SECTION 476-202-100
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GT&E STANDARD

DESCRIPTION

A.E. CO. PREPAY PAYSTATIONS

1. GENERAL

1.01 This section describes the physical characteristics and operation of types 62 and 82 prepay paystations.

1.02 Prepay paystations (see Fig. 1) are coded according to basic type. The 82 type prepay paystation has improved circuitry and supersedes the 62 type prepay paystation for procurement. A prefix LPA indicates that the paystation uses a manually adjusted loop compensating network; an LPB prefix indicates that the paystation uses a self-compensating network. The suffix -55 indicates that the paystation is equipped for 2-nickel control.

1.03 Schematic diagrams are provided in Figs. 13, 14, and 15.

2. OPERATION WITH CENTRAL OFFICE

2.01 The automatic exchange associated with the prepay paystation must be equipped with coin-control repeaters, sources of positive and negative 110-volt dc collect and refund battery, and an interrupter which results in intermittent coin-control current being applied to the line.

2.02 The calling party is connected to a paystation repeater at the central office upon removal of the handset, but cannot break dial tone until two nickels, one dime, or one quarter has been deposited. After deposit, the calling party may dial and extend a connection in the usual manner.

2.03 Upon completion of the call, the coins deposited are dropped into the cash compartment and the paystation is restored to normal automatically. When the call is not completed, the money is returned to the calling party and the paystation is restored to normal automatically.

2.04 On operator assistance calls, initial deposit is refunded upon connection to the operator. Toll operators may supervise collection of coins by audible signals picked up through a special transmitter. The operator controls the application of coin-collect and refund current on toll calls.

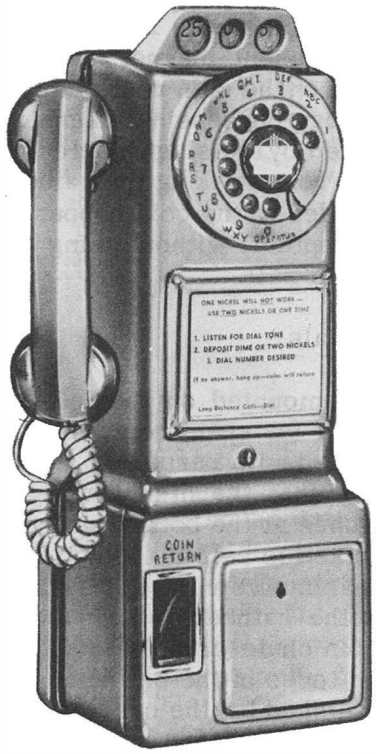


Figure 1. Prepay Paystation

3. MECHANISM

3.01 The coin gauge at the top of the upper housing consists of three different size openings: nickel, dime, and quarter. Each opening is connected to a different channel in the coin chute.

Coin Chute

3.02 The coin chute (Fig. 2) is mounted immediately below and in line with the coin gauge. The coin chute has three channels of varying sizes. The channel under the nickel gauge is larger than the dime channel and smaller than the quarter channel. Therefore, only the correct coin in its correct channel will operate the mechanism. All three channels end directly over the mouth of the coin hopper. The lugs which hold the coin chute to the upper housing are part of the framework welded to the upper housing. This framework constitutes the coin-return chute for incorrect coins. The incorrect coins will fall out of the coin chute because the depth of the particular channel on the

rear face of the coin chute is just deep enough to hold a coin of the right size. After falling out of the coin chute, the incorrect coins hit the coin-return chute and are guided to the mouth of the coin-return chute in the lower housing. On type LPB-82 and on some of the LPA-82 and 62 paystations, a permanent magnet, mounted in the quarter channel on the coin chute, acts as a slug rejector. A slug, possessing magnetic properties, is attracted by the slug rejector which prevents the slug from striking the cathedral gong. The slug is guided to the coin hopper, and later to the coin receptacle without being accepted in payment of a toll call.

Coin Signals

3.03 The bell mounted on the left side of the coin chute (as seen from the rear in Fig. 2), is so situated with respect to the nickel and dime channels that the nickel will strike and ring the bell once at the bottom of the bell. The dime will strike the bell at the top and again at the bottom, making two rings. A quarter strikes once against the cathedral gong located to the right of the coin chute (as seen from the rear in Fig. 2). The tones of the bell and the gong are easily distinguished by the operator at the central office. A transmitter, also shown in Fig. 2, conveys these signals to the operator.

Two-Nickel Control

3.04 Prepay paystations arranged for ten-cent service must be equipped to enforce the deposit of 2 nickels or 1 dime before a local call can be made. (This does not apply to prepay paystations equipped for five-cent service.) Enforcement of the correct initial deposit is accomplished by the microswitch shown in Fig. 3. The microswitch is mounted on the coin chute with an extension of the wire operating arm in the nickel channel.

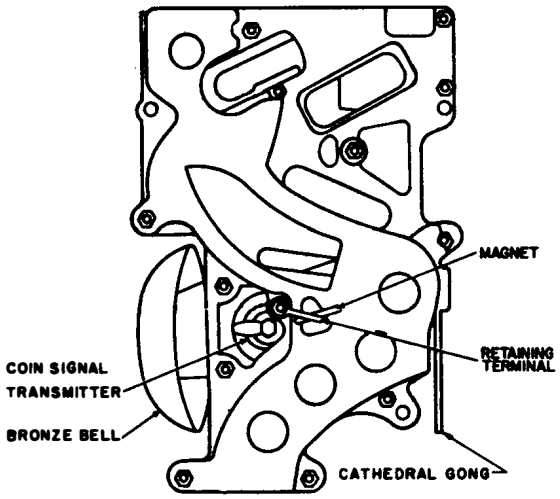


Figure 2. Coin Chute (Rear View)

3.04-a The first nickel slides the operating arm down along the edge of the pendulum, pushing it somewhat below the pendulum notch. Gravity then draws the narrow bottom of the pendulum against the microswitch operating arm. When the first nickel passes beyond the arm, spring tension in the microswitch lifts the arm into the notch where it latches as shown in the right-hand illustration of Fig. 3. The action of the operating arm short-circuits the dial pulse-springs.

3.04-b When the caller deposits the second nickel, it strikes the operating arm, pushing it down. The arm rides along the cam-like surface out of the notch, and throws the pendulum abruptly to the left. As the coin moves on, spring tension in the microswitch raises the operating arm to normal. By the time the pendulum swings back against the operating arm, the arm is above the position where it could relatch. The microswitch then restores and removes the short circuit from the dial pulse-springs. The caller can now dial.

3.04-c If a dime (or quarter) is used in the paystation, these operations do not occur; the pendulum and microswitch function only when the nickel slot is used.

3.04-d Immediately above the microswitch is the restoring magnet (Fig. 3). Since the restoring magnet is in series with the coin relay the restoring magnet operates every time the central office sends coin-collect or refund battery. In the event that either a single nickel (in the case of an abandoned call) or an odd number of nickels (in the case of a toll call) have been deposited, the armature extension of the energized restoring magnet moves the pendulum to the left and allows the microswitch operating arm to restore and reset the mechanism for the next call. If one nickel is inserted and the caller hangs up, the nickel is refunded. The shock lever is a protective device. If the paystation is given a blow after one nickel has been inserted, in an attempt to set the mechanism for a call with only one nickel, the shock lever moves over and stops the pendulum from moving and the

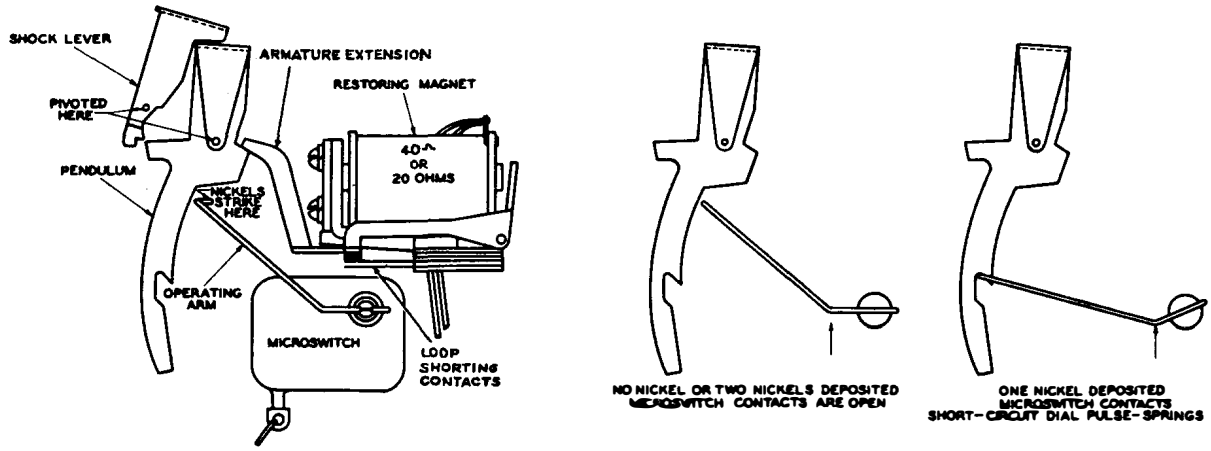


Figure 3. Two-Nickel Assembly

microswitch operating arm remains latched. Loop shorting contacts are installed on the restoring magnet where line loops exceed 500 ohms. The shorting contacts are required because battery current applied over a high resistance loop would be insufficient to operate the coin relay. When the restoring magnet operates on coin-collect or refund battery, the loop shorting contacts close setting up a short circuit across L1 and L2 thereby providing parallel paths (L1 and L2) for the application of battery potential to the paystation.

Coin Hopper

3.05 Fig. 4 shows the internal mechanism of the coin hopper with the housing removed. Figs. 5, 6, and 7 show typical operation of the hopper.

3.05-a As the coin leaves the coin chute, it enters the coin hopper mouth and operates the coin trigger. The coin trigger opens a set of dial shunt springs to allow the calling party to dial after the deposit of a dime or quarter (see Fig. 5) and simultaneously completes a circuit to ground for the coin relay. The trap bottom is held up by the roller of the deflecting vane, and the coin remains on the trap bottom.

3.05-b The projection of the deflecting vane is engaged with the fork of the operating arm of the coin relay. When current from the central office operates the relay, the fork of the operating arm moves to the right or left depending upon the voltage and polarity of the current.

3.05-c The fork in moving to the left or right carries the projection of the deflecting vane with it, and since the projection is part of

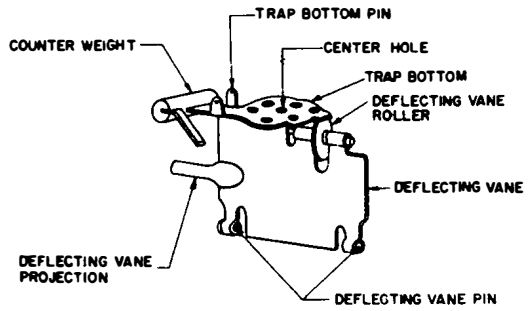


Figure 4. Coin Hopper Trap and Vane Assembly

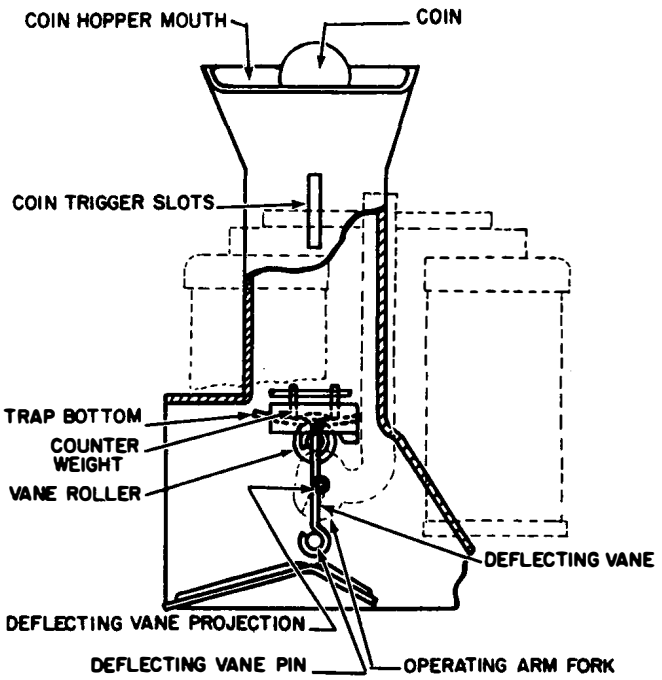


Figure 5. Trap and Vane in Normal Position

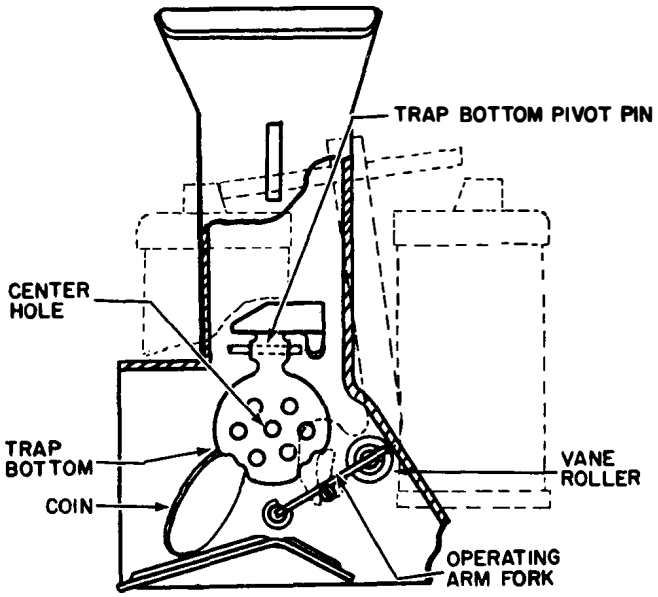


Figure 6. Trap and Vane in Refund Position

the deflecting vane, the vane must also move to the left or right. As the deflecting vane moves under the control of the fork, the roller moves from beneath the trap bottom. The weight of the coin overcomes the resistance of the counterweight, the trap bottom falls down, pivoting on its pin, and the coin slides off the trap bottom and is deflected by the deflecting vane to the left into the coin return chute or to the right into the cash compartment.

3.05-d On an unanswered local call, after the calling party hangs up, -110 volts dc is placed on the tip and ring of the line by the central office equipment, operating the coin relay. The operating arm fork moves to the right and positions the deflecting vane to deflect the coins into the refund compartment (see Fig. 6). On a completed local call, (after the calling party hangs up), a +110-volt dc pulse is applied to the tip and ring of the line and operates the coin relay. Coin relay operation causes the operating arm to move to the left, which positions the deflecting vane to deflect the coin into the cash compartment (see Fig. 7).

3.05-e After the coin has dropped, the trap-bottom counterweight returns the trap bottom to the horizontal position. Control current is then removed and the coin relay restores allowing the operating arm to return to the vertical position. The deflecting vane returns to the vertical position (see Fig. 5) to support the trap bottom.

Coin Relay

3.06 The coin relay (see Fig. 8) consists of two 510 ohm coils, a permanent magnet between coils, and a centrally located armature mounted above the coils and magnet. The armature will pivot to either side as determined by the polarity of the direct current applied to the relay coils. The position of the armature controls coin collection and refund. Various stages of coin relay operation are illustrated in Figs. 9, 10, 11, and 12.

3.06-a The operating arm assembly, pivoted in the center, is mounted on top of the armature. It consists of the fork (see Fig. 8) that engages the deflecting-vane projection (the horizontal portion of the operating arm is in contact with the armature), and restoring lever. The restoring lever carries the stud that operates the ground-switch springs. Restoring levers (see Fig. 8) are located above the operating arm and are pivoted on the same pin as the operating arm and armature. The restoring levers are in contact with the operating arm and are also connected to the restoring springs (see Fig. 9) which provide a spring bias. The restoring levers insure that the operating arm will return to a horizontal position upon removal of direct current from the coils. A switch lever is pivot-mounted on the coin relay frame. One end of the switch lever rests on the latch of the coin

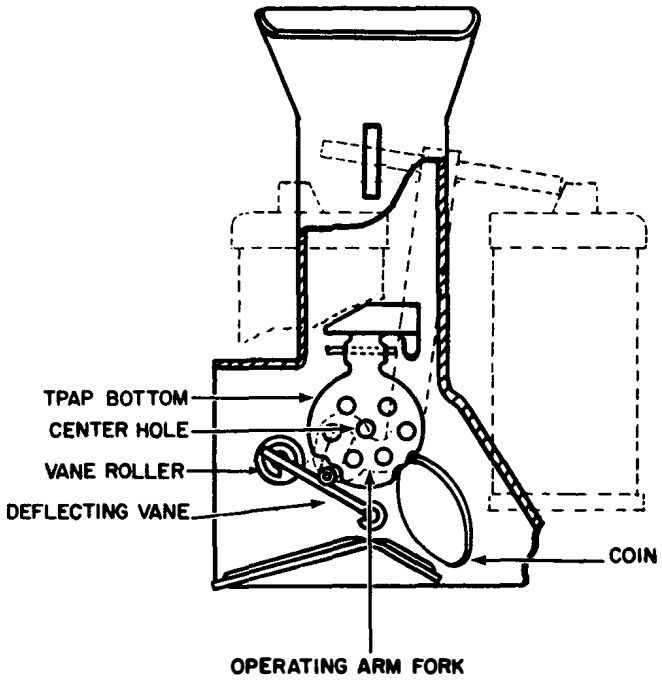
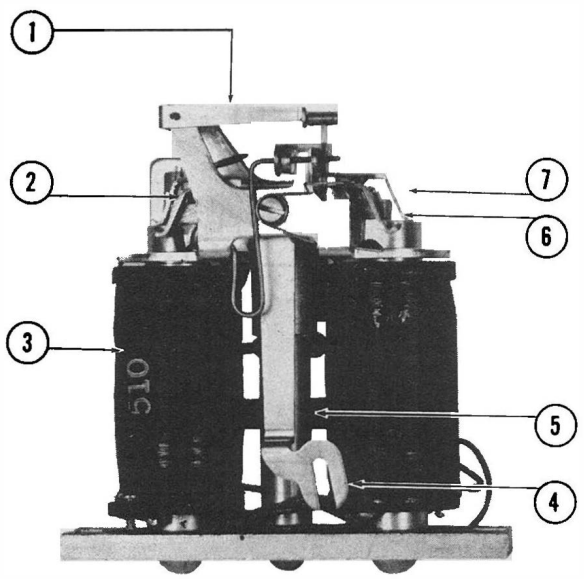


Figure 7. Trap and Vane in Collect Position



1. Switch lever
2. Restoring lever
3. Relay coils
4. Operating-arm fork
5. Magnet heelpiece
6. Armature
7. Restoring lever

Figure 8. Coin Relay (Rear View)

trigger. The other end has a half round set (see Fig. 9) to allow the stud of the restoring arm to restore the switch lever when required. The coin trigger, also pivot-mounted on the coin relay frame, is counter-balanced so that it always returns to the horizontal position when not restrained. The tip of the coin trigger protrudes through the slot in the front and rear of the coin hopper. A coin cannot pass through the coin hopper without tripping the coin trigger.

3.06-b Fig. 9 shows the relay and ground-switch springs in position before any coins have been deposited. The ground-switch contacts are open and the dial-shunt springs are closed preventing dial pulses from being sent to the central office. A deposited coin drops down the coin hopper and forces the coin trigger down. The coin trigger latch moves away from the switch lever and the switch lever drops slightly. When the switch lever is in this position, the coin trigger latch butts against the switch lever and cannot return to its horizontal position. The end of the switch lever with the half round set moves to the right and simultaneously closes the ground-switch contacts and opens the dial shunt contacts (see Fig. 10). The restoring-arm stud remains in the center. The dial can now send pulses, unless a first nickel was deposited. If a first nickel was deposited, the microswitch places a shunt across the dial, preventing pulses from reaching the central office until the second nickel has been deposited (see paragraph 3.04). When a dime or quarter is deposited, the coin relay has opened the path for dial pulses and there will be no dial shunt.

3.06-c When a caller hangs up after an incompleted local call, -110 volts dc is applied to the tip and ring of the line. This polarity reversal causes the armature to pivot to the left (see Fig. 11). The operating arm fork moves the deflecting vane to the right, allowing the trap bottom to drop. The deflecting vane guides the coins to the refund chute. Simultaneously, the operating-arm stud moves up out of the area of

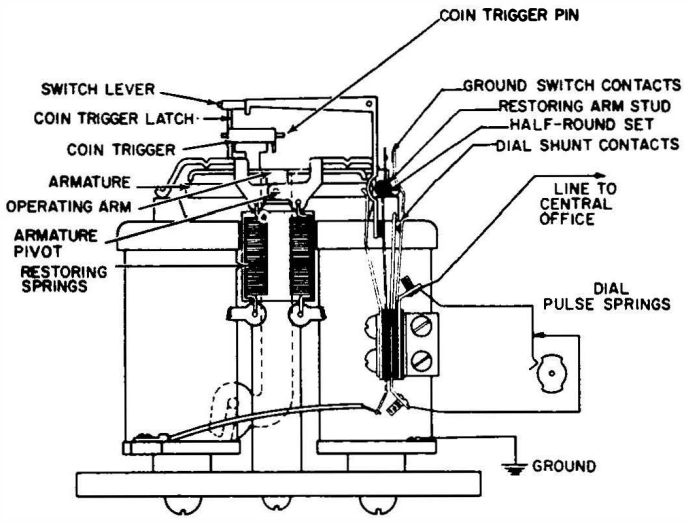


Figure 9. Coin Relay - Paystation Idle

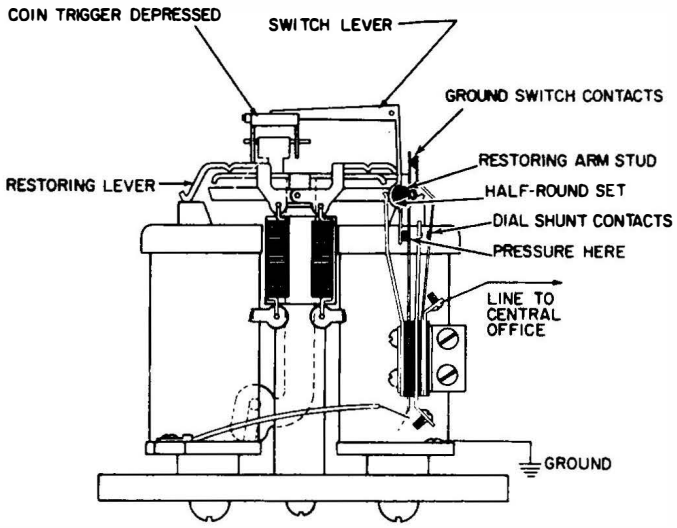


Figure 10. Coin Relay - Coin Trigger Tripped

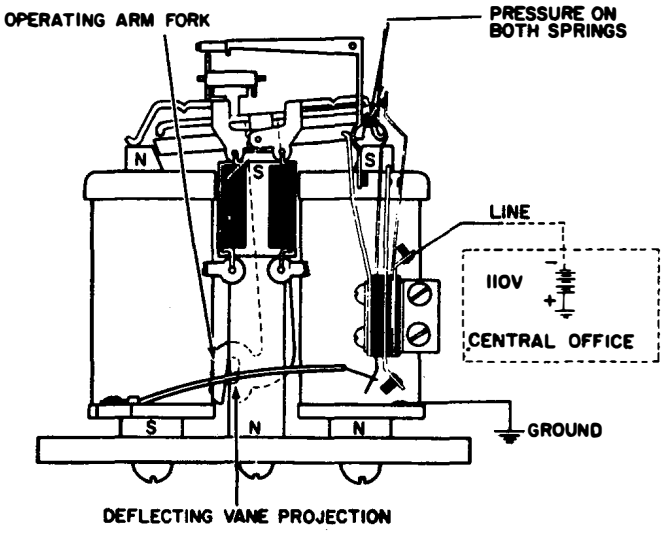


Figure 11. Coin Relay - Refund Position

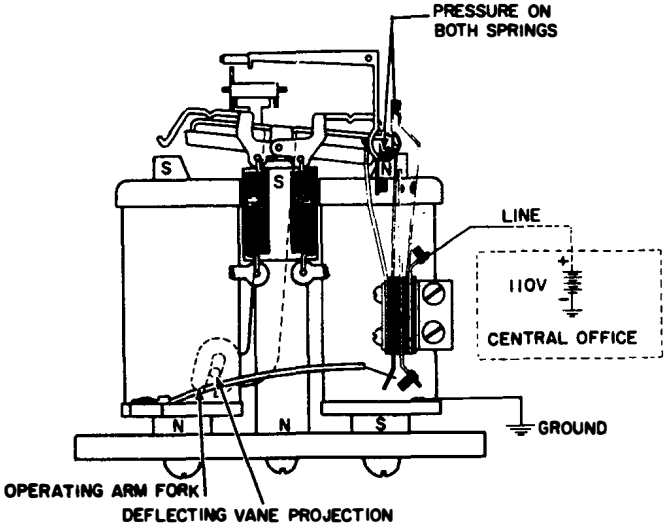


Figure 12. Coin Relay - Collect Position

the two half round sets in the switch lever and the ground-switch spring. The operating-arm stud forces the half round end of the switch lever to the left which allows the other end of the switch lever to move up away from the latch of the coin trigger. The coin trigger then returns to its normal horizontal position.

3.06-d The operating arm stud also insures (through counter-tension of opposing springs) that ground-switch-spring contacts remain closed throughout the operation. When the -110 volts dc is removed from the line, the switch lever will rest on the coin trigger projection causing the ground-switch contacts to open and the dial shunt contacts to close. The restoring lever and restoring springs move the armature to the horizontal position. See Fig. 9.

3.06-e When a caller hangs up after a completed local call, +110 volts dc is applied to the tip and ring of the line. The armature will pivot to the right (see Fig. 12). The operating arm fork moves the deflecting vane to the left allowing the trap bottom to drop. The deflecting vane guides the coins to the cash department. Ground-switch contacts remain closed. When the +110 volts dc is removed from the line, the restoring lever and restoring springs move the armature to the horizontal position.

NOTE: On operator calls, initial deposit is refunded as soon as connection is made with the operator. Coin relay operation is otherwise the same as on caller dialed calls, except that collect and refund current is controlled by the toll operator.

NOTES:
1. "X" CONTACTS BREAK FIRST, MAKE LAST.
2. ⊗ JACK CONNECTIONS BETWEEN UPPER AND LOWER HOUSINGS.
3. ○ TERMINAL BLOCK CONNECTIONS.
4. MICROSWITCH AND RESTORING MAGNET PROVIDED ON 62-55 ONLY.

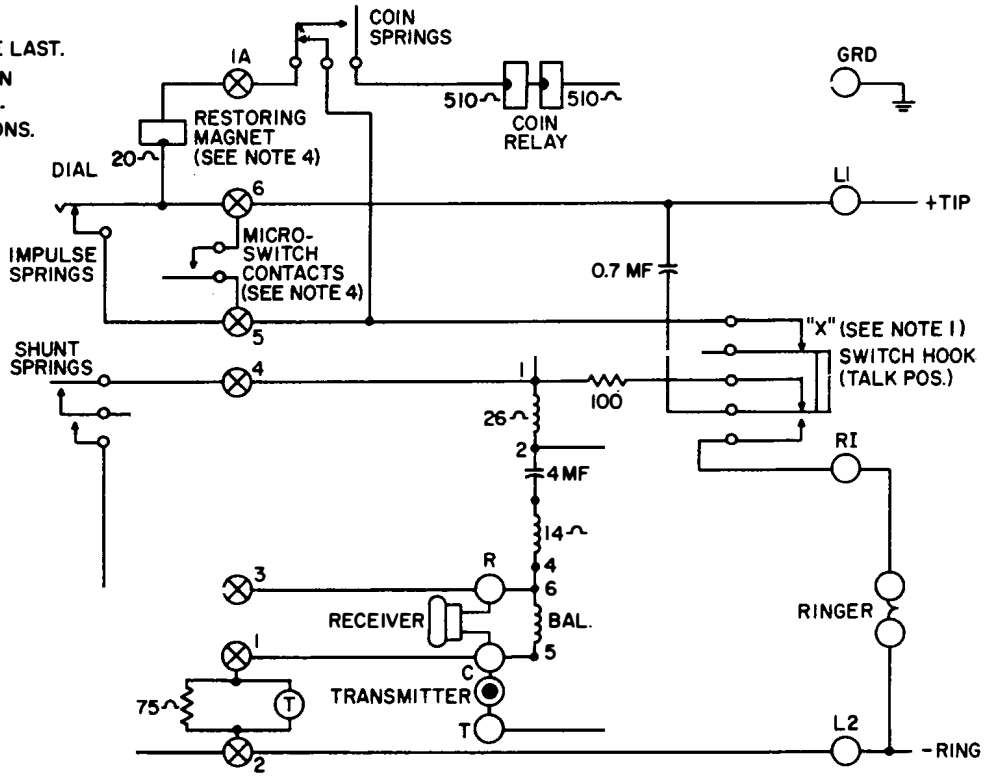


Figure 13. Type 62 Prepay Paystation - Schematic Diagram

NOTES:
1. "X" CONTACTS BREAK FIRST, MAKE LAST.
2. LOOP COMPENSATOR SET AT 2 FOR LESS THAN 200Ω LOOPS AND AT ZERO FOR OVER 200Ω.
3. SIDETONE BALANCING IMPEDANCE USED ON UNLOADED CABLE LOOPS OF OVER 200Ω PROVIDING ANY ADJACENT OPEN WIRE SECTION IS LESS THAN 200Ω.
4. ⊗ JACK CONNECTIONS BETWEEN UPPER AND LOWER HOUSINGS.
5. ○ TERMINAL BLOCK CONNECTIONS.
6. ON LOOPS ABOVE 500Ω, CONNECT LOOP SHORTING CONTACTS.
7. MICROSWITCH AND RESTORING MAGNET PROVIDED ON LPA-82-55 ONLY.

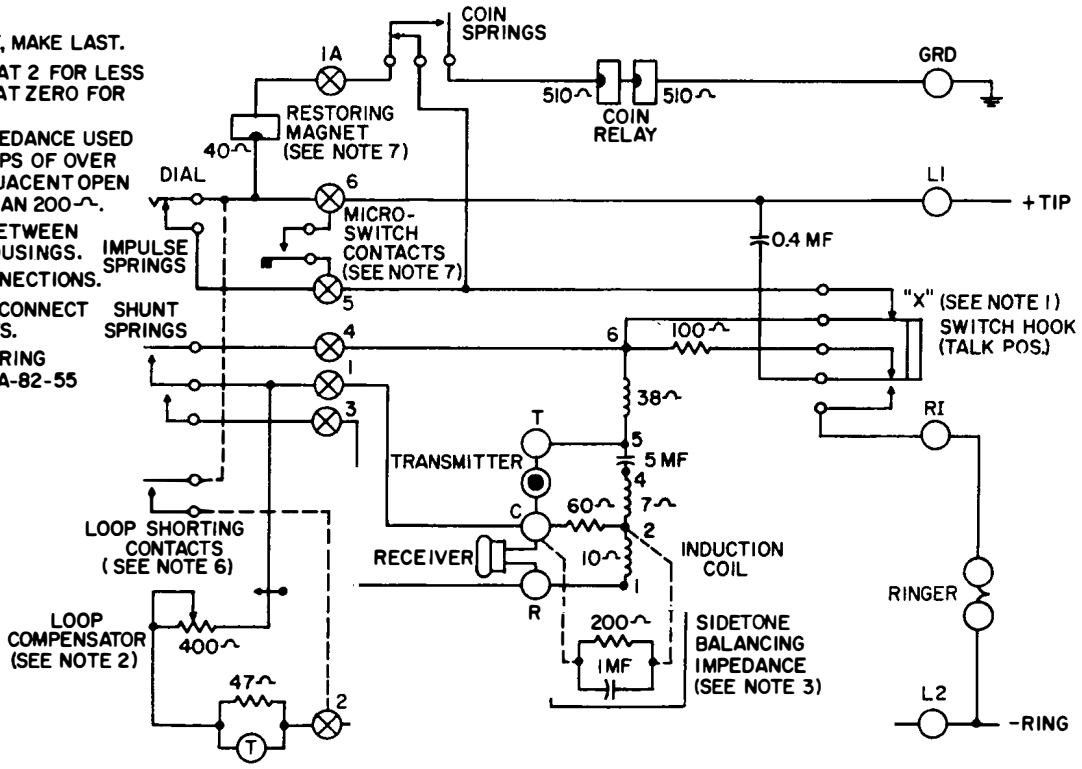


Figure 14. Type LPA-82 Prepay Paystation - Schematic Diagram

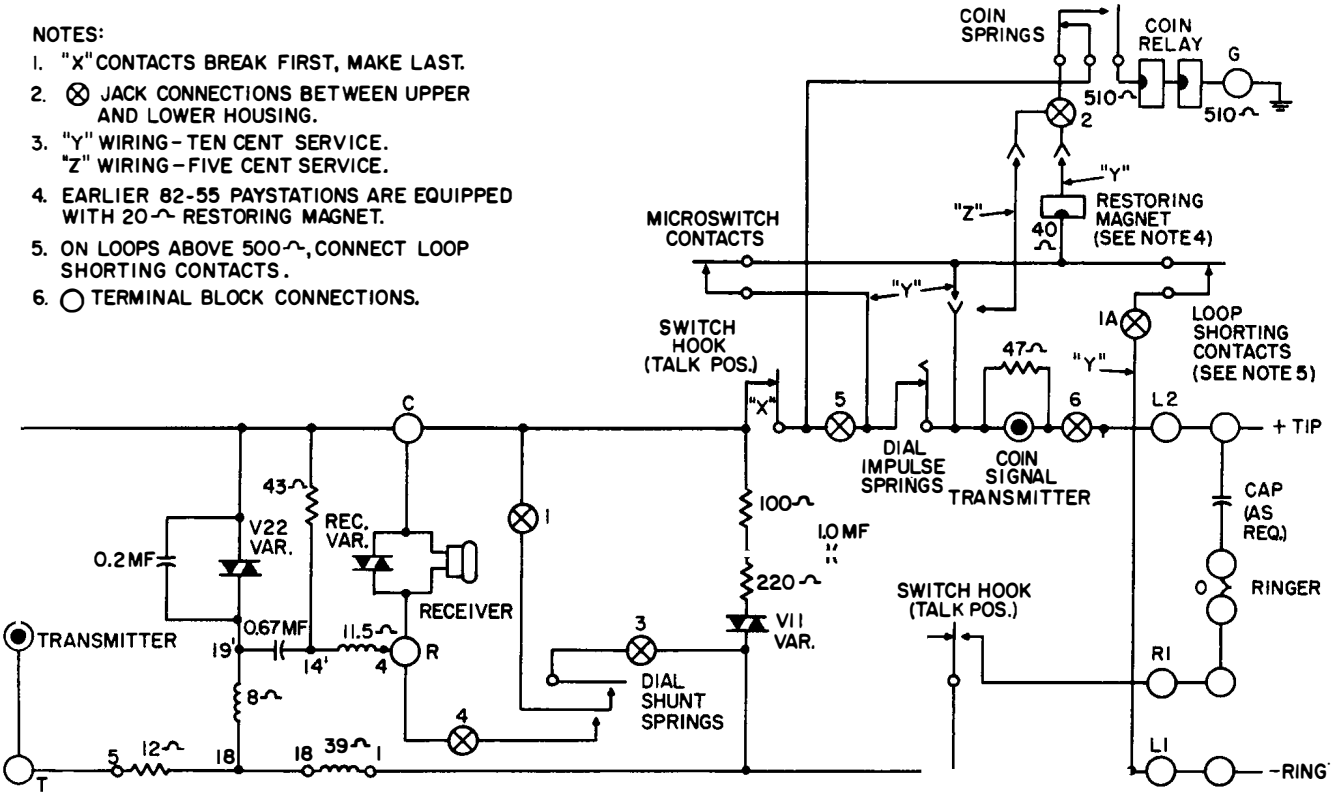


Figure 15. Type LPB-82 Prepay Paystation - Schematic Diagram