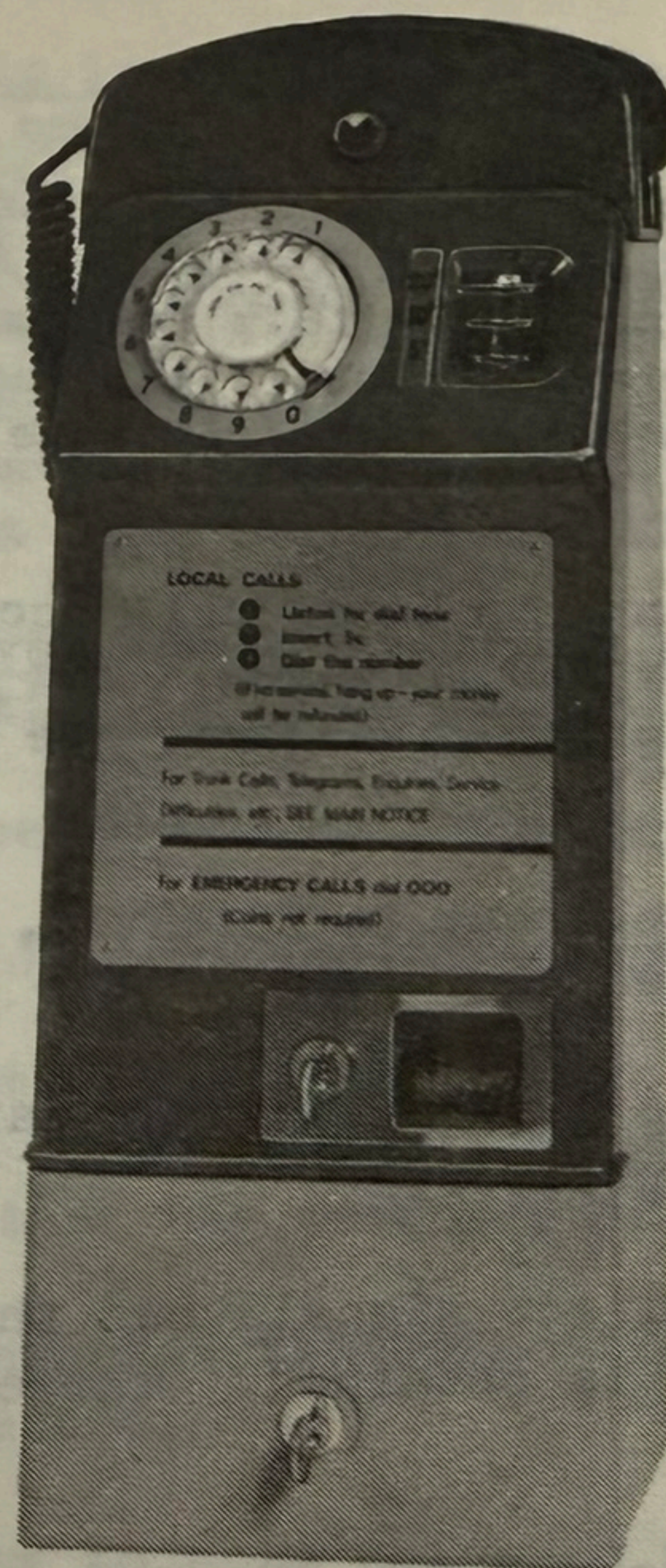
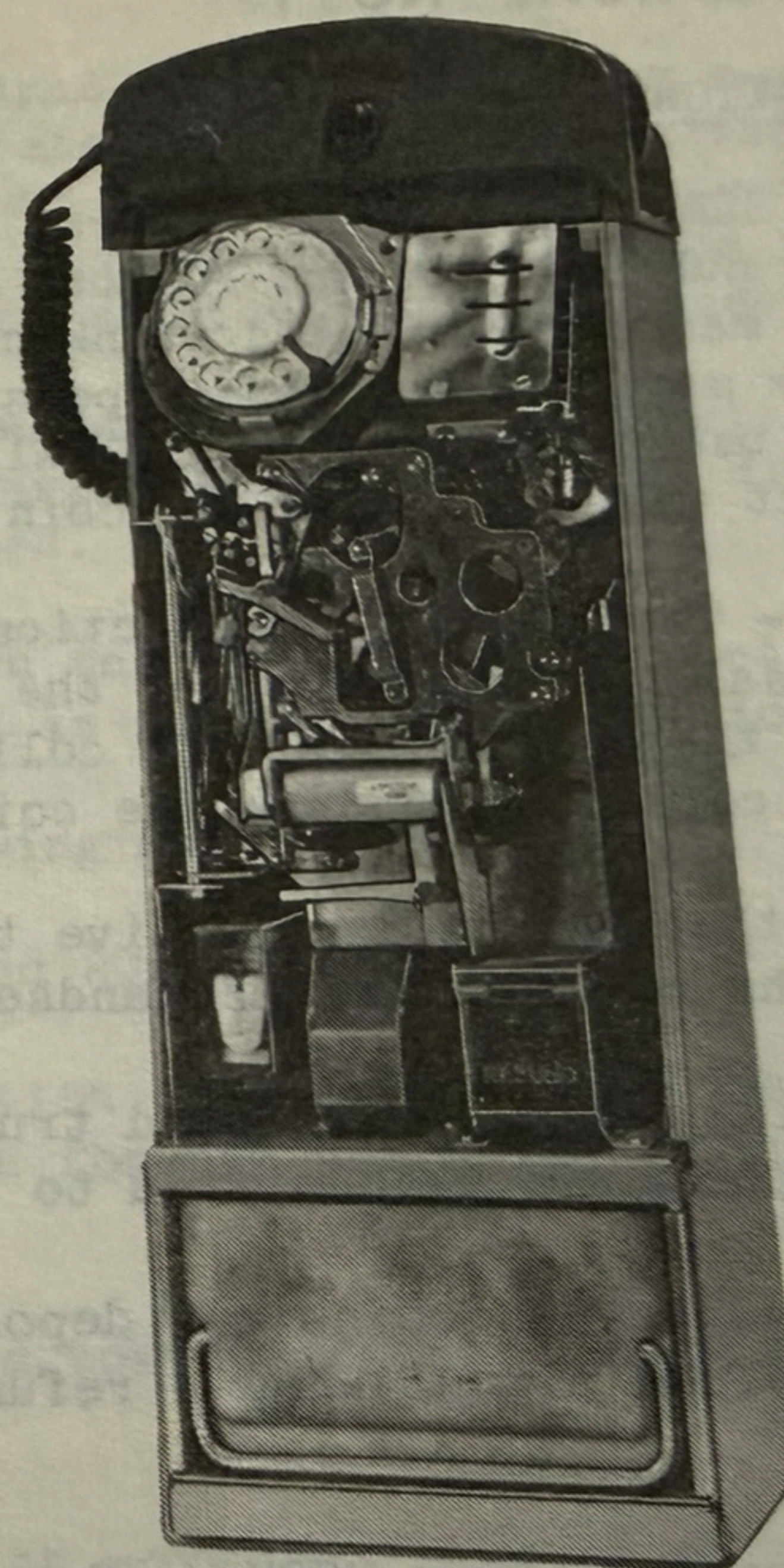


**LOCAL CALLS**

- Lift the handset
  - Insert the coin
  - Dial the number
- (If necessary, hang up—your money will be returned)

For Trunk Calls, Telegrams, Enquiries, Service  
Difficulties, etc., SEE MAIN NOTICE

For EMERGENCY CALLS dial 000  
(Coins not required)



# COIN TELEPHONE NO. 1.

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## I-16 COIN TELEPHONE NO. 1.

### GENERAL INFORMATION.

E.I. TELEPHONE SUBSTATION E 3111 refers. - Coin Telephone No. 1 is the standard non STD multi-coin public telephone for use in automatic networks throughout Australia. Both local and manually assisted trunk calls can be made from this instrument. When a local call is made the telephone operates as a prepayment public telephone without collect button use, but when a trunk call is made the user must press the collect button to direct the money into the coin tin.

Coin Collection - The automatic collection of the coin on a local call occurs when a full line reversal is received after the called party has answered. The full line reversal causes the operation of the collect magnet which disengages the mechanism and permits the coin to fall into the coin tin.

Coin Refund - If the call is ineffective that is no reversal is received, the coin is directed to the refund when the handset is replaced.

Trunk calls - During manually assisted trunk calls the line polarity remains normal and the following signals are transmitted to the trunk operator:-

Coin identity signals when coins are deposited, a collect signal when the coins are collected and a refund signal when a refund of money is obtained. These signals are as follows:-

- (i) Coin Identity Signals - 900Hz pulses - 1 for 5c; 2 for 10c and 4 for 20c.
- (ii) Coin Collect Signal - 250Hz tone of 2 seconds minimum duration.
- (iii) Refund Signal - 900Hz tone of 2 seconds minimum duration.

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Non-chargeable local calls - These can be obtained without depositing a coin. Normally if no coin has been deposited to operate the balance arm a line reversal will cause the line to be shunted by a diode and oscillator which introduces a tone to mask reception, but in the absence of line reversal, i.e. on a free call, the diode is non-conducting, the tone is absent and the call can proceed.

Ring Trip - When the handset is lifted to answer an incoming call a pair of auxiliary gravity switch contacts make momentarily and short circuit the line, thus ensuring that the incoming ring is tripped.

Coin Tin Removal - A micro-switch operates when the coin tin is removed and places a loop condition to the line when the handset is in the normal position.

Mechanism - The mechanism comprises the following main items:-

- (i) Coin slot arranged to accept 5c, 10c and 20c coins.
- (ii) Coin entry arranged so that semi insertion of a coin causes the three prongs of the associated plate to move forward and hold any further coins that may be inserted.
- (iii) Coin runways arranged so that coins and tokens of unstandard diameter are ejected.
- (iv) Mechanism to hold coins in suspense with movable flaps to direct held coins into collect or refund hoppers as required.
- (v) Latching balance arm (released by depression of gravity switch plungers).

## I-18 COIN TELEPHONE NO. 1.

(vi) Electrical Sub-assemblies comprising Balance Arm Contacts, Coin Identity Contacts, Coin Collect Contact, Collect Magnet and No Coin Oscillator.

Gravity Switch Delay Mechanism. - This mechanism contains a delay feature governed by a train of gears and a pallet escapement. Special cams operate the springsets. One pile contains GS1 and GS2 which corresponds to the two sets in the 800 type telephone. The other pile contains GS3 and GS4 which provide for the opening for triggering the A relay delay circuit and the tripping of the ring respectively.

### ELECTRICAL ASSEMBLIES.

Telephone Board - The main wiring is in the form of a printed circuit board on which are fitted the circuit components. Three sets of jacks are provided for the Dial and Handset Connector Plug, the Gravity Switch Connector Plug and the Tone Generator Printed Circuit Board.

Two small printed circuit boards containing the S.C.R. delay components for the slow release of the A relay and the slow operation of the collect magnet are connected on the main board each by three screws. A transmission pad is also attached and is inserted into the line by special strapping when the line current is more than 50 milliamps.

Tone Generator - There are three potentiometers associated with the tone generator; two are volume controls for varying the output of the 250Hz and 900Hz tones and the other provides for adjustment to various line currents to ensure that the voltage drop across the parallel resistors R1 or R2 is the correct value for the satisfactory operation of the tone generator. The calibrations for these controls can be seen through the aperture in the chassis. Screwdriver adjustments are provided for and can be carried out from the front of the instrument.

## COIN TELEPHONE NO. 1. I-19

The A Relay Sub-Assembly - This is a 400 ohm 3,000 type relay which operates on normal line polarity only when the GS'3' contact opens on the down stroke of the gravity switch.

Dial - B.P.O. No. 21 dials are fitted but the instrument will accomodate the new A.P.O. dial and adaptor ring A.D.C.2 as a replacement.

Handset and Cord - A weighted (4 oz) B.P.O. 706 type handset and heavy duty B.P.O. public telephone cord is fitted and in the event of damage they are to be replaced with the Standard A.P.O. 400 type handset and cord.

Bell - The bell is a standard B.P.O. 706 type supplied with one gong.

The Coin Collect Magnet - Is a 400 ohm 3,000 type relay without springsets. An armature restore spring is rivetted to the yoke and the armature has a buffer spring inside a special bracket to cushion the action of the plastic mechanism release lever.

The Collect Button Assembly - This is a single changeover micro-switch and push button which provides a means for operating the collect magnet when no line current reversal is available.

Micro-Switch Latch Assembly - The single make micro-switch and latch operates during coin collection to shunt the dial impulse springs so that the loop cannot be broken by holding the dial off normal. The switch latches after operation and is only unlatched by replacing the handset or depressing the gravity switch plungers.

No Coin Oscillator - This is a 200Hz oscillator in small printed circuit form which is mounted on the coin identity holding bracket. It operates and provides a tone of sufficient volume to effectively mask reception when no coin is deposited on a local chargeable call i.e. when line reversal occurs with the balance arm not operated.

## I-20 COIN TELEPHONE NO. 1.

Circuit Functions General. The telephone operates on line currents from 30 to 50mA and a special transmission pad is fitted which is to be connected when the initial line current exceeds 50mA. The D.C. resistance limits for signalling purposes are 255 ohms less than for ordinary services. This resistance is necessary to provide a suitable operating voltage for the tone generator.

The "A" Relay Network. The A relay operates during normal line potential when the GS3 contacts open momentarily during gravity switch plunger depression. Contact A2 fires the SCR delay unit which replaces the short circuit across the A relay after 2 seconds delay. A1 short circuits the GS1 contacts to maintain the connection for a minimum of 2 seconds and A3 triggers the tone generator. A4 applies a break to the dial off normal circuit to prevent masking of the tone by holding the dial off normal.

Latching Balance Arm. When a coin has been deposited it operates the balance arm which then latches in this position. Operation of the balance arm springset removes diode MR1 and the no coin oscillator from circuit so that a subsequent line reversal has no effect on speech. If no coins are deposited the balance arm stays unoperated and on reversal MR1 is conducting and the introduction of 200Hz tone masks reception. The balance arm is restored to normal on handset replacement or gravity switch plunger depression.

A secondary circuit is provided on the make side of the balance arm springset so that the triggering voltage is not connected to the coin collect contact until after the balance arm is operated. This is a precautionary measure to avoid the possible false transmission of coin collect signals if no coins are deposited.

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## COIN TELEPHONE NO. 1. I-21

The Collect Magnet Network. Line reversal causes the SCR delay unit to fire and allow operation of the collect magnet after a delay of 200mS. This delay prevents operation of the collect magnet to reversals of 150mS which are associated with calls to some levels. For coin collection on manual calls where no line reversal occurs, operation of the collect button removes diode MR2 from across the collect magnet to allow its operation.

The Tone Generator. The 250Hz tone has its own 2-second delay circuit so that the operation of the coin collect contact for any duration causes the coin collect signal to be transmitted for 2 seconds when the line polarity is normal.

The 900Hz tone is controlled by the A3 contact, which having its own 2 second delay causes the tone to be transmitted for 2 seconds each time the receiver is replaced when the line polarity is normal. The 900Hz tone generator also transmits bursts of tone on receipt of trigger signals from the coin identity contacts.

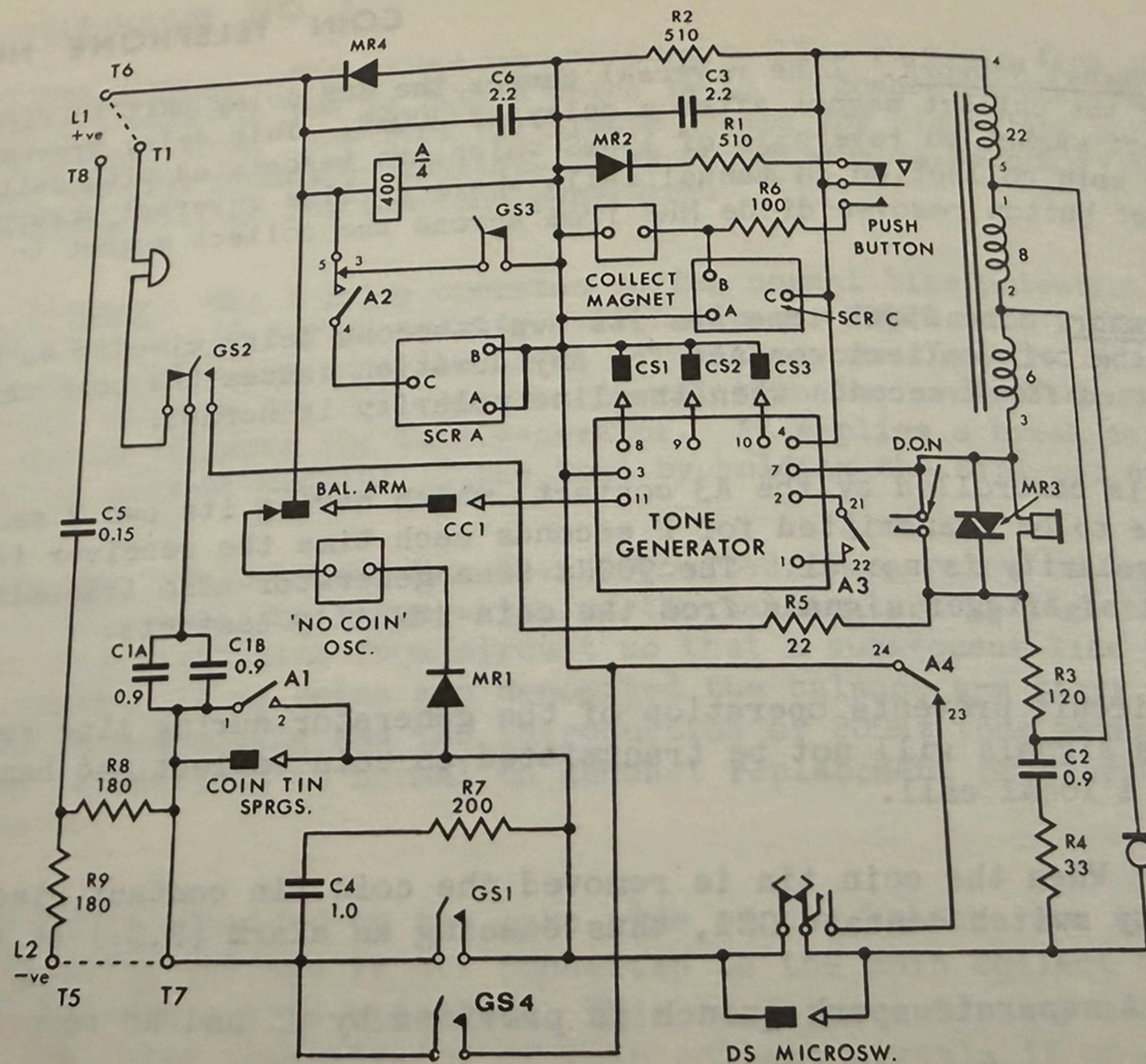
A diode in the circuit prevents operation of the generator during line reversal conditions so as signals will not be transmitted on coin collect and handset replacement for a local call.

Coin Tin Contact. When the coin tin is removed the coin tin contact places a short circuit on gravity switch contact GS1, thus causing an alarm (P.G.) at the exchange.

Spark Quenching. A separate spark quench is provided by C5 and R8 to protect A1 contact.

Extension Bell. Terminals are provided to allow for the fitting of an extension bell.

I-22



COIN TELEPHONE NO. 1 CIRCUIT

MAINTENANCE.

The maintenance procedure set out in E.I. TELEPHONE SUBSTATION M 3001 is to be applied to this instrument. The normal Maintenance Technicians will carry out only front line maintenance, which means he will replace defective transmitter and receiver insets, ear-caps, mouth pieces, handset, cords, dial and clear minor blockage where it is possible to do this without interfering with the setting of the mechanism. When the fault cannot be corrected by the above means or when the instrument has an unsatisfactory fault history a special inspection by a Technician who is a specialist in public telephone maintenance should be arranged in accordance with the procedure set out in E.I. TELEPHONE SUBSTATION M 3001.

The instrument comprises the following easily replaceable assemblies, doors, handset cradle, handset and cord, chassis, mechanism, gravity switch delay mechanism, telephone board, tone generator, SCR delay units, A relay sub-assembly, dial, bell. The public telephone specialist by observing the operation of the instrument and by carrying out appropriate tests will isolate the trouble to one of the above mentioned units and replace the complete unit. The defective unit should be returned to the Postal Workshops or maintenance depot for reconditioning. He should not attempt to replace individual components of the unit or to alter any adjustments. This restriction is imposed because the components can be more easily assembled in the Workshops, also the failure of one component indicates that it is appropriate that the complete assembly should be thoroughly inspected and reconditioned. All adjustments are factory set and should not require alteration throughout the life of the instrument. Again the loss of adjustment is an indication that undue wear has occurred and complete reconditioning is warranted.

I-24 COIN TELEPHONE NO. 1.

| TEST NO | TESTING PROCEDURE                                                            | FUNCTIONS AND DIRECTIONS                                              |
|---------|------------------------------------------------------------------------------|-----------------------------------------------------------------------|
| 1       | Lift off.                                                                    | If no dial tone, check for line reversal.                             |
| 2       | Dial "0".                                                                    | Dial tone should be broken.                                           |
| 3.      | Manually set mechanism and operate collect magnet.                           | D.S. micro-switch should operate and latch.                           |
| 4       | Open impulse springs by returning dial slowly from off normal.               | Opening of loop with restoration to dial tone should not be possible. |
| 5       | Replace handset.                                                             | D.S. micro-switch should release.                                     |
| 6       | Lift off, deposit 5c and call a selected S.T.D. number.                      | If not barred and coin collected, notify the testing officer (T.O.).  |
| 7       | Replace handset for coin refund, lift off, dial test desk number (09).       | With line polarity normal conversation is possible.                   |
| 8       | T.O. meets you via distributor or shoe, (exchanges with P.T. marking bases.) | With line polarity normal conversation is possible.                   |
| 9       | T.O. applies line reversal.                                                  | 200Hz no-coin tone prevents conversation.                             |
| 10      | Deposit 5c.                                                                  | Coin collected, no-coin tone disconnected and conversation possible.  |

# COIN TELEPHONE NO. 1. I-25

|    |                                                                                                                                                                                                 |                                                                                      |
|----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| 11 | Replace handset until T.O. carries out line test and calls back.                                                                                                                                | Check bell before answering.                                                         |
| 12 | T.O. carries out dial and loop tests and if required, advises the positioning of the line pad and potentiometer. (Hold the dial off normal during positioning tests).                           | T.O. to enter the pad and potentiometer positions on the master cord.                |
| 13 | Deposit a 5c, a 10c and a 20c coin.                                                                                                                                                             | T.O. should hear identity signals.                                                   |
| 14 | Momentarily replace handset. Adjust volume control if required.                                                                                                                                 | Coin should be refunded and T.O. should hear approx. 2 seconds of 900Hz refund tone. |
| 15 | Deposit 5c and press collect button. Adjust volume control if required.                                                                                                                         | Coin should be collected and T.O. should hear 250Hz coin collect tone.               |
| 16 | Dial Trunk Exchange. Request check of tones as follows:- Deposit 5c and momentarily replace handset. Redeposit refunded coin and press coin collect button. Adjust volume controls if required. | Operator should hear coin identity signals, refund tone and coin collect tone.       |

## I-26 COIN TELEPHONE NO. 1.

The table opposite is provided as a guide so that, where necessary, the testing officer (who is unable to read line current at the test desk) may direct the positioning of the line pad and the line current potentiometer setting. The column details are as follows:-

- (i) Column 1 indicates the number of each example.
- (ii) Column 2 indicates the line resistance, measured at the test desk, of each example with the line pad strapped out of circuit and the dial off normal.
- (iii) Column 3 indicates the calculated line currents when the exchange voltage is applied to the total loop resistance of the exchange equipment, the varying lines and the telephone with the receiver off and the pad strapped out of circuit. (For each example, a resistance of 700 ohms, including 400 ohms for the exchange equipment, 255 ohms for the telephone coin collect network and 45 ohms for the transmitter, was added to the line resistance).
- (iv) Column 4 indicates the line resistance after the necessary 360 ohm pad is added to lines where the initial line current is 50mA or more.
- (v) Column 5 indicates the calculated line current when the pad is added to reduce the initial line current below 50mA.
- (vi) Column 6 indicates the correct line potentiometer setting for the examples given.

For example a line with a resistance of 800 ohms will have 34mA of line current. The pad will remain strapped out of circuit and the line potentiometer will be set on 34. A line with a resistance of 200 ohms will require insertion of the 360 ohm pad giving a final resistance of 560 ohms. From the table, the potentiometer setting will be 41. It will be noted that the line resistances requiring insertion of the pad are 300 ohms or less.

# COIN TELEPHONE NO. 1 I-27

| 1    | 2                            | 3                         | 4                           | 5                        | 6                              |
|------|------------------------------|---------------------------|-----------------------------|--------------------------|--------------------------------|
| Line | Line Resistance<br>Pad "Out" | Line Current<br>Pad "Out" | Line Resistance<br>Plus Pad | Line Current<br>Pad "In" | Potential-<br>meter<br>Setting |
| 1    | 50 Ohms                      | 70mA                      | 410 Ohms                    | 47mA                     | 47                             |
| 2    | 100 Ohms                     | 65mA                      | 460 Ohms                    | 45mA                     | 45                             |
| 3    | 160 Ohms                     | 60mA                      | 520 Ohms                    | 42mA                     | 42                             |
| 4    | 240 Ohms                     | 55mA                      | 600 Ohms                    | 40mA                     | 40                             |
| 5    | 300 Ohms                     | 50mA                      | 660 Ohms                    | 37mA                     | 37                             |
| 6    | 460 Ohms                     | 45mA                      | "Pad Out"                   | "Pad Out"                | 45                             |
| 7    | 600 Ohms                     | 40mA                      | "Pad Out"                   | "Pad Out"                | 40                             |
| 8    | 775 Ohms                     | 35mA                      | "Pad Out"                   | "Pad Out"                | 35                             |
| 9    | 1025 Ohms                    | 30mA                      | "Pad Out"                   | "Pad Out"                | 30                             |
| 10   | 1350 Ohms                    | 25mA                      | "Pad Out"                   | "Pad Out"                | 25                             |
| 11   | 1840 Ohms                    | 20mA                      | "Pad Out"                   | "Pad Out"                | 20                             |

NOTE: The Line resistance measurements are to be made with the dial off normal.

# COIN TELEPHONE NO. 1 SPARE PARTS

| Title                                    | Serial | Item |
|------------------------------------------|--------|------|
| Coin Telephone No. 1                     | 35     | 101  |
| * Mechanism complete with Collect Magnet | N      | S    |
| * Mechanism Compartment Door Assembly    | N      | S    |
| * Gravity Switch Delay Mechanism         | N      | S    |
| * Telephone Board with Mechanism Plug    | N      | S    |
| * Tone Generator                         | N      | S    |
| * SCR Delay Unit A.                      | N      | S    |
| * SCR Delay Unit C.                      | N      | S    |
| * A Relay Assembly                       | N      | S    |
| * Collect Button Micro-switch Assembly   | N      | S    |
| * Handset Cradle                         | N      | S    |
| * Handset Plunger Assembly               | N      | S    |
| * Bell Set 59A/1                         | N      | S    |
| * No Coin Oscillator                     | N      | S    |
| Dial B.P.O. 21 Assembly                  | 311    | 26   |
| Handset 400 Type                         | 304    | 27   |
| Mouthpiece 400 Type                      | 304    | 26   |
| Earpiece 400 Type                        | 304    | 25   |
| Transmitter Inset 400 Type               | 19     | 56   |
| Receiver Inset 400 Type                  | 20     | 43   |
| Handset Cord Coiled 400 Type             | 30     | 48   |

\* Available from Workshops on an exchange basis.