

PREPAYMENT COIN-BOX INSTALLATIONS (AUTOMATIC AREAS)
Public Call-Offices Plan No. 5A and Subscribers' D.E.L. Circuits
Circuit Description

★[Note:—As this Instruction has been completely revised, individual paragraphs have not been "starred"]

1. General.—This Instruction describes the circuit operation of prepayment coin-box installations in automatic areas.

In U.A.X. Nos. 5 and 6 areas, slight differences apply and these are described in par. 11. Par. 12 describes the special conditions that apply when Relay Control of Operator Re-call is used.

2. Outgoing call.—A call to a subscriber in the unit-fee area is made by lifting the telephone handset, waiting for dialling tone, inserting four pennies into the coin-box and dialling the number required. When the called subscriber answers, button 'A' must be pressed to allow the caller to speak. The circuit action described is with reference to Dgm. N 2408, Panel 1.

3. Lifting of handset.—When the handset is lifted, a loop is extended to the exchange via the A line, RB14 and 13, 35-ohm winding of induction coil, gravity-switch springs 2 and 1, telephone transmitter, D4 and 5, gravity-switch springs 4 and 3, CB6 and 7 to the B line. As the dial pulsing springs are short-circuited via D6 and 7 and BA10 and 9 in parallel with CB3 and 2, dialling at this stage is not possible.

4. Insertion of coins.—The insertion of the first penny operates the coin-bar and its associated CB springs.

CB1 and 2 short-circuit the telephone transmitter to prevent the caller being able to speak for the present.

CB2 and 3 remove one of the short-circuiting paths from D4 and 5.

CB4 and 5 connect the 120-ohm resistor across the telephone receiver. This degrades the receiver to prevent it being used fraudulently as a transmitter without pressing button 'A'.

CB6 and 7 remove the short-circuit from the coin transmitter but this has no significance on local calls.

After the insertion of the second, third and fourth pennies, the balance arm operates.

BA9 and 10 remove the second short-circuit path from D4 and 5, so making it possible to dial.

5. Dialling conditions.—During dialling D1 and 2 (in conjunction with D4 and 3) place the 30-ohm non-inductive winding of the induction coil in series with the 2 μ F capacitor across D4 and 5 to form a spark quench. The 30-ohm winding also shunts the bell to prevent bell tinkling during dialling. The induction coil, receiver and telephone transmitter

are short-circuited by D3 and 4 during pulsing. The dialling loop to line is given via A line, RB14 and 13, D3, 4 and 5, gravity switch springs 4 and 3, and the coin transmitter to B line.

6. Called subscriber answers.—On hearing the called subscriber answer, the caller presses button 'A'. This action restores the CB spring-set and deposits the money into the cash box.

CB1 and 2 remove the short-circuit from the telephone transmitter

CB4 and 5 remove the shunt from the receiver

CB6 and 7 replace a short-circuit across the coin transmitter.

Thus transmission conditions equivalent to a Telephone No. 232 are set up.

7. Ineffective calls.—If busy or N.U. tone is heard by the caller or no reply is received, button 'B' is pressed. This action returns the money to the caller, restores the CB spring-set and operates the RB springs which are mechanically linked to an escapement mechanism which delays the restoration of the RB springs for a period of approximately 7 seconds.

RB13 and 14 break the loop to the exchange and clear the line

RB11 and 12 are spare

CB1 to 7 restore the circuit so that when the RB springs release another call may be made.

8. Incoming calls.—On incoming calls, ringing current is received on the B line and passes via CB7 and 6, capacitor and bell, RB13 and 14 to the A line. When the handset is lifted transmission conditions are set up.

9. Assistance calls. The Dial, Automatic, No. 13 normally used in prepayment coin-box installations is so arranged that when the digit '0' or '9' is dialled, D6 and 7 open during the period the dial is returning to normal. This permits '0' or '999' calls to be made without inserting any money. After the caller has dialled '0' the operator asks him to insert coins for the fee. The first coin inserted, whatever its denomination, operates the coin-bar and CB springs.

CB6 and 7 remove the short-circuit from the coin transmitter so that the coins may signal their respective tones to the operator. A penny strikes the wire gong once. A sixpence strikes the bell gong once and a shilling twice. Thus the operator checks the insertion of the necessary money.

CB1 and 2 short-circuit the telephone transmitter to prevent the caller from being able to speak for the present.

CB4 and 5 connect the 120-ohm resistor across the telephone receiver. As for local calls, this degrades the efficiency of the receiver and prevents its fraudulent use as a transmitter at this stage. A full short-circuit cannot be used for this purpose as it may be necessary for the operator to give instructions to the caller.

The caller presses button 'A' either when he hears the called party on the line or when the operator asks him. Transmission conditions are then set up in the same way as for the local call already described.

In areas where '100' is dialled for assistance calls a Dial, Automatic, No. 20 must be used. This dial is so arranged that D6 and 7 are normally open, but they close when any digit from 2 to 8 inclusive is dialled.

10. Early type bell-sets.—The circuit shown on Panels 1–3 of Dgm. N 2408 uses a Bell-set No. 33, Mark 3. Mark 2 bell-sets are exactly similar electrically but have a modified mounting plate. Mark 1 bell-sets are slightly different electrically and the circuit is shown on Panels 4–5 of Dgm. N 2408 (yellow).

In the Mark 3 bell-set, dialling on local calls is not possible unless both CB and BA spring-sets operate whereas in the Mark 1 bell-set dialling may take place if only the BA spring-set is operated. The latest arrangement prevents a type of fraud using mutilated coins (see D 3001). The Mark 1 bell-set also differs in that it has an earlier type of induction coil.

11. U.A.X. Nos. 5 and 6 areas.—The circuit arrangements used in these areas are shown on Dgm.

N 2407 and are similar to those in other automatic areas except in respect of '0' calls.

In these areas it is necessary to dial '01' for assistance calls. When '0' is dialled:—

D6 and 7 disconnect the short-circuit from the 75-ohm relay S which operates to the exchange battery and earth.

S1 removes the short-circuit from D4 and 5 and, since the relay holds during pulsing, allows the ten pulses to be sent to line. S2 prevents D6 and 7 from short-circuiting relay S when the dial returns to normal and so permits a second digit to be dialled. Subsequent operations are similar to those described for other automatic areas. Relay S finally releases when the exchange loop is broken at the end of the call.

12. Relay Control of 'Operator Re-call'.—When Bell-sets No. 45 and 46 are used to combat fraud, (see D 3001), the circuit is as shown in Dgm. N 2421 or N 2422.

In each case, when the handset is raised relay CR operates in series with the loop and CR1 and CR2 short-circuit the gravity switch springs 1 and 2 and 3 and 4 respectively. This has no effect on the normal working of the circuit.

When however the gravity switch springs 1 and 2 and 3 and 4 restore at the end of the call or when re-calling the operator they have no immediate effect but springs 6 and 7 short-circuit relay CR which releases after a delay period of approximately 250ms.

CR1 and 2 break the loop and restore the circuit to normal.

References:—D 3001
(S1/2)

END