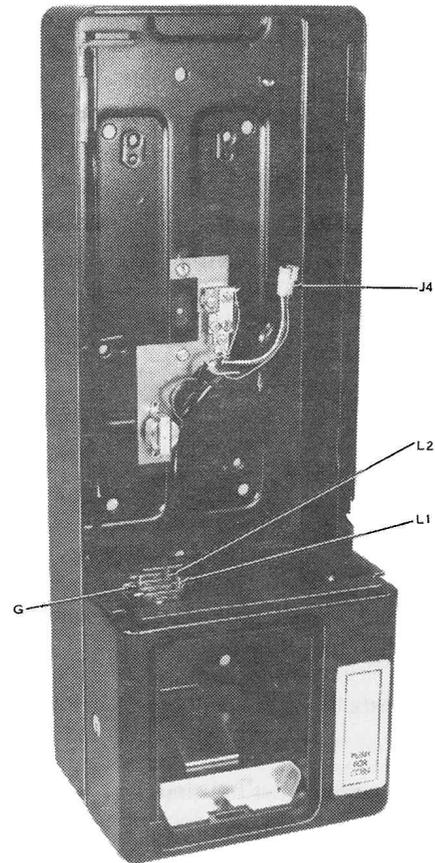


Figure 10b. Current Version.

Figure 10. Connecting Station Wires.

receptacle in its place. Further tightening may damage the screw.

4.23 Totalizers are preset by the manufacturer for an initial rate of 10 cents. If initial rates other than 10 cents are required, they should be reset prior to placing the chassis assembly into the telephone.

4.24 The initial rate is adjustable from 5 cents to 35 cents in 5-cent increments. The initial rate is equal to the total value of the pins to which the three totalizer initial-rate straps are connected. For example, a 15-cent initial rate would require straps to be connected to 5 cents, 10 cents, and 0. All straps must be connected to a pin even though that pin may be 0.

4.25 The totalizer assembly is mounted within the chassis and is accessible from the rear of the chassis. The three initial-rate strap wires are located on the outer card, and they are connected to pin terminals on the card.

4.26 To install the chassis assembly, perform the following:

- (a) Slide the chassis upward to engage the tab at the top of the chassis under the shear form at the top of the lower housing.
- (b) Seat the other two chassis tabs in the slots. Check to be sure the lower tab is seated in its slot. If this tab is not fully seated, it is impossible to install the upper housing.
- (c) Tighten the chassis mounting captive screw.
- (d) Insert the plugs from the coin relay and coin chute switches into the chassis receptacles.
- (e) Connect the plug from TB1 to the receptacle of the station wire terminal and transformer assembly.
- (f) Tap the mercury wetted relay (HB-1004-B) lightly on its right side to ensure that the relay contacts were not shorted during shipment.

4.27 To install the rejector mechanism, perform the following:

- (a) Tilt the tab at the bottom of the rejector mechanism inward and insert the tab into the tapered recess at the top rear of the coin relay-hopper and coin chute assembly.
- (b) Push the mechanism in until the upper mounting hole seats over the lower housing stud.

- (c) Tighten the rejector mechanism's captive mounting screw.

4.28 To install the reject chute, perform the following:

- (a) Tilt the bottom of the reject chute toward the Type 120A and push it into the opening of the rejector mechanism base at the right side of the coin relay-hopper and coin chute assembly.
- (b) Push the top of the reject chute up and inward, making sure that the locking tabs of the chute engage with the coin relay-hopper and coin chute assembly as the chute is pushed into place.
- (c) Tighten the reject chute's captive mounting screw.

4.29 To install the upper housing, perform the following:

- (a) Place the rear edge of the upper housing on the front edge of the lower housing. The upper housing must be unlocked with the T-wrench (Figure 4).
- (b) Slide the upper housing slowly backward as far as it will go. Guide pins in the dial housing align the dial housing plug and chassis receptacle as the cover is replaced.
- (c) Operate the locking mechanism with the T-wrench by turning the T-wrench one-eighth turn counter-clockwise.
- (d) Lock by rotating the key one-eighth turn clockwise and remove the key.

4.30 Install the rotary dial or TCU number card and user instruction cards.

Retrofit of Line Wire Termination Kit

4.31 To install the retrofit line wire termination kit, perform the following steps after removing the upper housing, vault door and coin box chassis assembly, coin reject chute, and rejector assembly:

- (a) Remove the left side relay rail mounting screw from the vault area.
- (b) Replace the relay mounting screw with the D-762047-E screw (shortest screw) provided in the retrofit kit.
- (c) Place the HD-781015-A terminal plate (provided in the kit) on the mechanism base with the cutout portion over the D-762047-E screw inserted in step (b).

NOTE: For all installations of parts, the L1, G, and L2 designations are kept to the installer's right.

- (d) Place the D-17345-A washer (provided) over the screw, install the D-7701-A nut (provided) and tighten.
- (e) Place the HD-150058-A terminal block (provided) onto the terminal plate and secure it with two D-762047-F screws (provided).

- (f) Attach the HD-540106-A three-conductor strap cable (smaller spade end) to the left side row of the terminal screws of the terminal block and bend the barrel portion up 90 degrees.
- (g) Attach the other end of the strap cable to the line pileup terminal screws of the existing line wire pileup.
- (h) Route the line wire and the ground wire to the right side row of the terminal screws of the terminal block of the mechanism base and terminate.

NOTE: When routing the line wire, ground wire, and strap cable, care should be taken that none of these wires are routed so that they would be under the chassis assembly when it is reinstalled.

- (i) Replace the rejector assembly, the coin reject chute, and the chassis assembly. Check for proper routing of wires and make certain that no wires are pinched under the chassis assembly.
- (j) Replace the upper housing, the new coin box and the vault door.

5. INSTALLATION TESTS

5.01 Standard installation tests for ringing, dial speed, and line noise level must be performed. In addition to these tests, various coin mechanism tests must be performed. Tests for prepay service differ from those for semipostpay service and, therefore, are discussed individually. Each test should be performed at least five times. The following wiring diagrams are included to assist the installer in tracing any malfunctions which may appear:

- (a) Figure 12, Wiring Diagram of Type 120A with Rotary Dial for Prepay Service.
- (b) Figure 13, Wiring Diagram of Type 120A with Touch Calling Unit for Prepay Service.

Prepay Service

5.02 To check the coin mechanism operation, use the following procedures:

- (a) For a coin telephone set strapped for 10-cent-service, deposit one nickel and check that a call cannot be made. Deposit a second nickel and dial the number assigned to the coin telephone. When busy tone is heard, hang up and check for correct coin refund.
- (b) Deposit a dime or quarter and dial the number assigned to the coin telephone. When busy tone is heard, hang up and check for correct coin refund.
- (c) Remove the cash vault door if it is in place.
- (d) Insert a dime and dial the test line.
- (e) When the connection is completed to the test line, hang up. Check that the dime falls into the cash vault.

- (f) Deposit a quarter, dial the test line and hang up when connection is made. Check that the quarter falls into the cash vault.
- (g) Deposit a dime and dial the local testboard or operator. Deposit a dime, nickel, and quarter. Have the testboardman or operator identify the coins.
- (h) Deposit various coins and have the testboardman identify each coin.
- (i) Have the testboardman apply refund current. Check that the coins drop into the coin return receptacle.
- (j) Redeposit the coins and have the testboardman apply collect current. Check that coins drop into the cash vault.
- (k) Replace and lock the cash vault door.

Semipostpay Service

5.03 To check operation, use the following procedures:

- (a) Dial the coin telephone set number and wait for busy tone. Hang up.
- (b) Unlock the cash vault door.
- (c) Dial a predetermined number for assistance in checking the coin telephone's operation. Do not call the operator.
- (d) When the called party answers, deposit one nickel. The transmission block should remain; therefore, deposit a second nickel, which should remove the transmission block. Hang up.
- (e) Call the same party for further assistance and, when the called party answers, deposit a dime. The transmission block should be removed. Hang up.
- (f) Repeat step (e) using a quarter.
- (g) Call the operator for assistance with coin signal testing.
- (h) Deposit a coin of each denomination and have the operator identify each coin. Hang up. Lock the cash vault door.

6. OPERATION OF TYPE 120A IN PREPAY MODE

6.01 Because of the operational differences between a Type 120A strapped for prepay and one strapped for semipostpay, each operation is explained individually.

Operation with Central Office (Prepay)

6.02 The automatic exchange associated with a prepay coin telephone must be equipped with coin-control repeaters, sources of ± 110 Vdc collect and refund battery, and an interrupter that produces intermittent coin control current being applied to the line. If the coin telephone is to be arranged for emergency coin-free service, a repeater or adapter and associated equipment designed for this type of service must be installed at the central office.

6.03 The calling party is connected to a coin telephone repeater at the central office upon lifting the handset but

cannot break dial tone until the initial rate amount has been deposited. After deposit of the initial rate deposit, which is 10 cents in most localities, the calling party may dial in the usual manner.

6.04 Upon termination of a call, the central office sends either collect or refund battery to the coin telephone, depending upon whether the call was completed, abandoned, or incomplete. If the call is complete, the coins are directed into the cash compartment. If the call is abandoned or incomplete, the coins are directed into the coin return receptacle. After the coins have been collected or refunded, the coin telephone is returned to its normal condition (ready for another call).

6.05 On operator-assisted calls, the initial-rate amount is refunded upon connection to the operator. Toll operators supervise collection of coins by audible signals generated by an audio oscillator located within the coin telephone. The operator controls the application of coin collect and refund on toll calls.

Operational Sequence (Prepay)

6.06 The calling party, upon initiating a call, lifts the handset and dial tone is extended; however, the caller cannot break dial tone until the initial deposit is made. The coin or coins that are inserted into the coin slot are directed into the rejector mechanism where they are gauged and tested as described in paragraph 3.16. After the coins clear the rejector mechanism, they pass through a coin chute that contains three trigger switches, one for each of the three denominations of coins used in the coin telephone set.

6.07 When the coins actuate the trigger switches in the coin chute, the trigger switches close a path to the totalizer. The action of the totalizer is described in paragraph 3.23. The first coin in its path to the coin hopper also actuates the trigger in the coin relay. The triggering of the coin relay operates a set of contacts which prepare a ground path to the transmission network. This action, however, has no effect on the loop unless the initial rate has been deposited. When the initial rate has been deposited, the totalizer causes the rate relay to operate enabling the dial or TCU, and extending coin relay ground to the transmission network. This function and other functions of the interface circuit are explained in paragraphs 3.23 through 3.26. After the handset is restored, the coins are diverted either into the cash vault or refund receptacle, and the coin telephone is restored to normal.

7. OPERATION OF TYPE 120A IN SEMIPOSTPAY MODE

7.01 Semipostpay operation differs from prepay operation. In a Type 120A strapped for semipostpay operation, the coin relay is not needed and coins are not refunded. In prepay operation, the opposite is true.

Operation with Central Office (Semipostpay)

7.02 Semipostpay operation provides fully automatic enforcement of coin collection on local calls in central offices arranged for reverse battery answer supervision. The station user receives dial tone without deposit of coins and can dial the number of digits required to place a local call or reach the toll or Extended Area Service (EAS) operator. Should the call not be completed for any reason, the coin telephone will not refund coins because none has been deposited. When the called party answers, the switching equipment reverses the polarity of battery-feed to the calling line, preventing conversation between the calling and called parties. When the initial rate deposit is made, the transmission impairments are removed and the parties can converse.

Operational Sequence (Semipostpay)

7.03 The calling party, upon initiating a call, lifts the handset and dial tone is extended. The user dials the desired digits, and the call is extended to the called party. The calling party can hear the called party answer the call but conversation cannot take place because transmission is impaired until the initial deposit is satisfied. This impairment is provided by the rate relay in the interface circuit.

7.04 The calling party, upon hearing the called party, inserts the correct amount of coins into the coin slot. The coins are directed into the rejector mechanism where they are gauged and tests as described in paragraph 3.16. After the coins have cleared the rejector mechanism, they pass through a coin chute that contains three trigger switches, one for each of the three denominations of coins used in the coin telephone set. The trigger switches close a path to totalizer. The action of the totalizer is described in paragraph 3.23. After the coins leave the coin chute, they are diverted directly into the cash compartment.

7.05 After the initial rate is deposited, the totalizer causes the rate relay to operate which removes the transmission impairment and allows the calling and called parties to converse. This function and other functions of the interface circuit are described in paragraphs 3.23 through 3.26. After the call has been completed and both parties restore their handsets, the coin telephone restores to normal.

8. FIELD MAINTENANCE

General

8.01 In general, field maintenance should be limited to cleaning and replacing defective components. No attempt should be made to repair defective components. Adjustment and troubleshooting information is contained in Tables 4 through 10.

Chassis Assembly

8.02 Perform the following routine inspection of the chassis assembly before proceeding with the specific troubleshooting in Table 4:

- (a) Check L1, L2, and GND on the chassis for loose connection and/or bad crimp on the wires. If bad crimp exists, replace the entire assembly.
- (b) Check all pin terminals for good connection. If loose, replace the entire assembly.
- (c) Verify that proper strapping exists and correct if necessary.
- (d) Inspect the trigger switches for obvious damage. If necessary, replace the entire hopper relay coin chute assembly.
- (e) Verify that the coin relay contact springs operate fully on coin drop and are fully restored when the relay operates. Verify that no interference with the covers exists. If necessary, replace the entire assembly.
- (f) Tap the mercury-wetted relay on the right side to properly settle mercury.
- (g) Check for damaged components. If damage exists, replace the entire assembly.
- (h) Check for the shorting of the chassis to the line wire assembly. If it is shorted, insulate it with electrical tape or reroute the line wire. Line wires should not be under the chassis frame except for the short distance (approximately 1 inch) from the entry point through the rear of the housing to the line wire termination pileup.
 - (i) Verify that the line is alright.
 - (j) Check for broken wire in the plugs. Replace the defective assembly or subassembly.
 - (k) Check the wiring connections on the hookswitch dial housing assembly.
 - (l) Verify that the hookswitch operates properly. If necessary, replace the entire assembly.
 - (m) Make sure the dial shunt operates properly. If not, replace the entire hookswitch-dial housing assembly or dial.
- (n) Ensure that the chassis frame is installed properly, i.e., that all tabs are in their respective slots.

Coin Hopper-Relay Coin Chute Assembly

8.03 Perform the following routine inspection for the coin hopper-relay coin chute assembly before proceeding with the specific troubleshooting in Table 5:

- (a) Perform a routine inspection of the chassis assembly (paragraph 8.02).
- (b) Check for stuck coins in the coin chute assembly. If coins are found, remove them by removing the entire coin hopper-relay coin chute assembly and turning it upside down. If this does not work, replace the entire assembly.

Table 4. Troubleshooting for Chassis Assembly.

STEP	SPECIFIC TROUBLE	FIELD ACTION
1	Cannot break dial tone.	(a) Tap mercury relay. (b) Replace entire assembly.
2	Return to dial tone after dialing, or during collect or refund during call, after toll call coin deposit.	Line or central office problem.
3	Free calls are obtained upon picking up handset.	Replace entire chassis assembly.
4	Calls on less than base rate deposit.	(a) Check strapping and correct. (b) Check trigger switches and replace coin relay-hopper chute assembly, if necessary.
5	Dead telephone no dial tone.	(a) Check if line wire is shorted to chassis and correct. (b) Check for loose harness terminals and correct. (c) Check for shorted dial shunt springs; if found, replace dial.
6	Coin relay will not collect or refund less than base rate deposit.	(a) Replace entire chassis assembly. (b) Problem at central office.
7	Wrong number of pulses.	(a) Replace entire chassis assembly. (b) Replace coin relay-hopper coin chute assembly.
8	Pulse width or repetition rate of coin signal not correct.	Replace entire chassis assembly
9	Coin tone level or frequency not correct.	Replace entire chassis assembly.
10	No coin tone produced for one denomination of coin but alright for other denominations of coins.	Replace coin relay-hopper coin chute assembly.
11	Coin tones heard in receiver.	Replace entire chassis assembly.
12	Initial rate is reached for a value of coin deposit different than the amount strapping indicates.	Replace entire chassis assembly.
13	Touch Calling unit or rotary dial not disabled by totalizer before initial rate is reached (regular prepay option).	Replace entire chassis assembly.
14	Transmitter not disabled on reverse battery before rate is reached (semipostpay).	Replace entire chassis assembly.
15	No ring or bad ring.	Replace entire chassis assembly.

Table 4. Troubleshooting for Chassis Assembly (Continued).

STEP	SPECIFIC TROUBLE	FIELD ACTION
16	Base rate reached on 5- and 10-cent combination but not with 25 cents or vice versa.	Replace coin relay-hopper coin chute assembly.
17	Noisy line.	Line or central office problem.
18	Reach base rate but no coin tones generated thereafter.	Replace entire chassis assembly.
19	Deposit over base rate will not work (telephone set still disabled).	(a) Tap mercury-wetted relay. (b) Replace entire chassis assembly.
20	Can't talk after base rate (semipostpay option).	(a) Tap mercury-wetted relay. (b) Check strapping. (c) Replace entire chassis assembly.
21	Can't replace upper housing fully.	Verify that chassis is fully seated.
22	Lose base rate during dialing.	Replace dial.
23	Ringer transmission unit broken off from chassis.	Replace entire chassis assembly if components are damaged. Remount bracket if components are not damaged.
24	Neon broken off from interface card.	Replace entire chassis assembly.
25	Capacitor broken off of coin pulse generator card.	Replace entire chassis assembly.
26	Loose cards.	Snap or screw into place.
27	Varistors damaged on transmission network.	Replace entire chassis assembly.

- (c) Check for coins jammed in the hopper. If jammed, dislodge them, using an orange stick or similar device, taking care not to damage the door, latch, or latch spring.
- (d) Check for a missing or kinked latch return spring. Replace the entire coin hopper-relay coin chute assembly if the spring is missing or kinked.
- (e) Check that the assembly locking tab in back of the coin chute is properly seated in its groove.
- (f) Check for foreign particles between the relay armature and the pole piece. If particles are found, remove them.

Rejector Assembly

8.04 Perform the following routine inspection of the rejector assembly before proceeding with the specific troubleshooting procedure in Table 6:

- (a) Ensure that the rejector is level within 1-1/2 degrees. If it is not level, correct by leveling the backboard or booth.
- (b) Ensure that the rejector is clean and free of foreign matter. If not, clean with a lint-free rag; also, clean the nickel bounce tester using a rag wrapped around the tip of an orange stick or screwdriver. Do not allow the gate to slam shut.
- (c) Verify that parts have not been damaged or have fallen off, i.e., cradles, counterweights, etc. If so, replace the entire assembly.
- (d) Make sure that the nickel bounce tester mounting screws are snug. If not, tighten down but do not overtorque.
- (e) Check for good free operation of the linkage. If binding is detected, replace the entire assembly.
- (f) Check the coin release lever on the upper housing assembly for proper operation. If a problem is detected, replace the upper housing.

Table 5. Troubleshooting for Coin Hopper-Relay Coin Chute Assembly.

STEP	SPECIFIC TROUBLE	FIELD ACTION
1	Refund or collect door hangs open.	(a) Add retrofit deflector. (b) Replace entire assembly.
2	Latch spring fallen off.	Replace entire assembly.
3	Doors do not operate freely.	Replace entire assembly.
4	Relay does not operate.	(a) Check ground, L1 and L2, plug. (b) Replace entire assembly.
5	Relay operates too fast.	(a) Clean armature and pole piece. (b) Replace entire assembly.
6	Wrong number of coin pulses.	(a) Replace entire assembly. (b) Replace chassis assembly.
7	Coins jammed in hopper.	Dislodge with probe, taking care not to damage assembly.
8	Single dime hangs up on door.	If frequent, replace entire assembly.
9	Dime stuck in coin chute.	Replace entire assembly.
10	Latch spring kinked or damaged.	Replace entire assembly.
11	Relay operates too slowly.	Replace entire assembly.
12	Coin relay ground is not present after initial rate has been reached or during coin test.	(a) Check for proper operation of coin relay trigger. If defective, replace entire assembly. (b) Perform a routine inspection of chassis assembly. (c) Replace chassis assembly.
13	No coin tone produced for one denomination of coin but alright for other denominations of coins.	(a) Check for trigger switch spring damage. If damaged replace assembly. (b) Perform a routine inspection of chassis assembly. (c) Replace chassis assembly.
14	No indication of coin deposit.	(a) Check trigger coin chute triggers and coin relay trigger. If defective, replace entire assembly. (b) Perform a routine inspection of chassis assembly. (c) Replace chassis assembly.
15	Refund or collect door opens upon coin deposit.	(a) Add deflector. (b) If still problem, replace assembly.

Table 5. Troubleshooting for Coin Hopper-Relay Coin Chute Assembly (Continued).

STEP	SPECIFIC TROUBLE	FIELD ACTION
16	Will not operate on long loop.	(a) Check for good ground. (b) Replace entire assembly.
17	Relay pulses or chatters.	(a) Check for stuck coins and clear them if found. (b) Check for door hanging open. If found, add deflector. (c) Check for proper operation of trigger. If defective, replace entire assembly. (d) Check selector card for proper biasing on pin. If found, replace entire assembly.
18	Cannot mount replacement.	(a) Ensure that relay tab and coin chute tab are in their respective slots. (b) Check for burrs on hopper. If found, use different replacement relay. (c) Check that rail is alright. If not, replace rail.
19	Card selector does not operate fully (hits pin).	Replace entire assembly.
20	Latch not welded properly.	Replace entire assembly.
21	Iron filings on armature or core.	(a) Clean and check. (b) Replace entire assembly.
22	Switch card bottoms on pileup bracket during pull in.	Replace entire assembly.
23	Trigger switch springs bent.	Replace entire assembly.
24	Coin chute mounting tab broken off.	Replace entire assembly.

Rejector Adjustment

8.05 To ensure maximum operating efficiency with the Type 120A operating in a semipostpay area with a call rate in excess of 10 cents, the telephone rejector mechanism should accept the highest percentage of genuine coins (nickels, dimes, quarters). Adjustments should be made by field repair personnel (on the site) on only those rejectors displaying a genuine 10-cent coin acceptance problem. If a telephone is suspected of either holding or rejecting a genuine 10-cent coin, use the following adjustment procedure:

- (a) Drop 10 genuine 10-cent coins into the rejector unit, making certain not to use damaged (bent) coins.
- (b) If one or more of the coins are rejected, loosen the 10-cent deflector mounting screw (Figure 11a) and move the deflector to the left to a position corresponding to the position shown in Figure 11b.

- (c) Loosen the separator mounting screw (see Figure 11a) and move the separator to the right to a position corresponding to the position shown in Figure 11c.

NOTE: By adjusting either the 10-cent deflector or separator, or both, the rejector mechanism may become more susceptible to bogus 10-cent acceptance (slugs or coins from other countries resembling a genuine U.S. coin). If a telephone is suspected of accepting an undesirable amount of bogus 10-cent coins, it may be necessary to readjust the rejector's 10-cent section (deflector and separator) to scrutinize slugs more closely.

Hookswitch and Dial Housing Assembly

8.06 Perform the following routine inspection of the hookswitch and dial housing assembly before proceeding with the specific troubleshooting procedure in Table 7:

Table 6. Troubleshooting for Rejector Assembly.

STEP	SPECIFIC TROUBLE	FIELD ACTION
1	Rejects more than approximately one-fifth good coins, or accepts copper slugs, or accepts zinc slugs.	(a) Level booth or backboard. (b) Clean rejector assembly. (c) Replace rejector assembly if necessary.
2	Will not clear Canadian coins.	(a) Clean with lint-free cloth. (b) Clean rejector assembly. (c) Replace scavenger spring with spring (HD-110031-A). (d) Replace rejector assembly if necessary.
3	American rejector will not accept Canadian coins.	Normal – do not adjust.
4	Accepts a certain type of slug.	Refer problem to repair shop.
5	Cradle fell off.	Replace rejector.
6	Washer catcher fell off.	Unless a problem with slugs exists, do not replace.
7	Linkage binds.	(a) Clean rejector. (b) Replace rejector assembly.
8	Does not accept 100 percent of all good coins.	Normal may accept approximately four-fifths. Do not adjust.
9	Does not reject all slugs.	Normal only reject the majority of common slugs, do not adjust.
10	Coins sticking.	(a) Clean rejector. (b) Replace rejector.
11	Will not scavenge an American quarter.	(a) Clean rejector. (b) Replace rejector assembly.
12	Rejector stays open after coin release.	(a) Check the lower lead in the chute mounting screw for interference with the rejector gate assembly. If necessary, put a washer under the screw. (b) Replace rejector.
13	Foreign matter in rejector.	Clean rejector.
14	25-cent exit track wears out.	Replace rejector assembly.
15	Scavenger assembly hangs up; will not return to normal.	(a) Clean rejector. (b) Replace rejector assembly.
16	Washer will not hang up on washer catcher.	Change rejector if experiencing slugs; otherwise, do nothing.
17	Accepts pennies.	Replace rejector.

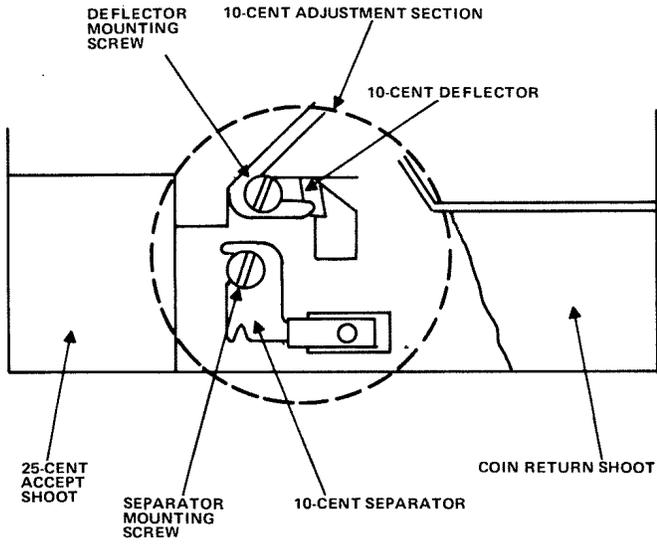


Figure 11a. Deflector Screw Adjustment.

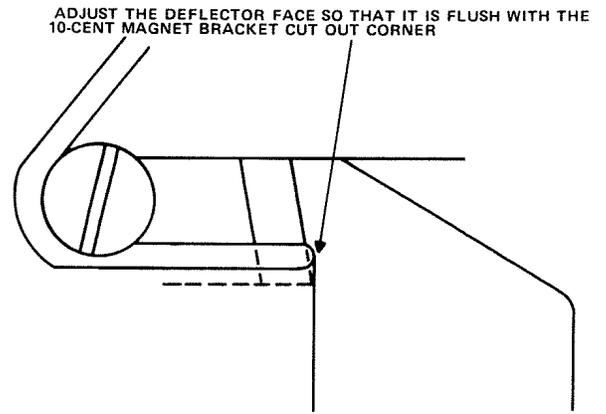


Figure 11b. Deflector Position.

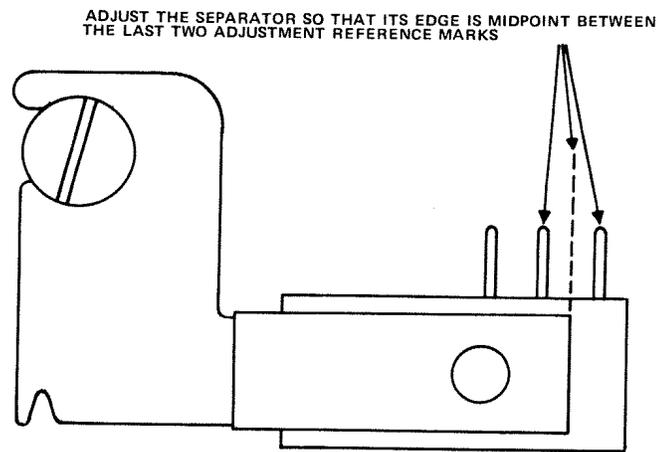


Figure 11c. Separator Position.

Figure 11. Rejector Adjustment.

- (a) Check for a damaged or missing fingerwheel and replace it if necessary.
- (b) Check for a damaged handset cradle and replace it if necessary.
- (c) Check for binding of the fingerwheel or sticky pushbuttons. If necessary, replace the entire hookswitch and dial-housing assembly, or TCU.
- (d) Check for a broken guide pin on the ribbon connector. If necessary, replace the entire hookswitch and dial-housing assembly.
- (e) Verify that the armored cord mounting bracket is in place. If its screw is stripped, replace the entire hookswitch and dial housing assembly.
- (f) Verify that the hookswitch cam is not damaged. If it is, replace the entire assembly.
- (g) Check for poor or broken connections. If any are found, repair the connections or replace the entire assembly.
- (h) Make sure the hookswitch contacts are operating properly. If not, replace the entire assembly.

Armored Cord and Handset, Line Wire and Housing Assemblies

8.07 For specific troubleshooting information on the armored cord and handset assembly, the line wire assembly, and the housing assembly, refer to Tables 8, 9 and 10, respectively.

Finish Retouch

8.08 The finish of the coin telephone may become scratched or marred. The finish of the black and beige coin telephone sets can be touched up at the installation without removal of the telephone set.

8.09 The chrome-plated telephone sets or chrome-plated components of the painted telephone sets must be returned to the shop for replating, if the finish is marred. To preserve the chrome finish, the exposed surfaces must be polished with a good commercial, chrome polisher/cleaner at least once every 2 months.

8.10 Use the following procedures to touch up the scratches and nicks on painted telephone sets:

- (a) Obtain an artist's brush.
- (b) Obtain touch-up paint from GTE Automatic Electric.
The order numbers are as follows:
Black – SMC 850002
Beige – SMC 850003
- (c) Apply the touch-up paint with an artist's brush, taking care to fill nicks and scratches.

Table 7. Troubleshooting for Hookswitch and Dial Assembly.

STEP	SPECIFIC TROUBLE	FIELD ACTION
1	Dial too fast.	Replace entire assembly or replace dial.
2	TCU tones out of specification.	Replace entire assembly or replace TCU.
3	Hookswitch is out of adjustment.	Replace entire assembly.
4	Guide pin broken.	Replace entire assembly.
5	TCU pushbuttons are sticking.	Remove entire assembly, then replace TCU.
6	Armored cord bracket mounting screw is stripped.	Replace entire assembly.
7	Hookswitch cradle is damaged.	Replace hookswitch cradle.
8	Dial sticking.	Replace dial assembly.
9	Shunt spring shorted out.	Replace dial assembly.
10	Break dial tone, but cannot dial out; telephone goes dead after dialing the first number or base rate is lost after dialing.	Replace dial assembly.
11	TCU or rotary dial dead after rate is reached.	Replace TCU or dial assembly.

Table 8. Troubleshooting for Armored Cord and Handset Assembly.

STEP	SPECIFIC TROUBLE	FIELD ACTION
1	Receiver dead or weak or transmitter dead or weak.	(a) Routinely inspect chassis. (b) Replace handset assembly.
2	Cannot remove handset caps (caps are cemented on many sets to reduce vandalism).	Replace handset assembly.
3	Hard-of-hearing coil not working.	Replace handset assembly.

Table 9. Troubleshooting for Line Wire Assembly.

STEP	SPECIFIC TROUBLE	FIELD ACTION
1	Chassis shorted to line wire.	Place a piece of electrical tape on side of line wire pileup.
2	Insulator breakdown.	Replace assembly.
3	No power to patch plug.	Check for continuity.

Table 10. Troubleshooting for Housing Assembly.

STEP	SPECIFIC TROUBLE	FIELD ACTION
1	Cannot replace upper housing fully.	(a) Verify that chassis is fully seated. (b) Replace upper housing assembly.
2	Instruction cards fading.	Replace cards.
3	Paint peeled off or scratched.	Touch up finish.
4	Key breaks (upper housing or vault).	(a) Pull key out, obtain second key. (b) Push key to unlock position with stub and unlock if possible.
5	Foreign matter in keyway (upper or lower).	Push foreign matter through with a small wooden stick or key.

NOTES

1. FOR EMERGENCY CALLING, REMOVE STRAP BETWEEN PINS Y AND Z, STRAP Q AND I.
2. "X" CONTACTS MAKE FIRST.
3. "Y" CONTACTS BREAK LAST.
4. ⊙ DENOTES SCREEN TERMINAL.
5. ● DENOTES SOLDE WIRE LEAD CONNECTION.
6. ▲ DENOTES PUSH-ON TERMINAL.
7. ↑ DENOTES PIN CONNECTION.
8. ▲ DENOTES COMMON GROUND.
9. △ DENOTES -2V INPUT.
10. TRANSISTORS Q1, Q4, Q6, Q7 AND Q8 ARE FD-1029-NG, Q2 IS FD-1029-ML, Q3, Q5 AND Q8 ARE FD-1029-LL.
11. CHECK CR1 IS FD-1028-FE, CR2 THROUGH CR6 AND CR14 THROUGH CR18 ARE FD-1028-AC, CR12 IS FD-1028-LD, CR9 THROUGH CR11 ARE FD-1028-OG.
12. RATE RELAY CONTACTS SHOWN FOR TELEPHONE SET "OFF-HOOK". "NORMAL BATTERY", NO COINS DEPOSITED.

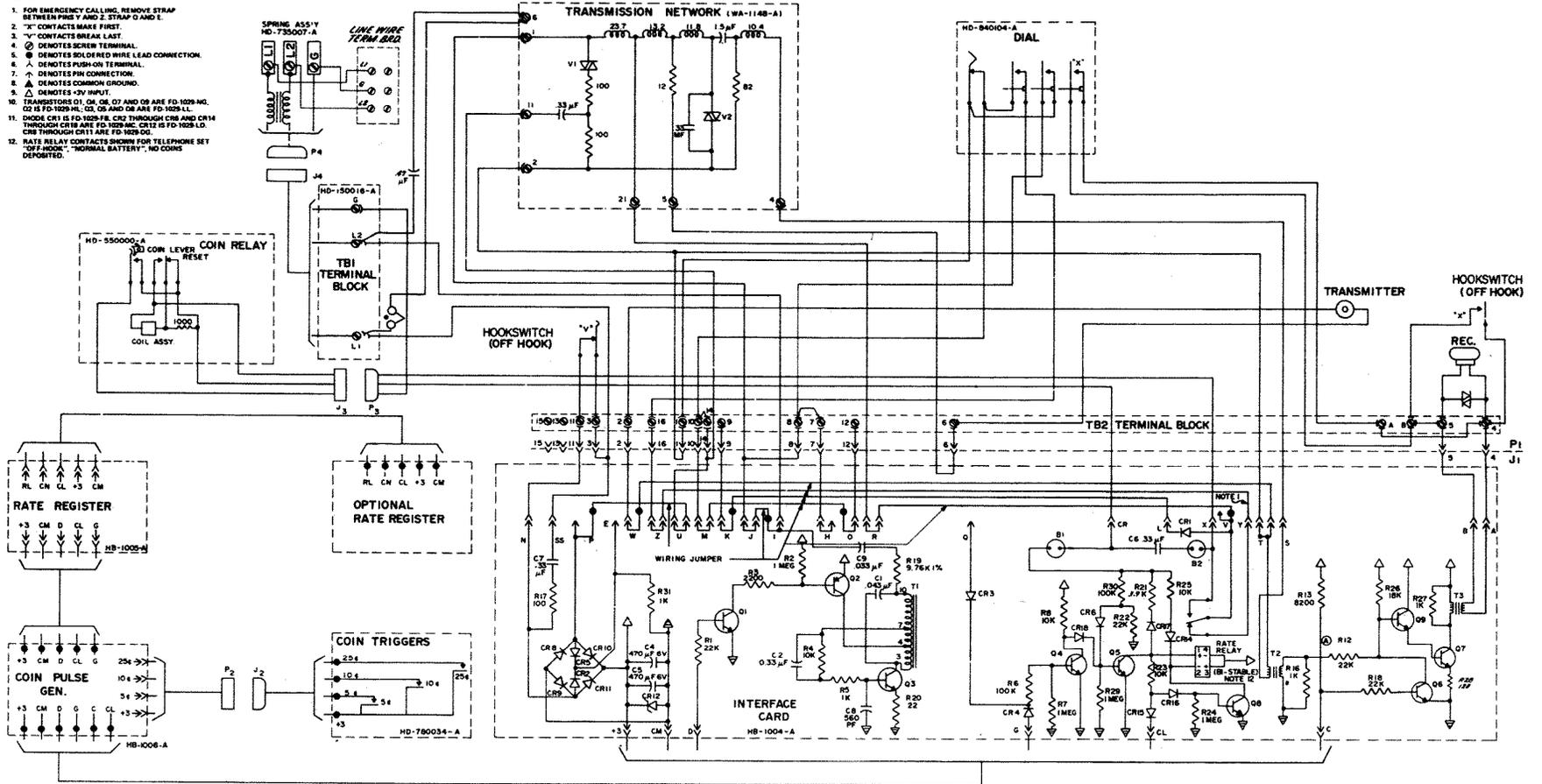


Figure 12. Wiring Diagram of Type 120A Equipped with Rotary Dial for Prepay Service.

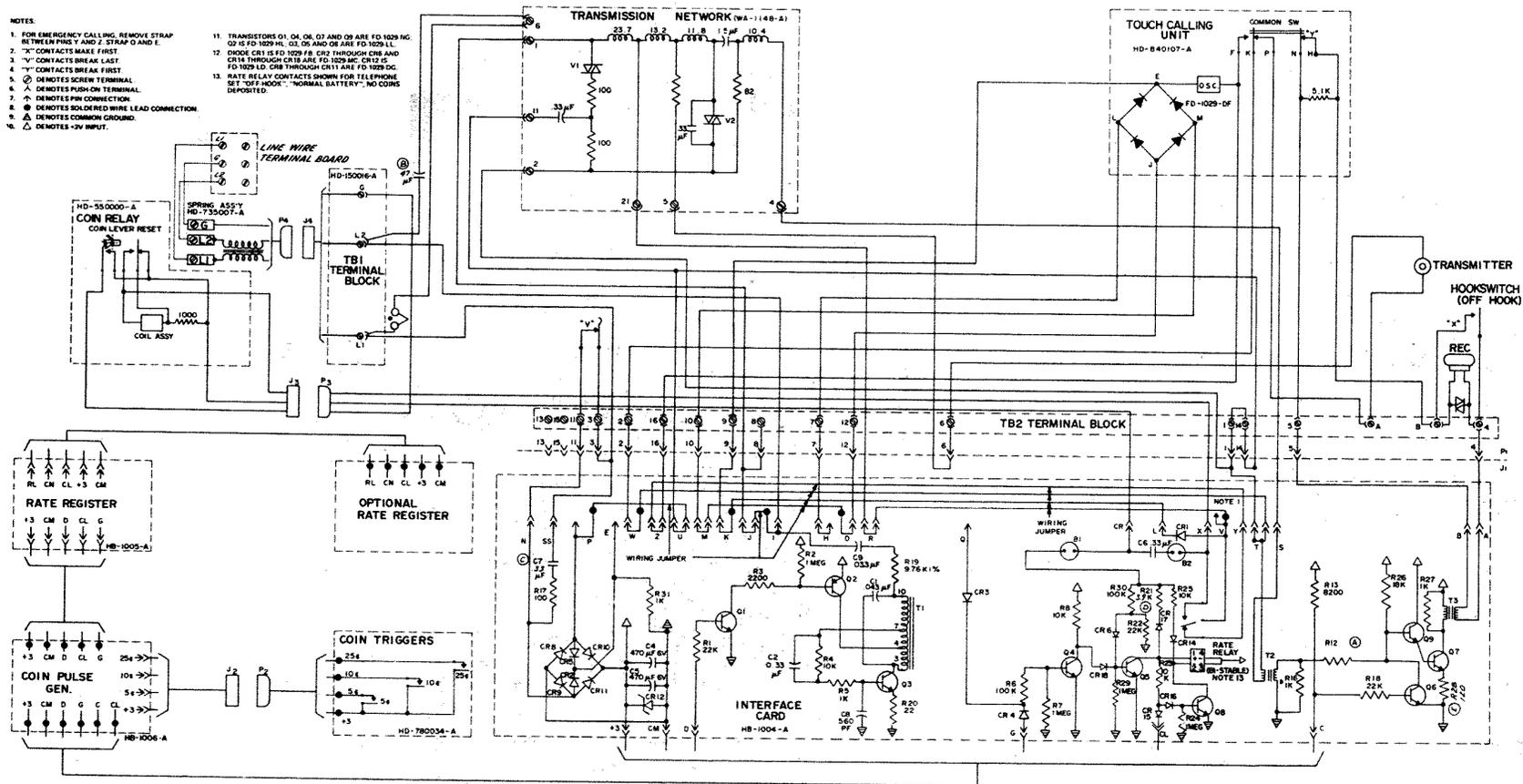


Figure 13. Wiring Diagram of Type 120A Equipped with Touch Calling Unit for Prepay Service.

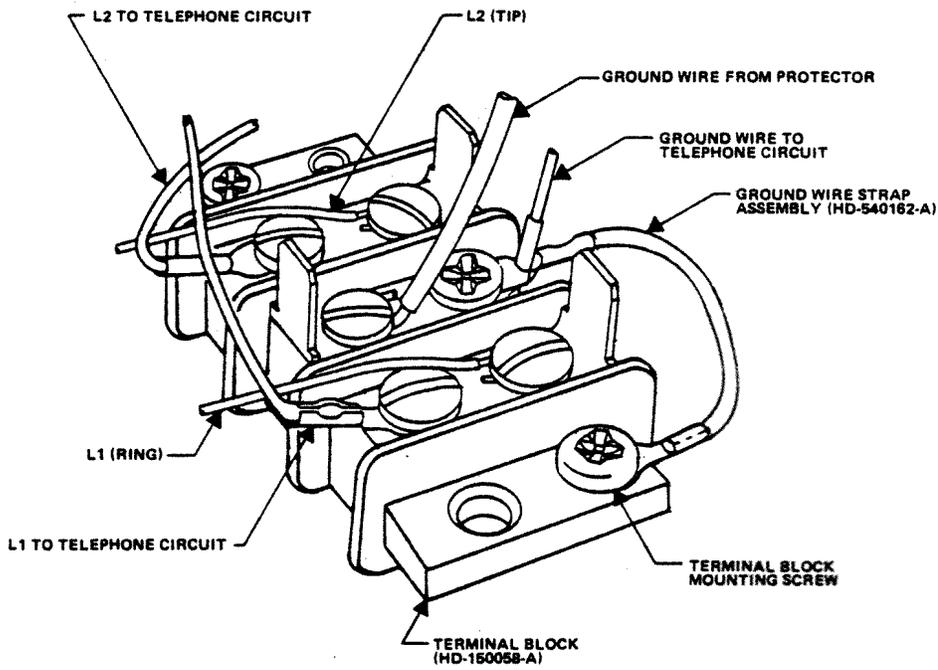


Figure 14. Terminal Block Wiring.