MULTISLOT COIN TELEPHONE SET TOTALIZER DESCRIPTION, OPERATION, INSTALLATION, AND INSTALLATION TESTS

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1. GENERAL

1.01 This section provides description, installation, and operation information for the multislot coin telephone set totalizer hereafter referred to as totalizer (Figure 1).

1.02 The totalizer kit (HH-880023) was specially designed to allow the GTE AE coin telephone sets' initial coin rate to be varied by wire strapping from ten cents to 25 cents in five cent increments. The totalizer can be installed in five cent coin telephone sets in preparation for future rate changes. However, it performs no function until connected for rates of ten cents to 25 cents. Each totalizer kit consists of a bracket on which are mounted a nickel and dime microswitch and a printed wiring card.

2. DESCRIPTION

Functional Description

2.01 The totalizer functions in conjunction with the coin relay trigger springs to control the dial and coin ground connection (prepay); the receiver, transmitter, and Touch Calling unit (semi-postpay); or the dial only (local prepay). Totalizers are pre-strapped for ten cent Prepay operation at the factory. Changes in the initial rate or type of service may be made by moving the jumper wires.

2.02 Installation requires the removal of the existing two-nickel mechanism and its associated wiring from the upper housing, then mounting the totalizer unit in the same location, using the same mounting screws and nuts, or those provided with the kit. Spade-ended leads from the totalizer are terminated on the upper housing terminal strip using wiring information provided for the specific telephone set being modified. Some telephone sets also require wiring modifications of the lower housing. A screwdriver is all that is needed to rearrange both the upper and lower housing wiring.

2.03 The totalizer may be used on virtually all prepay, semi-postpay, and local prepay telephone sets in the LPA, LPB, and LPC series. Certain requirements and limitations are necessary when using the totalizer in the following telephone sets:

(a) Prepay — Simplexing of the line conductors at the coin telephone set cannot be provided on telephone sets equipped with the totalizer. Older sets with the two-coil coin relay must be restricted to 800 ohm loops, or a single coil coin relay must be installed to regain 1200 ohm loop operation. The totalizer may not be used in telephone sets served from central offices that do not refund on abandoned calls unless coin ground is detected.

(b) Local Prepay — The LPB 89-55 surface-mounted coin telephone sets which have been field converted to Touch Calling may be equipped with a totalizer only when used with a battery-connected ringing generator. An additional terminal (1B) is required

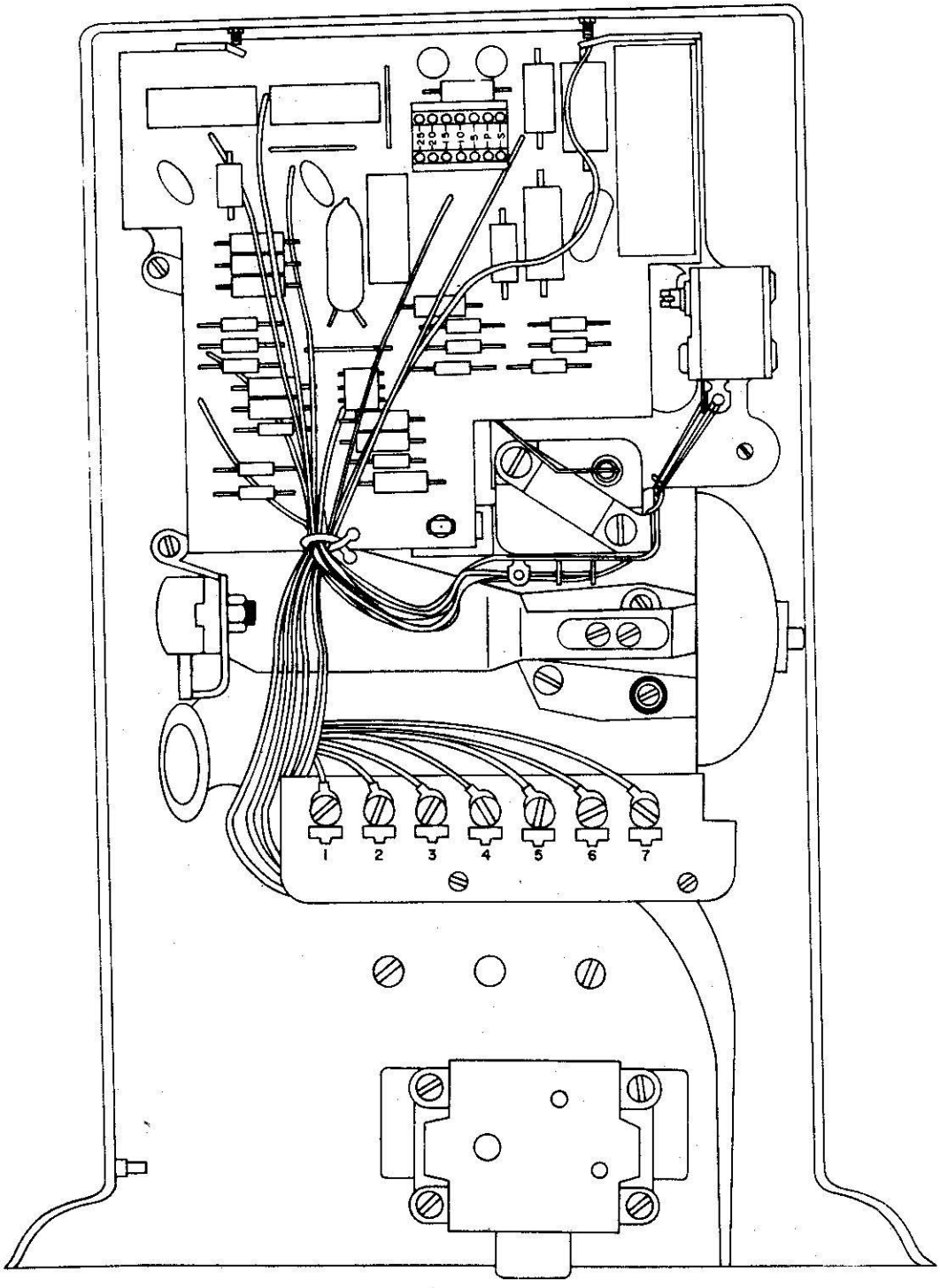


Figure 1 Multislot Coin Telephone Set Totalizer.

for LPA and LPB telephone sets used with certain ringing generator arrangements (Table 1). This additional terminal is provided in kit HH-880029-1.

(c) Semi-Postpay — The LPB 86-55 surface-mounted coin telephone sets which have been field converted to Touch Calling also require an additional terminal (1B).

NOTE: Terminal kit HH-880029-1 consists of several bushings and self-tapping screws, a clamping plate, etc.

3. INSTALLATION

Totalizer Installation

3.01 Installation of the totalizer into a coin telephone set requires removal of the existing two-nickel mechanism and its associated wiring from the upper housing. The totalizer is then mounted in the same location using the same mounting screws and nuts, or those provided with the kit. Before attempting to convert to totalizer use, however, always verify that the coin telephone set is in working order and that the coin relay functions properly, because proper functioning of the coin relay is essential to the operation of the totalizer.

CAUTION: Do not lay the totalizer down on the triggers because they extend through the underside of the mounting plate. Misadjustment of these triggers may result.

302. For totalizer installation, use the following steps:

(1) Separate the coin chute from the upper housing by removing its three mounting screws.

(2) Remove the two-nickel mechanism from the coin chute by removing its two mounting screws and nuts and the mechanism's associated wiring.

(3) Remove the totalizer's printed wiring card from its baseplate by squeezing the locking tab of the plastic standoff with long-nose pliers and lifting up on the lower end of the card.

(4) While the printed wiring card hangs free, mount the baseplate to the coin chute using the screws and nuts removed from the two-nickel mechanism, or the extra ones provided with the kit. Replace the coin chute in the upper housing.

(5) Check the operation of the coin triggers by operating manually to ensure that the triggers operate freely and do not touch the coin chute. Deposit several coins and verify that the coins do not slip past the coin triggers without operating the switches. To adjust the trigger wires for proper operation, use a pair of long-nose pliers.

(6) Replace the printed wiring card by slipping the tab at the top of the card under the baseplate slots and snapping the card over the plastic standoff.

(7) Wire the totalizer using the wiring instructions in Table 1. The totalizer leads are connected to terminals of the upper housing terminal strip.

(8) To ensure proper operation of the mercury-wetted relay contacts, lightly tap the relay (located on upper right corner of printed wiring card) several times with finger.

(9) Set the new initial rate by inserting the jumper wires into the desired receptacle openings from 10 cents to 25 cents (factory wired for 10 cents). Set the mode of service as follows:

(a) Prepay — Jumper in P position (factory wiring).

(b) Semi-Postpay — Jumper in S position.

(c) Local Prepay — Jumper in P position, clip out the red insulated jumper at the lower corner of the printed wiring card next to the plastic standoff.

(10) Replace the upper housing and proceed with the installation tests.

4. INSTALLATION TESTS

Prepay and Local Prepay

4.01 With the handset off hook, insert one nickel and return the handset to on hook. At the same time the coin is returned, the totalizer is reset and will ensure the correct initial state of the logic and bistable relay. Whenever the telephone set is put out of service, this same step should be repeated when restoring the telephone set to service.

Prepay and Semi-Postpay, Local Prepay

4.02 Test the telephone set on the new initial rate with various coin combinations to verify that the full rate is required to complete a call. Return the rate strap to the present rate until cutover is required. At that time, the new rate may be strapped. If, however, the present rate is five cents, leave the rate strap set for the new rate but connect totalizer lead DP (BRN) as follows:

(a) Prepay – connect to same terminal as lead CR (GRN)

(b) Semi-postpay – connect to same terminal as lead TR (PINK)

(c) Local prepay – connect to same terminal as lead L2A (WHT)

At cutover time, move lead DP (BRN) to the proper terminal as discussed in Table 1.

Troubleshooting

4.03 Troubles such as free calls, the inability to break dial tone, the possible causes, and corrective actions necessary are contained in Table 2.

5. OPERATION

5.01 When connected for prepay or local prepay service, the totalizer is reset at the end of a call from coin battery in preparation for the next call. In the reset state, the totalizer does not restrict the dial or open the coin ground connection. However, the coin relay disables the telephone through its coin springs prior to deposit.

Prepay and Local Prepay

5.02 When the coin telephone set is in operation the deposit of the first coin causes the totalizer to short the dial or Touch Calling unit (prepay and local prepay) and open the ground path (prepay only) when the deposit is less then the initial rate. The coin relay removes the short from the dial or Touch Calling unit and closes the ground contacts when the first coin trips the coin relay trigger. Deposit of the full rate causes the totalizer to remove the dial short and complete the coin ground path. The coin relay also disables the coin telephone set through its coin springs prior to deposit.

5.03 In order to prevent fraudulent operation, the totalizer is powered from the line at all times. This is necessary to count on-hook as well as off-hook deposits. If the totalizer were not powered in the on-hook condition, a coin deposit of less than the initial rate could not be counted by the totalizer, but would trip the coin relay and remove the dialing restriction. Upon going off-hook, the totalizer would not restrict the dial or ground connection since it begins in the reset state. A call could therefore be placed for a deposit of less than the initial rate.

Semi-Postpay

5.04 When the totalizer is connected for semi-postpay service, the answer of a chargeable local call (reverse battery) is the only time the totalizer is required to count coin deposits. All other calls such as free local numbers, incoming calls, and toll calls return normal battery to the telephone, and the totalizer is not functional.

5.05 On answer of a chargeable local call, reverse battery supervision causes the coin relay to operate its coin springs and disable the transmitter as well as mute the receiver to a low level to prevent its use as a transmitter. Reverse battery supervision also enables the totalizer, and coin deposits can be counted. If the first coin deposited is less than the initial rate, the totalizer shorts the entire transmission network. As soon as the first coin trips the coin relay trigger, the initial restriction of transmission is removed. Deposit of the full rate causes the totalizer to remove the short from the transmission network and conversation may begin.

Table 1. Totalizer Wiring (Loop Start) (Sheet 1 of 4).

TELEPHONE SET	UPPER HOUSING								LOWER HOUSING
	CONNECT TOTALIZER LEADS								
	L1 BLK TO	L1A YEL TO	L2 RED TO	L2A WHT TO	DP BRN TO	CR GRN TO	TR PINK TO	WIRING CHANGES	WIRING CHANGES
LPA 82-55	5	4	2	6	5 Note 1	1A	Tape	Remove GRN dial lead from terminal 4 and tape.	Note 1.
LPB 82-55	1A	3	5	BLK lead at C.S.* xmtr.	5 Note 1	2	Tape	Remove GRN dial lead from terminal 3 and tape.	Note 1.
LPB 82-55 Dial Panel	1A	3	5	4	5 Note 1	2	Tape		Remove GRN dial lead from panel terminal block and tape. Note 1.
LPB 82-55 T.C. Field Conv.	1A	3	6	4	5 Note 1	2	Tape		Note 1.
LPB 82-55 T.C. Field Conv. Panel	1A	1	6	4	5 Note 1	2	Tape		Note 1.
LPC 72-55	7	YEL & RED lead at C.S. xmtr.*	1	3	5 Note 1	2	Tape	Move BLK-WHT lead from terminal 1 to 3.	Move RED-BLK lead from terminal L2 to network 21. Note 1.
LPC 72-55 T.C. Panel	7	WHT lead at C.S. xmtr.*	1	3	5 Note 1	2	Tape		Move RED-BLK lead from terminal L2 to network 21. Move BRN-GRN lead from terminal R1 to network 21. Move WHT lead of T.C.U. to same panel terminal as BRN-GRN lead. Remove BRN-YEL lead from panel terminal block and tape. Note 1.
LPC 82-55	7	1	4	5	4 Note 1	2	Tape	Remove GRN dial lead from terminal 1 and tape. Reverse WHT and YEL leads to coin signal transmitter.	Move ORN and RED-BLU leads from terminal L2 to S. Move BLK lead from terminal S to L2. Note 1.
LPC 82-55 Dial Panel	7	1	4	5	4 Note 1	2	Tape	Reverse WHT and YEL leads to coin signal transmitter.	Move ORN and RED-BLU leads from terminal L2 to S. Move BLK lead from terminal S to L2. Remove GRN dial lead from panel terminal block and tape. Note 1.
LPA 89-55	1A or 1B Note 2	6	1	6	5	1A	4	Remove terminal link inside dial between pulse springs and shunt springs. For battery-connected ringing generator, add terminal 1B to terminal strip.	For battery-connected ringing generator, add 1B spring and connect to terminal L1.
LPB 89-55	1A or 1B Note 3	3	1	6	5	1A	2	Remove GRN dial lead from terminal 3 and tape. For ground-connected ringing generator, add terminal 1B to terminal strip.	For ground-connected ringing generator, add 1B spring and connect to terminal L1.

Table 1. Totalizer Wiring (Loop Start) (Sheet 2 of 4).

TELEPHONE	UPPER HOUSING								LOWER HOUSING
	CONNECT TOTALIZER LEADS								
	L1 BLK TO	L1A YEL TO	L2 RED TO	L2A WHT TO	DP BRN TO	CR GRN TO	TR PINK TO	WIRING CHANGES	WIRING CHANGES
LPB 89-55 Dial Panel	1A or 1B Note 3	3	1	6	5	1A	2	For ground-connected ringing generator, add terminal 1B to terminal strip.	Remove GRN dial lead from panel terminal block and tape. For ground-connected ringing generator, add 1B spring and connect to terminal L1.
LPB 89-55 T.C. Field Conv.	1A	4	BRN lead at C.S. xmtr.*	3	5	1A	1B	Note 4.	
LPB 89-55 T.C. Field Conv. Panel	1A or 1B Note 3	4	1	3	5	1A	2	For ground-connected ringing generator, add terminal 1B to terminal strip.	Connect jack strip terminal 4 to WHT hookswitch lead at panel terminal block. For ground-connected ringing generator, add 1B spring and connect to terminal L1.
LPC 79-55	SL lead from term. 7 with dracon	ORN-WHT lead at C.S. xmtr.*	6	3	5	2	7		Move ORN lead from terminal G to L1.
LPC 79-55 T.C. Panel	RED lead from term. 7 with dracon	1	BRN-BLK lead at C.S. xmtr.*	3	5	2	7		Move ORN lead from terminal G to L1. Move BRN lead from network 2 to terminal R.
LPC 89-55	1	3	4	5	4	2	7	Remove GRN dial lead from terminal 3 and tape.	Move ORN lead from terminal R1 to L1.
LPC 89-55 Dial Panel	1	3	4	5	4	2	7		Remove GRN dial lead from panel terminal block and tape. Move ORN lead from terminal R1 to L1.
LPA 86-55	Tape	1	2	1A	3	Tape	1		Remove diode between coin relay 83 ohm coil and spring 4; add 3" lead between same terminals. Remove BRN lead from coin relay 77 ohm coil and BLK lead from 83 ohm coil; tie together with dracon connector. Move YEL lead from coin relay spring 4 to terminal G. Connect 12" lead between terminal G and coin relay 77 ohm coil.

Table 1. Totalizer Wiring (Loop Start) (Sheet 3 of 4).

TELEPHONE	UPPER HOUSING								LOWER HOUSING
	CONNECT TOTALIZER LEADS								
	L1 BLK TO	L1A YEL TO	L2 RED TO	L2A WHT TO	DP BRN TO	CR GRN TO	TR PINK TO	WIRING CHANGES	WIRING CHANGES
LPB 86-55	Tape	6	2	1A	3	Tape	1	Remove diode between terminal 1 and 6.	Remove BLU lead from coin relay spring 4 and ORN lead from terminal G; tie together with dracon connector. Connect 12" lead between terminal G and coin relay 77 ohm coil.
LPB 86-55 Dial Panel	Tape	6	2	1A	3	Tape	1	Remove diode between terminal 1 and 6.	Remove BLU lead from coin relay spring 4 and ORN lead from terminal G; tie together with dracon connector. Connect 12" lead between terminal G and coin relay 77 ohm coil.
LPB 86-55 T.C. Field Conv.	Tape	1B	3	1	3	Tape	1B	Remove diode between terminal 1 and 1A. Add terminal 1B to terminal strip.	Add 1B spring and connect to terminal G. Remove ORN lead from coin relay 77 ohm coil and tape. Remove BLU lead from coin relay 83 ohm coil and ORN lead from terminal G; tie together with dracon connector. Connect 3" lead from coin relay 83 ohm coil to spring 4. Connect 12" lead between terminal G and coin relay 77 ohm coil.
LPB 86-55 T.C. Field Conv. Panel	Tape	5	3	1A	3	Tape	5	Remove diode between terminal 1 and 1A.	Remove WHT lead from induction coil terminal 1 and connect to terminal G. Remove ORN lead from coin relay 77 ohm coil and tape. Remove BLK lead from coin relay spring 4 and ORN lead from terminal G; tie together with dracon connector. Connect 3" lead from coin relay 83 ohm coil to spring 4. Connect 12" lead between terminal G and coin relay 77 ohm coil.
LPC 76-55	Tape	7	BRN lead at C.S. xmtr.*	2	SL lead at C.S. xmtr.*	Tape	7	Remove diode between terminal 2 and 7. Remove BLU lead from terminal 2 to 6. Remove BRN-YEL lead from terminal 7 to 2. Move PINK lead from terminal 1 to 7.	Remove BLK lead from coin relay 77 ohm coil and PINK lead from spring 4; tie together with dracon connector. Untape VIO lead from harness and connect to terminal G.
LPC 76-55 T.C. Panel	Tape	3	BLU lead at C.S. xmtr.*	4	RED lead at C.S. xmtr.*	Tape	3	Remove diode between terminal 2 and 7. Move GRN lead from terminal 2 to 7.	Remove BLK lead from coin relay 77 ohm coil and SL lead from terminal CR; tie together with dracon connector. Move BLU lead from network 1 to terminal G.

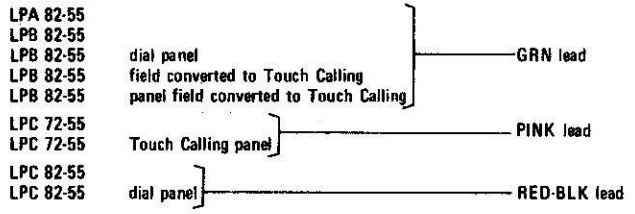
Table 1. Totalizer Wiring (Loop Start) (Sheet 4 of 4).

TELEPHONE	UPPER HOUSING								LOWER HOUSING
	CONNECT TOTALIZER LEADS								
	L1 BLK TO	L1A YEL TO	L2 RED TO	L2A WHT TO	DP BRN TO	CR GRN TO	TR PINK TO	WIRING CHANGES	WIRING CHANGES
LPC 86-55	Tape	7	4	2	1	Tape	7	Remove diode between terminal 2 and 3. Move BLU and WHT leads from terminal 6 to 2. Move GRN lead from terminal 2 to 3.	Remove BLK lead from coin relay 77 ohm coil, tie to 12" lead using dracon connector; connect other end of 12" lead to terminal S.
LPC 86-55 Dial Panel	Tape	7	4	2	1	Tape	7	Remove diode between terminal 2 and 3. Move BLU and WHT leads from terminal 6 to 2. Move GRN lead from terminal 2 to 3.	Remove BLK lead from coin relay 77 ohm coil, tie to 12" lead using dracon connector; connect other end of 12" lead to terminal S.

*C.S. xmtr. = coin signal transmitter.

NOTES:

1. For emergency calling service, remove and tape totalizer lead "DP." Remove and tape one dial shorting lead from coin relay as follows:



2. For LPA 89-55 sets used with battery-connected ringing generator, connect totalizer lead L1 to terminal 1B. For ground-connected generator, connect lead L1 to terminal 1A.

3. For LPB 89-55 sets used with ground-connected ringing generator, connect totalizer lead L1 to terminal 1B. For battery-connected generator, connect lead L1 to terminal 1A.

4. LPB 89-55 surface-mounted sets that have been field converted to Touch Calling may be equipped with the totalizer for battery-connected ringing generator only.

Table 2. Totalizer Trouble Shooting Chart.

Trouble	Cause	Corrective Action
Free calls.	Coin relay trigger does not reset at end of call.	Adjust coin relay to eliminate trigger bind.
	Semi-postpay coin relay springs 1, 2 and 3 dirty or out of adjustment.	Burnish coin relay contacts and/or adjust springs. Refer to the 997 division of GTE practices.
	Semi-postpay line polarity reversed and coin relay malfunctioning.	Correct line polarity and adjust coin relay. Refer to the 997 division of GTE practices or replace.
Call on single coin less than rate strapped on totalizer.	Totalizer rate strap broken or loose.	Seat strap firmly in socket or replace.
	No coin registration—5¢ or 10¢ triggers on totalizer assembly not operated by coin or stuck in operated position.	If necessary, adjust triggers to extend full into coin track or prevent rubbing against sides of chute or printed wiring card. Loosen switch mounting screws slightly to eliminate internal bind due to overtightened screws. If switches cannot be adjusted to operate properly, replace entire totalizer assembly.
	Semi-postpay coin relay springs 4 and 5 not making contact on coin deposit.	Burnish coin relay contacts and/or adjust springs. Refer to the 997 division of GTE practices.
	Totalizer circuit board malfunction.	Replace entire totalizer assembly
Can't break dial tone.	Prepay or local prepay-partial coin registration—5¢ or 10¢ triggers on totalizer assembly not operated by coin or stuck in operated position.	If necessary, adjust triggers to extend fully into coin track or prevent rubbing against sides of chute or printed wiring card. Loosen switch mounting screws slightly to eliminate internal bind due to overtightened screws. If switches cannot be adjusted to operate properly, replace entire totalizer assembly.
	Prepay coin relay springs have no continuity to ground.	Burnish coin relay contacts and/or adjust springs. Refer to the 997 division of GTE practices.
	Semi-postpay coin relay coil grounded.	Insulate coil terminals from frame.
	Totalizer circuit board malfunction.	Replace entire totalizer assembly.
Can break dial tone, but can't complete dialing.	Totalizer circuit board malfunction.	Replace entire totalizer assembly.