ELCOTEL INC.

TELECOMMUNICATIONS SYSTEMS

SERVICE & INSTALLATION MANUAL

MODEL 1200-4

ELCOTEL INC.

IMPORTANT NOTICE

The Model 1200-4 generates, uses, and can radiate radio frequency energy, and if it is not installed and used in accordance with this manual, it may cause interference to radio communications. The Model 1200-4 has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of the FCC Rules, which are designed to provide reasonable protection against such interference when the product is operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference. In such cases, the payphone owner is required to take whatever measures are necessary, and at his or her own expense, to correct the problem.

This equipment complies with Part 68 of the FCC Rules. The label affixed to this equipment contains, among other information, the FCC Registration Number and Ringer Equivalence Number (REN) for this equipment. In order to ensure compliance with state tariff requirements, the telephone company must be notified prior to connecting the Model 1200-4 to the telco line. In some states, prior approval of the State Public Utility or Public Service Commission may be required. Connection of unregistered customer-owned coin-operated phones requires the use of VP couplers.

The REN is useful to determine the quantity of devices you may connect to your telephone line and still have all of those devices ring when your telephone number is called. In most areas, the sum of the REN's of all devices connected to one line should not exceed five (5.0). To be certain of the number of devices you may connect to your line, as determined by the REN, you should contact your local telephone company to determine the maximum REN for your calling area.

IMPORTANT INFORMATION

If your telephone equipment causes harm to the telephone network, the telephone company may discontinue your service temporarily. If possible, it will notify you in advance. But if advance notice is not practical, you will be notified as soon as possible. You will be informed of your right to file a complaint with the FCC.

Your telephone company may make changes in its facilities, equipment, operations or procedures that could affect the proper functioning of your equipment. If it does, you will be notified in advance to give you an opportunity to maintain uninterrupted telephone service.

If you have trouble with this equipment, please contact us at the address provided below for information on obtaining service or repairs. The telephone company may ask that you disconnect this equipment from the network until the problem has been corrected or until you are sure that the equipment is not malfunctioning.

As a jack, a 17-Q interface for an RJ11 hookup must be ordered from the telephone company in order to connect this product to the public communication network.

This equipment may not be used on coin service lines provided by the telephone company. Connections to party lines are subject to state tariffs. Contact your local telephone company if you plan to use this equipment on party lines.

This product is hearing-aid compatible (HAC) per Section 68.316, FCC Rules and Regulations.

Telephone companies generally will require registration numbers for customer-owned coin-operated telephones (Registration Class CX), protective couplers (Registration Classes HP, WP, and VP), data equipment (Registration Classes DM, DP, DT, and MD) and systems. Signal power and wiring affidavits may also be required.

This information will be used to ensure that the customer orders the correct services, facilities, and jacks; and to ensure network protection and tariff compliance.

This telephone is furnished equipped for prepay operation and coin-free emergency calling.

Refer to Sections 8 and 9 of this manual for field maintenance and troubleshooting procedures that you may follow to solve equipment problems.

Equipment problems, however, may be beyond the solutions of normal field maintenance and troubleshooting procedures. This product is not field repairable. Units in need of service must be returned to us at the address below. A return authorization number must be obtained from us before each lot is shipped.

> Elcotel, Inc., Telecommunications Systems
>
> 6428 Parkland Drive
>
> Sarasota, FL 34243

> Telephone: 1-800-ELCO-SVC (1-800-352-6782)
>
> (Customer Service)
>
> (813) 751-7585 (Customer Service)
>
> 1-800-ELCOTEL (1-800-352-6835)
>
> (813) 758-0389

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SECTION 1. INTRODUCTION

The Elcotel Model 1200-4 is a "smart" payphone, which is capable of normal prepay operation, long distance as well as local, without the assistance of an intervening telephone operator. The directing intelligence of the system is the Payphone Control Module (PCM-4)[1]: This includes the 8-bit, 2.5 megahertz microprocessor that monitors and controls the entire payphone operation, the battery-backed RAM, and other associated components mounted on the two printed circuit boards of the assembly.

The battery-backed RAM stores rating data from the rating module. The rating module is a unique non-volatile EPROM cartridge, which, at the time of its manufacture, contains the most accurate and up-to-date rate information. Easily installed, the plug-in rating module includes rate tables and COCOT-owner defined site-specific parameters, such as PBX access number, restricted numbers and exchanges, information numbers, and charges for all local and long distance calls.

In addition, the EPROM for each payphone contains the options and registers necessary to use Elcotel's own Long Distance Operator Service (LD*OS[SM]). LD*OS[SM] is a state-of-the-art alternative operator service that allows the payphone owner to share in the profits generated from every billable long distance operator-assisted (0+), operator-only (0−), and operator-assisted credit card call that is made from the payphone. Note, however, that the PUC in some states does not allow revenue sharing of intraLATA calls; however, the PCM-4 can be programmed as required to allow or disallow these calls.

Operation of the payphone can be be programmed and verified in the voice telemetry mode locally via the TCU keypad of the payphone or remotely through DTMF signalling.

An optional Bell 103-compatible 300 BPS modem allows the owner to utilize an IBM-compatible personal computer with the Elcotel Payphone Network Manager (PNM) software package to remotely monitor and control a network of Elcotel payphones. This includes the ability to poll all payphones for status, receive calls from the payphones when alarm thresholds are crossed, and program a new set of variables to any remote payphone via data telemetry (modem telemetry).

The PCM-4 contains high quality digitally-recorded voice intructions, which inform the customer of the cost of the call and the time purchased. The payphone's voice also reports the status of the options, registers, and variables which define the performance characteristics of the unit.

The following documentation describes the Elcotel Model 1200-4 payphone and its operation in greater detail. In addition, the manual contains installation, test and troubleshooting procedures to assist the customer in the installation and service of the equipment.

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1   Refer to the glossary on pages 71 through 78 for additional definitions of terms and acronyms.

SECTION 2. DESCRIPTION

2.1. The Housing

The Elcotel Model 1200-4 payphone, shown in Figure 1, is encased in a reinforced, deep-drawn steel housing. The reinforced cashbox vault door has a heavy gauge steel door to protect against unauthorized entry. The dimensions of the housing are: 21 inches high by 7-5/8 inches wide by 6 inches deep. Hardened steel liners and the tongue-and-groove construction of the mating surfaces of the upper and lower housings and the cashbox vault door provide additional security. Two housings are available: the GTE 120B housing, shown in Figure 1B, and the hybrid housing, which resembles an AT&T housing in appearance and is illustrated in Figure 1A.
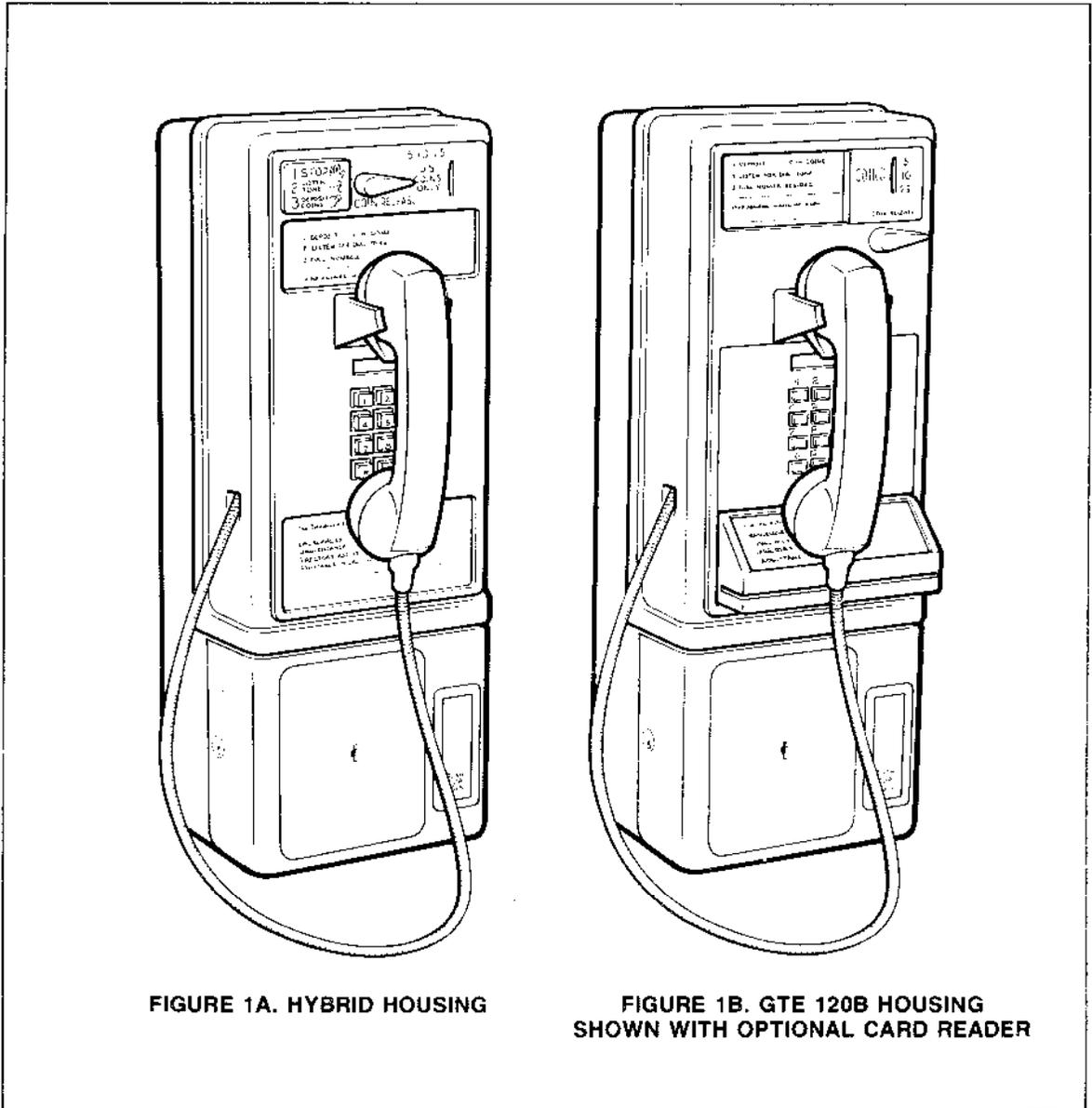

| FIGURE 1A. HYBRID HOUSING | FIGURE 1B. GTE 120B HOUSING |
| | SHOWN WITH OPTIONAL CARD READER |

FIGURE 1. MODEL 1200-4 HOUSINGS.

2.2. Securing the Upper Housing to the Lower Housing

The upper housing is secured to the lower housing by a slide-bar latch, which is locked or released by a T-wrench inserted into an opening on the upper right side of the upper housing. However, a studded cam, which is controlled by a cylinder lock, will continue to hold the latch locked in place unless a key is used to unlock the cylinder lock.

2.3. Cashbox Vault

A four-point latching mechanism secures the cashbox vault door to the lower housing. It too is locked or released by a T-wrench, which is inserted into the opening in the center of the door. It must be unlocked with a key before the T-wrench can release the latch.

2.4. Mounting Holes

The positions of the mounting holes and the wire entry hole are the same standard "footprint" as in all major payphones. This facilitates mounting in any typical phone booth or other predrilled location. Note, however, that the lower housing has no channel for wire entry from surface-wired locations. In such cases, a backboard may be used. However, note that surface wiring that is accessible to unauthorized personnel is not recommended. Additional mounting holes behind the cashbox may be used when mounting the payphone to a backboard. The lower housing also contains four threaded holes for security studs.

2.5. Coin Return Receptacle

A top-hinged swinging door, marked "PUSH FOR COIN," is located immediately to the right of the cashbox vault on the lower housing. Returned coins enter the coin return receptacle from a chute behind this door, and they collect immediately below it. The area where the coins collect is in the form of a trough that extends further back and upward in the receptacle. When the swinging door is opened, coins in this trough are within reach, but the chute by which they enter the receptacle is blocked. The rearward extension of the trough appears to be the entry chute, but the actual chute is blocked by the opened door. This feature prevents stuffing of the entry chute.

2.6. The Upper Housing

The upper housing of the Model 1200-4 contains the dial housing, the coin release lever, and the handset. Figure 2 shows the major components of both housings.

2.6.1 Dial Housing
Mounted on the dial housing are the touch call unit (TCU), the hookswitch, a 17-pin connector and cable assembly, and the TCU terminal board. Leads from the TCU, the hookswitch, the cable, and the handset are interconnected at the TCU terminal board, mounted on the rear of the dial housing. Electrical connections from the upper housing's TCU terminal board to the lower housing's PCM-4 assembly are made by plugging the 17-pin connector into the jack (J4) above the captive screw on the PCM-4 assembly. The cable from the TCU terminal board to the connector is long enough to permit separation of the upper housing from the lower housing without disabling the payphone.

2.6.2 The Handset
Mounted on the upper housing is a stationary hanger for holding the handset. The hookswitch lever, made of chrome-plated, die-cast material, projects through an opening in the housing between the arms of the hanger. When the handset is removed from the hanger, the hookswitch lever is released, and this causes the hookswitch cam to operate the hookswitch, signalling the PCM-4 to apply dial tone to the handset receiver.

The handset is equipped with a hearing-aid coupler coil, making the payphone hearing-aid compatible (HAC) per Part 68 of the FCC Rules and Regulations. The blue grommet on the handset indicates that the handset is an HAC handset. An armored cord extends from the handset to the left side of the upper housing, and its leads are connected to the TCU terminal board.
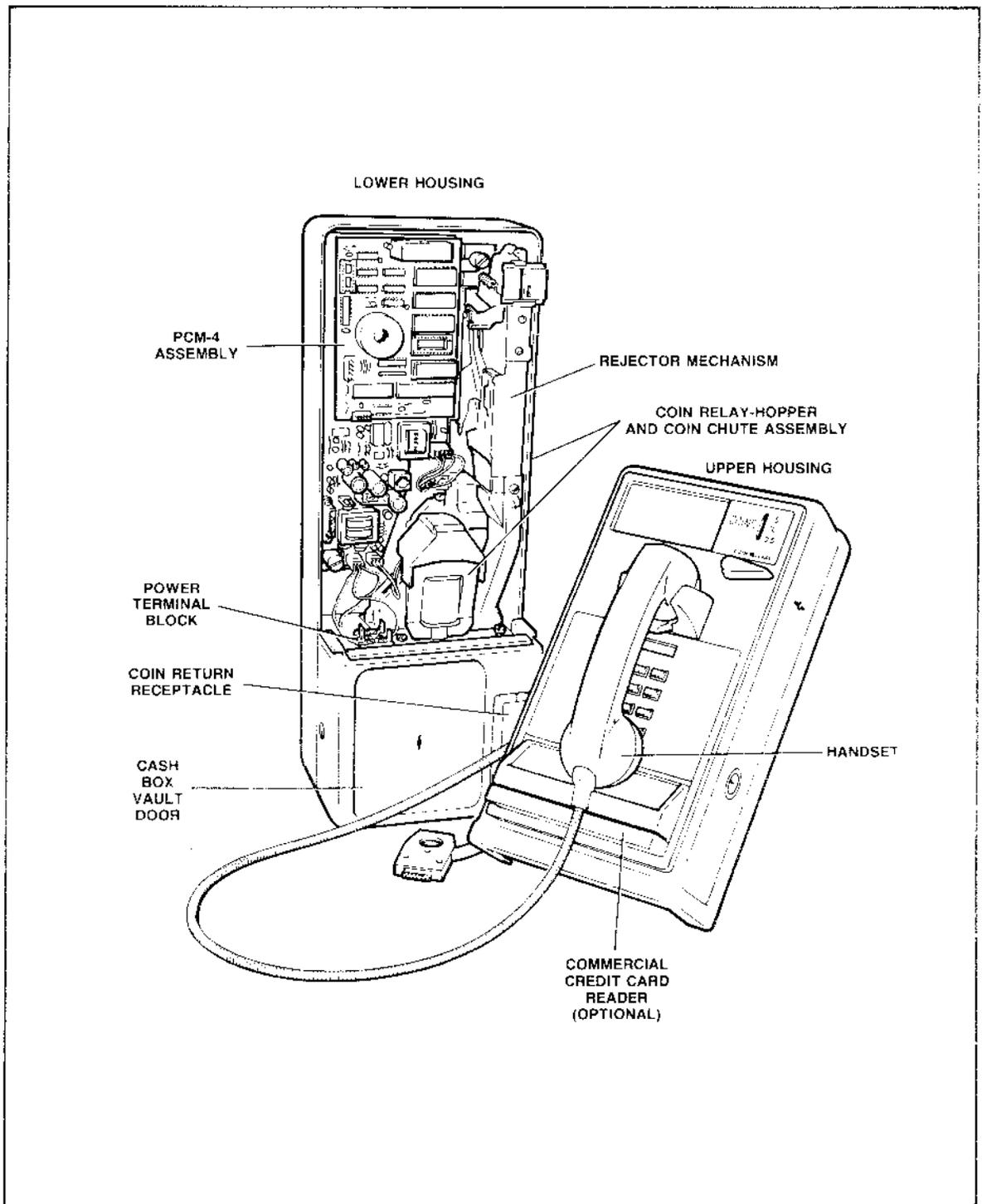

FIGURE 2. MAJOR MODULES OF THE MODEL 1200-4.

2.7. **The Lower Housing**

The lower housing of the payphone contains the power terminal block as well as the following major modules: rejector mechanism, coin relay-hopper and coin chute assembly, and PCM-4 assembly. See Figure 2 for the locations of these modules.

2.7.1 **Rejector Mechanism**

The rejector mechanism is the device that tests coins to determine whether or not they are genuine. It is capable of rejecting the majority of slugs and other objects that may be inserted into the coin slot in an attempt to defraud the payphone. Coins entering the rejector mechanism are sorted by size and separated into nickels, dimes, and quarters. Thereafter, each coin is put through the appropriate channel for that coin denomination.

Quarters and dimes are checked for diameter, weight, and deformity. If a quarter or a dime meets the requirements for those categories, it rolls down a rail and is checked for thickness. If the coin is within tolerances for its denomination, it will continue to roll to the next test, where it is examined for serration. In that test, objects that do not have serrated edges are rejected.

Like quarters and dimes, nickels are checked for diameter, weight, and deformity, and, if they are within the limits for these categories, they are released down a rail and checked for thickness. A genuine nickel will then roll down the rail and bounce off the nickel deflector through the legs of the oversize lever and into the coin chute assembly. Not having the same bounce as a genuine nickel, a slug will become caught on the oversize lever and rejected to the reject chute and the coin return receptacle.

Most of the coins that are rejected pass through the reject chute assembly and into the coin return receptacle; however, oversized coins, ferrous slugs, and washers may become trapped in the rejector mechanism. They can be dislodged by operating the coin release lever, which causes wiper blades to clear the coin channels. In addition, operating the coin release lever will allow you to open the right side of the rejector mechanism. You can then carefully insert an orange stick or your fingers to help dislodge coins or slugs.

2.7.2 **Coin Relay-Hopper and Coin Chute Assembly**

Genuine, accepted coins from the rejector mechanism enter the coin relay-hopper and coin chute assembly, which is located below the rejector mechanism. The coin relay-hopper and coin chute assembly is held to the lower housing by a tab that drops into an opening in the reinforcing plate. There are two coin exits in the hopper: The collect exit extends through the lower housing floor and into the cashbox whereas the refund exit channels coins into an opening in the reject chute which, in turn, leads into the coin return receptacle. A plate, locked in place by three screws, is used to hold the hopper in place.

When a coin passes through the coin chute assembly, it operates the trigger switch for its coin denomination. Each time a coin passes a trigger switch, the trigger switch signals the PCM-4 microprocessor, which calculates the amount of the deposit and compares it against the rate from the rating module. A 4-pin connector-terminated cable plugs into J5 of the PCM-4, linking the coin chute assembly and the microprocessor. See Figure 3 for an illustration of the PCM-4.

The coin then falls into the relay-hopper where it rests on a double trapdoor. Voltage application then causes the selector mechanism to open the proper trapdoor to either collect or refund the coins: Positive voltage causes the selector mechanism to open the trapdoor above the collect exit, which leads to the cashbox; thus, collecting the coins. Negative voltage opens the trapdoor above the return exit, which leads to the reject chute and the coin return receptacle; thus, refunding the coins. A 3-pin connector-terminated cable that plugs into J7 of the PCM-4 assembly enables the microprocessor to control the application and polarity of the voltage applied to the relay coil.

2.7.3 **PCM-4 Assembly**

The PCM-4 assembly consists of two printed circuit boards mounted to a metal chassis, and the entire assembly is mounted to the left of the rejector mechanism in the lower housing. It is positioned by a tab and locked in place by a captive screw, which is located on the assembly itself.

The auxiliary board, also known as the piggyback board, mounts to a 46-pin dual row header (Position J2) on the mainboard. The female counterpart on the auxiliary board is Position J1. In addition, female connector J3 on the auxiliary board connects with a 14-pin single row header (J3) on the mainboard. See Figure 3 for an illustration of the PCM-4 assembly.
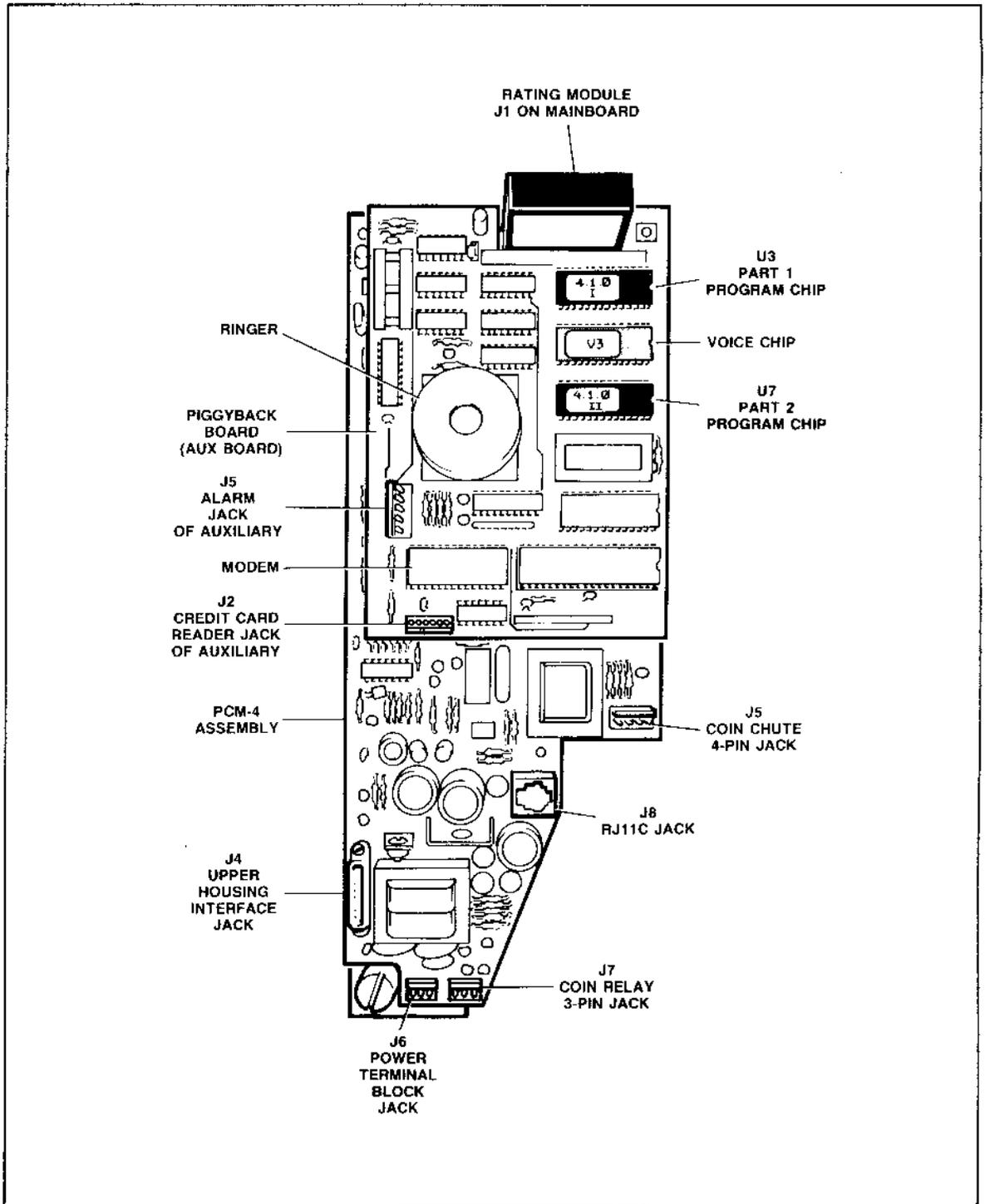

FIGURE 3. PCM-4 ASSEMBLY.

The PCM-4 is the module that makes the unit a "smart" payphone. Its microprocessor controls the operation of most other assemblies, which interconnect with the PCM-4 by means of connector-terminated cables that plug into jacks on the mainboard of the assembly. A 17-pin connector and jack interface connects the handset, dial housing and hookswitch assembly to the PCM-4 at Position J4 on the mainboard. The coin chute trigger switches are connected to the assembly by a 4-pin connector at Position J5 on the mainboard, and 3-pin connectors and jacks are used to connect both the coin relay (at Position J7 on the mainboard) and the power from the terminal block (at Position J6 on the mainboard) to the PCM-4. The telco line is connected to the mainboard of the assembly by an RJ11C plug and jack at Position J8 on the mainboard.

A 26-pin rating module, which contains the rate tables that enable the payphone to price calls, is mounted on the 26-pin jack (Position J1) on the mainboard.

A 6-pin jack (Position J2) on the auxiliary board interfaces with the optional credit card reader.

The PCM-4 also includes precision reset circuitry. If AC voltage from the power line drops too low, the precision reset circuitry will pull the microprocessor to a reset state; that is, it will shut the microprocessor down until voltage returns to normal, thus protecting the payphone from the erratic operation that can result from low voltage conditions. When the microprocessor resets, it seldom needs to reload the rating module since the precision reset circuitry usually manages to protect the data in the battery-backed RAM.

PCM-4 assemblies marked Revision C or later have been modified to include Wink detection, and this modification removes reverse battery supervision; therefore, the only method of call completion since Revision C is voice detection. See Section 3.5 for a description of Wink operation.

2.8. Alarm Inputs

The Model 1200-4 is equipped with four alarm inputs: Upper housing access, handset monitor, cashbox vault access, and one for an external contact. The handset monitor is built into the payphone. Upper housing access and cashbox vault access alarms are available as a kit (Part No. 116-0002) from Elcotel. A 5-pin connector-terminated cable, provided as part of this kit, plugs into a jack (Position J5) on the auxiliary board of the PCM-4 assembly.

2.9. Long Distance Service Operation

The Model 1200-4 will interface with several types of long distance service switches. The unit may be optioned to route all coin/toll (1 +) calls through an OCC such as MCI or US/Sprint via Feature Group "B" or Feature Group "D" access, while Operator-only (0 −) and Operator-assisted (0 +) calls can be routed through an Alternative Operator Service (AOS) or Elcotel's own LD*OS℠ Long Distance Operator Service. In addition, the payphone can be equipped with an optional commercial credit card (CCC) reader; however, the payphone must be connected to the LD*OS℠ network to utilize this feature.

2.10. Power Supply

The Model 1200-4 is powered by an externally-mounted wall plug-in transformer rated at 16 VDC, 1 ampere. The transformer is provided with four-screw terminals: Three are the center-tapped secondary while the fourth is connected to the earth ground prong of the plug. The ground and the center tap terminals are connected internally or by an external jumper wire or ground strap.

If 18-gauge stranded conductor is used, the transformer may not be located more than 25 feet from the payphone; however, if 16-gauge wire is used, the transformer may be located a maximum of 50 feet from the payphone. Distances greater than 50 feet are unacceptable regardless of the wire gauge.

The three conductor power cable must be fed through the back of the phone and terminated with 1/4 inch quick disconnects at the power terminal block, which is located on the floor of the lower housing.

The center terminal of the power block is directly connected to the metal enclosure, thereby effectively grounding the cabinet. As already mentioned, a 3-pin connector connects the terminal block to Position J6 on the PCM-4 mainboard. An illustration of the correct wiring connections between the transformer and the terminal block is presented in Figure 10, in Section 4.0: Installation.

NOTE: *In some locations near radio broadcasting antennas, if a 50-foot power line is used, it may be necessary to bring a special ground wire from a nearby metal water pipe to ensure that the radio signal does not interfere with the call completion detect circuit. This special ground may be connected directly from the water pipe to the center (ground) terminal of the power terminal block in the phone housing. However, if PVC plastic pipe is used between the incoming water line and the water meter, it will remove the ground from the water pipe. In such cases, a ground rod is an effective substitute. For information on ground rods, consult a local electrician. Required length of ground rod and installation method may vary, depending upon conditions.*

SECTION 3. OPERATION

3.1. Call Initiation

(1) Upon hearing the dial tone, the customer uses the keypad to enter the desired number. The dial tone ceases immediately after the first digit is dialed.

(2) The PCM-4 analyzes the number dialed and determines the initial period charge. It uses the rating tables stored in the rating module to obtain proper rates for initial and subsequent periods.

(3) The payphone's voice informs the customer of the cost and time purchased. The high quality digitally-recorded voice instruction set is stored in EPROM and played back through D/A circuitry into the receiver. This instruction set contains sentences normally used by a telco operator to request payment for a call and to inform the customer of the time purchased in minutes when applicable.

3.2. Dialing

(1) When the customer deposits the amount required for the call, the PCM-4 turns off the receiver and keypad, goes off-hook towards the C.O., and monitors for the dial tone.

    a. If the PULSE DIALING Option is OFF (Option 125), the payphone tone dials the number.

    b. If the PULSE DIALING Option is ON, the payphone pulse dials the number.

(2) When the number has been dialed, the payphone turns the receiver back on. If the OCC switch option is ON (Option 123: ACCESS TO OCC THROUGH LOCAL CALL), the payphone turns on the keypad. This allows the customer to use a locally-accessed OCC.

3.3. Call Completion Detection

The PCM-4 detects call completion through one of two possible methods:

3.3.1 Voice Detection
A sophisticated voice detect algorithm is used to determine the end of ringback and the beginning of conversation. Since this method of call completion detection makes the payphone extremely sensitive to the content of the signals in the phone line, the microphone in the handset is turned off until call completion is established.

3.3.2 Reverse Battery Supervision
For software levels 4.0.24 and earlier and board assemblies marked earlier than Revision C, the PCM-4 will detect reverse battery supervision and regard that as the call completion event in locations where the telephone company extends reverse battery supervision to the local loops. Note that this feature is not available with Revision C or later hardware revisions.

3.4. Call Termination

(1) The call is terminated when the customer places the handset on-hook or if the purchased time expires. When 30 seconds remain on the call, the payphone's voice will request additional coinage to be deposited for a given time period. A second request is made when ten seconds remain on the call. Only the caller hears the message.

(2) The payphone collects the coinage in the hopper. Calls may also be aborted or terminated if there is no answer or if a busy signal is received. The payphone will then return the coinage.

3.5. **Wink**

If the board assemblies are marked Revision C or later or have been upgraded to include the Revision C Wink modification and if the software level is 4.1.0 or later, the PCM-4 can be programmed to detect the momentary loss of voltage, or Wink, resulting from Central Office switching between call termination and the return of dial tone. Upon call completion (voice detection), the PCM-4 will begin to look for Wink. When the call is terminated -that is, when called party hangs up- and the Wink occurs, the PCM-4 detects the Wink and shuts off the keypad so that fraudulent calls cannot be made with the returned dial tone. This anti-fraud Wink detection is activated by turning on Option 126. This option should be ON if Option 145 is also ON. 123 and 127 should be OFF if 126 and 145 are ON. Wink is used in areas where the Central Office returns dial tone after call termination by the remote party.

3.6. **Coin/Toll Calls through an OCC**

If Option 143 (ENABLE OCC 1 + COIN/TOLL CALLS ROUTED THROUGH OCC) is OFF, the payphone will route all coin/toll calls (toll calls paid for in coins) through the Local Central Office (LCO). If Option 143 is ON, and 10-XXX service is available where the payphone is located, the payphone will access the OCC by dialing the 10-XXX number stored in Register 260 (OCC ACCESS NUMBER), and it will then dial the destination number.

If 10-XXX service is not available, the payphone will dial the number stored in Register 260 (950-XXXX or any other number). After the PCM-4 detects the OCC acknowledgement tone, the payphone will dial the authorization code stored in Register 261 (OCC AUTHORIZATION CODE) followed by the destination number. The PCM-4 will then monitor the line for call completion to determine when to start timing the call.

3.7. **0 – and 0 + Calls through an AOS**

If Options 138 (O-AOS) and 139 (O + AOS) are OFF, the payphone will route all operator calls (0 + and 0 –) through the LCO. If Option 138 is ON, the payphone will route 0 – calls through the AOS switch whose access number is stored in Register 262 (AOS ACCESS NUMBER). If Option 139 is ON, the payphone will route 0 + calls through the AOS switch whose access number is stored in Register 262 (AOS ACCESS NUMBER). Since there are several types of Alternative Operator Services, including Elcotel's own LD*OS[SM], there are several interface requirements which must be met to properly operate the payphone through these switches. In addition, the AOS may be located outside the local calling zone of the payphone, in which case the call may have to go through an OCC or an in-wats line (1 + 800).

LD*OS[SM]

3.7.1 **LD*OS[SM]Access**
Regardless of the type of call, LD*OS[SM] is always accessed directly, without going through an OCC. When accessing LD*OS[SM], the payphone will dial the AOS access number stored in Register 262. Note that direct access to LD*OS[SM] requires that Option 140 be ON. When it detects an acknowledgement tone, the payphone will dial the LD*OS[SM] authorization code stored in Register 281 or 283. When it detects an acknowledgement tone, the payphone will dial the destination number. The payphone will then turn on the microphone in anticipation of verbal communication with the LD*OS[SM] operator. The opening of the microphone is considered to be call completion.

Non-LD*OS[SM]

3.7.2 **10-XXX through an OCC**
When the AOS cannot be accessed directly (Option 140 OFF), the payphone will dial the 10-XXX number stored in Register 260 (OCC ACCESS NUMBER) and then go on to the operation described in 3.7.5.

3.7.3 **950-XXXX through an OCC**
When 10-XXX service is not available from the LCO serving the payphone and if the payphone cannot access the AOS directly (Option 140 OFF), the payphone will dial the 950-XXXX number stored in

Register 260 (OCC ACCESS NUMBER). When it detects an acknowledgement tone, the payphone will dial the authorization number stored in Register 261 (OCC AUTHORIZATION CODE) and then go on to the operation described in 3.7.5.

3.7.4   1 + 800 through an OCC

When an AOS using in-wats lines to handle calls from outside the local zone cannot be accessed directly (Option 140 OFF), the payphone will dial the 1 + 800-XXX-XXXX number stored in Register 260 (OCC ACCESS NUMBER). When it detects the acknowledgement tone, the payphone will dial the identification number stored in Register 261 (OCC AUTHORIZATION CODE) and then go on to the procedure described in 3.7.5.

3.7.5   AOS Access

If accessing Elcotel's AOS, the phone will operate according to the LD*OS^{SM} operation described in 3.7.1. For direct access to other alternative operator services or for access to one of those services after going through an OCC, the payphone will dial the AOS access number stored in Register 262. Note that direct access to an AOS requires that Option 140 be ON. If accessing an OCC first, Option 140 must be OFF. When it detects the acknowledgement tone, the payphone will dial the AOS authorization code stored in Register 263; however, if the AOS is Central Corporation, the payphone will dial the authorization code stored in Register 264 instead. If Option 141 (AOS: DELETE LEADING 0 IN DESTINATION NUMBER) is ON, the payphone will delete the leading 0 in the destination number; if the option is OFF, the payphone will accept the destination number as dialed by the customer. The payphone will then wait the number of seconds specified in Register 231 (AOS DELAY), or not wait at all if Register 231 contains 0. Then, it will dial the destination number and open the microphone so that the customer may speak to the AOS operator. The opening of the microphone is considered to be call completion in AOS 0 + and 0 − calls.

3.8.   Commercial Credit Card Calls

When the payphone is equipped with a Commercial Credit Card (CCC) reader, and Option 128 is ON (PHONE EQUIPPED WITH CREDIT CARD READER), the unit will operate with either coins or CCC's. If the customer dials the destination number first, the payphone's voice will request that the credit card be inserted or the proper amount be deposited. If the customer inserts the credit card first, the payphone will read the contents of the card and process the call as follows:

3.8.1   SUMMA-4 Credit Card Switch

The payphone will dial the contents of Register 265 (CREDIT CARD ACCESS NUMBER) towards the local central office. After it receives the acknowledgement tone from the service's call processor, the payphone transmits the contents of Register 266 (CREDIT CARD READER ID NUMBER). The call processor acknowledges the ID by returning an acknowledgement tone, and the payphone then dials the card number, expiration date, and checksum. The call processor acknowledges this data by returning the acknowledgement tone, and the payphone then dials the destination number and opens the microphone. The opening of the microphone is considered to be call completion. The feature is not available with 4.1 or later series software.

3.8.2   Credit Cards with LD*OS^{SM}

The payphone will dial the AOS access number stored in Register 262. When it detects an acknowledgement tone, the payphone will dial the LD*OS^{SM} authorization code stored in Register 281 or 283. When it detects another acknowlegement tone, the payphone will dial the destination number and the credit card number. The payphone will then turn on the microphone in anticipation of the call being answered by the called party. The opening of the microphone is considered to be call completion.

3.9.   LD*OS^{SM}

LD*OS^{SM} is Elcotel's Long Distance Operator Service. It is a state-of-the-art AOS that provides the payphone owner with a share of the profits from every billable 0 + and 0 − call placed from the payphone. With LD*OS^{SM}, the caller has the convenience of being able to choose one of a number of methods of payment. The LD*OS^{SM} network will process calls made with a major commercial credit card

or a phone company calling card as well as processing collect calls and calls billed to a third party. The payphone is equipped with the software necessary to utilize LD*OS^{sм}; however, in some states, certain 0 + or 0 − traffic may be restricted. In such cases, the payphone owner may have to program the phone accordingly or have the rating module programmed to accomodate local tariff restrictions.

3.10. Telemetry

3.10.1 Local and Remote Access

The payphone can be accessed locally or remotely to obtain information on the status of the variables or to program the payphone; however, if the payphone is optioned for modem telemetry (Option 130 ON), Option 129 must also be ON in order to use a keypad and voice telemetry to access the phone remotely. Local, on-site access and programming are covered in greater detail in Section 5 of this manual.

3.10.2 Voice Telemetry

The payphone can be accessed locally or remotely in voice telemetry (Option 129 ON, Option 130 OFF). You can obtain the status of variables and/or program the phone through the payphone's keypad or by DTMF dialing from your home or office phone. Local access programming is described in Section 5 of this manual. When accessing the payphone remotely from your office or home, dial the payphone's number. When it answers, follow the same programming procedures as described in Section 5. Then, when you complete your programming or information retrieval, dial 963 to hang up the payphone.

If the payphone calls home (to report an alarm, cashbox total, or inactivity), it rings the home primary phone number. If no one answers within four rings, it will hang up, wait five minutes, and try again. Again, if no one answers within four rings, the payphone will hang up. After waiting five minutes more, it will dial the home secondary phone number. If no one answers within four rings, it will hang up, wait five minutes, and dial the secondary phone number again. If no one answers within four rings, it will hang up, wait five minutes, and return to dialing the home primary phone number. The payphone will continue to repeat this cycle until someone answers.

When someone answers, the payphone's voice will say the payphone's station ID number and then proceed with its report. If an alarm has been tripped, the payphone will report the status of that alarm and then report the cashbox total. If no calls have been made from the payphone during the number of hours set in Register 280 (Inactivity Timer) and if the last call made was a free call, the voice will report "No calls" and the cashbox total. If no calls have been made from the payphone during the number of hours set in Register 280 and if the last call made was a coin call, the voice will report "No dollars" and the cashbox total. When the cashbox is 80% full, and again when it is 95% full, the payphone will call and report the cashbox total.

3.10.3 Voice Telemetry/Modem Telemetry ON

When the payphone is optioned for modem telemetry (Option 130 ON) so that it will send an alarm or status report to a serial printer or to a computer equipped with PNM, it can still be accessed and programmed locally or remotely through voice telemetry; however, Option 129 must also be ON to allow voice telemetry with remote access. If accessing remotely, dial the payphone's number. When the payphone answers, the payphone's modem expects to communicate with a modem; therefore, it turns on its carrier (loud high frequency pitch). This sound will change in pitch before stopping completely. When it stops, program the phone according to the procedures described in Section 5. When you have finished programming or obtaining the status of variables, dial 963 to hang up. If accessing locally, refer to Section 5 of this manual.

Since the payphone in this example is optioned for modem telemetry, it will not report through voice telemetry. If you are not using PNM, you will need a serial printer and a 300-BPS, Bell 103-compatible

auto-answer modem. The payphone's modem will transmit the data to the auto-answer modem. The serial printer will then print out a report similar to the one described below:

The sample below reveals that Payphone 3942 called home to report that the cashbox crossed the $150.00 threshold.

cr lf bell NNNN MM/dd HH:mm $DDD.cc LLL SSS TTT UUU XXXX YZ cr lf bell 3942 07/10 14/27 $151.75 348 023 012 018 0000 01

The meanings of the transmitted ASCII characters are as follows:

CR =   Carriage Return

LF =   Line Feed

Bell

NNNN   Four-digit station identification code

MM/dd   Date in month/day format where M = month and d = day

HH:mm   Time in hour/minute format where H = hour and m = minute

$DDD.cc   Cashbox total since last service call where D = dollars and c = cents

LLL   Three digits for number of local calls since the last service call

SSS   Three-digit number for number of long distance calls since the last service call

TTT   Three digits for number of 0 calls since the last service call

UUU   Three-digit number for the number of miscellaneous calls since the last service call

XXXX   Four digits for the status of each of the active alarm inputs: 0 = not tripped, 1 = tripped and reporting now, 2 = tripped and has reported or attempted to report.

YZ   Y represents the status of the battery-backed RAM: 0 = normal, 1 = RAM has default values from the rating module and all changes and additions are missing and must be reentered. Z represents the status of the cashbox: 0 = normal, 1 = 80% full trigger level has been exceeded, 2 = 95% full trigger level has been exceeded)

NOTE: *If inactivity is being reported (Inactivity Timer - Register 280 - must be turned ON), NO CALLS$ or NO DOLLARS$ will be inserted after HH:mm. The remainder of the status line to the right of the inactivity report will be a list of zeros.*

3.10.4 Modem Telemetry/Voice Telemetry OFF

If the payphone is optioned for modem telemetry (Option 130 ON) and Option 129 is OFF, all remote communication is accomplished through PNM, an IBM-compatible personal computer and 300-BPS, Bell 103-compatible modems. Any attempt at accessing the payphone remotely through voice telemetry is not permitted; however, voice telemetry can still be used in local, on-site access. When the payphone is optioned for modem telemetry with voice telemetry OFF, reports from the payphone are modulated, transmitted in analog form, and demodulated into digital data for the computer at the receiving end.

SECTION **4. INSTALLATION**

4.1. **General**

The shipping box contains the completely assembled payphone, power transformer, rating module, documentation and keys; however, a station interface box for an RJ11C hookup must be ordered from the telephone company in order to connect this product to the phone line.

4.1.1 **Radio Interference**

In some locations near radio broadcasting antennas, if a 50-foot power line is used, it may be necessary to bring a separate ground wire from a nearby metal water pipe to ensure that the radio signal does not interfere with the call completion detect circuit. This special ground may be connected directly to the center terminal of the power terminal block in the lower housing along with the center tap from the transformer that supplies power to the payphone.

4.1.2 **Barrier-Free Areas**

A payphone installed in an area designed to be used by the wheel-chaired physically handicapped must never be installed in a corner and must not have obstacles within three feet of its front or sides.

4.1.3 **Static Electricity**

Wear a static ground wrist strap when handling the PCM-4 assembly and when installing software chips and rating modules. Ground the wrist strap to the case of the phone. If no ground strap is available, be sure to touch the housing ground before handling the PCM-4 in order to discharge whatever static electricity you may have accumulated.

4.2. **Inspection**

(1) Ensure that the product has not been damaged in shipping and that it is as ordered.

(2) Compare your copy of your rating module questionnaire with the rating module form shipped with the phone. Figure 4 is a sample of part of a rating module questionnaire. Verify that the rating module shipped to you is the rating module you ordered.

(3) Use a DVM or DMM to check grounding and correct line voltage on the 120 VAC outlet. See Figure 5. The following readings should be obtained:

Neutral to Hot	105 to 126.5 VAC
Ground to Hot	105 to 126.5 VAC
Neutral to Ground	0.0 to 1.0 VAC

Any deviation from these values could affect the performance of the payphone.

NOTE: *If neutral to ground is too high, have an electrician correct the outlet. If the outlet cannot be corrected, the use of a No. 14 wire from the ground terminal (G) of the payphone's terminal block to a cold water pipe or ground rod is a possible solution. However, if you use a cold water pipe or ground rod, remove the transformer's ground strap or jumper wire first. In the case of internally-grounded transformers, which lack an external ground strap or jumper, plug the transformer into an adapter plug and plug the adapter plug into the AC outlet. There should be no connection with the ground terminal of the AC outlet in such cases. Then, run No. 14 wire from the ground terminal of the payphone's terminal block to the cold water pipe or ground rod.*

(4) Ensure that the 120 VAC outlet is not being used to supply power to other electrical devices, particularly neon lights and motor-driven devices. White noise (static interference), hum, and spikes could all be caused by these devices being powered by the same power line.

ELCOTEL INC.

RATING MODULE OWNER QUESTIONNAIRE

Company Name ? _____   CO# _____

Local area code ? _____   Date ___/___/____

Local exchange code ? _____   State ____

Series level ____   Rate center _____

Person to contact ? _____   Phone ? _____

Quantity   N X X   Quantity   N X X   Quantity   N X X

Notes: _____

120 Enable operator only calls (set charge in 248 if on) .... ON _____
121 Enable O-plus calls (set charge in 249 if on) .... ON _____
122 Enable incoming calls .... ON _____
123 Enable access to OCC through local call .... OFF _____
124 Enable operation through PBX (set digit in 229 if on) ... OFF _____
125 Enable pulse dialing .... OFF _____
126 Enable reverse battery supervision .... ON _____
127 Enable keypad on after dialing (for pocket pagers) .... ON _____
129 Enable voice telemetry .... OFF _____
130 Enable modem telemetry .... OFF _____
131 Enable alarm 1 .... OFF _____   132 Enable alarm 2 .... OFF _____
133 Enable alarm 3 .... OFF _____   134 Enable alarm 4 .... OFF _____
135 Enable high security .... OFF _____
136 Enable time of day discount .... OFF _____
145 Enable keypad after dialing (keypad always on) .... OFF _____
146 Enable "1" to be dialed before 10 digit calls .... [orm no. R]

229 PBX
230 Owne
232 Hold
     completio
233 Cash
     Amou
234 Ste
235 Sta
236 Ste
237 Fir
238 Sec
243 Hom
     Pho
244 Ho
     Al
245 St
     Fo
246 80
247 90
248 O
250 L
251 I
252 I
253 U
Any f

Any r

Restr

Is th

Time   Price   Time   Price
____ _____   ____ _____
Enter local charge
(Default to site specific value per local rate band 1)
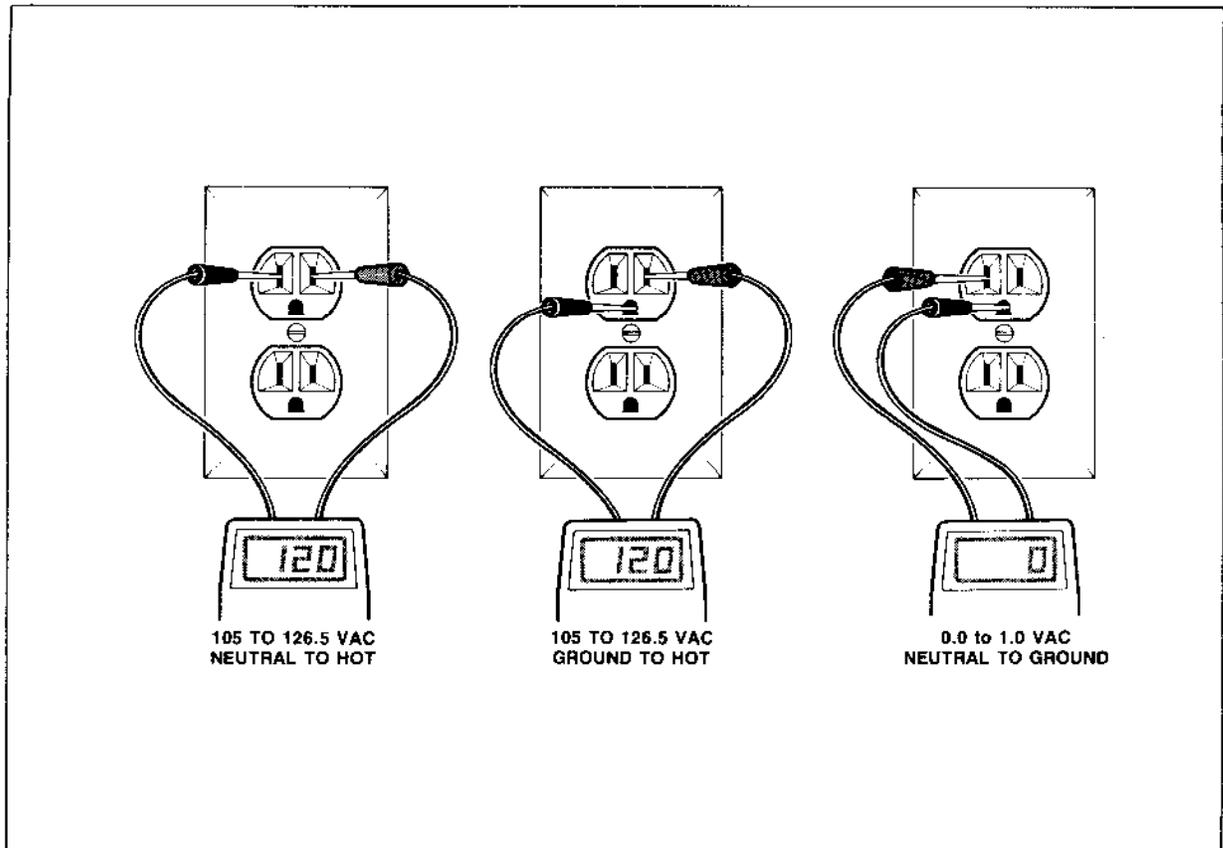
FIGURE 4. SAMPLE RATING MODULE QUESTIONNAIRE.

FIGURE 5. CHECKING THE 120 VAC OUTLET.

(5) Ensure that the interface box is not easily accessible to unauthorized people.

(6) Remove the cover from the interface box.

(7) Ensure that either a gas tube or a carbon surge protector has been installed by the telco.

(8) Connect a test set (butt-set) to the tip and ring terminals of the interface box, set the butt-set to the talk position, and attempt to dial. If you can't break dial tone with DTMF dialing, try rotary dialing. If dial tone can still not be broken you may have a "ground start" line. Inform the telco and request a loop start line.

(9) Using the butt-set, dial a known working local number to verify that a number can be dialed. Note that most telcos provide loop start DTMF access lines for payphone operations; however, in some cases, the line may be a pulse dial line. In the payphone, Option 125 must be set OFF for DTMF tone dialing or ON for pulse dialing; therefore, it may be necessary for you to change the setting after you load the rating module (Section 4.9).

(10) Dial "0" and request the operator to identify if the line has call screening. Call screening prevents billing both outgoing (third party billing) and incoming (collect) calls to the payphone. If call screening is not available, setting Register 271 can provide some protection against fraudulent calls. Register 271 provides the message - "Payphone. Not a billable number" - to inform the operator not to bill the call to the payphone. Setting the register at 5 (five repetitions) should be sufficient.

(11) Disconnect the butt-set.

4.3. **Power Preparation**

(1) If the transformer is located no more than 25 feet from the payphone's terminal block, run No. 18 gauge (AWG) stranded conductor cable between the payphone and the transformer; however, if the distance between the transformer and the terminal block is more than 25 feet, use No. 16 gauge (AWG) wire. Maximum acceptable cable length is 50 feet. DO NOT CONNECT yet.

(2) Ensure that the cable is not adjacent or too close to other electrical devices or wiring. Electrical devices or wires could cause noise in the line.

4.4. **Phone Line Preparation**

(1) If there will be twenty-five or more feet of exposed phone line between the interface box and the payphone, install a gas tube surge protector or Elcotel's own LP-1 surge protector at the paystation. This surge protector is in addition to the surge protector provided by the telco. Exposed phone line is phone line that is not contained in a metal conduit or is not shielded by a grounded, braided cable.

(2) Run No. 22 gauge telephone wire between the station interface and the payphone, but DO NOT CONNECT yet.

(3) Ensure that the wire is not too close to power wires carrying heavy amperage. Other wires might cause noise in the line.

4.5. **Site Preparation**

Check for a vertical mounting surface as follows. A mounting surface that is within 1-1/2 degrees of vertical is required. A tilt greater than 1-1/2 degrees in any direction can cause a malfunction of the rejector mechanism.

(1) Place a spirit level vertically against the mounting surface. The top end of the level should be at the required height for the mounted telephone. Mounting height as measured from the floor to the top of the mount (for example, a backboard) is as follows:

Without seats = 63 inches   With seats = 52 inches

Mounting height for payphones to be used in barrier-free areas or by the wheel-chaired physically handicapped is 54 inches. If a shelf is to be installed, the shelf must be 30 inches from the floor.

(2) Move the top or bottom end of the spirit level away from the mounting surface until a vertical reading is obtained. Ensure that a vertical position is obtained in both directions.

When a vertical reading is obtained, the end of the level should be no more than 5/8 inch from the mounting surface for a 24 inch level or 15/16 inch from the mounting surface for a 36 inch level. This ensures that the payphone will be mounted within 1-1/2 degrees of vertical.

4.6. **Payphone Disassembly for Mounting**

In order to mount the payphone, the inner side of the mounting holes of the payphone must be exposed; therefore, it is necessary to separate the upper and lower housing and remove the PCM-4 assembly and the rejector mechanism from the lower housing to install a minimum of three mounting bolts. Figure 6 calls out the parts and modules that correspond with the steps in the disassembly procedure where such correspondence can be clearly illustrated.

(1) While facing the phone, insert the key into the lock on the right side of the upper housing and turn it counterclockwise one-quarter turn.

(2) Insert the T-wrench into the opening on the right side of the upper housing and turn it clockwise one-eighth turn.

(3) While grasping both sides of the upper housing, slide the upper housing toward you approximately two inches. Then, while supporting the housing with the right hand, use your left hand to reach around the housing and disconnect the jack-ended cable that connects the TCU on the upper housing to the mainboard at Position J4. If the phone is equipped with a card reader, unplug the card reader cable from Position J2 on the auxiliary board. Continue to remove the upper housing and set it aside.

(4) Remove the rejector mechanism as follows:

      a. Loosen the screw that attaches the reject chute to the rejector mechanism, and disconnect the reject chute from the rejector mechanism.

      b. Tilt the reject chute forward.

      c. Loosen the mounting screw at the top of the rejector mechanism mounting plate.

      d. Lift the rejector mechanism over the mounting screw, remove the mechanism, and set it aside.

(5) Remove the PCM-4 assembly as follows:

      a. Disconnect the connector-ended cables (coin chute, coin relay-hopper, and power terminal block) from the mainboard.

      b. Loosen the captive screw, which is located at the bottom of the assembly, until the assembly is free of the mounting bolt.

      c. Lift the assembly to disengage the tab above the assembly, and place the assembly, chassis side down, on a table or flat work surface.

(6) If one or more bolts are to be installed behind coin return receptacle, loosen and remove the screw above the coin return receptacle, and remove the coin return receptacle.

(7) If one or more bolts are to be installed behind the cashbox, it is necessary to remove the cashbox.

      a. Insert the key into the lock on the side of the lower housing and turn it counterclockwise one quarter turn.

      b. Insert the T-wrench into the opening in the cashbox vault door and turn it clockwise one-eighth turn.

      c. Remove the cashbox vault door.

      d. Remove the cashbox from the vault.

      e. If you wish to remove the cashbox vault key from the lower housing, turn it back to the locked position. Similarly, it is necessary to move the T-wrench to the locked, or latched, position if you wish to remove it from the cashbox vault door.

(8) If a bolt is to be installed behind the coin relay-hopper, it is necessary to remove the coin chute and coin relay-hopper assembly.

      a. Remove the cashbox per step (7) above.

      b. Loosen the screw connecting the coin chute assembly and the hopper.

      c. Lift the coin chute assembly out of its tab slot in the housing, and remove the coin chute assembly.
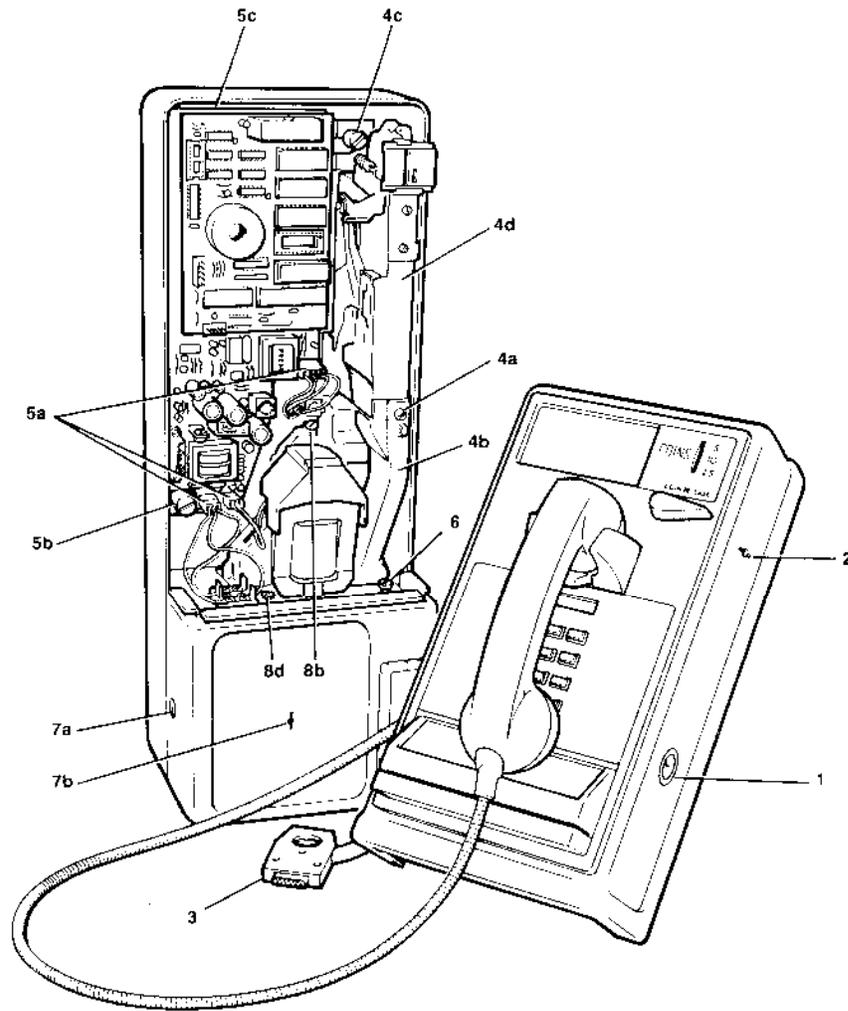
NOTE: *Callouts correspond with steps in Section 4.6: Payphone Disassembly.*

FIGURE 6. PAYPHONE DISASSEMBLY.

d. Unscrew and remove the screw located between the terminal block and the coin relay on the shelf of the lower housing.

e. Unscrew and remove the two hex head screws from the rail or top plate on the ceiling of the cashbox vault. See Figure 7.

f. Slide the rail forward to release the hopper.

g. Remove the coin relay-hopper assembly.

NOTE: *Callouts correspond with steps in Section 4.6: Payphone Disassembly.*
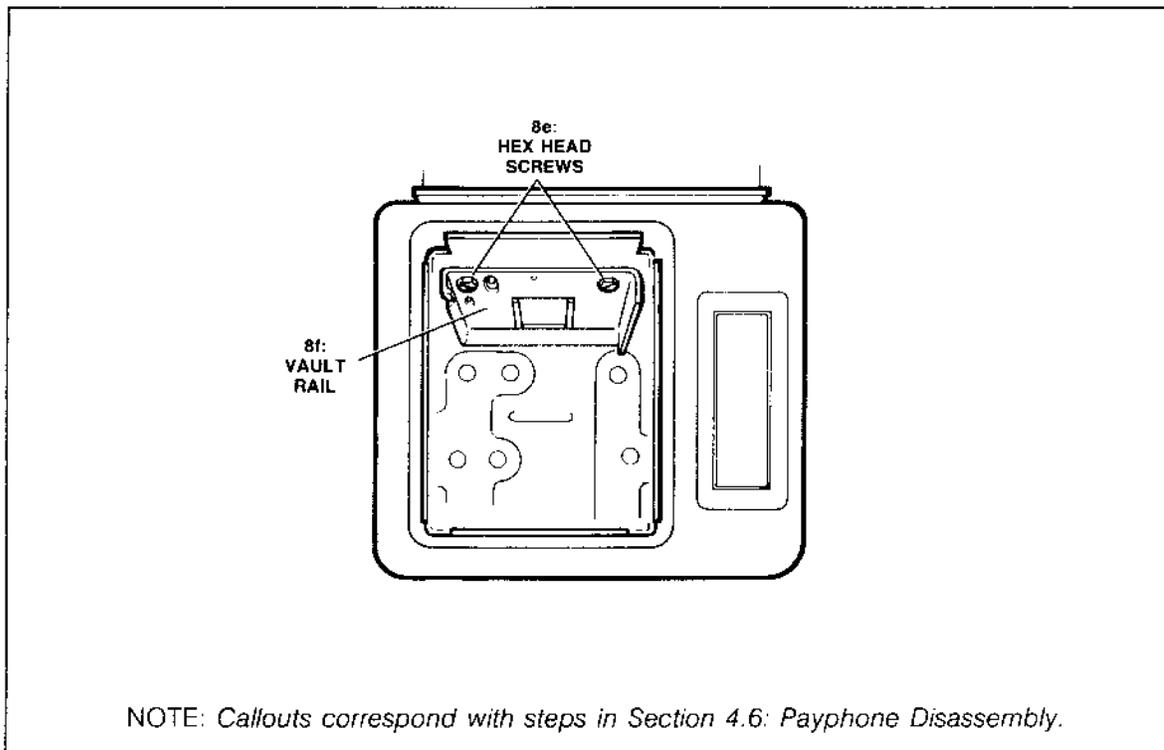
FIGURE 7. DISASSEMBLY--CASHBOX VAULT.

4.7. Mounting

The procedure described below is the procedure for mounting the payphone to a backboard. When mounting without a backboard, the procedure may vary, but the principles remain the same. A backboard is used when a predrilled mounting surface is not available.

The surface on which the backboard is to be mounted must be strong enough to support both the backboard and the payphone. The surface must be flat and free of peaks and valleys. This ensures that the backboard can be mounted squarely and firmly against the surface, thereby increasing the strength of the mount and eliminating gaps that could encourage vandals to attempt to pry the backboard loose from the surface.

The backboard has ten mounting holes. To ensure strong mounting, the bolts used for mounting the backboard to the surface must be of the proper type and size and in sufficient quantity for the type of mounting surface. Elcotel recommends the use of ten 1/4 inch toggle bolts on dry walls and panelling. Six No. 12 x 2 inch zinc-plated wood screws are an alternative if each one can be screwed into a stud. For solid concrete or poured walls, use at least six 1/2 inch masonry sleeve anchors. For concrete block,

use ten 1/4 inch toggle bolts or six 1/2 inch masonry sleeve anchors. For brick walls, use at least six 1/2 inch lag bolts with six 5/16 inch lead anchors.

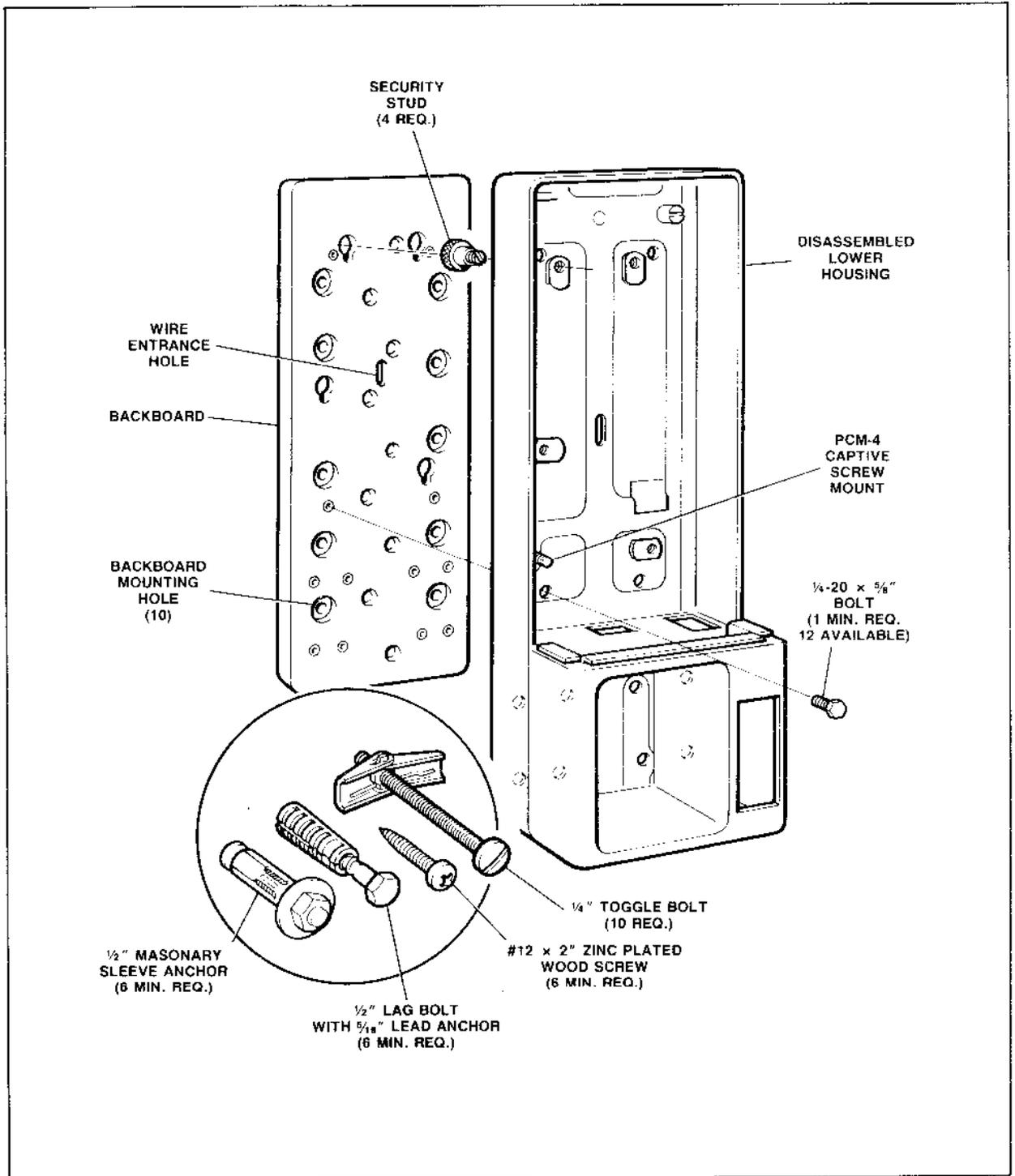See Figure 8 for an illustration of mounting to a backboard.

Figure 8. Mounting to a Backboard

(1) If the phone wire and the 16 VAC power wire are on the mounting surface, position them such that they lie flat in the backboard channel and pass through the backboard's entrance hole. Tape the wires with electrical tape, if necessary, to keep them in the channel. If the wires run through the mounting surface, ensure that the entrance hole of the backboard aligns with the wires.

(2) Using the appropriate bolts, mount the backboard when it is level in all directions.

(3) Screw the four security studs into the four threaded holes on the back of the payphone. Ensure that the entrance hole is sealed with a rubber grommet. If mounting in an outside location, caulk all holes that will not be used in mounting the payphone: This will help to ensure that moisture and dirt does not get into the cabinet.

(4) Align the payphone with the backboard and run the phone line and power line from the backboard into the wire entrance hole of the payphone.

(5) Align the four security studs of the payphone with the key slots of the backboard.

(6) Push the payphone against the backboard so that the security studs enter the key slots. Each security stud should slide into the groove of its key slot, thus locking the payphone in place.

(7) To prevent the payphone from being lifted off the backboard, install and tighten one (1) 1/4-20 x 5/8 inch bolt through the hole below the PCM-4 captive screw mount. If greater security is desired, use four (4) 1/4-20 by 5/8 inch bolts. Mount two bolts on the left side: Mount one in the upper left hole behind the position where the PCM-4 assembly is mounted and mount the other bolt in the hole below the PCM-4 captive screw mount. Mount another bolt in the upper right hole behind the position where the rejector mechanism is mounted, and mount the fourth bolt in one of the holes behind the coin return receptacle. The bolt holes in the back of the upper housing must line up with the corresponding threaded holes in the backboard. Note that a total of twelve bolts may be used if there is the need for still greater reinforcement.

4.8. **Payphone Setup**

(1) Refer to Figure 9 for an illustration of a prepared RJ11C interface. Prepare the RJ11C interface as follows:

  a. Cut off 6-8 inches of modular phone cable.

  b. Strip back insulation 1/4 inch from one end of the 6-8 inch piece of modular phone cable.

  c. With the tab side of an RJ11C connector (six-position, four-terminal modular plug) facing up, insert the four wires into the open end of the connector. Ensure that the red wire enters second from the right and the green wire enters third from the right. Note that the other wires occupy the first and fourth positions from the right. Crimp with an RJ11C crimping tool.

  d. Strip back 2 inches of insulation at the other end of the modular cable and insert the red wire into a 2-wire butt connector (We recommend Scotchlok UY 14911 or UY 14919, wire range of solid 22 to 26 AWG). Insert the green wire into another 2-wire butt connector. Wrap the black and yellow wires around the insulated cable and tape them to the cable.

  e. Repeat step d for the corresponding wires of the telephone line, ensuring that red connects with red and green connects with green.

  f. Using a pair of pliers or a crimping tool, crimp the 2-wire butt connectors to make the connection between the phone cable and the RJ11C connector.

(2) Connect the phone cable to the telco interface box as follows:
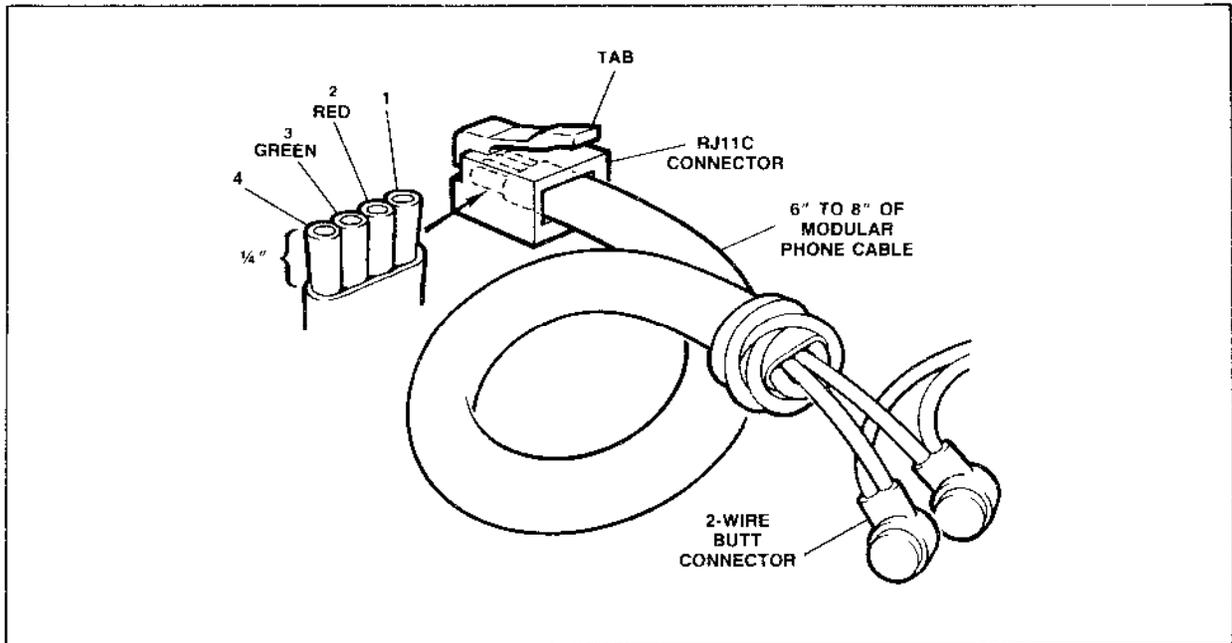
  a. Strip back 1/2 inch of insulation from the cable.

Figure 9. RJ11C Interface

    b. Connect the green wire to the tip terminal.

    c. Connect the red wire to the ring terminal.

    d. Wrap the black and yellow wires around the insulated cable and tape them against the cable.

(3) Using three insulated spade terminals for No. 6 screw and 16-18 gauge wire, connect the power line to the transformer, but DO NOT PLUG IN transformer.

    NOTE: *Elcotel recommends the use of stranded wire; however, if you use solid wire, crimped quick disconnects and spade lugs may present a problem. In such cases, strip back 1/2 inch of insulation, hook end of wire, attach it under screw head of terminal, and tighten screw to secure connection.*

(4) Using 1/4 inch quick disconnects (female, insulated quick disconnects for .250 x .032 inch tab, 16-18 gauge wire), connect the power line to the payphone terminal block. The payphone ground is connected to the payphone housing.

    Refer to Figure 10 for an illustration of the correct wiring from the transformer to the terminal block.

(5) After wiring from the wall transformer to the terminal block, plug the 16 VAC transformer into the 120 VAC receptacle. Use a DVM or DMM to measure the following voltages at the terminal block:

Terminal Block	VAC
L1 to L2	14.4 - 19.2
G to L1	7.2 - 9.6
G to L2	7.2 - 9.6

    Refer to Figure 10 for the terminal locations.

(6) Being responsive to the needs of its customers, Elcotel periodically changes and adds to its software. When this occurs, Elcotel will ship you the updated software chips. If you did not install your payphone prior to receiving updated chips, install the chips now as follows:
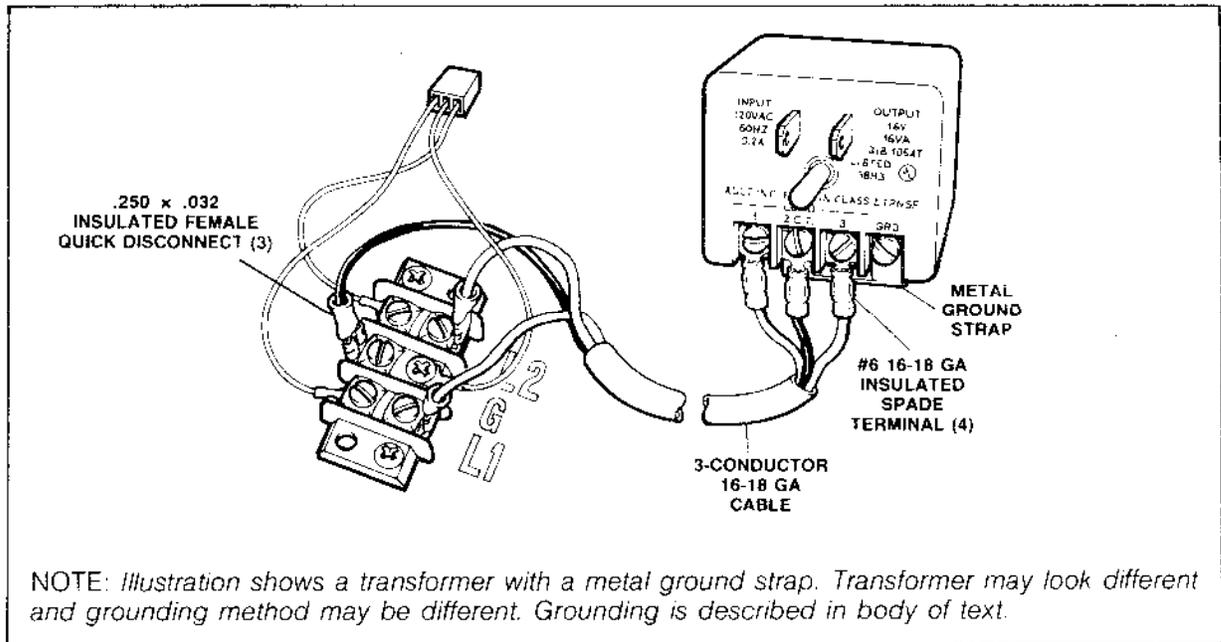
NOTE: *Illustration shows a transformer with a metal ground strap. Transformer may look different and grounding method may be different. Grounding is described in body of text.*

Figure 10. Transformer to Terminal Block Wiring

a. Using a small blade screwdriver, gently pry the outdated Part I software chip from its socket at U3 on the auxiliary board.

b. Insert the new or updated Part I software chip into the socket. Ensure that the notch on the chip faces outward, away from the center of the board. In order to fit the chip into the socket, it may be necessary to push one row of pins in slightly by carefully pressing the row of pins against the edge of a table. Ensure that no pins are bent in the process of installing the chip.

CAUTION: If any chip is installed with the notch facing in the wrong direction, the software will be destroyed when the power is applied.

c. Remove the outdated Part II software chip from its socket at U7 or the auxiliary board and insert the new or updated chip in its place. Again observe the same chip orientation and precautions as in step b. Note that the three software chips must be positioned in the following order from the cutout area of the auxiliary board: Part I (Position U3), V3 (voice chip, Position U6), and Part II (Position U7). See Figure 13 in Section 7: Software Installation.

(7) Verify that the phone number printed on the rating module's label corresponds with the number of the payphone.

(8) Insert the rating module into its place on the mainboard at Position J1. Note that the cutout area at the upper end of the auxiliary board is directly above the 26-pin jack that seats the rating module, and the rating module fits neatly through the cutout area of the auxiliary board. Note that the screw end of the module must face outward, away from the board, or upward if the board is mounted in the housing. The label should face inward, or downward if the board is mounted in the housing.

CAUTION: If the rating module is mounted in the wrong direction, it is possible that the software will be destroyed when the power is applied.

See Figure 13 and Figure 11. Note that Figure 11 shows the parts and modules that correspond with the steps in the setup procedure where those correspondences can be clearly illustrated.
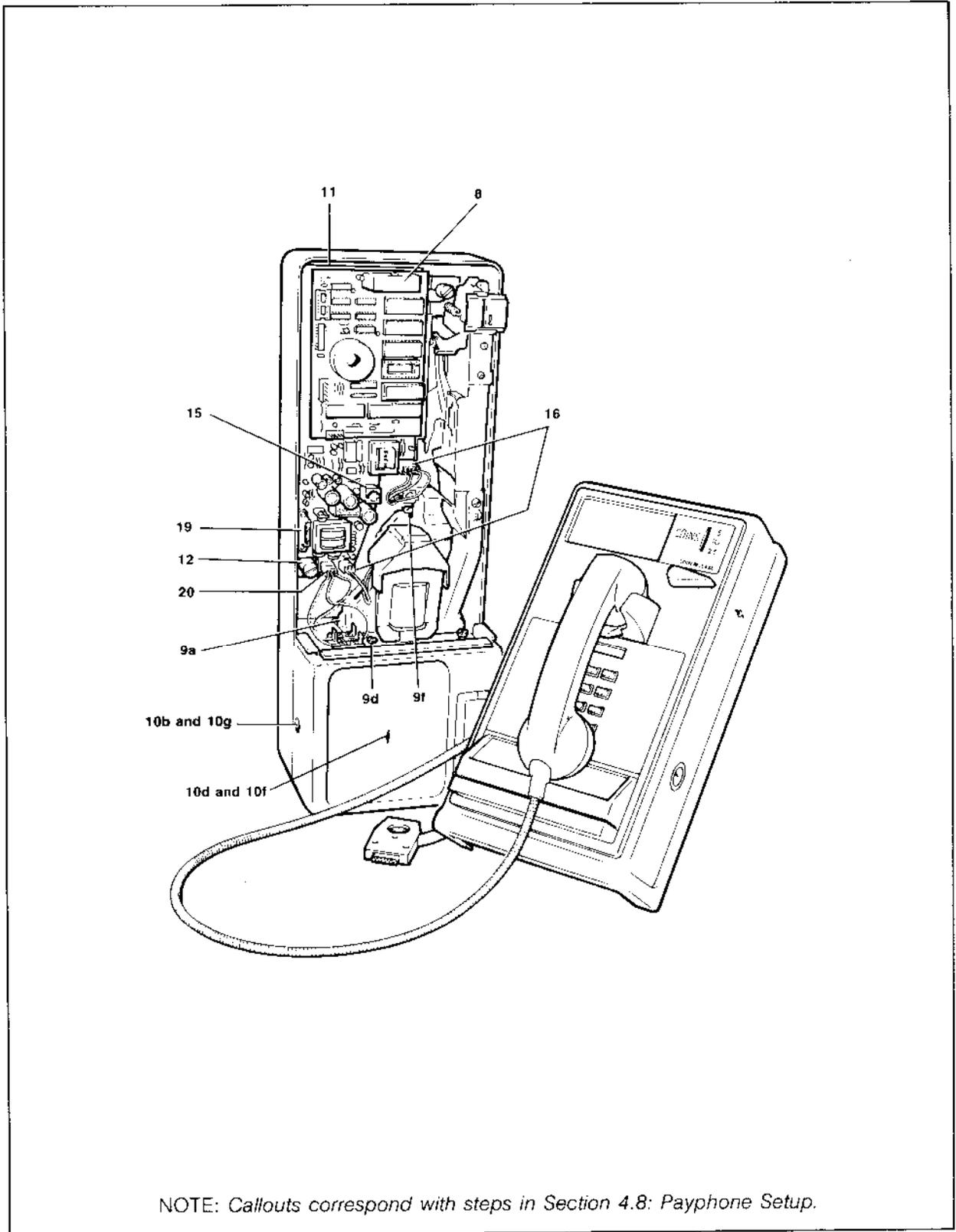
NOTE: *Callouts correspond with steps in Section 4.8: Payphone Setup.*

Figure 11. Payphone Setup

(9) If the coin chute and coin relay-hopper assembly were removed, install them now.

    a. Mount the coin relay-hopper assembly. Ensure that the hopper fits into the hole above the cashbox vault.

    b. Slide the rail or top plate back into place to secure the coin relay-hopper assembly.

    c. Insert and tighten the two hex head screws.

    d. Insert the screw back into position on the shelf of the housing and tighten it.

    e. Place the coin chute assembly in its correct position above the hopper. Ensure that the plastic lip or tab is in the mounting slot on the lower housing.

    f. Tighten the mounting screw to securely mount the coin chute assembly on the hopper.

(10) If the cashbox was removed, install it now.

    a. Release catch and open cashbox cover. Using a blade screwdriver, turn the screw on the bottom of the cashbox cover clockwise until you hear a click. This resets the spring lock of the cashbox cover window. See Figure 12.

NOTE: *Callout corresponds to step 10a in Section 4.8: Payphone Setup.*
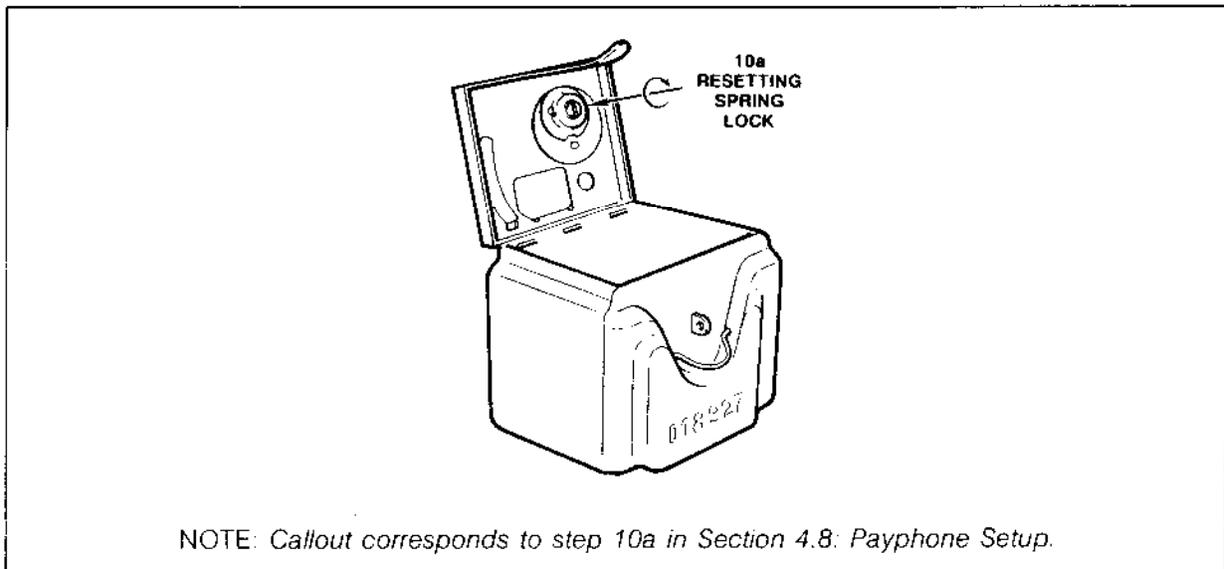
FIGURE 12. PAYPHONE SETUP--CASHBOX.

    b. If you previously removed the cashbox vault key from the lock on the left side of the lower housing, insert it in the lock and move it to the unlocked position by turning it counterclockwise one quarter turn.

    c. Return the cashbox to the vault.

    d. If the T-wrench had been removed from the cashbox vault door, insert it into the opening in the cashbox vault door and turn it one-eighth turn clockwise to unlatch it.

    e. Place the cashbox vault door back in position, closing the vault.

    f. Turn the T-wrench one-eighth turn counterclockwise to latch the door.

g. Turn the cashbox vault key clockwise one quarter turn to lock the door.

h. Remove the cashbox key and T-wrench.

(11) Mount the PCM-4 assembly in the lower housing. Ensure that the tab at the upper end of the chassis is mounted in the slot on the upper left interior of the lower housing.

(12) Tighten the captive screw at the bottom of the PCM-4 assembly.

(13) Install the coin return receptacle, the rejector mechanism, and the reject chute in reverse order of removal. Tighten all screws. Note that the tab at the base of the rejector plate fits into the slot where the coin chute assembly is snug against the lower housing.

(14) DO NOT PLUG the power connector from the terminal block into the mainboard yet.

(15) Plug the RJ11C connector into the jack (Position J8) provided on the mainboard of the PCM-4 assembly.

(16) Plug the coin chute and coin relay-hopper cables into the mainboard of the assembly. Note that the coin chute connector plugs into a 4-pin jack (J5) while the coin relay-hopper connector plugs into the 3-pin jack (J7) farthest to the right of the captive screw.

(17) Attach a service hanger to the lower housing.

NOTE: *A service hanger, or parking tool, is a piece of stamped metal that can be mounted in the slots along the inner rim of the lower housing. Then, the upper housing can be suspended on the hanger, allowing the upper housing to remain connected to the lower housing and electrically connected to the PCM-4 assembly when the housing is open. This facilitates servicing of the payphone. Elcotel recommends Communico as a source of service hangers for the Model 1200-4.*

(18) With the service hanger mounted in the slots along the inner rim of the lower housing, support the upper housing on the lower housing. If you do not have a service hanger, you will have to hold the upper housing close enough to the lower housing to permit connection of the upper housing to the PCM-4.

(19) Plug the upper housing interface cable into its jack (J4) on the mainboard of the PCM-4 assembly.

(20) Connect the power by plugging the connector from the power terminal block into its 3-pin jack (J6) on the mainboard of the PCM-4 assembly. The coin relay should actuate: A click should result from applying power to the PCM-4 followed by a louder switching sound as the coin relay actuates.

4.9. Loading the Rating Module

NOTE: *If the initial loading sequence cannot be performed as follows, it is possible that the rating module has loaded upon power-up. In that case, go to step (7) of this loading procedure.*

(1) Lift the handset off-hook. Note that if the handset is already off-hook, it may be necessary to press the hookswitch and release it to reset the phone and return dial tone.

(2) Enter #999 on the keypad. This is the bypass code on every phone shipped by Elcotel. When the rating module is loaded, the owner bypass code will replace this code.

(3) Wait four seconds.

(4) Enter 122. Habitually, we use Option 122 for this procedure; however, you can substitute any variable from the Options Group or the Registers Group.

(5) Listen through the handset for the payphone's voice to say "122 on" or "122 off." It takes approximately 3 seconds for this response. If the voice says "please dial again," repeat the sequence, beginning with step 1. If the voice continues to say "please dial again," go to step (7).

"122 on" indicates that the ringer (Incoming Calls) is on, whereas "122 off" indicates that the ringer is off. The reporting of the status of an option or register also indicates that the payphone is in the programming mode. The programming mode allows you to change the status of your variables as well as verify their current status; however, DO NOT change the status or value of any variable until the rating module has been loaded. The payphone's voice will report the status of a variable for 25-26 seconds or until you interrupt it by entering another variable number. If you enter only one or two digits, the PCM-4 will recognize an invalid number, and the voice will say "please dial again, thank you." This message will be repeated for 25-26 seconds or until another variable number is entered. If the voice is allowed to continue to report the status of a variable or "please dial again" for the full 25-26 seconds, the PCM-4 will exit the programming mode. In such cases, you have to repeat steps (1) thru (5) to re-enter the programming mode; however, if the rating module has already been loaded, substitute # and the owner bypass code for #999.

(6) Load the battery-backed RAM with the rating module's data by entering 964. The keypad should become inactive (no DTMF tones) and the payphone's voice should continue to indicate "122 on" or "122 off." The payphone's voice will repeat the message for 12 seconds. Then, it will say "please dial again, thank you" before the PCM-4 allows dial tone to the receiver. At this point, the new owner bypass code is loaded. This code is printed on the rating module's label, and it is used whenever you wish to program or verify the status of any of the variables in the PCM-4. The use of a private, confidential owner bypass code protects your investment by preventing unauthorized access to your payphone's software.

(7) Press the hookswitch and release.

(8) Perform steps (8) through (11) to verify that the loading of the rating module has been successfully accomplished. Enter # and your 3-digit owner bypass code. If the payphone's voice gives a "please dial again" message or if the PCM-4 exits the programming mode at any time during the verification, return to step (7).

(9) Wait four seconds.

(10) Enter 122. Again, another option or register may be substituted.

(11) Listen for the payphone's voice to say "122 on" or "122 off."

(12) After the above sequence is completed, user-programmed changes can be made as required. Refer to Section 5.0, Programming the PCM-4.

SECTION 5. PROGRAMMING THE PCM-4

5.1. General

It may not be necessary to do anything to the variables beyond verifying that their values are the same as you ordered on the rating module questionnaire; however, you may wish to change some of these variables before the rating module itself can be updated. You can program the PCM-4 in voice telemetry on-site via the keypad and DTMF tones or remotely through DTMF tones. In modem telemetry, remote programming must be done through a modem and PNM software unless voice telemetry is also ON. If voice telemetry is also ON, remote programming can be accomplished through DTMF dialing.

NOTE: *In the event that the rating module has been incorrectly programmed, you must return the rating module to Elcotel within 30 days from the date Elcotel shipped the rating module to you if you wish to have your rating module corrected free of charge. If you decide to initiate changes to variables which have been programmed according to what you ordered, and you want those changes to be programmed into the rating module, return the rating module for reprogramming and you will receive a partial credit.*

5.2. Preparation

The payphone must be in the programming mode. If the payphone is not already in the programming mode, place it in the programming mode as follows:

(1) Press the hookswitch, and release.

(2) Enter # and your 3-digit owner bypass code.

(3) Wait 4 seconds. If programming locally, the payphone will exit the programming mode if you do not press any key within 20 seconds. If programming remotely, the payphone will hang up if you do not press any key within 20 seconds. This is the case throughout the programming operation.

(4) Enter 122.

(5) Listen through the handset for the payphone's voice to say "122 on" or "122 off." It takes approximately 3 seconds for this response. The response ("122 on" or "122 off") verifies that you are now in the programming mode.

NOTE: *A variable other than Option 122 may be used for this purpose. It is the voice report of the value or status of the variable that indicates that you are in the programming mode.*

5.3. Programming the Options Group

(1) If the payphone is not already in the programming mode, place it in the programming mode according to the procedure described in 5.2.

(2) Enter the number of the option to be changed. The payphone's voice will report enabled as "on" and disabled as "off."

(3) Enter *. This flips the status from on to off or vice versa. The payphone's voice reports the status within 3 seconds. If you press * twice, the voice will report the change without delay; however, if you press * after the voice has begun to report the new status, the status will flip back to its previous setting.

NOTE: *Several options require that a value be set in the registers group; for example, if operator only calls (Option 120) are enabled, Register 248 must contain a 0 for no charge or an amount in cents if the call is to be charged.*

5.4. **The Options Group**

The following is a list of the three-digit variables stored by the PCM-4 as options. The default setting of each is indicated in parentheses. These default values are the settings prior to loading the rating module, which should contain the settings you ordered.

120   ALLOW OPERATOR CALLS (0 –). Allows 0 – calls. If on, set value in Register 248, which contains the price. (ON)

121   ALLOW OPERATOR ASSISTED (0 +). If on, set value in Register 249, which contains the price. (ON)

122   INCOMING CALLS. Allows incoming calls. If off, it does not prevent incoming telemetry calls. ON = ringer ON; OFF = ringer OFF. See Options 129 and 130. (ON)

123   ACCESS TO OCC THROUGH LOCAL CALL. Keeps keypad alive long enough to allow the customer to use his own account number with an OCC. If the keypad is left on after dialing and Wink is not present, you can be exposed to fraudulent "chain dialing" in locations where the central office returns dial tone when the called party terminates the call. If Wink is not available, but you have to access an OCC through keypad entry of digits, set Options 123 and 127 ON. If Wink is present, set Option 126. (ON)

124   OPERATION THROUGH PBX. If on, set PBX access value in Register 229. (OFF)

125   PULSE DIALING. If on, phone is set for pulse dialing. If off, phone is set for tone dialing. (OFF)

126   WINK DETECT. Wink is the momentary loss of voltage resulting from Central Office switching between call termination and the return of dial tone. If Option 126 is set ON, the PCM-4 will begin to look for Wink. When the call is terminated - that is, when the called party hangs up - and the Wink occurs, the PCM-4 detects the Wink and shuts off the keypad so that fraudulent calls cannot be made with the returned dial tone. Wink detect is available with boards marked Revision C or later and boards upgraded to include the Revision C Wink modification, providing the software is level 4.1.0 or later. (OFF)

127   OCC KEYPAD "ON" AT FIRST RINGBACK. Opens keypad for 30 seconds. For DTMF signalling. If keypad is left on after dialing and Wink is not present, you can be exposed to fraudulent "chain dialing" in locations where the central office returns dial tone when the called party terminates the call. If Wink is not present, but you have to access an OCC through DTMF entry of digits, set Options 123 and 127. If Wink is present, set Options 126 and 145. (ON)

128   PHONE EQUIPPED WITH CREDIT CARD READER. (OFF)

129   VOICE TELEMETRY. Allows DTMF programming with voice responses. Refer to section 3.10. (ON)

130   MODEM TELEMETRY. Used with PNM and other modem telemetry such as for sending a status report to an auto-answer modem for a hard copy printout from a serial printer. Refer to section 3.10. (OFF)

131   ENABLE ALARM 1. Sets upper housing alarm. Alarms Group Variable 920 will indicate the current status of the alarm. (OFF)

132   ENABLE ALARM 2. Sets handset monitor alarm. Alarms Group Variable 921 will indicate the current status of the alarm. (OFF)

133   ENABLE ALARM 3. Sets vault access alarm. Alarms Group Variable 922 will indicate the current status of the alarm. (OFF)

134   ENABLE ALARM 4. Sets external contact alarm. Alarms Group Variable 923 will indicate the current status of the alarm. (OFF)

135   A factory option. (OFF)

136 CLOCK PRESENT. To be used in areas where your payphone must give discounts depending upon the time of day. Set values in Registers 234 through 242. (OFF)

137 DISABLE UNLISTED NXX TIMER. Disables the call completion timer for exchanges that are not in the rates database. (OFF)

138 0 – AOS. Operator-only calls routed through an AOS or LD*OS^{SM} long distance switch. (OFF)

139 0 + AOS. Operator-assisted calls routed through an AOS or LD*OS^{SM} switch. (OFF)

140 AOS ACCESS. To be used in areas where the AOS can be accessed directly, without having to route call through an OCC. ON = Direct Access; OFF = Indirect Access, through an OCC. When ON, set Registers 262 and 263. When OFF, set Registers 260, 261, 262, and 263. Since LD*OS^{SM} is always accessed directly, this option must always be set ON if using LD*OS^{SM} as your AOS. (OFF)

141 AOS: DELETE LEADING 0 IN DESTINATION NUMBER. Deletes leading "0" in the destination number in AOS or LD*OS^{SM} applications. (OFF)

142 AOS: DETECT ACKNOWLEDGEMENT TONE AFTER AUTHORIZATION CODE. The payphone will look for the acknowledgement tone after the authorization code has been sent in 1 + OCC applications. This is used when the destination number is not sent until an acknowledgement tone has been received. (OFF)

143 ENABLE OCC 1 + COIN/TOLL CALLS ROUTED THROUGH OCC. If ON, set Registers 260 and 261. (OFF)

144 AOS: DETECT ACKNOWLEDGEMENT TONE AFTER AOS ANSWERS. The payphone looks for the acknowledgement tone after the AOS answers. After receiving the acknowledgement tone, the phone sends the authorization code and destination number. (OFF)

145 KEYPAD "ALWAYS ON" AFTER DIALING. For DTMF signalling. If the keypad is left on after dialing, you may be exposed to fraudulent "chain dialing" in locations where the central office returns dial tone when the called party terminates the call. If there is secondary dial tone, this Option is to be used in conjunction with Option 126 - Wink Detect - to allow manual keypad entry of digits to send to an OCC. Wink, in this case, must be present; however, if Wink is not present, do not use this option unless there is no secondary dial tone. If Wink is not present and there is secondary dial tone, set Options 123 and 127 if you have to send keypad-entered digits to an OCC. (OFF)

146 INSERT LEADING "1." If a 10-digit number is dialed, the payphone will insert a 1 before the digit string. (OFF)

147 A factory option, for use by Elcotel Customer Service personnel. (OFF)

148 CENTRAL FORMAT. Enables the format for Central Corporation's Alternative Operator Service. (OFF)

149 INCREASE ANSWER DETECT SENSITIVITY. ON = Increases Sensitivity, OFF = Decreases Sensitivity. (OFF)

150 DISABLE BONG ON 0 + CALLS. If the AOS service is not equipped to handle credit card numbers transmitted by DTMF, an AOS operator will answer and verbally ask the caller for the number. In such cases, it is necessary to disable the BONG so that the digits of the credit card number will not be stored and transmitted by the microprocessor. This BONG tone, which is sent to the handset receiver after the destination number has been entered at the keypad, signals the caller to enter the credit card number. The number is then stored by the payphone and sent to the AOS after receiving the acknowledgement tone from the AOS. If an AOS service is not equipped to accept these digits, they should not be sent, and this feature should be disabled. (OFF)

151 ADD NPA TO 1 + 7-DIGIT NUMBER. Turning on Option 151 will insert the home NPA after digit 1 in 1 + 7 toll calls. (OFF)

152 A factory option, for use by Elcotel Customer Service personnel. (OFF)

153 SEND KEYED-IN CARD CALLS TO TELCO OPERATOR. In card reader-equipped phones (128 on), routes all calls made with commercial credit cards to the AOS and all keypad-entered credit card calls to the local telco operator. (OFF)

154 DOUBLE INCOMING RING COUNT IN REGISTER 272. Doubles the number of incoming rings set in Register 272 to a maximum of 18 rings. (OFF)

155 AOS B-TONE REROUTE. If ON, the payphone reroutes an AOS call to the telco by dialing the number in Register 278 after receiving the DTMF "B" tone from the AOS. (OFF)

156 DISABLE 911 CALLS. An anti-fraud device, for use where 911 calls are not available. If 911 calls are not available, the central office turns the 911 call over to an operator, and then the caller can defraud the payphone by requesting that the operator dial another number that he or she claims to have dialed but was unable to reach. When ON, the payphone will not dial 911 into the telco line. (OFF)

157 ENABLE SMDR. If ON, the phone will store SMDR data that will be transmitted along with the payphone status report. To receive the SMDR, the home phone office must be equipped with a printer and a 300-BPS auto-answer modem. (OFF)

158 LOW SPEED ROTARY DIALING. If the option is turned ON, the payphone will dial at 7.5 pulses per second, or at 10 pulses per second if OFF. (OFF)

159 RETURN COIN FOR UNDERPAID CALLS. If ON, the payphone will return the original deposit prior to quoting the cost of the call. (OFF)

160 ENABLE LD*OS^{SM} FORMAT. If ON, this option allows calls to the Elcotel Long Distance Operator Service (LD*OS^{SM}). (OFF)

161 A factory option, for use by Elcotel Customer Service personnel.

162 RESTRICT INTRALATA 0+ TO STATE. IntraLATA 0+ calls are normally routed to Elcotel's LD*OS^{SM}; however, in some areas, intraLATA 0+ calls are not allowed to go to an AOS. When turned on, this option routes those calls to the local central office operator. (OFF)

163 CHARGE 950 CALLS: ON = Free Call; OFF = Charge Normally. (OFF)

164 PROPER PRICING AND DIALING FOR 7 AND 1 + 7-DIGIT CALLS. Corrects user dialing when the user enters only 7 digits for a 1 + 7 digit call. Setting this options will cause the PCM-4 to look at the NXX numbers and determine if the call is a 7 digit or a 1 + 7 digit call. It will then insert the leading 1 where required. For California, Massachusetts, New Jersey, New York, and Pennsylvania only. The answer to the 1 + 7 digit calls question on the rating module questionnaire must be NO to enable this option. (OFF)

165 A factory option, for use by Elcotel Customer Service personnel.

166 MICROPHONE ALWAYS ON FOR 0+ CALLS. Opens microphone after dialing 0 + call. (OFF)

167 A spare option.

5.5. **Programming the Registers Group**

(1) If the phone is not already in the programming mode, place the phone in the programming mode according to the procedure described in 5.2.

(2) Enter the number of the register. The payphone's voice will respond with the value currently stored in the register.

(3) Enter *.

(4) Enter the new value. If you delay 3 seconds or longer in entering the digits, the PCM-4 will accept whatever you have already entered as the new value. For example, if in the process of entering 345678, you paused for three seconds after entering 5, the PCM-4 will place the value 345 in the register. If this occurs, it is then necessary to reprogram the register.

(5) Enter * again. The payphone's voice will report the new value within 3 seconds.

NOTE: *Registers 221 through 225 can be reset by using maintenance code 962. It is recommended that your maintenance person reset these registers whenever the cashbox is serviced.*

5.6. **The Registers Group**

The following is a list of the 3-digit variables stored by the PCM-4 as registers. When applicable, the default value of each is indicated in parentheses.

220 CASH VAULT TOTALIZER. Amount collected by the payphone since the day of shipment. Amount is in five cent increments; for example, 2000 = $100.00. Non-resettable.

221 CASH VAULT TOTAL. Amount collected since last service call.

222 TOTAL OF LOCAL CALLS. Total number of local calls since the last service call.

223 TOTAL OF LONG DISTANCE CALLS. Total number of long distance calls (excluding 800 and 900 calls) since the payphone was last serviced.

224 TOTAL OF ALL 0 CALLS. Total number of operator-assisted and operator only calls since the last service call.

225 TOTAL NUMBER OF CALLS. The sum total of the contents of Registers 222 through 224 since the last service call.

226 VOICE FILTER 1. Integration factor for the leading edge of the voice filter. 0 = minimum; 3 = maximum. (0)

227 VOICE FILTER 2. Integration factor for the trailing edge of the voice filter. 0 = minimum; 3 = maximum. (0)

228 FIRST RING DETECT. Integration factor affecting only the first ringback detected. Needed when there is excessive central office switching noise after dialing and before the first ringback is heard. 0 = minimum; 3 = maximum. (0)

229 PBX ACCESS CODE. Single digit required to access "outside line." (9)

230 OWNER BYPASS CODE. Three-digit number. (999)

231 AOS DELAY. Single-digit number used to set the time in seconds for the delay between the phone ID and the destination number in AOS applications. (0)

232 HOLD OFF. Determines when the call is considered to be completed. Used in areas where SIT tones are not provided. It is a two-digit time delay (in seconds) following the actual detection of call completion by the payphone. Usually set at 7 or 10. (00)

233 CASH VAULT TRIGGER LEVEL. Three-digit amount in dollars that will cause the phone to call home. (150)

234 START PREMIUM PERIOD. Hours and minutes in 24 hour format (HH:mm). All four digits must be entered. (0800)

235 START FIRST DISCOUNT PERIOD. Hours and minutes in 24 hour format (HH:mm). All four digits must be entered. (1700)

236 START SECOND DISCOUNT PERIOD. Hours and minutes in 24 hour format (HH:mm). All four digits must be entered. (2300)

237 FIRST DISCOUNT. Amount of first discount in percent. When applicable, it is usually 40 percent. (40)

238 SECOND DISCOUNT. Amount of second discount in percent. When applicable, it is usually 60 percent. (60)

239 READ/SET DAY OF WEEK. Single-digit number: Sunday = 1, Monday = 2, etc.

240 READ/SET TIME. Hours and minutes in 24 hour format (HH:mm). All four digits must be entered (for example; 1445 = 2:45 pm).

241 READ/SET DATE. Month and Day (MM/dd). All four digits must be entered (for example; 0620 = June 20).

242 READ/SET YEAR. Two-digit number (for example; 88 = 1988).

243 HOME PRIMARY NUMBER. Phone number for Home as dialed from the remote phone location. Used for reporting alarm status and cashbox total. Maximum of eleven digits. (0)

244 HOME SECONDARY NUMBER. Alternate phone number for Home as dialed from the remote phone location. Used as a back-up number for reporting alarm status and cashbox total. The phone willdial the home primary number first. If there is no answer after four rings, the phone will hang up, wait five minutes, and dial the home secondary number. If there is no answer after four rings, the phone will hang up, wait five minutes, and dial the home primary number. The phone will continue this procedure, alternating between the two numbers, until there is an answer. Maximum of eleven digits. (0)

245 STATION ID NUMBER. Four-digit number assigned to this specific phone/location for purposes of identification. Used with PNM. (0000)

246 800 CHARGE. Three-digit number for amount in cents. (0)

247 900 CHARGE. Three-digit number for amount in cents. (050)

248 OPERATOR-ONLY CHARGE. Three-digit number for amount in cents. (0)

249 0 + PLUS CHARGE. Three-digit number for amount in cents. (0)

250 LOCAL INFORMATION CHARGE. Three-digit number for amount in cents. Used in conjunction with Register 253. (0)

251 INTRA NPA INFORMATION CHARGE (1 + 555-1212). Three-digit number for amount in cents. (50)

252 INTER NPA INFORMATION CHARGE (1 + NPA-555-1212). Three-digit number for amount in cents. (50)

253 LOCAL INFORMATION NUMBER. Used to ensure proper charge for local information calls. Register 273 counts these calls. Maximum of eleven digits. (411)

254 A factory register.

255 A factory register.

256 A factory register.

257 A factory register.

258 ACCESS ATTEMPTS. Number of times someone has tried unsuccessfully to enter the programming mode by attempting to find the owner bypass code. A total since the last service call. Two digits, resettable through 962.

259 MISCELLANEOUS CALLS. Total number of miscellaneous calls (800, 900, free calls, etc.) since the last service call. Reset through 962.

260 OCC ACCESS NUMBER. Maximum of twelve digits. Option 143 enables OCC access. (10XXX, 950-XXXX, etc.). (0)

261 OCC AUTHORIZATION CODE. Maximum of eleven digits. (0)

262 AOS ACCESS NUMBER. Maximum of eleven digits. (0)

263 AOS AUTHORIZATION CODE. Identification number for AOS calls. Maximum of twelve digits. (0)

264 DESTINATION NUMBER TERMINATOR. Maximum of twelve digits to be added to the destination number when required. (0)

265 CREDIT CARD ACCESS NUMBER. Phone number required to access the CCC call processor. For Summa-4 only. Maximum of eleven digits. Not used in 4.1 series software. (0)

266 CREDIT CARD READER ID NUMBER. Identification number associated with the credit card reader-equipped payphone owner. For Summa-4 only. Not used in 4.1 series software. Maximum of eleven digits. (0)

267 DELAY RINGBACK DETECT. Delays payphone's recognition of ringback tones until register times out. Can be set from 0 through 9 seconds. Used to overcome switch noise before call is completed. (0)

268 VOICE MAILBOX PHONE NUMBER. Maximum of eleven digits. 0 disables the feature. (0)

269 MANUAL/COIN AOS ACCESS. Phone number for manually-operated phone system with operator. Dialing #99 dials the number in this register to access the manual/coin AOS operator. When the operator dials *, the phone will tell him/her the amount deposited. When the operator dials #, the phone will collect the deposit. Maximum of eleven digits. 0 disables the feature. (0)

270 AMOUNT ADDED TO NORMAL 976 CALL. The price to add to normal charge. 976 exchange is restricted when charge is 9.95. (995)

271 TIMES TO REPEAT "NOT A BILLABLE NUMBER." Message is delivered to the operator. Use of this register helps in areas where there is no call screening. Used for all outgoing 0 – calls and all incoming calls. If sending 0 – call to LD*OS^{SM}, the message will not be announced to the LD*OS^{SM} operator; however, when the LD*OS^{SM} operator sends (splash back) the call to the telco, the message will be announced to the telco operator. One-digit number. (0)

272 NUMBER OF TIMES PHONE WILL RING BEFORE TELEMETRY ANSWERS. Can be set from 0 through 9. If more than 9 rings are needed, refer to Option 154. (5)

273 TOTAL NUMBER OF LOCAL INFORMATION CALLS. Counts and stores the number of local information calls since the last service call.

274 NUMBER OF TIMES PHONE WILL LET RING FOR MAILBOX. Determines the number of rings allowed before calling the Voice Mailbox (Register 268) system. This is specifically for using MPI (Messenger Phone Inc.). (5)

275 CASH VAULT ALARM BYPASS NUMBER. Disables the cashbox vault alarm for five minutes, thereby permitting removal of the cashbox without having to use the owner bypass code. To use this register, enter a pound sign (#) and the three digits that you set for this register. (000)

278 AOS 2 ACCESS NUMBER. This register contains the number to be dialed to reroute ITI and NTS calls to the telco. (0)

279 SOFTWARE LEVEL NUMBER. This 3-digit number indicates the software level of the software installed in the PCM-4 assembly. It cannot be changed by the owner. New software chips must be installed and the rating module reloaded to change the software level number.

280 INACTIVITY TIMER. If this register is set and times out, it will cause the payphone to call home and report that no completed calls have been made and/or no coins have been collected over a specified period. The 2 digits of the register signify the number of hours for the timer to time out. (00)

281 LD*OS^{SM} AUTHORIZATION CODE ONE. For operator assistance. 7 digits. (0)

282 A factory register, for use by Elcotel Customer Service personnel.

283 LD*OS^{SM} AUTHORIZATION CODE TWO. For no operator assistance. 7 digits. (0)

284 NPA-NXX - AREA CODE AND EXCHANGE OF RATING MODULE. This a read only register, programmable only through the rating module. (NPANXX)

285 SERIAL NUMBER OF RATING MODULE. This is a read only register, programmable only through the rating module. (0000000)

286 A factory register.

287 A factory register.

288 A factory register.

289 A factory register.

290 A spare register.

291 A spare register.

5.7. **Programming the Automatic Dialer Group**

The owner of the payphone may provide a directory of auto dialed and free numbers so that the customer can take advantage of this feature. The list must contain the name of the party to be automatically dialed, the charge, and the auto dial number (#20 through #69 are available). For example:

Acme Cab Co. ($.65 charge).....................Dial #25

A maximum of fifty phone numbers may be stored in the PCM-4 automatic dialer. Note that the auto dial number which the customer enters on the keypad corresponds to the two least significant digits of the applicable variable. For example: When the customer enters #25 (pound sign plus 25), the number stored in variable 325 is dialed automatically. Program auto dial numbers as follows:

(1) If the payphone is not in the programming mode, place it the programming mode according the procedure described in 5.2.

(2) Enter the variable number.

(3) Enter *.

(4) Enter the phone number, including long distance direct dial code and area code if applicable (for example; 18137564583 = 1-813-7564583).

NOTE: *If you wish to delete the number in the auto dial variable, enter 0. If, however, you wish to replace the number existing in the auto dial variable, enter the new number.*

(5) If the number is to be charged normally, enter #. If the number is to be dialed free of charge, enter *.

5.8. **The Automatic Dialer Group**

320   FIRST PHONE NUMBER IN AUTOMATIC DIALER. Maximum of eleven digits. (0)

-through-

369   LAST PHONE NUMBER IN AUTOMATIC DIALER. Maximum of eleven digits. (0)

5.9. **Programming the Band Charges Groups**

The PCM-4 provides several "bands" for pricing local, intraLATA, interLATA, special NPA, and interstate calls. Each band contains four variables: Initial rate (IR), initial period (IP), subsequent rate (SR), and subsequent period (SP). Rates are stored in cents (three digits) and period is stored in minutes (two digits). 00 indicates unlimited time. Prior to adding new information, be sure that you will be storing it in an empty band. Program the band as follows:

(1) If the payphone is not already in the programming mode, place the payphone in the programming mode according to the procedure described in 5.2.

(2) Enter the variable number.

(3) Enter *.

(4) Enter the value in cents (for rate) or minutes (for period).

(5) Enter *.

NOTE: *Remember that the band consists of 4 consecutive variables; therefore, the above procedure must be performed four times, once for each variable.*

5.10. **Programming the Exceptions Groups**

All known local, intraLATA, interLATA, and special NPA exchanges and rates associated with the exchange where the payphone is located are stored in the rating module at the time of manufacture; however, new exhanges are created all the time, and the rates associated with some exchanges may change. In addition, it is possible to restrict an entire exchange. The exceptions groups have priority over the data stored in the rating module. Program exceptions as follows:

(1) If the payphone is not already in the programming mode, place it in the programming mode according to the procedure described in 5.2.

(2) Enter the variable number.

(3) Enter *.

(4) Enter the 3-digit exchange number.

(5) Enter the 2-digit band number (for example: Enter band 4 as 04.).

NOTE: *00 in place of band number restricts the exchange. 0 alone, instead of the five digits entered in steps 3 and 4, cancels the entire exception.*

(6) Enter *.

5.11. **Band Charges and Exceptions Charts**

Use the charts on the following pages as a convenient way to keep track of band rates, periods and exceptions:

5.12. **LOCAL BAND CHARGES GROUP**

NOTE: *Local Rates are not discounted.*

BAND 1
420 IR ____ ____ ____
421 IP ____ ____
422 SR ____ ____ ____
423 SP ____ ____

BAND 2
424 IR ____ ____ ____
425 IP ____ ____
426 SR ____ ____ ____
427 SP ____ ____

BAND 3
428 IR ____ ____ ____
429 IP ____ ____
430 SR ____ ____ ____
431 SP ____ ____

BAND 4
432 IR ____ ____ ____
433 IP ____ ____
434 SR ____ ____
435 SP ____ ____

BAND 5
436 IR ____ ____ ____
437 IP ____ ____
438 SR ____ ____ ____
439 SP ____ ____

BAND 6
440 IR ____ ____ ____
441 IP ____ ____
442 SR ____ ____ ____
443 SP ____ ____

BAND 7
444 IR ____ ____ ____
445 IP ____ ____
446 SR ____ ____ ____
447 SP ____ ____

BAND 8
448 IR ____ ____ ____
449 IP ____ ____
450 SR ____ ____ ____
451 SP ____ ____

BAND 9
452 IR ____ ____ ____
453 IP ____ ____
454 SR ____ ____ ____
455 SP ____ ____

BAND 10
456 IR ____ ____ ____
457 IP ____ ____
458 SR ____ ____ ____
459 SP ____ ____

BAND 11
460 IR ____ ____ ____
461 IP ____ ____
462 SR ____ ____ ____
463 SP ____ ____

BAND 12
464 IR ____ ____ ____
465 IP ____ ____
466 SR ____ ____ ____
467 SP ____ ____

BAND 13
468 IR ____ ____ ____
469 IP ____ ____
470 SR ____ ____ ____
471 SP ____ ____

BAND 14
472 IR ____ ____ ____
473 IP ____ ____
474 SR ____ ____ ____
475 SP ____ ____

BAND 15
476 IR ____ ____ ____
477 IP ____ ____
478 SR ____ ____ ____
479 SP ____ ____

5.13. **LOCAL BAND EXCEPTIONS GROUP**

480 Exception 1. ____ ____ ____ ____ ____
481 Exception 2. ____ ____ ____ ____ ____
482 Exception 3. ____ ____ ____ ____ ____
483 Exception 4. ____ ____ ____ ____ ____
484 Exception 5. ____ ____ ____ ____ ____
485 Exception 6. ____ ____ ____ ____ ____
486 Exception 7. ____ ____ ____ ____ ____
487 Exception 8. ____ ____ ____ ____ ____
488 Exception 9. ____ ____ ____ ____ ____
489 Exception 10. ____ ____ ____ ____ ____

490 Exception 11. ____ ____ ____ ____ ____
491 Exception 12. ____ ____ ____ ____ ____
492 Exception 13. ____ ____ ____ ____ ____
493 Exception 14. ____ ____ ____ ____ ____
494 Exception 15. ____ ____ ____ ____ ____
495 Exception 16. ____ ____ ____ ____ ____
496 Exception 17. ____ ____ ____ ____ ____
497 Exception 18. ____ ____ ____ ____ ____
498 Exception 19. ____ ____ ____ ____ ____
499 Exception 20. ____ ____ ____ ____ ____

5.14. **INTRALATA BAND CHARGES GROUP**

NOTE: *IntraLATA call prices include all surcharges and may be subject to discounts.*

BAND 16
520 IR ____ ____
521 IP ____ ____
522 SR ____ ____ ____
523 SP ____ ____

BAND 17
524 IR ____ ____ ____
525 IP ____ ____
526 SR ____ ____ ____
527 SP ____ ____

BAND 18
528 IR ____ ____ ____
529 IP ____ ____
530 SR ____ ____
531 SP ____ ____

BAND 19
532 IR ____ ____ ____
533 IP ____ ____
534 SR ____ ____ ____
535 SP ____ ____

BAND 20
536 IR ____ ____ ____
537 IP ____ ____
538 SR ____ ____ ____
539 SP ____ ____

BAND 21
540 IR ____ ____ ____
541 IP ____ ____
542 SR ____ ____ ____
543 SP ____ ____

BAND 22
544 IR ____ ____ ____
545 IP ____ ____
546 SR ____ ____ ____
547 SP ____ ____

BAND 23
548 IR ____ ____ ____
549 IP ____ ____
550 SR ____ ____ ____
551 SP ____ ____

BAND 24
552 IR ____ ____ ____
553 IP ____ ____
554 SR ____ ____ ____
555 SP ____ ____

BAND 25
556 IR ____ ____ ____
557 IP ____ ____
558 SR ____ ____ ____
559 SP ____ ____

BAND 26
560 IR ____ ____ ____
561 IP ____ ____
562 SR ____ ____ ____
563 SP ____ ____

BAND 27
564 IR ____ ____ ____
565 IP ____ ____
566 SR ____ ____ ____
567 SP ____ ____

BAND 28
568 IR ____ ____ ____
569 IP ____ ____
570 SR ____ ____ ____
571 SP ____ ____

BAND 29
572 IR ____ ____ ____
573 IP ____ ____
574 SR ____ ____ ____
575 SP ____ ____

BAND 30
576 IR ____ ____ ____
577 IP ____ ____
578 SR ____ ____ ____
579 SP ____ ____

5.15. **INTRALATA EXCEPTIONS GROUP**

580 Exception 1. __ __ __ __ __ __ __ __
581 Exception 2. __ __ __ __ __ __ __
582 Exception 3. __ __ __ __ __ __ __ __
583 Exception 4. __ __ __ __ __ __ __ __
584 Exception 5. __ __ __ __ __ __ __ __
585 Exception 6. __ __ __ __ __ __ __ __
586 Exception 7. __ __ __ __ __ __ __ __
587 Exception 8. __ __ __ __ __ __ __ __
588 Exception 9. __ __ __ __ __ __ __ __
589 Exception 10. __ __ __ __ __ __ __ __

590 Exception 11. __ __ __ __ __ __ __ __
591 Exception 12. __ __ __ __ __ __ __
592 Exception 13. __ __ __ __ __ __ __
593 Exception 14. __ __ __ __ __ __ __ __
594 Exception 15. __ __ __ __ __ __ __ __
595 Exception 16. __ __ __ __ __ __ __ __
596 Exception 17. __ __ __ __ __ __ __ __
597 Exception 18. __ __ __ __ __ __ __ __
598 Exception 19. __ __ __ __ __ __ __ __
599 Exception 20. __ __ __ __ __ __ __ __

5.16. INTERLATA BAND CHARGES GROUP

NOTE: *InterLATA Band Charges include all surcharges, and may be subject to discount.*

BAND 31
620 IR ____ ____ ____
621 IP ____ ____
622 SR ____ ____ ____
623 SP ____ ____

BAND 32
624 IR ____ ____ ____
625 IP ____ ____
626 SR ____ ____ ____
627 SP ____ ____

BAND 33
628 IR ____ ____ ____
629 IP ____ ____
630 SR ____ ____ ____
631 SP ____ ____

BAND 34
632 IR ____ ____ ____
633 IP ____ ____
634 SR ____ ____ ____
635 SP ____ ____

BAND 35
636 IR ____ ____ ____
637 IP ____ ____
638 SR ____ ____ ____
639 SP ____ ____

BAND 36
640 IR ____ ____ ____
641 IP ____ ____
642 SR ____ ____ ____
643 SP ____ ____

BAND 37
644 IR ____ ____ ____
645 IP ____ ____
646 SR ____ ____ ____
647 SP ____ ____

BAND 38
648 IR ____ ____ ____
649 IP ____ ____
650 SR ____ ____ ____
651 SP ____ ____

BAND 39
652 IR ____ ____ ____
653 IP ____ ____
654 SR ____ ____ ____
655 SP ____ ____

BAND 40
656 IR ____ ____ ____
657 IP ____ ____
658 SR ____ ____ ____
659 SP ____ ____

BAND 41
660 IR ____ ____ ____
661 IP ____ ____
662 SR ____ ____ ____
663 SP ____ ____

BAND 42
664 IR ____ ____ ____
665 IP ____ ____
666 SR ____ ____ ____
667 SP ____ ____

BAND 43
668 IR ____ ____ ____
669 IP ____ ____
670 SR ____ ____ ____
671 SP ____ ____

BAND 44
672 IR ____ ____ ____
673 IP ____ ____
674 SR ____ ____ ____
675 SP ____ ____

BAND 45
676 IR ____ ____ ____
677 IP ____ ____
678 SR ____ ____ ____
679 SP ____ ____

5.17. INTERLATA EXCEPTIONS GROUP

680 Exception 1. __ __ __ __ __ __ __ __
681 Exception 2. __ __ __ __ __ __ __ __
682 Exception 3. __ __ __ __ __ __ __ __
683 Exception 4. __ __ __ __ __ __ __ __
684 Exception 5. __ __ __ __ __ __ __ __
685 Exception 6. __ __ __ __ __ __ __ __
686 Exception 7. __ __ __ __ __ __ __ __
687 Exception 8. __ __ __ __ __ __ __ __
688 Exception 9. __ __ __ __ __ __ __ __
689 Exception 10. __ __ __ __ __ __ __ __

690 Exception 11. __ __ __ __ __ __ __ __
691 Exception 12. __ __ __ __ __ __ __ __
692 Exception 13. __ __ __ __ __ __ __ __
693 Exception 14. __ __ __ __ __ __ __ __
694 Exception 15. __ __ __ __ __ __ __ __
695 Exception 16. __ __ __ __ __ __ __ __
696 Exception 17. __ __ __ __ __ __ __ __
697 Exception 18. __ __ __ __ __ __ __ __
698 Exception 19. __ __ __ __ __ __ __ __
699 Exception 20. __ __ __ __ __ __ __ __

5.18. **SPECIAL NPA BAND CHARGES GROUP**

NOTE: *Special NPA Band Charges include all surcharges and may be subject to discount.*

BAND 46
720 IR ____ ____ ____
721 IP ____ ____
722 SR ____ ____ ____
723 SP ____ ____

BAND 47
724 IR ____ ____ ____
725 IP ____ ____
726 SR ____ ____ ____
727 SP ____ ____

BAND 48
728 IR ____ ____ ____
729 IP ____ ____
730 SR ____ ____ ____
731 SP ____ ____

BAND 49
732 IR ____ ____ ____
733 IP ____ ____
734 SR ____ ____ ____
735 SP ____ ____

BAND 50
736 IR ____ ____ ____
737 IP ____ ____
738 SR ____ ____ ____
739 SP ____ ____

BAND 51
740 IR ____ ____ ____
741 IP ____ ____
742 SR ____ ____ ____
743 SP ____ ____

BAND 52
744 IR ____ ____ ____
745 IP ____ ____
746 SR ____ ____ ____
747 SP ____ ____

BAND 53
748 IR ____ ____ ____
749 IP ____ ____
750 SR ____ ____ ____
751 SP ____ ____

BAND 54
752 IR ____ ____ ____
753 IP ____ ____
754 SR ____ ____ ____
755 SP ____ ____

BAND 55
756 IR ____ ____ ____
757 IP ____ ____
758 SR ____ ____ ____
759 SP ____ ____

BAND 56
760 IR ____ ____ ____
761 IP ____ ____
762 SR ____ ____ ____
763 SP ____ ____

BAND 57
764 IR ____ ____ ____
765 IP ____ ____
766 SR ____ ____ ____
767 SP ____ ____

BAND 58
768 IR ____ ____ ____
769 IP ____ ____
770 SR ____ ____ ____
771 SP ____ ____

BAND 59
772 IR ____ ____ ____
773 IP ____ ____
774 SR ____ ____ ____
775 SP ____ ____

BAND 60
776 IR ____ ____ ____
777 IP ____ ____
778 SR ____ ____ ____
779 SP ____ ____

5.19. **SPECIAL NPA EXCEPTIONS GROUP**

780 Exception 1. ____ ____ ____ ____ ____
781 Exception 2. ____ ____ ____ ____ ____
782 Exception 3. ____ ____ ____ ____ ____
783 Exception 4. ____ ____ ____ ____ ____
784 Exception 5. ____ ____ ____ ____ ____
785 Exception 6. ____ ____ ____ ____ ____
786 Exception 7. ____ ____ ____ ____ ____
787 Exception 8. ____ ____ ____ ____ ____
787 Exception 9. ____ ____ ____ ____ ____
789 Exception 10. ____ ____ ____ ____ ____

790 Exception 11. ____ ____ ____ ____ ____
791 Exception 12. ____ ____ ____ ____ ____
792 Exception 13. ____ ____ ____ ____ ____
793 Exception 14. ____ ____ ____ ____ ____
794 Exception 15. ____ ____ ____ ____ ____
795 Exception 16. ____ ____ ____ ____ ____
796 Exception 17. ____ ____ ____ ____ ____
797 Exception 18. ____ ____ ____ ____ ____
798 Exception 19. ____ ____ ____ ____ ____
799 Exception 20. ____ ____ ____ ____ ____

5.20. INTERSTATE BAND CHARGES GROUP

All known area codes (NPAs) which are outside of the state where the payphone is located are stored in the rating module at the time of manufacture; however, new NPAs are created all the time and the rates between some NPAs may change. When a new NPA is created, you must add the new NPA to the special NPA exceptions group. When rates change or if you desire to initiate a change (for example; changing initial period from 1 minute to 3 minutes), you must use the interstate band charges group.

NOTE: *Interstate Band Charges include all surcharges, and can be subject to discounts.*

BAND 1
820 IR ____ ____ ____
821 IP ____ ____
822 SR ____ ____ ____
823 SP ____ ____

BAND 2
824 IR ____ ____ ____
825 IP ____ ____
826 SR ____ ____ ____
827 SP ____ ____

BAND 3
828 IR ____ ____ ____
829 IP ____ ____
830 SR ____ ____ ____
831 SP ____ ____

BAND 4
832 IR ____ ____ ____
833 IP ____ ____
834 SR ____ ____ ____
835 SP ____ ____

BAND 5
836 IR ____ ____ ____
837 IP ____ ____
838 SR ____ ____ ____
839 SP ____ ____

BAND 6
840 IR ____ ____ ____
841 IP ____ ____
842 SR ____ ____ ____
843 SP ____ ____

BAND 7
844 IR ____ ____ ____
845 IP ____ ____
846 SR ____ ____ ____
847 SP ____ ____

BAND 8
848 IR ____ ____ ____
849 IP ____ ____
850 SR ____ ____ ____
851 SP ____ ____

BAND 9
852 IR ____ ____ ____
853 IP ____ ____
854 SR ____ ____ ____
855 SP ____ ____

BAND 10
856 IR ____ ____ ____
857 IP ____ ____
858 SR ____ ____ ____
859 SP ____ ____

5.21. Alarms Group

The Alarms group consists of a series of registers containing the status of the various alarms in the system. Since the contents of variables 920 through 923 are a function of external events, they cannot be changed; however, their status can be monitored. To obtain the status of any alarm input, dial the valid owner bypass code, wait four seconds, and dial the three-digit variable. Tripped alarms are reset automatically, but only after reporting their status to the home phone.

920   ALARM NO. 1. Always associated with upper housing access. (OFF)

921   ALARM NO. 2. Always associated with handset monitor. (OFF)

922   ALARM NO. 3. Always associated with vault access. (OFF)

923   ALARM NO. 4. Always associated with an external contact such as may be found in vending machines (empty indicators), or in intrusion detectors. (OFF)

924   ALARM NO. 5. Battery-backed RAM status. If the RAM has been reloaded with the default values from the rating module while the owner-programmed changes and additions have not been reloaded, the alarm switches to ON. (OFF)

925   ALARM NO. 6. Cashbox 80% full level has been exceeded. (OFF)

926   ALARM NO. 7. Cashbox 95% full level has been exceeded. (OFF)

5.22. Maintenance Group

The Maintenance group consists of commands used by the maintenance person locally or remotely to initiate specific actions in the payphone. To initiate the command, simply dial the 3-digit variable number. Note that the payphone must be in the programming mode.

960   TRANSPARENT MODE. Causes the payphone to be connected directly to the telco line without payphone intervention, such as a request for money. Since the payphone's keypad will be connected directly to the telco line, it requires that the telco line be a tone dialing line. This mode of operation is terminated when the payphone is returned on-hook. Transparent mode cannot be initiated by remote access.

961   CALL HOME. If Option 129 is on, it causes the payphone to initiate a call to the "Home" base and report the alarm status through voice telemetry. If Option 130 is on and the unit is equipped with the optional modem, the payphone calls home and delivers a status report via modem telemetry. There must be a home primary number in Register 243 and an ID number in Register 245. This command should be used by the maintenance person upon arrival at the payphone site if the cashbox is to be serviced.

962   RESET ALL COUNTERS. This command is to be used by the maintenance person after the cashbox is serviced.

963   TERMINATE TELEMETRY MODE. Causes the payphone to go back on-hook to terminate a telemetry link. This is used in remote voice telemetry.

964   RELOAD BATTERY-BACKED RAM. Clears the RAM of all changes and additions and loads default values from the rating module. This command is normally used when a new rating module is installed. Changes and additions that have not been added to the new rating module must be reprogrammed.

965   FLIP COIN RELAY TO RETURN COIN. Provides remote control of the coin relay to return coins when operating in the voice telemetry mode.

966 FLIP COIN RELAY TO COLLECT COIN. Provides remote control of the coin relay to collect coins when operating in the voice telemetry mode.

5.23. **Formats**

Detailed below are the formats to program into the RAM or to have programmed into the rating module in order to access a particular service directly. Note that these formats are for direct access to the particular service. If calls have to be routed through an OCC first, Option 140 must be OFF, and Registers 260 and 261 must be set with the proper values for the OCC to be accessed; however, LD*OS^{SM} is always accessed directly, and Option 140 must be ON for LD*OS^{SM} operation.

Elcotel's LD*OS^{SM}

1. Turn on Option 138 to send all 0 − calls to LD*OS^{SM}.

2. Turn on Option 139 to send all 0 + calls to LD*OS^{SM}.

3. Turn on Option 140 to access LD*OS^{SM} directly.

4. Turn on Option 160 to enable the LD*OS^{SM} format.

5. Ensure that Factory Option 161 is OFF.

6. Set AOS switch number in Register 262 (1-800-444-9606) (950-0370 is for certain parts of area code 305 only).

7. Set LD*OS^{SM} authorization code 1 for operator assistance in Register 281.

8. Set LD*OS^{SM} authorization code 2 for no operator assistance in Register 283.

Central Corporation

1. Turn on Option 138 to send all 0 − calls to Central Corporation.

2. Turn on Option 139 to send all 0 + calls to Central Corporation.

3. Turn on Option 140 to access Central Corporation directly.

4. Turn on Option 148 to enable the Central Format.

5. Set the Central Corporation switch number in Register 262.

6. Set the identification number for 0 + calls in Register 263.

7. Set the destination number terminator in Register 264. This is usually "##."

COMM Systems (For use with an equal access line.)

1. Turn on Option 166 so that the microphone is always on for 0 + calls.

2. Turn on Option 150 to disable the Bong tone.

ITI

1. Turn on Option 138 to send all 0 – calls to ITI.

2. Turn on Option 139 to send all 0 + calls to ITI.

3. Turn on Option 140 to access ITI directly.

4. Turn on Option 144 to detect the acknowledgement tone after ITI answers.

5. Turn on Option 150 to disable the Bong tone.

6. Turn on Option 155 to reroute AOS ''B'' tone calls to the telco.

7. Set the ITI access number in Register 262. This should be a 1-800 number.

8. Set the ITI authorization code in Register 263.

NTS

1. Turn on Option 138 to send all 0 – calls to NTS.

2. Turn on Option 139 to send all 0 + calls to NTS.

3. Turn on Option 140 to access NTS directly.

4. Turn on Option 144 to detect the acknowledgement tone after NTS answers.

5. Turn on Option 150 to disable the Bong tone.

6. Turn on Option 155 to enable AOS ''B'' tone reroute.

7. Set NTS access number in Register 262.

8. Set NTS authorization code in Register 263.

9. Set re-route access number at 10288 in Register 278.

Notes:

(1) Use Option 143 and Registers 260 and 261 to have the phone always use an OCC on 1 + calls.

(2) If you have a credit card reader, turn Option 128 ON.

SECTION **6. INSTALLATION TESTS**

6.1. **General**

Your rating module for the Model 1200-4 is programmed according to your choices indicated in the questionnaire you submitted at the time of purchase. You should verify these values at this time. All other variables (options, registers, etc.) will be set to their default values. If you decide to make changes in the program and set new values yourself, verify that the new values have been set.

6.2. **Preparation**

(1) Ensure that the rating module has been loaded by doing the following: Make a 1 + call. If the call cannot be made, the rating module either has been mounted incorrectly on the PCM-4, it has not been loaded, or it has been improperly loaded.

(2) The following test is optional: With the telephone open and the upper housing supported on the lower housing by a service hanger, conduct an audible test by lifting the payphone receiver "off hook" and dialing a telco silent line. If no silent line is known, break dial tone by entering the programming mode as in step (5), entering 960 to place the phone in the transparent mode, and pressing one key on the TCU keypad. No hum or noise should be present. If hum or noise is present, go to step (3). If not present, go to step (4).

(3) The following test is optional; however, if noise or hum was present in step (2), this test should be performed. Connect a test set to the tip and ring. Make a comparison of reception on the payphone receiver and the test set receiver. If noise is present on both receivers, there is a possible problem with the telco line. If the noise is only on the payphone receiver, the problem relates to the payphone itself or to faulty installation, but the telco line is definitely not the cause. Refer to Section 9.0, Troubleshooting.

(4) Remove the service hanger and carefully close the telephone. Be sure not to crimp or jam any cables.

(5) Put the handset back on-hook, deposit a quarter, and verify that the coin relay fires and the coin returns via the coin return receptacle. Repeat the test with a dime, and then, with a nickel. If any coins do not return, isolate the cause, and correct the problem. Refer to Section 9: Troubleshooting.

(6) Lift the handset off-hook and enter the programming mode as follows:

    a. Enter # and your 3-digit owner bypass code.

    b. Wait four seconds.

    c. Enter 122.

    d. Listen for the payphone's voice to say "122 on" or "122 off."

(7) Verify that the settings of the variables are correct according to your choices on the rating module questionnaire and any changes you may have programmed into the payphone. Dial the 3-digit variable number and listen to the response of the payphone's voice. If a setting is incorrect, reset the variable according to the procedure described in Section 5.0, Programming the PCM-4.

(8) Press the hookswitch and release.

6.3. **Test Calls**

VOICE RESPONSE

Lift the handset off-hook and listen for the dial tone. Dial a known local number, such as the time or weather forecast. After the number is dialed, the payphone's voice will respond with: "Please deposit X cents for Y minutes," where X is the initial rate (IR) and Y is the initial period (IP). The message should repeat every 3 seconds.

Deposit the amount required and note the following as you deposit coins:

If three seconds or more elapse between coins. the PCM-4 will calculate the remaining difference, and the payphone's voice will prompt you to deposit the amount required. When the exact amount is deposited or exceeded, the voice will acknowledge it by saying "thank you."

Answer Supervision Tests

The next four tests are answer supervision tests. Note that many older telephone central offices are equipped with electromechanical switching equipment which generates excessive noise between the end of dialing and the initial ringback. Consequently, the telephone answer supervision may not perform correctly. It may then be necessary to set Registers 226, 227, and 228 to values that will permit consistent and proper answer supervision.

RINGBACK TEST

Dial several local exchanges where at least 7 cycles of ring can be heard. Verify that the coin is returned when the handset is placed back on-hook. If the coin is not returned or if noise on the line causes the microphone to open, set Option 149 OFF. If necessary, adjust Registers 226, 227, and/or 228 to values that will prevent premature opening of the microphone.

ANSWER TEST

Dial several local exchanges where the phone will be answered. Verify that the mouthpiece (microphone) opens when the call is answered and that the coin is collected when the handset is placed on-hook. If the microphone does not open, set Registers 226, 227, and 228 at 0 and Option 149 ON. If Register 232 (HOLD OFF) - the call completion timer - is set at 0, the phone will collect the coinage immediately upon detecting answer, or call completion. If Register 232 is set at other than 0, the phone will hold off or delay, for that number of seconds, the decision to collect or return coins upon answer detect. If the call is terminated before the timer times out, the coinage will be refunded, but if the call is terminated after the timer times out, the coinage will be collected. If it is not collected, ensure that the exchange dialed is a valid exchange and, if necessary set Option 137 (disable unlisted NXX timer) ON.

SIT INTERCEPT TEST

The Model 1200-4 is equipped with a "SIT" (Special Information Tones) tone detector, which detects the 3-tone sequence preceding a telco intercept message. Dial any number which you know will result in a telco message preceded by this tone sequence. Verify that the coinage is returned when you place the handset on-hook. If the coinage is not returned, set Option 137 OFF.

Other Tests

RATE TEST

(1) Dial several local and long distance numbers and verify that the phone is pricing the calls. Note that the call does not have to be completed. The payphone's voice should indicate the amount required and the time purchased. If it does not, refer to Section 9 of this manual for troubleshooting procedures. If the problem persists after making adjustments according to Section 9, notify El-cotel.

(2) Dial "911" to ensure that the emergency number can be dialed if available in your area, and to ensure that the phone does not charge for that call. Identify yourself as a phone repairman.

(3) Dial "0" to verify that the operator can be called and that the call is properly charged (generally free of charge).

(4) Dial "411" and/or other information numbers to confirm that the information operator can be called and that the calls are being charged properly.

(5) Dial posted repair service line and refund number to determine if the calls can be made free of charge.

COIN-FREE AND EMERGENCY NUMBERS

The PCM-4 is programmed to allow 911 to be dialed free of charge; however, other emergency or coin-free numbers may be programmed at the site. Free area codes and exchanges are programmed into the exceptions groups, whereas free numbers are programmed into the speed dialing group. Test each number as follows: Dial the number, verify the ring, the answer, and the number.

RESTRICTED NUMBERS/EXCHANGES/AREA CODES

Exchanges and area codes can be restricted in the rating module or they can be programmed remotely or on site to be restricted; however, individual phone numbers cannot be restricted by remote or on-site programming. Area codes and exchanges can be restricted through the exceptions groups, but restricted individual numbers must be added to your rating module. All restricted numbers, exchanges, and area codes can be tested on site by dialing the numbers. Note that the voice will say "invalid number" and return dial tone on a restricted area code or exchange. If an individual phone number is restricted, the phone will return a busy signal.

SPECIAL CHARGES

The PCM-4 can be programmed with special charges or restrictions for information calls, operator-only calls, operator-assisted calls, 800 and 900 number calls, and intraLATA calls. Special charges or restrictions for intraLATA calls should be programmed into the intraLATA Exceptions Group. Special charges or restrictions for information calls, operator-only calls, operator-assisted calls, and 800 and 900 number calls are programmed into the appropriate option or register. These charges or restrictions can be programmed locally, remotely, or through an updated rating module. To test these charges, initiate a call for each number. The call can be aborted after the payphone's voice states the charge required or, in the case of a restricted call, says "please dial again."

TELEMETRY TEST (Optional)

Enter the programming mode and verify that correct telemetry, home numbers, and ID numbers have been programmed into the payphone. Initiate a "Call Home" through Maintenance Command 961 and place the handset on-hook. Wait approximately two minutes. Then, call the home office and verify that the telemetry report was received.

LD*OS^{SM}

Perform the following tests to verify LD*OS^{SM} operation for any PCM-4 which has been programmed for LD*OS^{SM}.

(1) Dial a 0 to test 0 – calls. Do not dial any other digits. The payphone's voice will say "thank you" and the payphone will begin outpulsing. After awhile, the voice will periodically inform the customer to "please wait." When the operator answers, identify yourself as a repairman and verify that the operator is an Elcotel LD*OS^{SM} operator. Have the operator complete the call. After connection, stay on the line for three minutes before terminating the call. Log down date, time, type of test, and duration of call.

(2) To test 0 + calls, dial a 0 + NPA-NXX-XXXX or 0 + NXX-XXXX number. Verify that the payphone produces a "bong" tone. Do not dial any other digits. The voice will say "thank you" and "please wait." When the operator answers, identify yourself as a repairman and verify that the operator is an Elcotel LD*OS^{SM} operator. Have the operator complete the call. After connection, stay on the line for three minutes before terminating the call. Log down date, time, type of test, and duration of call.

(3) Dial 0, but do not dial any other digits. The voice will say "thank you" and the phone will begin outpulsing. After awhile the voice will periodically say "please wait." When the Elcotel LD*OS^{SM} operator answers, identify yourself as a repairman and request the operator to test the re-route feature. You will hear a short tone. When telco operator answers, verify that the operator is a telco operator.

SECTION 7. SOFTWARE UPDATES

Being responsive to the needs of its customers, Elcotel periodically changes and adds to its software. If the payphone has already been installed and is in use prior to receiving updated software chips, install the chips according to the following procedure. Note that any changes you programmed that are not included in your rating module will be lost, and they will have to be reprogrammed.

CAUTION: Wear a static ground wrist strap when handling the PCM-4 assembly and when installing software chips and rating modules. Ground the wrist strap to the case of the phone. If no ground strap is available, be sure to touch the housing before handling the PCM-4 board assembly in order to discharge whatever static electricity you may have accumulated.

(1) Open the cabinet and disconnect the connector-terminated terminal block power cable from the PCM-4 at Position J6 of the mainboard. See Figure 13 on the following page.

(2) Disconnect all other connectors from the PCM-4.

(3) Remove the PCM-4 from the lower housing and place it on a table or flat work service.

(4) Using a small blade screwdriver, gently pry the outdated Part I software chip from its socket on the auxiliary board.

(5) Insert the updated Part I software chip into the socket. Ensure that the notch on the chip faces outward, away from the center of the board. In order to fit the chip into the socket, it may be necessary to push one row of pins in slightly by carefully pressing the row of pins against the edge of a table. Ensure that no pins are bent in the process of installing the chip.

CAUTION: If any chip is installed with the notch facing in the wrong direction, the software will be destroyed when the power is applied.

(6) Gently pry the outdated Part II software chip from its socket on the auxiliary board.

(7) Insert the updated Part II software chip into the socket. Observe the same chip orientation and precautions as in step (5). Note that the three software chips must be positioned in the following order from the cutout area of the auxiliary board: Part I (Position U3), V3 (voice chip, Position U6), and Part II (Position U7). See Figure 13.

(8) If installing a new or updated rating module, do the following:

   a. Remove the outdated rating module.

   b. Verify that the phone number on the new or updated rating module corresponds with the number of the payphone.

   c. Insert the new or updated rating module into its place on the mainboard. Note that the cutout area at the upper end of the auxiliary board is directly above the 26-pin jack (Position J: of the mainboard) that seats the rating module, and the rating module fits neatly through the cutout area of the auxiliary board. The screw end of the module must face outward, away from the board, or upward if the board is mounted in the housing. The label should face inward, towards the board, or downward if the board is mounted in the housing.

CAUTION: If the rating module is mounted in the wrong direction, it is possible that the software will be destroyed when the power is applied.

(9) Install the PCM-4.

RATING MODULE
AT POSITION J1

PART I
SOFTWARE CHIP
AT POSITION U3

VOICE CHIP

PART II
SOFTWARE CHIP
AT POSITION U7
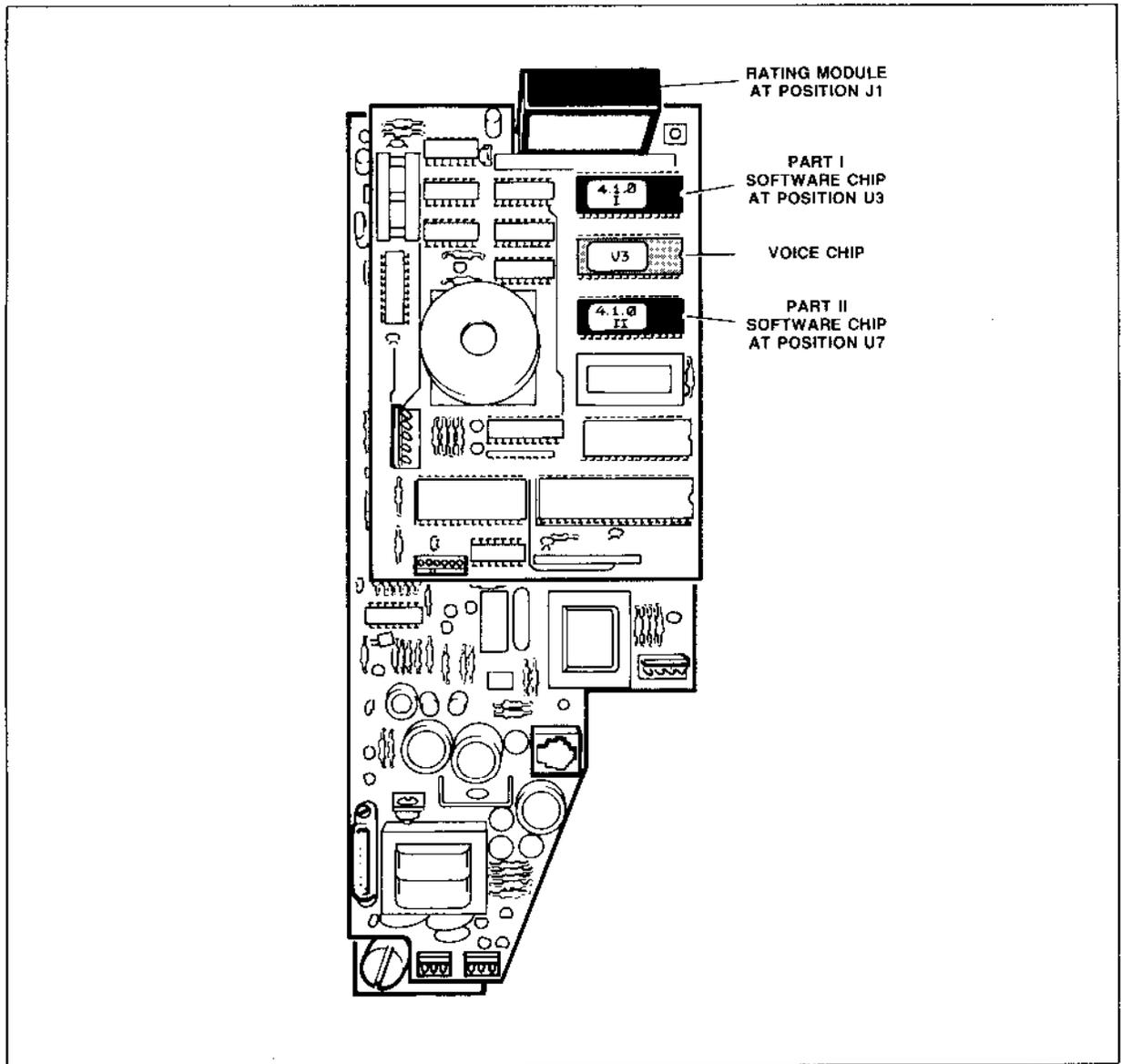
Figure 13. Software Installation

(10) Plug in all connectors except the connector from the power terminal block. DO NOT CONNECT the terminal block power until all other connectors are plugged into the PCM-4.

(11) Plug the terminal block connector into PCM-4 board assembly at Position J6 of the mainboard.

(12) Reload the rating module. Refer to Section 4.9.

(13) Re-program the PCM-4. Refer to Section 5.0.

(14) Perform the answer supervision tests described in Section 6.0, Installation Tests; however, it is only necessary to make one call per test, and all four calls may be to the payphone's local exchange.

(15) Close the cabinet.

SECTION **8. FIELD MAINTENANCE**

Field maintenance of the Model 1200-4 is normally limited to cleaning or replacing defective components and subassemblies. Units in need of service must be returned to Elcotel. A return authorization number must be obtained from Elcotel's Customer Service Department before each lot is shipped.

CAUTION: Wear a static ground wrist strap when handling a PCM-4 assembly and when installing software chips and rating modules. Ground the wrist strap to the housing of the phone. If no ground strap is available, be sure to touch the housing before handling the PCM-4 in order to discharge whatever static electricity you may have accumulated.

NOTE: *Keep an extra, working PCM-4 assembly on-hand to assist in troubleshooting and field maintenance procedures.*

Prior to performing troubleshooting procedures, perform the following routine inspection:

8.1. **Preparation - Power Inspection**

(1) Check the power terminal block. Check for loose connections and/or bad crimping of the wires. If bad crimping exists, replace the cable.

(2) Measure 16 VAC across the outer terminals. Use a DVM or a DMM to measure the following voltages at the terminal block:

Terminal Block	VAC
L1 to L2	14.4 - 19.2
G to L1	7.2 - 9.6
G to L2	7.2 - 9.6

If voltages are not within the ranges indicated, the cause could be a faulty transformer or 120 VAC receptacle, shorted or pinched wires, incorrect wire gauge, improper installation, or line voltage that is not within specifications. If line voltage is not within specifications (105 - 126.5 VAC), notify the power company. For other causes, replace the appropriate part and/or follow correct installation procedures.

(3) Turn power off and use an ohm-meter or a DMM to measure resistance between the center terminal (Phillips head screw on the terminal block) and the lock on the side of the lower housing. If a 0-2 ohm reading is not obtained, tighten the Phillips head screw on the terminal block. Ensure that the Phillips head screw threads past the terminal block and into the lower housing.

8.2. **Telco Line**

Is the telco line firmly seated in the RJ11C jack on the mainboard? If it is not, reseat the RJ11C connector.

8.3. **Connectors**

Are all connector-terminated cables attached to the assembly? Connect them if they are not.

8.4. **Wires**

Are any connector-terminated wires broken? Replace any defective connector assemblies.

8.5. **Rating Module**

(1) Is the rating module properly installed? If it is not, power down and reseat the module. The screw side of the module must be facing upwards; label side of the module should be facing downwards.

(2) Is the label side of the rating module snug against the edge of the auxiliary board? If it is not, reseat the rating module. The auxiliary board has been designed to properly guide the module into the connector.

8.6. **Components**

Are any components damaged? If yes, replace the entire PCM-4 assembly.

8.7. **PCM-4 Seating**

Is the PCM-4 assembly installed properly and fully seated? If it is not, reseat the assembly.

8.8. **Coin Relay-Hopper and Coin Chute Assembly**

(1) Are coins jammed in the coin chute assembly? If yes, power down and free lodged coins. Remove the assembly and turn it upside down. If the coins remain lodged, replace the entire assembly.

(2) Are coins jammed in the coin relay-hopper? If yes, power down and use an orange stick or Popsicle stick to free jammed coins from the coin-relay hopper. Exercise care around the latch springs.

(3) Is the tab in back of the coin chute assembly in its mounting slot on the housing? If it is not, power down and reseat the assembly.

(4) Is the area between the relay armature and the pole piece of the coin relay free of foreign matter? If it is not, power down and clean the coin relay to remove this material.

(5) Are the coin chute trigger switches dirty or damaged? If they are dirty, power down and clean them with spray contact cleaner. Replace the coin chute assembly if the switches are damaged.

(6) Do the coin relay contact springs operate fully when the coin passes through the trigger, and does the trigger fully restore after the relay is operated? If no, power down and replace the entire coin relay-hopper assembly.

(7) Do the wires or the plastic relay cover restrict movement of the coin relay? If yes, power down and correct the problem.

8.9. **Rejector Mechanism**

(1) Is the rejector mechanism within 1-1/2 degrees of vertical? If it is not, adjust the mount.

(2) Is the rejector mechanism clean? If it is not, wash it in hot sudsy water, rinse, and air dry.

(3) Does the rejector mechanism operate smoothly, without sticking or binding? If it sticks or binds, clean the unit by soaking it in hot, soapy water. Rinse and air dry it. If the condition cannot be corrected, replace the entire assembly.

(4) Does the coin release lever operate properly? If it does not, replace the entire upper housing.

8.10. **Hookswitch and Dial Housing Assembly**

(1) Is the white, plastic hookswitch cam damaged? If yes, power down and replace the entire assembly.

(2) Are the hookswitch contacts operating properly? If they are not, power down and replace the entire assembly.

(3) Is the armored handset cord's mounting bracket, which is located inside the upper housing, mounted securely? If it is not, power down, position the bracket and tighten the mounting screw as necessary. If the mounting screw is stripped, power down and replace it.

(4) Is the handset damaged? If yes, power down and replace the handset.

(5) Does the keypad operate properly, without sticking or binding? If it does not, power down and clean it as follows:

   a. Remove the dial housing and hookswitch assembly from the upper housing.

   b. Remove the TCU assembly from the dial housing and hookswitch assembly.

   c. Remove the metal keys and plastic plate from the TCU.

   d. Soak the metal keys and plastic plate in hot soapy water. DO NOT soak the plastic-keyed keypad and TCU. Rinse, air dry, and re-assemble.

   If cleaning does not solve the problem, replace the TCU assembly.

SECTION 9. TROUBLESHOOTING

This section is a guide for troubleshooting the Model 1200-4 payphone. Its purpose is to assist in identifying problems that may be encountered in the field and to suggest procedures that you may perform to remedy those problems.

CAUTION: Never remove or install the rating module when the power is connected to the circuit board. Ensure that the rating module has been loaded before performing the following procedures. If the rating module reloads at any time, any data that you manually programmed will be lost and the variables will return to the values stored in the rating module. In such cases, reprogram any necessary changes.

CAUTION: Wear a static ground wrist strap when handling the PCM-4 assembly and when installing software chips and rating modules. Ground the wrist strap to the housing of the phone. If no ground strap is available, be sure to touch the housing before handling the PCM-4 in order to discharge whatever static electricity you may have accumulated.

NOTE: *Keep an extra, working PCM-4 assembly on-hand to assist in troubleshooting and field maintenance procedures.*

OBSERVATION	CAUSE	SOLUTION
9.1. Coin Relay		
Coin relay is actuated at 5 second intervals.	Incorrect seating of rating module upon connector pins.	Remove power and reseat the rating module. Ensure that the screw faces upwards, away from the center of the board.
	Incorrect installation of program chips.	Remove power and ensure that the pins are installed in the correct sockets and that all pins are properly seated in their sockets. The notch on each chip should be facing outwards, away from the center of the board. See Figure 13. The program chip designated as Part I must be installed at U3. Chip V3 must be installed at U6, whereas Part II must be installed at U7. If chips are installed improperly or if pins are not properly seated, reinstall the chips.
	Incorrect installation of the auxiliary board to the mainboard.	Remove power. Ensure that the auxiliary board is properly installed on the mainboard. Check for bent or broken pins on connectors between the auxiliary board and the mainboard. If installation is incorrect, reseat the auxiliary board to the mainboard. If pins are bent, straighten them before reinstalling. If pins are broken, replace the entire PCM-4 assembly.
Coin relay will not actuate on power-up.	Incorrect wiring at transformer or terminal block.	Ensure correct wiring: Refer to Figure 10.
	Transformer outputs incorrect voltage.	Check incoming line voltage. If it is not within the acceptable 105 to 126.5 VAC range, notify the power company.
		If the line voltage is within the acceptable range, check for 7.2 to 9.6 VAC transformer output at terminals 1 (L1) and 2 C.T. (C.T.) and 3 (L2). If transformer output is too low, it is probable that the PCM-4 printed circuit

OBSERVATION	CAUSE	SOLUTION
		board assembly is faulty. To be certain that the assembly is the cause, unplug the power connector from Positon J6 on the mainboard and check voltages again. If the voltage readings are now correct, replace the PCM-4 assembly with a known good board assembly and plug the power terminal block connector into the known good board. If voltages are correct, the previously-installed assembly was defective. If voltage readings are still incorrect, unplug the power connector from the assembly and check voltage readings at the AC outlet, the transformer, and the terminal block to isolate the cause.
	Transformer output is correct, but voltage at terminal block in lower housing is incorrect.	Acceptable voltage range is 7.2 to 9.6 VAC between G and L1 and between G and L2 of the terminal block. Unacceptable voltage could result from a number of reasons:
		Check for proper crimping of wires to connector pins. Repair or replace defective assemblies.
		Check for broken or shorted wires from the transformer to the phone. Eliminate the short or replace the wire as necessary.
		Check that the wire gauge of the wire used to connect the transformer to the terminal block is the correct wire gauge. 18 gauge AWG should be used for lengths no greater than 25 feet. 16 gauge AWG should be used for lengths greater than 25 feet. Do not exceed 50 feet.
		If excessive distance from the terminal block to the transformer is the cause, locate the payphone or the transformer such that the distance between the two will not exceed 50 feet.
		If the board assembly is defective, power down and replace the PCM-4 assembly.
	Poor connections or connections improperly placed.	Ensure that all connectors are properly located. Reseat if there is a poor connection. If reseating coin relay connector (J7 on mainboard), power down by removing the terminal block connector from Position J6 on the mainboard before disconnecting coin relay connector. Repair or replace any connector that is damaged.
Coin relay will not collect or return.	Defective connector or wires or improper connection of connector from coin relay to board.	Remove power. Check connector pins and wires for opens, shorts, or deformed pins. Replace if damaged. Reseat connector if not connected properly.
	Jammed coins in hopper.	Remove power. Insert an orange stick or Popsicle stick through the square-slotted vents in the hopper. Gently wiggle the stick to dislodge the coins.
	Incorrect wiring on transformer or terminal block.	Ensure correct wiring: Refer to Figure 10.
	Incorrect voltage at G and L1 and G and L2 of terminal block in lower housing.	Acceptable range is 7.2 to 9.6 VAC. Unacceptable range could be the result of a number of reasons:

OBSERVATION	CAUSE	SOLUTION
		Check for proper crimping of wires to connector pins. Repair or replace defective assemblies.
		Check for a broken or shorted wire from the transformer to the phone. Eliminate the short or replace the wire as necessary
		Check that the wire gauge of the wire used to connect the transformer to the terminal block is the correct wire gauge. 18 gauge AWG should be used for lengths no greater than 25 feet. 16 gauge AWG should be used for lengths greater than 25 feet. Do not exceed 50 feet.
		If excessive distance from the terminal block to the transformer is the cause, locate the payphone or the transformer such that the distance between the two will not exceed 50 feet.
		If the board assembly is defective. power down and replace the PCM-4 assembly.
	1K ohm black resistor shorting against metal parts of relay.	Ensure that the 1K ohm, 5 watt resistor that is attached to the back side of the coin relay is not shorting against metal parts.
	Hookswitch Assembly - poor "making and breaking" of contacts.	Power down and disconnect the upper housing interface cable from Positon J4 on the mainboard of the PCM-4. Clean contacts with contact cleaner. Replace hookswitch assembly if necessary.
	Broken wire to coin relay.	Power down and replace the appropriate wire.
	Defective coin relay.	Power down and replace coin relay.

9.2. Dial Tone and Dialing

OBSERVATION	CAUSE	SOLUTION
Intermittent dial tone or dialing.	Loose connections of wiring on transformer or on lower housing terminal block.	Ensure good connections at both locations.
	Faulty connections in handset.	Power down and disconnect the upper housing interface cable from Positon J4 on the mainboard of the PCM-4. Replace handset.
	Dirty hookswitch contacts.	Power down and disconnect the upper housing interface cable from Position J4 on the mainboard of the PCM-4. Clean hookswitch contacts with spray contact cleaner. If necessary, replace hookswitch assembly.
No dial tone.	Transformer outputs incorrect voltage.	Check incoming line voltage. If it is not within the acceptable range, check for 7.2 to 9.6 VAC transformer output at terminals 1 (L1) and 2 C.T. (C.T.) and 3 (L2). If the transformer output is too low, it is probable that the printed circuit board assembly is faulty. To be certain that the assembly is the cause, unplug the power connector from Position J6 on the mainboard, and check voltages again. If the voltage readings are now correct, replace the PCM-4 assembly with a known good board assembly and plug the power terminal block connector

OBSERVATION	CAUSE	SOLUTION
		into the known good board. If voltages are correct, the previously installed assembly is defective. If voltages are still incorrect, unplug the power connector from the assembly and check voltage readings at the AC outlet, the transformer, and the terminal block to isolate the cause
	Transformer output is correct, but voltage at terminal block in lower housing is incorrect.	Acceptable range is 7.2 to 9.6 VAC at G and L1 and G and L2 of the terminal block. Unacceptable range could be the result of a number of reasons:
		Check for proper crimping of wires to connector pins. Repair or replace defective assemblies.
		Check for a broken or shorted wire from the transformer to the phone. Eliminate the short or replace the wire as necessary.
		Check that the wire gauge of the wire used to connect the transformer to the terminal block is the correct wire gauge. 18 gauge AWG should be used for lengths no greater than 25 feet. 16 gauge AWG should be used for lengths greater than 25 feet. Do not exceed 50 feet.
		If excessive distance from the terminal block to the transformer is the cause, locate the payphone or the transformer such that the distance between the two does not exceed 50 feet.
		If the board assembly is defective, power down and replace the PCM-4 assembly.
	Poor "making and breaking" of contacts on back of hookswitch assembly.	Power down and disconnect the upper housing interface cable from Position J4 on the mainboard of the PCM-4 assembly. If the contacts are dirty, clean contacts with contact cleaner. If the contacts are out of alignment, align them according to GTE specifications. Replace the hookswitch assembly if necessary.
	Improper handset wiring.	Power down and disconnect the upper housing interface cable from Position J4 on the mainboard of the PCM-4. Check for poor wiring connections and reconnect wiring as necessary. Wiring for handset is as follows: Yellow from handset to "4" on back of hookswitch assembly; red from handset to "6" on back of hookswitch assembly; black from handset to "B" on back of hookswitch assembly; green from handset to the left of "15" on the hookswitch assembly.
	Defective handset	Power down and disconnect the upper housing interface cable from Position J4 on the mainboard of the PCM-4. Replace handset with GTE or a GTE-compatible handset.
No dialing out.	Poor RJ11C connection between telephone line and mainboard.	Reseat connector. If connector needs to be replaced, power down before replacing connector.

OBSERVATION	CAUSE	SOLUTION
	Payphone not set for type of telephone line.	Using a butt-set, check to see if the telephone line is touch or pulse dial. Set Option 125 accordingly. ON = Rotary (Pulse) Dialing; OFF = Tone (DTMF) Dialing.

9.3. Keypad

OBSERVATION	CAUSE	SOLUTION
Keypad tones sound low and/or distorted.	Hookswitch contacts dirty or corroded.	Power down and disconnect the upper housing interface cable from Position J4 on the mainboard of the PCM-4. Clean hookswitch contacts with spray contact. Replace entire assembly if the contacts are corroded.
	Loose connections on wiring from handset to back of keypad.	Power down and disconnect the upper housing interface cable from Position J4 on the mainboard of the PCM-4. Reseat connectors.
	Poor connection of interface cable from upper housing to mainboard.	Reseat connector.
	Defective handset.	Power down and disconnect the upper housing interface cable from Position J4 on the mainboard of the PCM-4. Replace handset with GTE or GTE-compatible handset.
	Defective keypad.	Power down and disconnect the upper housing interface cable from Position J4 on the mainboard of the PCM-4. Replace keypad.

9.4. Microphone

OBSERVATION	CAUSE	SOLUTION
Microphone delays or will not open after called party answers.	Incorrect grounding on transformer, payphone or the 120 VAC receptacle.	Check for proper grounding at those locations. To check the grounding of the transformer (unplugged), use an ohm-meter or a DMM and check resistance between the center tap (C.T.) and ground (G) screw terminals of the transformer. Then, check resistance between the ground screw terminal and the ground pin of the transformer. If both readings are 0-2 ohms, the transformer is grounded. On transformers with a ground strap or jumper wire, a reading greater than 2 ohms between center tap and ground terminals indicates that the strap or wire is damaged or improperly connected. Reconnect or replace wire or strap as required. On transformers with internal grounding, a reading greater than 2 ohms between the center tap and the ground terminal indicates that the transformer's internal ground is faulty. The addition of an external ground strap or jumper wire beneath the center tap and ground terminals may correct the problem. It is recommended that such a transformer be replaced. To check the grounding of the payphone, follow the procedure described in Section 8.1. If the reading is 0-2 ohms, the payphone is grounded. The grounding at the AC outlet can be verified by checking voltage as described in Section 4.2. If all three readings are within the proper ranges, it can be assumed that the AC outlet is grounded. If ground cannot be corrected, install additional ground as follows: Remove the transformer's ground strap or

OBSERVATION	CAUSE	SOLUTION
		jumper wire. In the case of internally-grounded transformers, which lack an external ground strap or jumper, plug the transformer into an adapter plug and plug the adapter plug into the AC outlet. There should be no connection with the ground terminal of the AC outlet in such cases. Lastly, run #14 wire from the ground terminal (G) of the payphone's terminal block to a cold water pipe or ground rod.
	Telephone line has hum, unusual noise, or poor or low transmission and reception qualities.	Check telephone line with a butt-set to determine, and have telephone company correct problem. For noise that is not excessive, such as standard switching noises, voice filters may be effective. Turn on Option 149 and decrease settings in voice filters (answer detect registers, registers 226-228) until an adequate setting is achieved.
Microphone opens during ringback or busyback signals.	Incorrect grounding on transformer, payphone, and or 120 VAC receptacle.	Check for proper grounding at those locations according to procedures previously described. If ground cannot be corrected, install additional ground as previously described.
	Telephone line has hum, unusual noise, or poor or low transmission and reception qualities.	Check telephone line with a butt-set to determine, and have telephone company correct problem. For noise that is not excessive, such as standard switching noises, voice filters may be effective. Turn on Option 149 and decrease settings in voice filters (answer detect registers, registers 226-228) until an adequate setting is achieved.
Microphone transmitting at weak and/or distorted levels.	Hookswitch contacts dirty or corroded.	Power down and disconnect the upper housing interface cable from Position J4 on the mainboard of the PCM-4. Clean the hookswitch contacts with spray contact cleaner. Replace entire assembly if the contacts are corroded.
	Loose connections on wiring from handset receiver to back of keypad.	Power down and disconnect the upper housing interface cable from Position J4 on the mainboard of the PCM-4. Reseat connectors.
	Poor connection of interface cable from upper housing to mainboard.	Reseat connector.
	Defective handset.	Power down and disconnect the upper housing interface cable from Position J4 on the mainboard of the PCM-4. Replace handset with GTE or GTE-compatible handset.
Microphone opens too late.	Answer detect is not sensitive enough.	Turn on Option 149.
Microphone opens before first ringback.	Answer detect is too sensitive.	Turn off Option 149. Set Register 228 at 1. If problem persists, decrease sensitivity by increasing value in Register 228.
Microphone opens during the ring.	Answer detect is too sensitive.	Turn off Option 149. Set Register 226 and/or Register 227 at 1. If problem persists, decrease sensitivity by increasing value in Register 226 and/or Register 227.
Microphone opens after the ring, but before actual call completion.	Answer detect is too sensitive.	Turn off Option 149. Set Registers 226 and/or 227 at 1. If problem persists,

OBSERVATION	CAUSE	SOLUTION
		decrease sensitivity by increasing value in Register 226 and/or Register 227.

9.5. Payphone

OBSERVATION	CAUSE	SOLUTION
Payphone cannot make credit card calls or access a beeper number.	Options 123 and 127 disabled.	Enable (turn on) Options 123 and 127.
	Keypad does not produce consistent DTMF tones.	Ensure that each key of the keypad produces a DTMF tone when pressed. If any key does not emit a tone, use a known good PCM-4 assembly to test. If key still does not produce a DTMF tone, replace entire TCU.
Payphone will not recognize deposited coins.	4-pin Molex connector from the coin chute trigger assembly incorrectly installed to the mainboard.	Reseat connector.
	Coin chute trigger operates incorrectly.	Power down and replace coin chute assembly.
	Dirty coin chute trigger contacts.	Power down and clean the contacts with spray contact cleaner.
Payphone looses information programmed in battery-backed RAM	Other devices are on the 120 VAC line from the breaker box to the AC receptacle.	Remove the other devices or obtain a dedicated AC power line for the payphone.
	Incorrect grounding on transformer, payphone, or 120 VAC receptacle.	Check for proper grounding at those locations. If ground cannot be corrected, install additional ground as previously described.
	Incorrect line voltage.	Ensure correct wiring and correct wire gauge. Refer to Figure 10 for an illustration of transformer to terminal block wiring. Correct wire gauge is 18 AWG for transformer to terminal block distances of up through 25 feet and 16 AWG for distances from 25 through 50 feet. If line voltage is still not within the acceptable 105 to 126.5 VAC range, call the power company.
	Surges, spikes, or excessive noise.	Install surge protector with noise filter.
Payphone does not price calls.	Rating module not installed or loaded properly.	Check to ensure that the rating module is seated properly in the 26-pin jack (Position J1) on the mainboard. Power down and reseat the rating module if it is not installed correctly. If the rating module will not fit due to interference by the outer red case, remove the red case from the module and install the module at Position J1 on the mainboard. If the module is installed correctly, but the payphone continues to not price calls, reload the rating module.

9.6. Radio Interference

OBSERVATION	CAUSE	SOLUTION
Radio Interference	Incorrect grounding on transformer, payphone, or 120 VAC receptacle.	Check for proper grounding at those locations according procedures previously described. If ground cannot be corrected, install additional ground as previously described.
	Improper wiring from transformer to telephone.	Check for correct wire gauge and length, and proper connections. Correct problem. Correct wire gauge is 18 AWG for transformer to terminal block distances up

OBSERVATION	CAUSE	SOLUTION
		through 25 feet and 16 AWG for distances from 25 through 50 feet.

9.7. **Rates**

Incorrect Rates	Spikes or surges from other electrical devices on same line.	Obtain a dedicated AC line or use a surge/noise suppressor between the AC outlet and the transformer. Using the 964 command, reload the rating module. If still incorrect, refer to the Elcotel Customer Service Department.
	Rating module incorrectly programmed.	Refer to the Elcotel Customer Service Department.

9.8. **Receiver**

Handset receiver sounds weak or distorted.	Hookswitch contacts dirty or corroded.	Power down, and disconnect the upper housing interface cable from Position J4 on the mainboard of the PCM-4. Clean the hookswitch contacts with spray contact cleaner. Replace the entire assembly if the contacts are corroded.
	Loose connections on wiring from handset to back of keypad.	Power down and disconnect the upper housing interface cable from Position J4 on the mainboard of the PCM-4. Reseat connectors.
	Poor connection of interface cable from upper housing to mainboard.	Reseat connector.
	Defective handset.	Power down and disconnect the upper housing interface cable from Position J4 on the mainboard of the PCM-4. Replace handset with original GTE handset or with a GTE-compatible handset.

9.9. **Ringer**

Ringer emits erratic or high-pitched tones.	Rating module incorrectly seated.	Remove power and rating module. Ensure that the screw on the rating module is face upwards, away from the center of the board. Reapply power.
	Incorrect installation of auxiliary board to mainboard.	Remove power. Ensure that the auxiliary board is properly installed on the mainboard. Check for bent or broken pins on connectors between the auxiliary board and the mainboard. If installation is incorrect, reseat the auxiliary board to the mainboard. If pins are bent, straighten them before reinstalling. If pins are broken, replace the entire PCM-4 assembly.

9.10. **Transformer**

Transformer gets hot.	More than one phone connected to the transformer.	Disconnect other phone or phones from the transformer.
	Incorrect wiring on transformer and terminal block in lower housing.	Ensure correct wiring: Refer to Figure 10.
	Faulty PCM-4 assembly.	Power down and replace the PCM-4 assembly.

SECTION 10. SPECIFICATIONS

Coin Acceptance:	Nickel, Dime, Quarter
Coin Relay Driver Output:	80 VDC
FCC Registration Number:	E2D507-71426-CX-E
Handset:	Hearing Aid Compatible (HAC). Complies with Part 68 of the FCC Rules.
Housing:	GTE Model 120B (for the Elcotel Models 1200A-4 and 1200R-4)
	Hybrid Model (Elcotel Models 1200D-4 and 1200DR-4)
Housing Dimensions:	21 x 7.625 x 6 inches
Outpulsing:	
DTMF:	On = 100 milliseconds Off = 75 milliseconds
Pulse Dialing:	Fast = 10 pulses/second Slow = 7.5 pulses/second
Payphone Weight:	48 lbs.
Power Interface:	Internal to the payphone. Terminal block and strip connections.
Power Source:	Wall-mounted transformer 16 VA 120 VAC primary 16 VAC center tap secondary
Rates:	Rating module contains area codes and exchanges for call pricing. Rates stored in battery-backed RAM, loaded from EPROM.
Relative Humidity:	Non-condensing, 0 - 95%
Ringer Equivalence Number (REN):	0.4A
Sensitivity:	-35 decibels to 0 decibels
Telco Line Interface:	Internal to the payphone. RJ11C connector-terminated cable and RJ11C jack on printed circuit board.
Telco Line Type:	COCOT (PAL), Loop Start
Telco Loop Current Range:	20mA to 80mA
Telco Loop Supervision:	Busy Tone Dial Tone Incoming Ring Reorder Tones Ringback Tones Special Information Tones (SIT) Voice
Voice:	High Quality digitally-recorded female voice in English

GLOSSARY

AC Alternating Current. An electric current that reverses direction at regular intervals.

Analog Transmission Transmission of data over communication channels in wave form.

Answer Supervision Tests Tests made from the payphone to determine the integrity of the device that detects human voice/call completion

AOS Alternative Operator Service. A non-telco operator service.

Auxiliary Board Also referred to as a piggyback board, it is the printed circuit board which is mounted above the mainboard in the PCM-4 assembly.

AWG American Wire Gauge. Used as the principal American standard for designating the size of wire. The larger the AWG, the smaller the cross-sectional area of the wire.

Backboard A device used as a mount for payphones in certain circumstances, such as when mounting a payphone in a surface-wired location.

Band Four closely-related variables for a particular rate/time group that can be used in pricing exchanges.

Barrier-Free Area An area where there are no obstructions to the wheel-chaired physically-impaired.

Battery DC power source of a telephone system.

Baud A unit of speed in data transmission, such as one bit per second (BPS) for binary signals; however, when each signal element represents something other than a single bit, baud and BPS are not synonymous.

Bit An acronym for binary digit, a bit is the basic data unit in the binary system used by computers. The binary system is a two-state system such as ON and OFF states in switching, and the value of the individual bit is either 1 or 0.

BPS Bits Per Second. The number of bits that can be transmitted in one second.

BOC/ROC Bell Operating Company/Regional Operating Company.

Bong Signal Used in 0+ dialing, the bong signal alerts the user to enter his/her telco credit card number after the tone.

Buttset A test set used to test a telephone line.

Call Completion That point in time when the payphone detects that the called party has answered the telephone.

Call Screening Protects the payphone owner from fraudulent calls by alerting the telco operator that the phone is a payphone and, therefore, not a billable number. In most cases, call screening can be supplied by the telco.

Call Termination That period of time when either the called party or the caller hangs up or the purchased time has expired.

Cashbox The metal container which serves as a receptacle for coins which are accepted as payment for a telephone call.

Cashbox Vault That area in the lower housing which is used to protect and house the cashbox.

CCC Commercial Credit Card.

CCCLDS Commercial Credit Card Long Distance Service.

Central Office Also known as an exchange, the central office, or C.O., is that place where telephone calls are directed, or switched, to the proper communication channel.

Center Tap A construction technique for transformers or coils. Tap is a connection, a way of breaking into or "tapping" a power line. When the line is tapped at the center of the secondary coil, the resulting voltage at that point is approximately one half the voltage of the two legs of the secondary. This is known as a center tap.

Chat Another term for PNM, the Payphone Network Manager software package.

CO Central Office.

COCOT Customer-Owned, Coin-Operated Telephone.

Coin Chute Assembly The unit that channels the coins past the coin detect switches before they enter the coin-relay hopper.

Coin Relay-hopper The assembly that temporarily stores the coins until call completion, when it channels the coins to the cashbox, or, if the call attempt is terminated prior to call completion, it refunds the coins to the coin return receptacle.

Coin Return Receptacle The die-cast receptacle that receives refunded coins and rejected coins and slugs.

Common Carrier A company that performs telecommunication through communication channels.

Communication Channel A medium for carrying data from one place to another; for example, telephone lines, coaxial cables, microwave links, and telegraph lines are types of communications channels.

CPU Central Processing Unit. This is the brain of a computer. It contains the control unit, the arithmetic/logic unit (ALU) for calculations, etc., and the primary storage unit. The CPU for a personal computer or a small computer like the PCM-4 is generally called the microprocessor.

Current A flow of electric charge. Measured in amperes.

D/A Digital to Analog conversion.

DC Direct current. An electric current flowing in one direction only.

Decibel A unit used to express relative difference in power, usually between acoustic or electric signals, equal to ten times the common logarithm of the ratio of the two levels. One decibel (1 dB) is the smallest amount of change in a sound power level that the human ear can detect.

Default A course of action chosen when several alternatives exist but none has been stated explicitly.

Demodulation The process of retrieving data from a modulated carrier wave by means of the conversion of transmitted analog waves to digital pulses at the receiving end of a communication channel.

Dial Housing   A housing mounted on the upper housing. It serves as a mount for the TCU, the TCU terminal board, and the hookswitch.

Digital Transmission   The transmission of data as distinct, non-continuous "on"/"off" pulses.

Disable   To place in an "off" state.

Discount Period   Period of time during which less than the full price of a call may be charged.

DMM   Digital Multimeter. It is used to check grounding and measure resistance and voltage.

DTMF   Dual-Tone Multi-Frequency. The dialing signals produced by a touch call unit (TCU).

DVM   Digital Volt Meter. It is used to measure voltage.

Enable   To place in an "on" state; however, when the "off" or disabled state of a variable, such as an option, enables a feature, allowing it to operate, enabling or placing the variable in an "on" state will actually disable the feature.

EPROM   Erasable Programmable Read-Only Memory. This memory unit can be erased and reprogrammed, but only by being subjected to a special process.

Equal Access   Allows the customer to dial OCCs other than the normal carrier.

Exchange   A telco switching center serving one geographical area. All telephones within the exchange usually share the same schedule of charges. The exchange may include several switches and NXX numbers.

Feature Group   A feature group is a telecommunications network term for the type of access to another carrier, such as an AOS or OCC, or from one telco to another.

Feature Group "B"   950-XXXX access.

Feature Group "D"   10-XXX access.

FCC   Federal Communications Commission.

Frequency   The number of repetitions per unit time of a complete waveform, as of an electric current.

HAC   Hearing Aid Compatible.

Handset   The hand-held unit that contains the receiver and the microphone for the user's voice transmission.

Hookswitch   A switch which is actuated by the removal of the handset from its hanger, in which case the handset is considered to be "off-hook," or by placing the handset back on the hanger or "on-hook." An "off-hook" status signals the TCU terminal board to open the line, returning dial tone to the receiver, whereas an "on-hook" status signals the TCU terminal board to close the line.

Housing   The two-part metal body, or cabinet, of the payphone. All modules and components of the payphone are mounted on and/or encased in the housing.

Hertz (Hz)   A unit of frequency equal to one cycle per second.

InterLATA   A call from one LATA (Local Access and Transport Area) to another. These calls are carried by interexchange companies.

InterNPA Calls from one NPA (Numbering Plan Area, also known as Area Code) to another.

IntraLATA Calls within the same LATA (Local Access and Transport Area). They may be free, toll, or so-called long distance from one area code to another (if within the same LATA). These calls are carried by the local Bell company (BOC).

IntraNPA Calls within the same NPA.

In-WATS Line Inward WATS line. This is a Wide Area Telecommunications Service. It may cover several NPAs. It permits interexchange communication from any station in the national network within the range selected by the subscriber, via an inward WATS dedicated access line. It is available intrastate as well as interstate.

IP Initial Period. The first time period in minutes of a telephone call. It is the period of time during which the initial rate of charge applies.

IR Initial Rate. The price for the initial time period of a telephone call.

IXC Interexchange Company. A company which carries telephone communications from one exchange to another.

K 1024 storage units when referring to a computer's primary storage capacity. An 8K rating module contains 8192 storage units, or bytes. K is also used to designate "one thousand" (eg. 4K resistor = 4000 ohm resistor).

LATA Local Access and Transport Area. A LATA reflects common social and economic communities of interest and does not necessarily correspond with exchange boundaries.

LCO Local Central Office.

LD*OS Elcotel's Long Distance Operator Service AOS.

LDS Long Distance Service.

Loop The local communication path between the central office and the payphone. An electrical current path comprised of one conductor from the CO to the telephone and another conductor from the telephone back to the CO forms the loop.

Loop Start A method used to signal the CO that a calling party has gone off-hook. The CO switching system supplies battery on one side of the line and ground on the other side. When a connection is made between tip and ring at the payphone, current flows through the completed loop that is established.

Lower Housing The part of the housing which contains most of the payphone's modules and components, including the microprocessor, the brains of the "smart" payphone.

Mainboard The larger of the two printed circuit boards in the PCM-4 assembly.

Microcomputer A very small computer; often a special-purpose or single-function computer on a single chip. The PCM-4 is a specialized microcomputer.

Microprocessor The CPU of a microcomputer such as the PCM-4.

Modem Modulator/demodulator. A device that modulates and demodulates signals transmitted over communication facilities. It converts analog waves to digital "on"/"off" pulses, and vice versa. It is usually used when transmitting or receiving data over telephone lines.

Modem Telemetry Telemetry that transmits digital data in analog form over a communication channel. The process requires a modem at each end of the communication channel to modulate digital to analog and to demodulate analog to digital.

Modulation The conversion of digital pulses to analog waves for transmission over a communication channel.

Noise Interference or sound on a line that can be the result of proximity to other lines or electrical devices, transmission of other electrical devices sharing the same line, or, in some cases, the result of telco switching.

NPA Numbering Plan Area. Also known as Area Code, NPA is the 3-digit code for a major North American geographical area such as a State or part of a State. It includes Canada, Mexico, Bermuda, the Bahamas, and Puerto Rico as well as the United States.

OCC Other Common Carrier. A non-telco common carrier such as MCI or US/Sprint

Off-hook Normal off-hook status exists when the handset is removed from the cradle, releasing the hookswitch, and the phone is then connected to the telco phone line. With Elcotel payphones, this is not the case, for connection to the telco line is not allowed until after the correct coinage for initial rate and initial period has been deposited. With Elcotel payphones, there are two types of off-hook situations: (1) Local off-hook status exists when the telephone's handset is off-hook; that is, when the handset is removed from the cradle, releasing the hookswitch. An internally-generated dial tone is sent to the handset. After the user dials the numbers for his call, the payphone's voice requests the amount to be deposited. After the coinage is deposited, the payphone goes (2) off-hook to the central office; that is, connection is made to the telco line.

Owner Bypass Code The 3-digit code used by the payphone owner in order to disable prepay operation, permitting the owner to use the phone without having to deposit coins, and allowing the owner to program and test the payphone.

PABX Private Automatic Branch Exchange. A private telephone switching system that is usually located on the customer's premises. It provides intra-premises exchange telephone service as well as access to the public exchange network and/or private facilities. Local calls and unrestricted trunk calls are made directly by the user.

PAL Public Access Line.

Payphone Network Manager This is the software package, also known as "chat," which is used to remotely control and monitor a network of payphones.

PBX Private Branch Exchange. A private telephone switching system that is usually located on a customer's premises. It is manually operated by an attendant.

PCM-4 Payphone Control Module for the Series 4, or Model 1200-4, Payphone. The Payphone Control Module assembly includes the two printed circuit boards, the microprocessor, and all other items mounted on the printed circuit boards as well as the chassis, which serves as a mount for the circuit boards.

Piggyback Board The printed circuit board which is mounted above the mainboard.

PNM Payphone Network Manager.

Premium Period As opposed to the discount period, this is the period when a telephone call is charged the full amount.

Primary Storage Unit Also known as internal storage, memory, or main storage, it is the section of the CPU that holds instructions, data, and intermediate and final results during processing.

PROM Programmable Read-Only Memory. Read-only memory that can be programmed for special functions in order to meet the unique needs of the user.

Pulse Dialing Also known as rotary dialing. The process breaks the current loop, and the number of times per second that this occurs is equivalent to the digit dialed.

PUN Program Update Notice. This document is the formal acceptance and software release for changes and updates to software.

RAM Random-Access Memory. This memory is accessed and the data submitted to the microprocessor randomly, as it occurs, without having to read preceding file data.

Rating Module EPROM that contains the rate tables, data, and other programmed variables as ordered by the customer.

Register An internal computer component used for temporary storage of an instruction or data; capable of accepting, holding, and transferring that instruction or data very rapidly

Rejector Mechanism A device that accepts genuine coins and rejects others.

Remote Input Input that must be sent to a central computer for processing.

Remote System A system where terminals are connected to the central computer by a communication channel.

Remote Terminal A terminal that is placed at a location distant from the central computer.

REN Ringer Equivalence Number. This is useful to determine the quantity of devices you may connect to your telephone line and still have all of those devices ring when your telephone number is called. In most, but not all areas, the sum of the RENs of all devices connected to one line should not exceed five (5.0).

Resistance The opposition to electric current. Measured in Ohms.

Reverse Battery Supervision A form of answer supervision. The polarity of tip and ring changes when an answer has been accomplished (call completion). Reverse battery supervision is not currently available in COCOTs.

RJ11C The interface used for connecting the telco line to the PCM-4.

ROM Read-Only Memory. The part of computer hardware containing items that cannot be deleted or changed by stored-program instructions because they are hard-wired into the computer.

Service Hanger A device employed for the purpose of keeping the upper housing attached to the lower housing when the housing is open and service is being performed on the payphone.

Silent Line Test number the telco supplies for determining noise on line.

SIT Special Information Tone. This is the three-tone sequence preceding a telco intercept message; for example, the three-tone sequence preceding "THIS CALL CANNOT BE COMPLETED...." etc., is a SIT tone.

"Smart" Payphone A payphone that is capable of normal prepay operation, long distance as well as local, without the assistance of an intervening telephone operator.

SMDR Station Message Detail Record. With Elcotel payphones, this is a detailed report of the last 50 calls. The report includes credit card number or a string of zeros if a credit card was not used, the number dialed, date, time, duration of call, and price of call.

SP Subsequent Period. This is the time period following the initial period of a telephone call.

Spikes Transients that appear on the AC line that exceed the specified voltage of the power company. Usually of a very short duration, as in microseconds.

SR Subsequent Rate. This is the call's price per minute for the time period following the initial period.

Stored Program Instructions Software that operates the PCM-4. Also known as the operating system, it is part of EPROM, and it physically resides in program chips I and II.

Surges Like spikes, but for a longer duration.

Tariff Telco information, including policies, procedures, and price lists for services.

TCU Touch Call Unit. This is the assembly that includes the keys, keypad, and terminal board that is used to generate DTMF tones for such purposes as dialing and payphone programming.

TCU Terminal Board The Touch Call Unit terminal board serves to interconnect the TCU keys, the hookswitch, the handset, and the cable that connects the upper housing to the PCM-4 assembly.

Telco A telephone operating company.

Telemetry The science and technology of automatic measurement and transmission of data by wire, radio, or other means from remote sources.

Terminal Block Mounted in the lower housing, the terminal block is the payphone's power interface, making an electrical connection between wires from the transformer and those from the PCM-4 assembly.

Tip and Ring The two sides of the pair of wires that form the talking circuit of a telephone line.

Tone Dialing Touch call dialing by means of a keypad and DTMF tones.

Transformer The device used to transform or alter AC voltage by either current or phase.

Transparent Mode During this mode of operation, the payphone is connected directly to the telco line without payphone (PCM-4) intervention. It is necessary to use the owner bypass code to enter the programming mode and then enter 960 to enter the transparent mode. This mode allows coin-free calls (although the telco will bill the payphone owner for any long distance calls), line testing, keypad testing, etc.

Upper Housing The part of the housing which serves as a mount for the dial housing and the handset.

VAC Volts of Alternating Current.

VDC Volts of Direct Current.

Variables Meaningful names assigned by the programmer to storage locations. With Elcotel's software, "variable" is the term used to signify any register (option, alarm, etc.), whereas a register is considered to be a location within the Registers Group (200's).

Varistor A device that serves to protect electrical equipment from the effects or surges and spikes. Under normal conditions, the resistance of varistors is very high. When there is a power surge or spike, the resistance of varistors drops sharply, creating a short circuit, and the surge or spike is channelled to ground. When the surge or spike has passed, the circuit returns to normal, and the varistors return to a high resistance state.

Voice Filter In telemetry voice detection, a voice filter allows adjustment of voice detection algorithms, filtering out other sounds (eg., pops on a line).

Voice Instruction Set That part of the EPROM which contains the digitally-recorded telephone operator voice. Accessed by the operating system, this data physically resides in program chip V3. When transmitted through D/A circuitry to the handset receiver, the voice instruction set instructs the payphone user through a normal telephone operator's voice. This instruction set contains all sentences normally used by a telco operator to request payment for a call and to inform the customer of the time purchased in minutes when applicable.

Voice Mailbox A place to which a call is diverted in the event of a busy signal or the absence of an answer. A voice mailbox offers the customer the option to leave a message.

Voice Telemetry Communications with the payphone and the payphone's voice responses are initiated by DTMF tones as opposed to the data transmission of modem telemetry.

Voltage Electromotive force, usually expressed in volts. One volt equals the difference of electric potential between two points on a conducting wire, having a resistance of 1 ohm and carrying a constant current of one ampere, when the power dissipated between the points is one watt. Volts = current X resistance.

White Noise Static interference. It usually sounds like a constant, rushing hiss.

Wink A momentary loss of voltage resulting from CO switching between call termination and the return of dial tone.

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