



**Pocket Reference:
Sentinel™ Series
Model 9000**

9000PR001.1 [699]

Protel Technical Support: (800) 209-8158



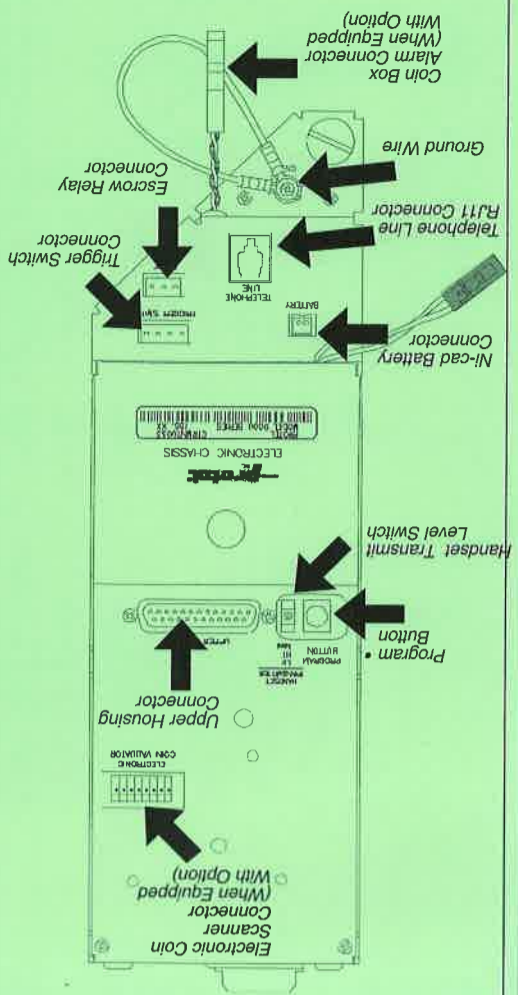
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Make sure all connections pointed out below are properly connected after installing the phone.



Reporting Commands

- Enter the reporting commands on the keypad to have the phone perform the following actions.
- *#1 XXXX **Coin box emptied:** Resets the coin box totalizer in the remote computer. The phone reports to the computer that the coin box is empty. XXXX = the "Coin Collection Security Code" provided by the computer operator.
- *#2 **General reporting status:** Causes the phone to report to the remote computer.
- *#3 **Program update:** Causes the phone to sound (in the handset) the ANI number of the phone, and to call the remote computer for a complete download. This command works only in the program mode. *This command should be used only when performing a new installation, when replacing the firmware on the chassis assembly or when replacing the chassis assembly.*
- *#4XXXX **Coin box totalizer by voice:** Causes the phone to report the value of the coin box totalizer to the phone's handset. XXXX = the "Coin Box Amount Security Code" provided by the computer operator.
- *#5XXXX **Reset coin box totalizer:** Resets the voice coin box totalizer in the phone. XXXX= the "Coin Box Amount Security Code" provided by the computer operator.

- *#6 **Time and date of last update:** Causes the phone to sound the date and time of the last successful phone-computer communication.
- *#61 **ANI verification:** Causes the phone to sound the telephone number that the phone is initialized to.
- *#62 **Firmware/software revision:** Causes the phone to sound its current firmware revision number. One of the following is sounded after the revision:
 "Number One"; firmware is in EPROM chip
 "Number Two"; firmware is in the download chip
- *#64 **Flags currently set in phone's memory:** Causes the phone to sound voice flag codes for the flags that currently set in the phone. See the "Voice Flag Codes" section of the *Pocket Reference*.
- *#65 **Remote reporting number:** Causes phone to sound the telephone number the phone dials to reach the computer.
- *#66 **Option Boards Installed:** Sounds code indicating option boards installed in the phone.

Standard Troubleshooting Process

These are general guidelines for troubleshooting a Prote! phone. Your exact steps may vary depending on the conditions you find at the phone and your level of experience.

1. Physically inspect the phone and components. Fix any obvious problems.
2. Check the error codes and flag codes.
 - a. Come off hook and listen for an error code. Hang up without completing the call.
 - b. Dial a local coin number and listen for an error code.
 - c. Come off hook and dial "*"#64" and listen for a flag code.
3. **NOTE:** Do not perform step 3 before step 2. If you enter the diagnostic mode first, some of the flag codes stored in the phone will be reset.
4. Perform all keypad diagnostics. Use the "Flowcharts Section" of the *Pocket Reference* if there is an error, if there is no dial tone or if you cannot enter the diagnostic mode.
5. See the "Symptoms and Causes" section of the *Pocket Reference*. When you have a set of symptoms but just can't put your finger on the cause, this section will help you pinpoint the trouble.
5. ALWAYS perform your standard company operational test before leaving the site. Also, perform all of the keypad diagnostics.

Error numbers are sounded in the handset when these conditions are detected by the phone.

- = Phone Hardware Related. Troubleshoot the phone.
 - ▲ = Programming Related. Recreate the error & confirm programming with computer operator.
 - = User Error. Recreate the error & confirm programming with computer operator.
- **Error 1 Ram Error** - Phone detected a discrepancy in the RAM checksum. Phone must be reinitialized.
 - **Error 2 Relay Jam** - Phone detected an error with the operation of the escrow relay.
 - **Error 3 ESC I Failure** - Phone detected an error with the operation of the ECS I.
 - **Error 4 ECS II Failure** - Phone detected an error with the operation of the ECS II.
 - **Error 5 ECS II Gate Failure** - Phone detected an error with the he coin accept/reject gate of the ECS II.
 - **Error 6 Key/Card Inactivity** - Handset off hook more than 25 sec. with no keypad or card reader activity
 - ▲ **Error 7 Invalid Speed Dial** - User pressed an unprogrammed speed dial button.
 - **Error 8 Invalid Key Press** - Phone detected a key press that is invalid in the sequence of pressed keys.
 - ▲ **Error 9 Invalid Speed Dial** - The number programmed for the speed dial key pressed is not a valid number.
 - ▲ **Error 10 Volume Control Error** - Volume control using "#" is disabled (Opt. 117).
 - **Error 11 Dialed Digits "11"** - The first two dialed digits are "11." This is an invalid sequence of dialed digits.
 - **Error 12 Equal Access # NG** - User dialed a 10XXX number and then dialed "1."
 - ▲ **Error 13 Coin Call Denied** - User dialed a restricted number. The "Over Time Period" in the Rate Band = "0."
 - **Error 14 User Didn't Pre-Pay** - Phone is programmed for continuous ground line and user didn't deposit enough coins before dialing local No.

Voice Error Messages (continued)

- ▲ Error 15 Card Route NG - The intralata route to be used for this type of call is not configured.
- Error 16 No Answer or Busy - Call was not answered or busy & handset stayed off hook longer than expected.
- ▲ Error 17 Store & Forward Limit - User made a Store & Forward or a Super Collect call and the time limit for the call expired.
- ▲ Error 18 Initial Period Time Out - The initial time period for the call expired and no over time is granted.
- ▲ Error 19 Over Time Expired - The over time period set up for the call has expired (Mode 6).
- Error 20 Insufficient Deposit - Phone did not detect required over time deposit.
- Error 21 Over Time Rate Error - The phone has detected an error in the calculated overtime rate for the call.
- Error 22 Call Rate Error - The phone has detected an error in the calculated rate for an operator assisted call.
- Error 23 Answer Not detected - The phone didn't detect loop reversal to indicate an answer when it expected to.
- Error 24 Collect Call Refused - Called party did not accept the Super Collect call.
- ▲ Error 25 Route Not Programmed - The alternate route to be used for this type of call is not configured.
- Error 26 Call Denied - Card call or international number was dialed and phone is set up to deny this type of call.
- Error 27 Program Mode Error - The program mode access code "100001XXXX" was entered incorrectly.
- Error 28 EPROM Error - The phone detected a discrepancy in the calculated checksum of the EPROM.
- ▲ Error 29 Invalid Speed Dial - The user pressed an unprogrammed speed dial button.
- Error 30 Stuck Key - The keypad has a stuck key or the user pressed a key for too long.
- ▲ Error 31 IXC Not Selected - IXC button not pressed when phone expected it or button is not set up with an IXC code.

Voice Error Messages (continued)

- Error 32 Reporting Error - Phone detected one of the following conditions during a "*#X" reporting attempt.
 - a. Program button was down during attempt to report.
 - b. Too much time passed before "Reporting" security code entry.
 - c. The "Reporting" security code is not programmed in phone.
 - d. 4-digit security code entered at keypad did not match the code programmed in the phone.
- Error 33 Keypress Time-out - The phone expected a keypress and a keypress did not occur.
- Error 34 Invalid Number Dialed - User dialed an invalid PBX code ("0" or "1") or 10-digit 976-XXXX number.
- ▲ Error 35 Invalid Number Dialed - The user dialed either a 1-900 phone number or an invalid area code.
- ▲ Error 36 Invalid Number Dialed - Office code of the 0+ or 1+ 7 digit number dialed is not found in the NXX table.
- ▲ Error 37 Card Group Denied - The cost band used to process the call does not have a route number programmed.
- Error 38 Card Group Denied - The cost band used for the call is set up to deny this call. ["Ovt Period = 0"]
- Error 39 Coin Mech/Relay NG - Coin call denied due to coin scanner failure or relay failure [ECS II Only].
- Error 40 No Coin Deposit - The phone did not detect deposited coins when it expected to.
- ▲ Error 41 IXC Button NG - The interexchange button pressed by the user has not been programmed.
- ▲ Error 42 International No. NG - The user has dialed an invalid international phone number.
- Error 43 No IXC Button Pressed - User did not press and IXC button when the phone expected one to be pressed.
- Error 44 End of the Price Quote - User dialed *0 for price quote of last call & did not hang up after the quote ended.
- Error 45 Coin Gate Failure - ECS II coin gate failed 3 times in a row. This error message is sounded immediately after the third attempt to accept or reject deposited coins.

Voice Error Messages (continued)

- Error 46 Coin Track Failure - Phone detected an error with the ECS's coin track.
- Error 47 ECS Failure - Phone detected error with the operation of the ECS. May be coin track or chassis assembly.
- ▲ Error 48 Incoming Call Denied - The phone has been set up to deny incoming calls.
- ▲ Error 49 Call Denied - Phone is set up to deny calls placed to this destination number.
- ▲ Error 50 Call Denied - Incoming call or coin call was made during a time that the phone is set to deny these calls.
- Error 51 Coin Mech Failure - Phone is not correctly detecting deposited coins (Incorrect coin frequencies).
- Error 52 Feature Group D Rest. - The Feature Group D code (10XXXX) entered is invalid.
- Error 53 Debit Card Error - Unable to debit the required amount from the debit card.
- Error 54 Loop Reversal Restrict - Phone detected loop reversal & is programmed to restrict local & 1+ coin calls.
- Error 55 Opto Coupler Defective - Phone detected an opto coupler hardware failure & will restrict coin calls.
- ▲ Error 56 Destination Number NG. - Phone did not find a match in the valid destination number table.
- ▲ Error 57 Too Few NPA Tables - Phone couldn't find enough tables to assign a cost band number (NANP).
- ▲ Error 58 Too many NPA Tables - The phone determined too many 100-byte tables assigned (NANP).
- ▲ Error 59 No NPA located in tables - The phone could not locate the desired NPA in its database (NANP).
- ▲ Error 60 Range outside limit - The calculated range is outside of the NPA/XXX limit (NANP).
- Error 61 Coin Tone Fraud - The phone detected coin tones generated outside the payphone.
- Error 62 Trigger Switch - The phone detected a stuck coin (nickel, dime, quarter shorted).

Voice Flag Codes

Listed below are definitions of voice codes that may be sounded in the handset by dialing the *#64 reporting command. Only those flags currently set in the phone are sounded in the handset. These flag codes indicate specific operating conditions with the payphones and are normally reported to the computer during polling.

Numeric Code	Flag Code	DESCRIPTION
00	E\$	Coin Box Emptied (*#1): Indicates that the coin box of the phone has been emptied and a repair person reported this information to the computer by entering the reporting command *#1 at the payphone keypad.
01	ST	Status Check (*#2): Indicates that a repair person entered the reporting command *#2 (General Reporting Status) at the phone keypad. This command causes the phone to call the computer and report the details of calls that have been made on the phone since the last time that the phone reported this information. The phone also verifies that the costing and options information stored in the phone is up to date, and if necessary requests a download of costing and options information from the computer.

Voice Flag Codes (continued)

02	PR	Phone Repair (*#3): Indicates that a repair person entered the reporting command *#3 (Program Update) at the payphone keypad. This reporting command causes the phone to call in to the computer and request a download of costing and options information in order to program or reprogram the phone.
03	PC	Peg Count: The number of calls made on the phone is equal to the number specified for the "Inactivity/Completed Calls peg counter" (Screen 2.3 - Options & Registers).
04	\$V	Coin Box Volume Reached: Indicates that the volume of coins in the coin box has reached the percentage (%) full programmed for the payphone to report (Screen 2.3 - Options & Registers). The coin box should be emptied at this time.
05	RE	Ram Error: Indicates that an error was detected in the RAM used for storing costing and options information. Fix: Poll the phone. If this flag does not reset, the RAM or the chassis assembly must be repaired.
06	RJ	Relay Jam: Indicates that the coin relay is not operating properly. Possible causes are a stuck coin, faulty trigger switch, faulty coin relay or faulty circuitry on the chassis assembly. Fix: check for stuck coin; stuck relay; or bad relay connections.

Voice Flag Codes (continued)

07	LR	Loop Reversed: Indicates that the tip and ring wires connected to the phone are reversed.
10	VE	Coin Box Volume Error: Indicates that an error was detected in the coin box volume percentage reported to the computer. Fix: Have the technician empty the coin box and use the *#1 reporting command [Coin Box Emptied]. If this flag does not reset, the chassis assembly must be repaired.
11	\$E	Coin Total Error: Indicates that an error was detected in the non-resettable coin totalizer in the phone. Fix: Poll the phone. If this flag does not reset, the RAM or the chassis assembly must be repaired.
12	TE	Resettable Coin Totalizer Error: Indicates that an error was detected in the "amount to date" reported to the computer. Fix: Poll the phone. If this flag does not reset, the RAM or the chassis assembly must be repaired.
13	BE	Box Amount Error: Indicates that an error was detected in the "coin box amount" totalizer. The "coin box amount" reported to the computer may not be accurate. Fix: Have the technician empty the coin box and use the *#1 reporting command [Coin Box Emptied]. If this flag does not reset, the chassis assembly must be repaired.

Voice Flag Codes (continued)

14	OE	Over Charge Memory Error: Indicates that an error was detected in the "overage amount" [amount deposited was more than the amount charged] reported to the phone. Fix: Poll phone. If flag doesn't reset, the RAM or the chassis assembly must be repaired.
15	AE	Accounting RAM Error: Indicates that an error was detected in the RAM used for call accounting. The information received from the phone may not be accurate. Fix: Poll the phone. If this flag does not reset, the RAM or the chassis assembly must be repaired.
16	CL	Billing CDR Limit Reached: This flag indicates that the number of Store & Forward calls made on the phone is equal to the number of calls specified in the option labeled "Number of Billable CDR Records before Reporting." (Screen 2.3 - Options & Registers)
17	CF	Billing CDR Full: This flag indicates that there have been 52 Store & Forward calls made on the phone and the call detail records for these calls have not yet been transferred to the computer. The Store & Forward records must be reported to the computer, and the Store & Forward call counter must be reset before the phone will allow any further Store & Forward calls.
21	\$F	Coin Box Full: Indicates that the volume of coins in the coin box has reached 100 percent. The coin box must be emptied to reduce the possibility of coins becoming jammed.

Voice Flag Codes (continued)

22	CG	Coin Gate Failure: Indicates that an error was detected with the operation of the collect/refund gate of the Electronic Coin Scanner II. This may be caused by a jam or failure in the coin gate circuit. Fix: replace ECS.
23	DE	Inactivity: This flag indicates that the payphone did not see deposited coins on ten consecutive attempts to process a call. This flag is automatically reset once a coin call is completed.
24	ME	Coin Mech Error: Indicates that a failure was detected with the operation of the Electronic Coin Scanner or associated circuitry. Possible causes: defective ECS, defective interconnect cable or chassis.
25	TR	Time Report: Indicates that the payphone has reported in to the computer during the "Remote Reporting Time." (See Screen 2.3 - Reporting Options).
26	NE	Audit CDR Error: Indicates that an error was detected in the data of the non Store & Forward call detail records (CDR) received from the phone. The records received from the phone may not be accurate. Fix: Contact your distributor or Protel for assistance. If this flag does not reset in the phone, the chassis assembly must be repaired.

Voice Flag Codes (continued)

27	CE	Billing CDR Error: Indicates that an error was detected in the Store & Forward call detail records (CDR) stored in the phone. The information transferred to the computer may not be accurate.
30	LB	Low Battery: Indicates that the chassis assembly detected that the voltage of the ni-cad battery is low and that the battery is in the process of being charged. Fix: If this flag reoccurs, replace the battery and test the incoming line for proper current and voltage.
34	HO	Handset Off Hook: Indicates that the handset was left off hook with no activity for approximately 15 minutes. Fix: check hookswitch operation.
36	LA	Lower Alarm: Indicates that the coin box was removed from the phone.
37	HG	Handset Gone: Indicates that there is improper resistance of the handset receiver. The handset may be missing or defective/incorrect wiring. Fix: check wiring, replace handset or chassis assembly.
40	NF	Audit CDR Full: Indicates that the number of non card CDR records stored in the phone is at maximum (500). This information should be transferred to the computer.

Voice Flag Codes (continued)

44	BG	Bad Ground: This flag indicates that the phone made four unsuccessful attempts to detect a collect or refund signal from the central office. This flag is reset after the phone successfully detects a collect or refund signal from the central office.
45	CR	Clock Reset: This flag indicates that the date and time in the phone has been reset due to a power-on reset condition.
46	EE	EEPROM Error: Indicates that the program stored in EEPROM within the payphone is corrupt. Replace EEPROM Chip(s).
47	TG	Trouble Gone: Indicates that a previously reported relay jam condition has cleared itself.
50	OC	Opto-Coupler: This error flag indicates a collect/refund hardware failure in the phone.
51	BR	Box Removed: This flag indicates that the coin box was removed from the phone during a time that is other than during the active coin box removal window.
52	RR	Relay Refund: This flag indicates that there is a problem with the escrow relay's refund function. This flag will become set if the phone makes six consecutive unsuccessful attempts to refund coins.

53	RC	Relay Collect: This flag indicates that there is a problem with the escrow relay's collect function. This flag will become set if the phone makes six consecutive unsuccessful attempts to collect coins.
54	SN	Silicone Ser #: This flag indicates that the phone detected a change in the serial number associated with the add-on board that is installed in the phone.
55	BM	Box Missing: This flag indicates that the coin box has been missing from the phone for at least 15 minutes.
56	DI	Dial Inactive: This flag indicates that the handset came off hook X number of times without a call ever getting to the point of call cut-through (phone dialed out, and transmitter/receive turned on). The value of X must be specified in the option labeled "Peg Coin/Inactivity" in the Options & Registers section of the payphone management system software. (Screen 2.3)

Diagnostics Procedures

These tests may be used to verify proper operation of the hardware components of the phone and should be performed at the time of installation, after the phone has been initialized, and when troubleshooting the phone. If a diagnostic test fails, use the flowcharts that follow this section to troubleshoot the phone.

- **Entering the Diagnostic Mode** Enter program mode and then dial [9] (pause) [0] (pause) [2] (pause).
- **Keypad Test** Press each key except [*] for voice verification (in handset) of the pressed key. Speed dial keys results in "81," "82," etc. sounded in the handset.
- **Coin Recognition Test** Each coin deposit results in voice verification to handset.
- **Escrow Relay Test (Refund)** Deposit coin, dial [*] [1], voice prompt = "Refunding," coin returns.
 (Collect) Deposit coin, dial [*] [2], coin is collected by phone.
 [Failed] - Two beeps sound in handset.

Diagnosics Procedures (continued)

- Loop Polarity Test Dial [*][3]. If tip & ring are properly connected, voice prompt sounds "Thank you."
 [Failed] - Warble tone in receiver means tip & ring are reversed or loop current from C.O. is not detected by phone.
- Alarm Switch Test Coin box removal results in bong tone. (Must have the optional alarm installed.)
- Coin Ground Test Deposit coin, dial [*][4], money in escrow is refunded (coin line only).
 [Failed] - Voice prompt "Error" sounds in handset. Two beeps indicate a bad relay.
- Exiting the Diagnostic Mode Dial [*][#] to exit diagnostic mode. Three beeps are sounded in the handset.

Cannot Enter Diagnostic Mode

