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INSTALLATION AND OPERATION MANUAL FOR

### **APLEX MODEL 3100E**

100-ZONE, SINGLE-AREA  
SUBSCRIBER'S CONTROL PANEL

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SOFTWARE: A1E250/L1100E66

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## GENERAL INFORMATION

The APLEX Model 3100E is a microprocessor-based, subscriber's control panel that can monitor a maximum of 100 zones. These are connected to the panel via line encoder modules (LEMs) using a 3-conductor, multiplex cable that should not exceed 2 km in length. Time-division multiplexing is used to sequentially interrogate each protection point. The panel has been designed to display extensive information in a way that can be quickly interpreted by the user.

The APLEX Model 3100E control panel accommodates one Master user code, one Service user code, and up to 248 general user codes. The user's name can be entered and will be printed on the log output. The extent of access to the system for each general user is determined by the Master user who selects, from a list, the options allowed the general user. In addition, an alarm log is maintained showing date, time, and event descriptions of the last 600 events.

The system has 19 pre-assigned outputs, the first 7 of which are available directly from the panel and the remaining 12 from C-LEMs or COMBO LEMs.

This manual describes the installation and operation of the APLEX Model 3100E with software version A1E259/L1100E66. If you are presently using an earlier version of software, you may obtain an update. Contact the factory for further assistance. Software version numbers are displayed in two parts. The first part identifies the main operating software version (e.g., A1E250) and the second part identifies the literal file (e.g., L1100E66).

L **Note:** The L icon in the margin signifies a new function or option or one that has changed from the previous manual.

## KEYBOARD AND KEYBOARD SECURITY

An important feature of the APLEX control panel is the membrane keyboard on the cabinet exterior. The user can enter a letter, character, number, or one of many important functions or modes directly into the system. There are 20 keys on the keyboard, 19 of which have 3 letters, characters, or numbers. This allows for 57 different selections on the keyboard, plus 5 predefined operating modes (e.g., fully armed, part armed, etc.).

Special attention has been given to prevent unauthorized access to the panel via the keyboard. If one or two incorrect codes or function or mode selections are entered, the message **\*\* INVALID ENTRY \*\*** will be displayed each time and no action will be taken. As well, if 90 seconds elapse after the start of the first or second incorrect attempt, the display will show **CODE ENTRY TIME-OUT**. If an entry is not completed within that 90-second period, it will also be counted as an incorrect entry and the display will show **CODE ENTRY TIME-OUT**. On the third incorrect attempt, the alert message **\*ID SECURITY ALERT\*** will be displayed and a full alarm will occur if the system is in the fully armed mode. The incorrect-entry counter is reset after a valid code, function, or mode is entered.

## GENERAL INFORMATION cont.

### CABINET

The metal cabinet is made from 18-gauge sheet steel. The door is hinged on the left and secured at the right with two fixing screws. A terminal-strip identification label on the inside of the door provides a quick reference for the installer or serviceperson.

### MODULES

Model 1020 Dual Line Encoder Modules (D-LEMs), Model 1024 Quad Line Encoder Modules (Q-LEMs), Model 1101 Command Line Encoder Modules (C-LEMs), and Model 1121 and 1166 Combination Line Encoder Modules (COMBO LEMs) may be placed in any order at any position on the network. No remote power is required by the D-LEMs or Q-LEMs; however, **the APLEX 12-volt DC auxiliary power must be used to power the C-LEMs and COMBO LEMs**, and may also be used to power other devices such as PIRs. If you are using D-LEMs and/or Q-LEMs mixed with COMBO LEMs and/or C-LEMs, we recommend **two runs of 22-gauge, "telephone-style" quad wire** (one quad supplying LEM data and the other quad **paralleled** to supply 12-volt DC power). The network of D-LEMs, Q-LEMs, and COMBO LEMs is scanned twice in one second to determine if any changes have occurred. This double pass minimizes the effect of external interference from lightning, static electricity, and inductive load switching (e.g., motors, fluorescent lamps, etc.).

When choosing a location for the LEMs, avoid any areas exposed to **condensation** (e.g., where snow or rain could enter around doors, windows, eaves, or attics; steam tables in restaurants; etc.). Condensing moisture of any amount will cause tamper or disconnect alarms to be created. If a LEM has to be in such an environment, then **it must be installed in a weatherproof housing**.

## KEYBOARD

An important feature of the APLEX control panel is the 20-key alphanumeric keyboard. In addition to the numbers 0 to 9, special keys allow access to certain functions and modes, as well as accessing letters and characters of the alphabet. These special keys are described below in the normal **non-shifted** mode:

A            ! YES !
----------------------------

Used to acknowledge YES to an alarm condition or to confirm an option as displayed. Also causes the cursor to FORWARDSPACE.

B            : NO X
---------------------------

Used to acknowledge NO to an alarm condition, to reject an option as displayed, or to eXit the current function. Also the letter "X".

C            . DISARM +
-------------------------------

Selects DISARM mode or increments a value. Also the character "+".

D            , PART ARM 1
---------------------------------

Selects PART ARM 1 mode or decrements a value. Also the character "-".

E            ' PART ARM 2
---------------------------------

Selects PART ARM 2 mode. Also the character "\*".

F            G FULL ARM /
---------------------------------

Selects FULL ARM mode. Also the character "/".

H            ? HELP =
-----------------------------

Provides HELP by listing the available options. Also the character "=".

SHIFT/ DELETE
------------------

SHIFTS all keys to the letter or character at the upper left or upper right, or the character or number below as indicated by the position of the cursor (V). When pressed continuously, it will DELETE characters.

U            V 2
---------------------

Causes the cursor to BACKSPACE.

Ⓐ(SPACE) % RETURN
----------------------

Completes an entry; ends a description; etc. Same as carriage RETURN on a typewriter. (The upper left character is a space bar.)

## KEYBOARD cont.

The keys described above will be referred to in this manual by the names shown in the left-hand column on the previous page. The cursor is normally a flashing  $\wedge$  symbol. In normal operation, when the cursor is pointing up, the number or phrase in the centre of a key is chosen when that key is pressed. If the SHIFT/DELETE key (generally referred to as the SHIFT key) is pressed once, the cursor changes to a  $<$  symbol and the upper, left-hand letter or character of each key is available. For example, in the case of the NO key, this is a "B" and, in the case of the RETURN key, it is a space, designated by the space bar symbol. This cursor mode is called LEFT SHIFT. Pressing the SHIFT key a second time will change the cursor to a  $>$  symbol and the upper, right-hand letter or character is then available. This is a ":" in the case of the NO key and "%" in the case of the RETURN key. This cursor mode is called RIGHT SHIFT. Pressing the SHIFT key again will return the cursor to a  $\wedge$  symbol and each key will have its original meaning. In text- entry mode, when the cursor is pointing up, the bottom character on non-numeric keys (e.g., +) becomes available instead of the operating phrase (e.g., DISARM). If you examine the layout of the keys, you will see that the letters used most often are available in left shift. This is convenient for zone-description entry as most descriptions can be completed without having to shift between characters. Because the keyboard has non-tactile keys, an audible feedback (a short beep from the piezo-sounder) confirms each operation of a key.

All keys have an autorepeat capability. If a key is pressed for longer than one second, the panel will generate about four duplicate characters a second until the key is released. The SHIFT key operates differently. If pressed for longer than one second, it will **delete** characters at about half the normal repeat rate. This is used when editing to delete errors made during zone-description entries, name entries, etc. **To correct an error**, ensure that the flashing cursor is pointing up. Press the BACKSPACE ( $\text{^}$ ) key to position the cursor over the error. Press and hold the SHIFT key to delete the incorrect character or characters, reposition the cursor and enter the correct character or characters (these will appear on the display, automatically moving the rest of the entry to the right), and use the YES key (in normal shift) to move the cursor right (forwardspace) to continue.

To summarize the editing functions:

- BACKSPACE: Cursor in normal shift; press BACK SPace key.
- DELETE: Press and hold SHIFT/DELETE key.
- FORWARDSPACE: Cursor in normal shift; press YES key.
- SPACEBAR: Cursor in left shift; press RETURN key.

The keyboard, made from high-grade polycarbonate, is very durable and can easily be cleaned with a damp cloth. Although firmly attached with contact adhesive, the keyboard can be peeled off if it is damaged without having to replace the cabinet.

## OPERATING CONVENTIONS

The following is a brief summary of how to select a function or mode, how to perform various functions, and how to exit from a selected function or mode.

### FUNCTION OR MODE SELECTION

L To execute *any* function or to select any mode on the panel, you need to do two things: first, identify yourself and, second, tell the panel what you want to do. To identify yourself, enter your four- or five-digit user code on the keypad. If you are using a four-digit code even though the five-digit option has been chosen (see SET IDS/OPTIONS, page 47), you must remember to press the RETURN key to complete the entry. For security reasons, the display will not show the numbers entered but instead will display a \* for every digit. To tell the panel what you want to do, enter a single character or number corresponding to the function or mode required. If you are allowed access to this option, the entry will be accepted. If you do not know the command character for the function or mode you want, enter your user code and press the HELP key. The panel will list the options available to you.

### ANSWERING A QUESTION

When the panel requires a yes or no reply to a question, it displays a flashing ?. For example: **QUIT ?** - The panel is asking if you want to quit (exit) the present operating function or mode. To answer yes, press the YES key. To answer no, press the NO key.

### ENTERING A NUMBER

When the panel requires a numeric entry, the display will usually indicate what is required. For example: **SHUNT ZONE 0** - A flashing cursor symbol indicates where the digits are to be placed. Type in the required number. If a number has been entered in error, press the BACKSPACE key to return the cursor to the incorrect number and then enter the correct number in its place. Press the RETURN key to complete the entry. To exit a numeric-entry routine without entering a number, simply press the NO key.

### SUB-MENUS

Certain functions and modes display a flashing message showing three choices, each separated by dashes. In such cases, the required choice is selected by pressing the key directly under the word in the display. For example: **IDS--OPTIONS--NAMES** - Press the DISARM key to select **IDS**, the PART ARM 2 key to select **OPTIONS**, and the HELP key to select **NAMES**.

### MESSAGES

Flashing alert messages (e.g., **\*\*\* FIRE ALARM \*\*\***) can only be removed by using the ACKNOWLEDGE ALARMS function (see page 40). WARNING messages (e.g., **AC POWER FAIL**) will disappear when the cause is removed.

## INSTALLATION PLANNING GUIDE AND CHECKLIST

Installation of the system involves mounting and wiring the control panel, configuring the system, and finally performing a thorough system test. The various steps involved are outlined below.

First-time users are well advised to configure a simple system on the bench using one or two LEMs to become fully familiar with the operation of the APLEX control panel's features before attempting to install a system at a site.

### 1. MOUNT THE PANEL AND WIRE THE SYSTEM

Read the section on pages 8 and 9 describing the mounting of the panel and wiring of the system. This section contains important information concerning cable type and length, LEM location, and various other installation rules and restrictions.

### 2. CLEAR THE PANEL MEMORY

The panel's memory should be cleared (COLD START/ZAP) **if it is being powered up for the first time**. Clearing the memory will set all values to their default factory settings. Some companies prefer to program the panel before taking it to the installation site. In this case, the memory should not be cleared at the site.

### 3. INITIALIZE THE LEMS

When all the LEMs are connected and the wiring has been checked, you may now have the panel perform a check of the LEM line and a count of the number of zones (two per D-LEM or COMBO LEM or four per Q-LEM) that it sees responding. This process is referred to as LEM-LINE INITIALIZATION and is described on page 35. If the system shows **ILLEGAL LEM NUMBER**, or **ON-LINE 0 --> 0**, or something similar to **NIGHT 3 = 22**, then refer to page 36.

### 4. CHECK LEM ANALOGUE VALUES

Select the SERVICE MODE mode (see page 43) and then the SINGLE-ZONE MONITOR option. Check the analogue values for all inputs on the system. Refer to page 46 for details on the analogue values. If the analogue values are incorrect, refer to page 45 for help with trouble-shooting.

### 5. SET ZONE DESCRIPTIONS, ZONE TYPES, VARIABLES

Refer to page 49 and select the ASSIGN ZONES/VARIABLES function. This function allows a text description of each zone to be entered, allows each zone number to be assigned a zone type (e.g., EXIT, NIGHT, PANIC, etc.), and allows all the system variables to be set (e.g., Exit Time, Bell Run Time, etc.).

## **INSTALLATION PLANNING GUIDE AND CHECKLIST cont.**

### **6. SET USER IDENTIFICATION CODES, OPTIONS, NAMES**

- L The system can have up to 248 general users. Each user can be assigned an identification (ID) code and his or her name can be stored in the panel. In addition, every user can be assigned any number of system options, including arming, disarming, shunting, setting the time, etc. Refer to page 47 for details on this function.

### **7. SET DATE AND TIME**

Refer to page 60 for instructions on setting the date and time.

### **8. PRINT REPORTS**

When the system is fully configured, a complete system report should be printed. This gives a full record of the installation and prints all variables, user options and names, a list of any program changes (literals), an on-line zone report (zone descriptions and types), and then the system log. It is important to produce two copies of this report, one for your own records and one for the customer. Refer to page 54 for further details.

### **9. WALKTEST THE ENTIRE SYSTEM**

This test should be done with a printer connected to the panel. A printed record of the test will then be obtained and a copy may be given to the customer. The object of the walktest is to trip every zone on the system and to confirm that the panel receives the activation. Refer to the WALKTEST option in the SERVICE MODE mode on page 44 for further details.

### **10. CHECK SYSTEM OPERATION**

The system may be connected to a central/monitoring station. In this case, the system should be armed, a zone tripped, and then the system disarmed. The central/monitoring station should be contacted to ensure that the relevant signals were received. If a dialler is used, all conditions being monitored should be activated (e.g., fire, holdup, etc.) to verify correct operation.

All system outputs being used, including C-LEMs and COMBO LEMs, should be tripped and reset to verify correct operation. Refer to the RELAY/C-LEM TEST function on page 54 for further details.

## MOUNTING THE PANEL AND WIRING THE SYSTEM

Locate the panel in an area that has convenient access and then fasten the panel securely to a wall at about chest height. Six mounting holes are provided. The keyholes at the top allow initial positioning and levelling. The panel can then be secured at the remaining holes using suitable screws and anchors.

If a communicator module is required, it may be installed to the right of the printed circuit board or underneath it by using double-sided foam tape. If it is to be located underneath the main board, prewire the terminal screws of this module with 6- to 10-inch wires and preset any switches or install any EPROMs because the module will be hidden beneath the APLEX printed circuit board. To remove the APLEX printed circuit board from the panel, proceed as follows: First, unplug the keyboard connector. Avoid pulling it by the ribbon cable; **to loosen it correctly**, lever the blue connector plug to the left with a small, flat-blade screwdriver and then pull it free from the header pins. The printed circuit board is secured by six nylon mounts. Squeeze the out-flanged arm of each nylon mount with a pair of needle-nose pliers and gently pull up on the board. To remount the printed circuit board, gently press each clearance hole onto its nylon mount. To determine which outputs could be connected to the module, refer to the terminal-strip designation chart on page 10 and the relevant operational characteristics on pages 11 and 12.

### LOCAL MULTIPLEX TELEMETRY CABLE (LMTC) - LEM LINE

The APLEX Model 3100E subscriber's control panel allows for the direct connection of zones 1 through 4. To add zones 5 through 100 requires the addition of a Local Multiplex Telemetry Cable (LMTC), more commonly known as a LEM line, and the installation of either up to six D-LEMs or COMBO LEMs or alternatively, two D-LEMs or COMBO LEMs and two Q-LEMs. The LMTC requires only **three** conductors for proper operation. C-LEMs, COMBO LEMs, and Model 3220/3230 remote keypads require an extra source of DC power in addition to the LEM-line connection. Normally, two "telephone-style" quad wires or a 6-conductor, mixed-gauge cable should be used. One quad wire is used for LEM signals, while the second quad wire or the extra conductors in the multi-cable can be used to supply auxilliary DC power from the panel. This auxilliary power source **must be used** to operate the C-LEMs and/or COMBO LEMs, and may be used to supply DC power to operate PIRs, etc. The extra conductors in the multi-cable **must not** be used for AC power or for DC power to disruptive loads like mechanical bells or strobelights. A network of up to 2 km of **unshielded cable**, consisting of the trunk cable connecting the panel to the furthest LEM and *including the length of the single longest zone loop*, can be supported. It is good practice to double up the LEM negative (-ve) wire. Connect the spare fourth wire in parallel with the wire selected as LEM negative to reduce the resistance

L value. **THIS PRACTICE IS MANDATORY IN LARGE SYSTEMS TO ALLOW PROPER INITIALIZATION OF THE ZONES!!** If shielded cable is used, only about half the length of LEM-line cable can be installed because of excess **cable capacitance**.

## MOUNTING THE PANEL AND WIRING THE SYSTEM cont.

### WIRING

Zones 1 through 4 are "home-run" wired to the panel. Zones 5 through 100 are connected using D-LEMs, Q-LEMs, or COMBO LEMs. Refer to page 13 for a drawing of how a door contact, PIR, etc., is wired to a zone input. Connect zone 1 to terminals 19 (input) and 20 (common negative), zone 2 to terminals 21 (input) and 20 (common negative), zone 3 to terminals 22 (input) and 23 (common negative), and zone 4 to terminals 24 (input) and 23 (common negative). If you require more than four zones, you will need to install a LEM line. Since zones 1 through 4 are directly connected, you may use a D-LEM for zones 5 and 6, and D-LEMs, Q-LEMs, or COMBO LEMs for zones 7 through 100. Based on this allocation, determine whether it is more economical to install D-LEMs or Q-LEMs given the number of zones required versus the cost of either LEM unit. The D-LEM is recommended for zones 5 and 6 because the lowest address Q-LEM services zones 3, 4, 5, and 6. Since zones 3 and 4 are already directly connected, the use of a Q-LEM in this situation would waste two zones as you cannot have zones 1 through 4 connected on a LEM line. (See the Q-LEM Coding Table on page 26.)

For additional wiring information, refer to page 13 for the D-LEM, page 22 for the C-LEM, pages 20 and 21 for the Q-LEMs, and page 24 for the COMBO LEM. Ensure that all covers are installed on the LEMs. Connect a 16- to 18-volt, 30-va transformer to terminals 34 and 35. Connect a 12-volt, 6-AHr minimum, standby battery to the flexible leads provided. **WATCH POLARITY!!** Connect the red lead to the standby battery positive (+ve) post and the black lead to the battery negative (-ve) post. At this time, the panel will automatically start up and will probably stop when the display shows **ENTER NAME/ADDRESS ?**. You may now proceed with the powering up of the panel. Refer to page 34.

### SERVICING THE PRINTED CIRCUIT BOARD

To remove the printed circuit board for service, disconnect the red positive (+ve) battery lead from the standby battery, disconnect the AC source from terminals 34 and 35, and then carefully lever up each terminal strip with a thin, flat-blade screwdriver. Remember **always** to remove the positive (+ve) battery lead and power from terminals 34 and 35 before attempting to lever off terminal strip 3. Do not unplug the keyboard connector by pulling it by the ribbon cable. **To loosen it correctly**, lever the blue connector plug to the left with a small, flat-blade screwdriver and then pull it free from the header pins. The printed circuit board is secured by six nylon mounts. Squeeze the out-flanged arm of each nylon mount with a pair of needle-nose pliers and gently pull up on the board. To remount the printed circuit board, gently press each clearance hole on its nylon mount, push the blue connector plug onto the 9-pin header, and then squeeze the 12-pin terminal strips back onto the header pins.

## TERMINAL CONNECTIONS

TERMINAL	OPERATION/FUNCTION
1	Remote Buzzer -ve Switch
2	+12 VDC (Fused at 1.25 amp, Fuse F2)
3	Output 3 +ve Switch (Clear To Arm)
4	Output 4 +ve Switch (System Armed)
5	Output 5 +ve Switch (Fire Trouble)
6	Output 6 +ve Switch (System Fault)
7	Relay 7 N/O
8	Relay 7 Common (Timed Bell Cut-off)
9	Relay 7 N/C
10	Relay 2 N/O
11	Relay 2 Common (Fire Alarm)
12	Relay 2 N/C
13	Relay 1 N/C
14	Relay 1 Common (Intrusion Output)
15	Relay 1 N/O
16	Aux. 4 Input (Cabinet Back Tamper N/O) <b>Affects keyboard!</b>
17	Aux. 4 Common
18	<b>DO NOT USE.</b>
19	Zone 1 Input
20	Common (-ve)
21	Zone 2 Input
22	Zone 3 Input
23	Common (-ve)
24	Zone 4 Input
25	LEM-Line -ve <b>Do not use as -ve for anything else!</b>
26	LEM-Line Clock
27	LEM-Line Data
28	0 VDC (Power -ve)
29	0 VDC (Power -ve)
30	Standby Battery -ve (Black wire)
31	Standby Battery +ve (Red wire, Fuse F1, 13.5-13.8 VDC)
32	12 VDC Aux. Power +ve (Fuse F2)
33	12 VDC Aux. Power +ve (Fuse F2)
34	AC Input (16 VAC, 30 VA)
35	AC Input (16 VAC, 30 VA)
36	Earth/Water-Pipe Ground
Comms Terminal Strip	<b>Reads bottom up.</b> (J Strip designations reference older PCBs.)
40/J24	RX Data or Printer-ready handshake
39/J23	TX Data (Prntr. = 1200 Baud, 7 Data bits, Even parity)
38/J22	+12 VDC (Not fused, Direct connect to bat. +ve!!)
37/J21	-ve (Signal ground)

## NOTES CONCERNING THE TERMINAL CONNECTIONS

Terminal 1 is a switched-negative output. Whenever the panel piezo-sounder is beeping, a quad Darlington-transistor integrated circuit (ULN 2004) switches to negative any load (remote buzzer, lamp, relay, etc.) connected to these terminals. To prevent the failure of this transistor switch, a 27-ohm, 2-watt current-limiting resistor is connected in series with this terminal. Should a short circuit occur in the load connected to terminal 1, all of the supply voltage is developed across this resistor, protecting the transistor switch. As a result, the useful amount of current available to operate the buzzer, lamp, relay, etc., is limited to approximately 100 ma. Terminal 2 is a convenient, fused, 12-volt DC source that can be used to provide positive power for the buzzer, lamp, relay, etc.

Terminals 3, 4, 5, and 6 are switched-positive outputs. Similar to the integrated circuit of terminal 1 above, a quad Darlington-transistor integrated circuit (54563) will switch 12 volts DC, therefore **sourcing** power to a load. As above, in series with each of these terminal screws, there are 27-ohm, 2-watt resistors to limit the current to approximately 100 ma. Should the load require more current, the output terminal voltage will drop below 10 volts.

Terminals 7 through 15 are standard Form C contact relays with a 2-amp, 24-volt DC resistive load rating.

Terminals 16 and 17 can be used, only if necessary, to connect a normally open back tamper switch to detect removal of the panel from the wall. This input, when operated, affects the keyboard! **Do not extend wiring leads from the panel!**

Terminal 18 is not used.

Terminals 19, 21, 22, and 24 are the inputs for zones 1 through 4 respectively. These are 2-wire, twin-resistor, EOL circuits connected to common terminals 20 and 23.

Terminal 25 is the LMTC (LEM-line) negative and **must not be used as a negative return** for any other applications. An excessive voltage drop (millivolts) could result, thereby causing the LEM data to be incorrectly decoded.

Terminal 26 is the LMTC (LEM-line) clock line providing a continuous train of nominally 9-volt pulses for use by the LEMs.

Terminal 27 is the LMTC (LEM-line) data line returning a series of nominally 6-volt pulses from the LEMs to be decoded by the panel.

Terminals 30 and 31 are used to connect the standby battery negative and positive respectively. Flexible wires terminated with Faston lugs have been provided. Connect the red lead to the positive (+ve) post and the black lead to the negative (-ve) post. **Watch the polarity. A zener diode on the panel will fail short circuit if the polarity is reversed! No extra chances!!**

## NOTES CONCERNING THE TERMINAL CONNECTIONS cont.

Terminals 2, 32, and 33 provide an auxilliary 12 volts (actually 13.6 volts) DC, fused at 1.25 amp, used for powering C-LEMs, COMBO LEMs, remote keypads, PIRs, ultrasonics, etc. Should this fuse fail in service, we recommend replacing it with a 2.0-amp fuse. Replacement fuses can be obtained from electronic wholesalers or retailers carrying the BUSSMAN or LITTLEFUSE line (BUSS product code GMA 2, or LITTLEFUSE 211.2).

Terminals 34 and 35 are used to connect a 16- to 18-volt AC, 30-va minimum transformer.

- L Terminal 36 **must be connected** to a cold-water pipe or Hydro ground using a heavy-gauge wire (18 ga. or 16 ga.) routed over the shortest possible distance. **A solid, direct connection is essential for effective operation of the lightning-protection devices on the printed circuit board.**

### COMMS TERMINAL STRIP/J TERMINAL STRIP

The Comms terminal strip, or J terminal strip as it was designated on earlier revisions, is used for telecommunications. **Please notice that it reads from the bottom up.**

Terminal 37/J21 is a signal ground (-ve). Connect this terminal to pin 7 (signal -ve) on a serial-input printer.

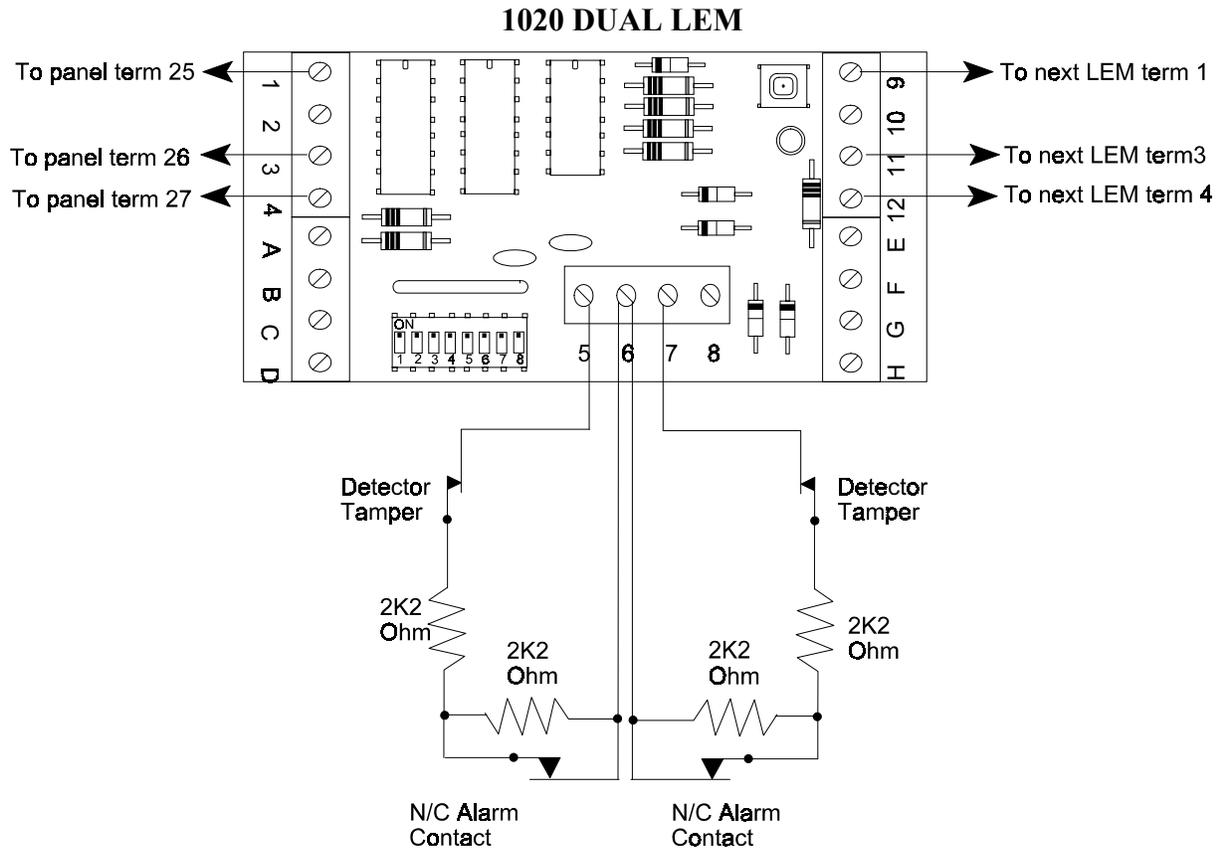
Terminal 38/J22 supplies +12 volts DC to power other serial devices, autodial modems, etc. **This terminal is connected directly to the positive battery and is not fused. Short circuits on this terminal will blow up tracks on the printed circuit board. If extending the wiring beyond the panel, you must install some type of fuseable link.**

Terminal 39/J23 is the transmit line for serial ASCII data. Terminal 39/J23 connects to pin 3 (Rx data) of a serial-input printer. It is not true RS-232C, as this line is not held to a negative level in the absence of data. If true RS-232C is required, then a EUROPLEX Model 1405 RS-232C adapter must be connected to this output.

Terminal 40/J24 is the receive line for incoming data [e.g., DVACS<sup>(tm)</sup> technology for polling the APLEX panel, autodial modem, etc.]. In non-polling applications (e.g., logging printer), this terminal is alternatively used as a handshake line. Connect this terminal to a pin that will supply positive voltage when your printer is on line (e.g., pin 4, 11, or 20 of the connector). Consult your printer manual. **If the handshake line from the printer is not used**, connect a 2,200-ohm resistor between terminals 38/J22 and 40/J24; otherwise, real-time data such as arming and disarming will not be printed. The presence of this handshake is not required for system log or report printing.

## MODEL 1020 DUAL LEM (D-LEM)

The Model 1020 Dual Line Encoder Module (D-LEM) is used to multiplex two devices (e.g., a door contact, a PIR, etc.) onto the LEM line. The LEM operates in an analogue mode allowing the APLEX control panel to measure the signal amplitude from a zone, compare it with a preset value, and therefore determine whether the particular zone is open (Alarm), closed (Restored), disconnected (LEM-cover tamper switch open or Break in loop wiring) or shorted (Cross in loop wiring). Transorbs and "spark-gap" staggered traces on each LEM printed circuit board protect against lightning and induced voltage transients on the LEM line.



The three LEM-line conductors used by the D-LEM are designated LEM GROUND (use black, if available), LEM CLOCK (use yellow), and LEM DATA (use green). **It is good practice to parallel the black wire with the red wire to provide a heavier ground return. ON VERY LARGE SYSTEMS WITH LONG WIRE RUNS, THIS DOUBLING OF THE GROUND RETURN IS ABSOLUTELY NECESSARY!!** By convention only, these colours are connected **in** to terminals 1, 3, and 4 respectively on the left side of the D-LEM and **out** to terminals 9, 11, and 12 on the right side of the D-LEM. The D-LEM tracking provides continuity through the printed circuit board. This cable may be branched at any point by connecting it in parallel with the main cable.

## MODEL 1020 DUAL LEM (D-LEM) cont.

The D-LEMs may be placed in any order and in any position on the cable. There is no restriction on the distance between D-LEMs. The end of the cable does not need to be looped back to the control unit; however, if convenient, you may install a "round-robin" LEM line terminated back again in the APLEX control panel. This will allow continuous operation of the system with a single break in the LEM line and easier trouble-shooting for service personnel.

### MODEL 1020 D-LEM CODING

The Model 1020 D-LEM is addressed by coding the Dual-in-Line (DIL) switch on the printed circuit board. There are eight individual numbered switches. In the up or ON position (towards the centre of the PCB), each switch number has a value zero (0); in the down or OFF position (towards the edge of the PCB), each switch number has a different decimal value. The decimal value is displayed in the chart below:

Switch No.:	1	2	3	4	5	6	7	8	ON = 0, OFF = Dec. Value
Decimal Value:	128	64	32	16	8	4	2	1	

The sum of the decimal value for all switches in the down (OFF) position is the address for that D-LEM unit (e.g., Switch numbers 6 and 8 down would be address 5; i.e., 4 + 1).

There are two zone inputs per D-LEM unit; therefore, the **zone number** is calculated as follows:

$$\begin{aligned}\text{ODD NO. Zone (input terminals 7 - 6)} &= (\text{LEM address value} \times 2) - 1 \\ \text{EVEN NO. Zone (input terminals 5 - 6)} &= \text{LEM address value} \times 2\end{aligned}$$

For example: The D-LEM unit above, coded to **address 5**, monitors **zone inputs 9 and 10**. The tamper microswitch on the D-LEM printed circuit board is in series with the **even-numbered zone input**, in this case, zone 10. If the zone is on line and the tamper is opened, a disconnect signal will be received by the panel. The APLEX panel will display **NIGHT 10 DISCON**. On initialization, the system will only recognize inputs that are **not** in the disconnect state (i.e., input loops with continuity); therefore, be sure that the covers are on the D-LEM units if the even-numbered zones are expected to function.

### IMPORTANT NOTES:

1. The first four zones on the APLEX control panel are directly connected. Even if these inputs are not used, the LEM line cannot have a D-LEM address of 1 (zones 1 and 2) or of 2 (zones 3 and 4) as these zones are not monitored on the LEM-line input.
2. No two D-LEM units may have the same address on the system. There is just one exception to this rule. If only one zone input is used on one D-LEM unit (say, zone 12 using terminals 5 to 6),

### MODEL 1020 DUAL LEM (D-LEM) cont.

leaving the second zone input open circuited, then the second zone input (say, zone 11 using terminals 6 to 7) may be used on the other identically addressed D-LEM unit, leaving its first input open circuited.

3. The coding table on page 25 shows the DIL switch settings for D-LEMs, C-LEMs, and COMBO LEMs. (Refer to page 22 for information on C-LEMs.) The maximum useable zone number, 100, comes from D-LEM address 50. The chart reflects this with the notation **LIMIT of 3100**. The table also shows C-LEM address 50 as this is the highest useable C-LEM/COMBO LEM address.

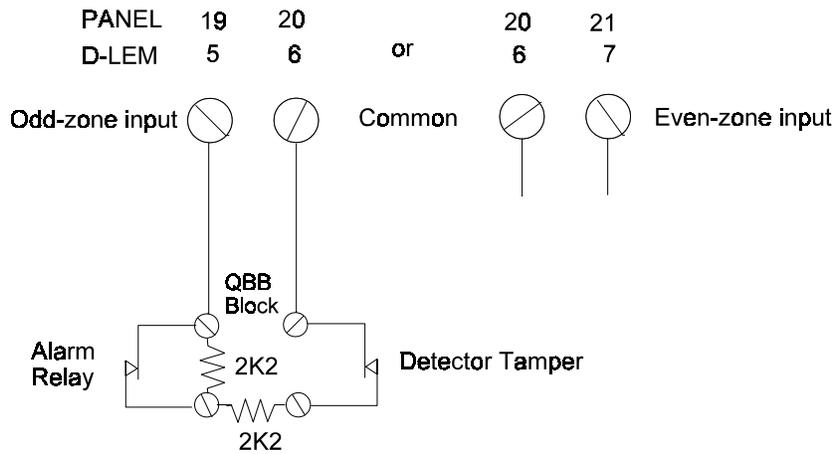
4. The coding table on page 26 shows the DIL switch settings for Q-LEMs. (Refer to pages 20 and 21 for information on Q-LEMs.) The maximum useable quad zone number, 98, comes from a Q-LEM address of 48. The chart reflects this with the notation **LIMIT of 3100**.

## LOOP-WIRING CONFIGURATIONS

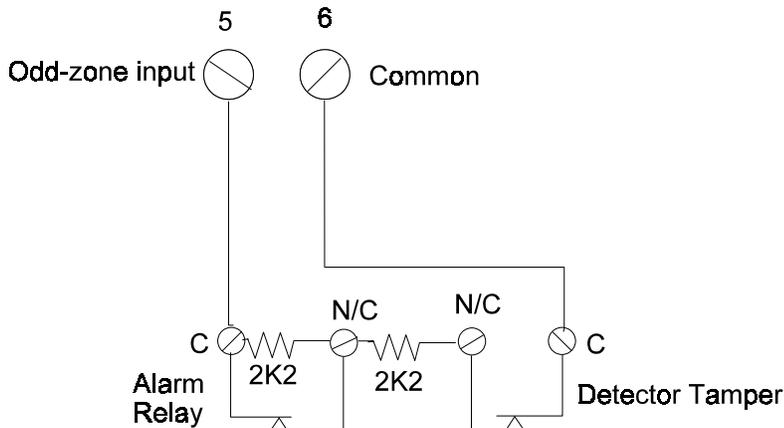
L Each Model 1020 D-LEM provides for two separate zone input loops to be connected. Effective mid-1995, for ULC-listed installations using 2 EOL resistor loops, you may use a Form B (SPST-NC) contact, connected in parallel with one of the two resistors. A *short across the loop* will result in a tamper alarm, a *break in the loop* in a disconnect alarm, and operation of the Form B contact (*open across one resistor*) in a general alarm. Each 2 EOL loop must have two 2,200-ohm (red-red-red) resistors in series with the loop and the normally closed alarm contacts are connected across one of the resistors. In the case of motion sensors, etc., the tamper contacts are connected in series with the loop.

### Circuit Wiring for ULC/Non-ULC Listed Installations

The above circuit wiring is easily implemented in a standard QBB block that may be installed close to the detector.



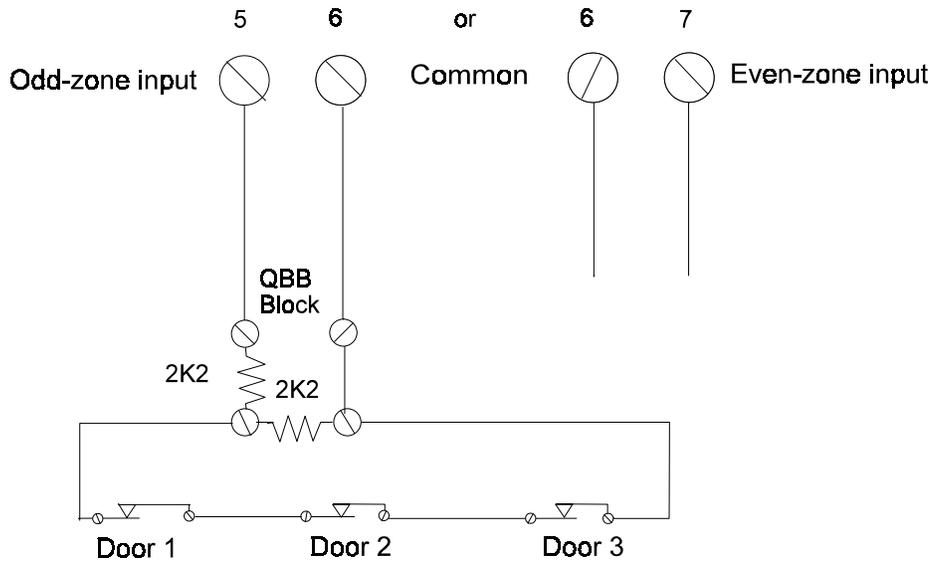
Connection inside an intrusion detector is even simpler:



## LOOP-WIRING CONFIGURATIONS cont.

### Circuit Wiring for Non-ULC Listed Installations

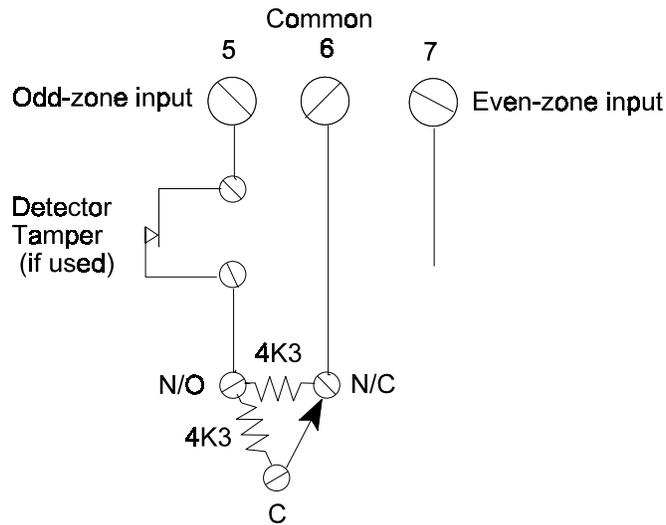
Note that the following wiring method is **not suitable for ULC-listed installations!** If a number of doors, windows, etc., are to be connected in series to an input, then wire as follows:



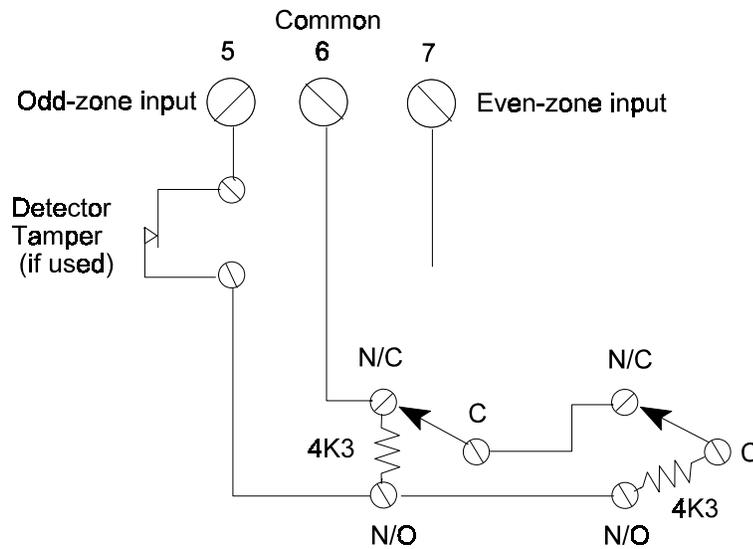
## LOOP-WIRING CONFIGURATIONS cont.

### Circuit Wiring for ULC-Listed Installations

Use Form C contacts and 4,300-ohm (yellow-orange-red) resistors to provide an alternate supervised connection for ULC-listed central/monitoring station installations.



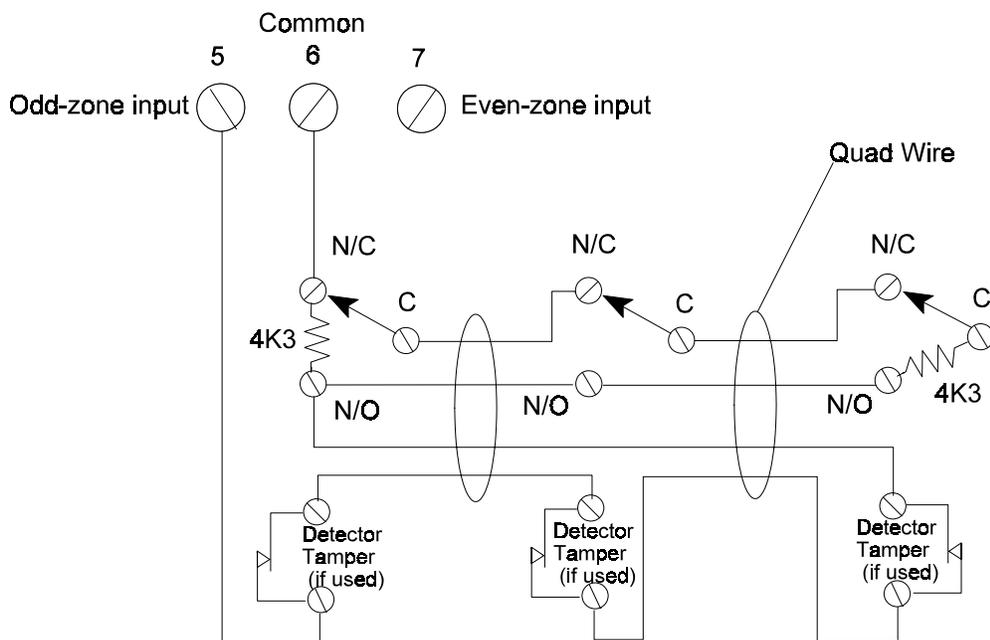
To series-connect two Form C devices, one with a detector cover tamper and one without, install the 4K3-ohm resistors in the first and second devices as follows:



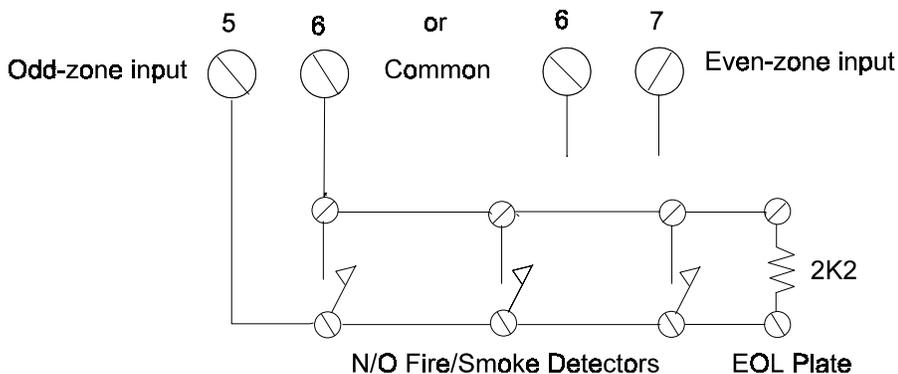
## LOOP-WIRING CONFIGURATIONS cont.

### Circuit Wiring for ULC-Listed Installations cont.

To series-connect three or more Form C devices, install the 4K3-ohm resistors in the first and last contacts as shown below. Pay close attention to the wiring as an interchange will cause a zone tamper alarm (a short on the loop).



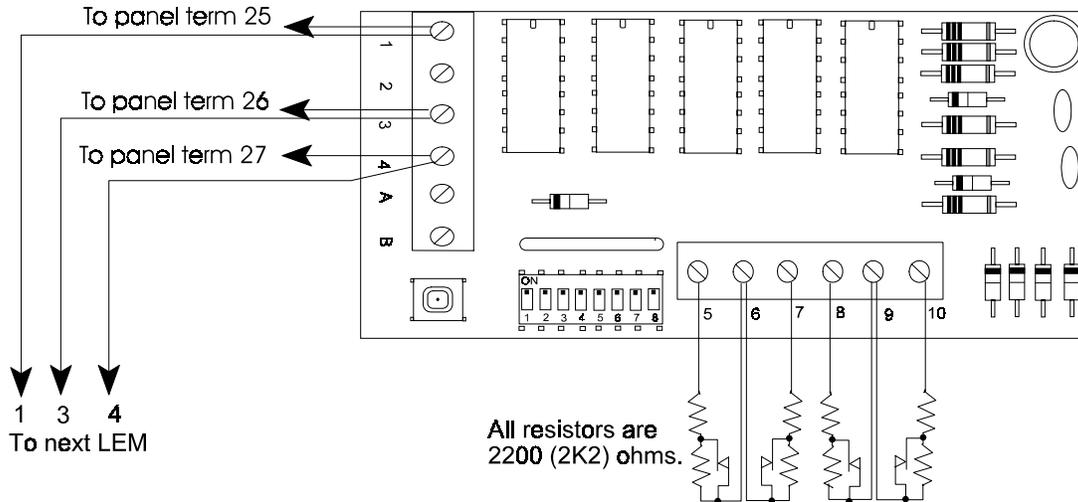
To connect a normally open, fire-detector circuit, install one 2K2-ohm resistor in the last detector or after the last detector using an EOL plate:



## MODEL 1024 QUAD LEM (Q-LEM)

The Model 1024 Quad Line Encoder Module (Q-LEM) features four input-loop connections and a tamper switch that can either be active or be shunted by switch number 8 on the DIL switch. The Q-LEM can be connected anywhere along the LEM line and the terminal connections are similar to those of the D-LEM except that the "in" and "out" connections are both made on the left-hand terminal strip only.

### 1024 QUAD LEM



The DIL switch settings establish the address of the Q-LEM. **Only switches 1 through 7** are used. Switch number 8 controls the tamper switch. When switch number 8 is OFF, the tamper switch is in series with zone input A (terminal 5); therefore, on a Q-LEM cover tamper alarm, the panel will display a **DISCON** for zone A. The general formula for determining the zone numbers from the address (decimal) value is the following:

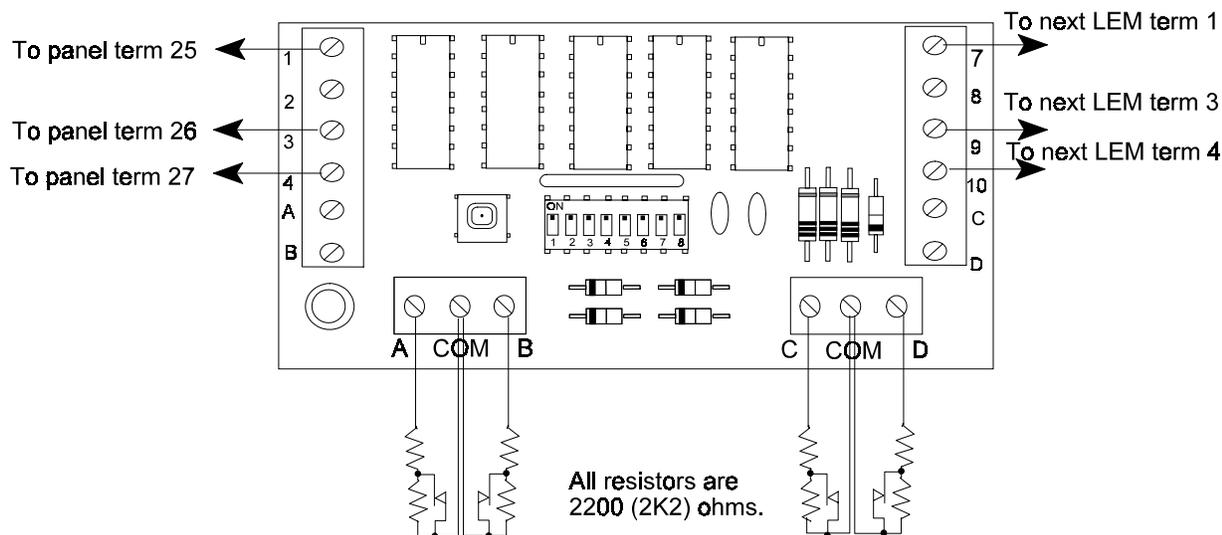
- Zone A Terminal 5 = (Address Value x 2)
- Zone B Terminal 7 = (Address Value x 2)-1
- Zone C Terminal 8 = (Address Value x 2)+2
- Zone D Terminal 10 = (Address Value x 2)+1

The coding table on page 26 may be used to determine the switch settings.

## MODEL 1024 REV 2.1 QUAD LEM (Q-LEM)

The Model 1024 Rev 2.1 Quad Line Encoder Module (Q-LEM) features four input-loop connections and a tamper switch that can either be active or be shunted by switch number 8 on the DIL switch. The Q-LEM can be connected anywhere along the LEM line, and the terminal connections are similar to those of the D-LEM. The Rev 2.1 printed circuit board features an LMTC (LEM-line) terminal strip on the right-hand side and a more secure tamper switch. Notice that the terminals on the right-hand strip are designated 7 through D. **Do not confuse them with the terminals designated 5 through 10 on the earlier ISS. 1 printed circuit board.**

### 1024 REV 2.1 QUAD LEM



The DIL switch settings establish the address of the Q-LEM. **Only switches 1 through 7** are used. Switch number 8 controls the tamper switch. When switch number 8 is OFF, the tamper switch is in series with zone input A (terminal 5); therefore, on a Q-LEM cover tamper alarm, the panel will display a **DISCON** for zone A. The general formula for determining the zone numbers from the address (decimal) value is the following:

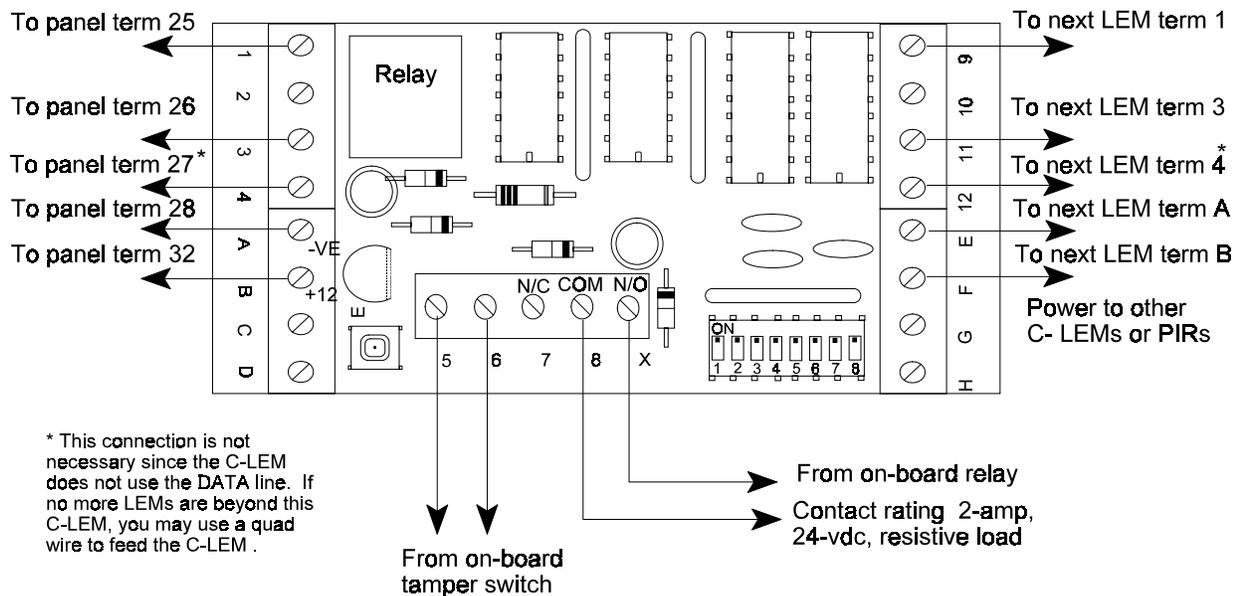
$$\begin{aligned} \text{Zone A} &= (\text{Address Value} \times 2) - 1 \\ \text{Zone B} &= \text{Address Value} \times 2 \\ \text{Zone C} &= (\text{Address Value} \times 2) + 1 \\ \text{Zone D} &= (\text{Address Value} \times 2) + 2 \end{aligned}$$

The coding table on page 26 may be used to determine the switch settings.

## MODEL 1101 COMMAND LEM (C-LEM)

L The Model 1101 Command Line Encoder Module (C-LEM) is a remote switching module that may be installed anywhere along the LEM line. The revised C-LEM MK II is fitted with an SPDT relay which is capable of switching a 2-amp, resistive load at 24 volts DC. The original C-LEM MK I (now discontinued) is described later on page 23. Similar to D-LEMs, C-LEMs have to be programmed to certain address values that determine their function and how they will operate. (See the OUTPUT ASSIGNMENT table for details, page 27). Unlike D-LEMs, several C-LEMs may be programmed to the same address, in which case they will all respond identically. C-LEM addresses are not monitored by the panel and therefore the panel does not know if any C-LEMs are connected. C-LEMs are coded similarly to D-LEMs, with address values 1 to 54 being valid.

### 1101 C-LEM



The decoding electronics on the C-LEM printed circuit board are powered from the LEM line; however, the on-card relay coil requires an external source of power. It is **imperative** that this power be supplied from the APLEX control panel's auxiliary power terminals 28 (-ve) and 32 or 33 (+ve). Connection can be made by using a second quad for power or the extra conductors of the multi-cable as described on page 2. The use of an extra field-installed power supply, **powered from a different phase or branch circuit** than the main panel, has created **severe problems in the main panel**.

## MODEL 1101 COMMAND LEM (C-LEM) cont.

Terminals 1, 3, 4, 9, 11, and 12 are connected exactly as for D-LEMs. Terminals B or F require +12 volts DC, while terminals A or E are negative. Note that the 12 volts DC **must** have a common negative with the panel. If you are using the APLEX panel's terminal 28 or 29 as a negative, then this requirement is met. If you use an auxilliary 12-volt DC power supply, try to power it from the same branch circuit as the panel. Connect a 2200-ohm (2K2) resistor link from the auxilliary supply negative to panel terminal 28 or use a 2200-ohm resistor to link terminal A to terminal 1 on a C-LEM. If more than one C-LEM is powered from the same auxilliary supply, then **only one** C-LEM should have the link between A and 1 to avoid ground loops. Terminals 5 and 6 are the dry contacts from the tamper microswitch on the C-LEM printed circuit board. You may wish to link this microswitch in series with the tamper circuit of a nearby LEM to supervise the C-LEM cover.

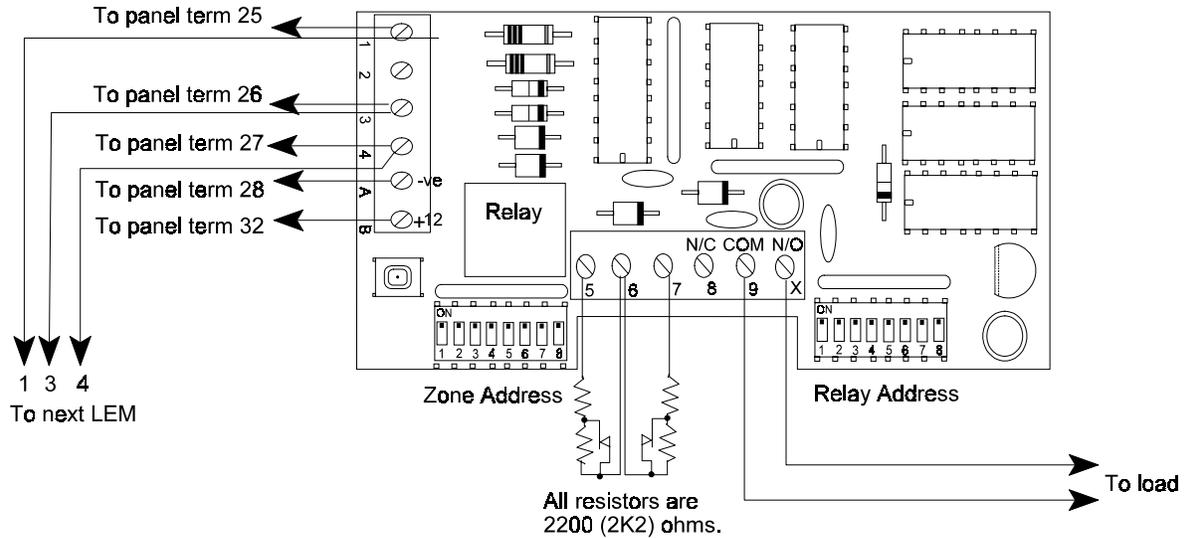
### C-LEM MK I (discontinued)

Information on the C-LEM MK I is presented here for reference purposes only. The C-LEM MK I differs from the MK II version in that the MK I used a 0.5-amp DIL SPST relay connected to terminals 7 and 8. The MK I C-LEM is distinguished by the rainbow-coloured BCD switch used to set the address. Normally open (i.e., close on alarm) or normally closed (i.e., open on alarm) operation is controlled by the brown DIL switch 1. As the MK I was originally designed to operate from 7 volts DC, terminal 3 should be linked to terminal 2 with a 1N4001 general-purpose diode or an equivalent. Connect the anode to terminal 3 and the cathode (banded end) to terminal 2.

## MODEL 1121 COMBINATION LEM (COMBO LEM)

The Model 1121 Combination Line Encoder Module (COMBO LEM) features one D-LEM and one C-LEM combined together on a standard LEM-size printed circuit board. The D-LEM is separately addressable from the C-LEM. This device is intended for use in installations that require local contact closure upon detection of an alarm condition (e.g., fire doors with a local siren).

### 1121 COMBO LEM



The DIP switches are used to address the D-LEM and C-LEM sections of the COMBO LEM in exactly the same way as an individual unit. See the coding table on page 25. The alarm input loops are wired like a standard D-LEM. See page 13.

## MODEL 1020 D-LEM, 1101 C-LEM, AND 1121 COMBO LEM CODING TABLE

ZONE NUMBER VS. TERM. STRIP SCREWS		D-LEM/C-LEM/ COMBO LEM	DIL SW. NO.
TERM. NO.	5 (Even)	7 (Odd)	ADDRESS
ZONE NO.			(Set to OFF)
	2	1	1
	4	3	2
	6	5	3
	8	7	4
	10	9	5
	12	11	6
	14	13	7
	<b>16</b>	15	8
	18	17	9
	20	19	10
	22	21	11
	24	23	12
	26	25	13
	28	27	14
	<b>30</b>	29	15
	32	31	16
	34	33	17
	36	35	18
	38	37	19
	40	39	20
	42	41	21
	44	43	22
	46	45	23
	48	47	24
	50	49	25
	52	51	26
	54	53	27
	56	55	28
	58	57	29
	60	59	30
	62	61	31
	64	63	32
	66	65	33
	68	67	34
	70	69	35
	72	71	36
	74	73	37
	76	75	38
	78	77	39
	80	79	40
	82	81	41
	84	83	42
	86	85	43
	88	87	44
	90	89	45
	92	91	46
	94	93	47
	96	95	48
	98	97	49
	<b>100</b>	99	<b>50</b>

	<b>LIMIT of 3016 LEM LINE</b>
	<b>LIMIT of 3030 LEM LINE</b>
	<b>LIMIT of 3100</b>

## MODEL 1024 Q-LEM CODING TABLE

### ZONE NUMBER VS. TERM. STRIP SCREWS

QUAD LEM REV 1.0				QUAD LEM REV 2.1				Q-LEM			
TERM. NO.	5	7	8	10	TERM NO.	<u>ZA</u>	<u>ZB</u>	<u>ZC</u>	<u>ZD</u>	ADDRESS	DIL SW. NO.
Designation	<u>A</u>	<u>B</u>	<u>C</u>	<u>D</u>	ZONE NO.	3	4	5	6	<u>VALUE</u>	<u>(Set to OFF)</u>
ZONE NO.	4	3	6	5	ZONE NO.	3	4	5	6	2	7
	8	7	10	9		7	8	9	10	4	6
	12	11	14	13		11	12	13	14	6	6,7
	<b>16</b>	15	18	17		15	<b>16</b>	17	18	8	<b>5 LIMIT of 3016</b>
	20	19	22	21		19	20	21	22	10	5,7
	24	23	26	25		23	24	25	26	12	5,6
	28	27	<b>30</b>	29		27	28	29	<b>30</b>	14	5,6,7 <b>LIMIT of 3030</b>
	32	31	34	33		31	32	33	34	16	4
	36	35	38	37		35	36	37	38	18	4,7
	40	39	42	41		39	40	41	42	20	4,6
	44	43	46	45		43	44	45	46	22	4,6,7
	48	47	50	49		47	48	49	50	24	4,5
	52	51	54	53		51	52	53	54	26	4,5,7
	56	55	58	57		55	56	57	58	28	4,5,6
	60	59	62	61		59	60	61	62	30	4,5,6,7
	64	63	66	65		63	64	65	66	32	3
	68	67	70	69		67	68	69	70	34	3,7
	72	71	74	73		71	72	73	74	36	3,6
	76	75	78	77		74	76	77	78	38	3,6,7
	80	79	82	81		79	80	81	82	40	3,5
	84	83	86	85		83	84	85	86	42	3,5,7
	88	87	90	89		87	88	89	90	44	3,5,6
	92	91	94	93		91	92	93	94	46	3,5,6,7
	96	95	<b>98</b>	97		95	96	97	<b>98</b>	48	<b>3,4 LIMIT of 3100</b>
	100	99	n/a	n/a		99	100	n/a	n/a	50	3,4,8

Note: This chart has been extended to show all possible address settings and reference is made to the 16-zone (3016) and 30-zone (3030) control panels.

## PANEL OUTPUTS

Included in the basic panel are seven outputs: three SPDT relays and four switched-positive, current-limited voltage outputs. The relay outputs have been arbitrarily designated as outputs 1, 2, and 7 and the voltage switches have been designated as outputs 3 through 6. If dry contacts are required from the voltage outputs, a EUROPLEX Model 1104 Quad Relay Module (QRM) may be installed either outside of the panel or within the panel. Operating in tandem with these panel outputs are C-LEMs 1 through 7 which can be used to provide remote-location duplicates of the outputs on the main control panel. Additionally, C-LEM outputs 8 through 19 have been factory assigned to provide dry-contact output for certain functions (refer to ZONE TYPES, page 28). Note that all output C-LEMs and INTRUSION panel output RELAY 1 (central/monitoring station alarm relay) are normally energized. These relays will fail in alarm in the event all power to the panel is removed. The other panel relays are normally de-energized. All panel outputs and C-LEMs except FIRE TROUBLE panel voltage OUTPUT 5 and TECH output C-LEMs 12 and 13 are reset upon entry or re-entry to the DISARM mode

### OUTPUT ASSIGNMENT

PANEL/C-LEM OUTPUT NO.	PANEL TERMINAL SCREW	FUNCTION
1	13-15	Cen./Mon. Station Output, SPDT relay
2	10-12	Fire Alarm, SPDT relay
3	3	Clear To Arm, +ve voltage
4	4	System Armed, +ve voltage
5	5	Fire Trouble, +ve voltage
6	6	System Fault, +ve voltage
7	7-9	Timed Bell Cut-off, SPDT relay
L 8	-	Remote Buzzer, C-LEM 8
9	-	Panic, C-LEM 9
10	-	Internal Bell, C-LEM 10
11	-	Monitor Zone, C-LEM 11
12	-	Group-follow Tech, C-LEM 12
L 13	-	Holdup/Duress, C-LEM 13
14	-	Fire Door, C-LEM 14
15	-	Line-cut Monitor, C-LEM 15
16	-	Gate Valve, C-LEM 16
17	-	Pressure Drop, C-LEM 17
18	-	24Hour, C-LEM 18
L 19	-	Smoke Detector Reset, C-LEM 19

## ZONE TYPES

As received from the factory, all 30 zones in the panel are programmed as instant-acting, NIGHT intrusion zones. Unless indicated, the zone loops are wired normally closed, opening on alarm. Each of the 30 zones in the panel may be programmed with a new zone type. These have been given descriptive names and their characteristics are described in the following section:

**FOLLWR:** This zone type is used to provide protection along the exit and entry path(s) between the control panel or the remote keypad and the exit and entry door(s). When the panel is armed, this type of zone is instant acting except for the following two cases. During exit, no alarm will occur on any follower zone within the exit time allowed (see Exit Time delay variable, page 50) and, similarly, during entry, no alarm will occur within the entry time allowed (see Entry Time delay variable, page 50). After the delay time expires, the FOLLWR zone responds as an instant-acting NIGHT zone. Straying from the follower path into other protected zones during the exit/entry time will also cause instant-acting alarms.

L **REMARK:** This zone type is used to allow remote arming and disarming of the control panel from keyswitch plates, digital keypads, access control systems, etc. It provides for two methods of operation as chosen from the Remarm Toggle variable (see page 52). If the variable is set to a one (1), each momentary closure of the dry contact (switch or relay) connected to a single end-of-line resistor input will change the armed/ disarmed status of the panel. If the momentary closure operation is chosen, multiple arming stations wired in parallel may be used. The end-of-line resistor should be installed in the last arming station. To wire a Form A (SPST-NO) contact as a momentary switch, see the drawing for contacts configured for a single end-of-line resistor fire detector service on page 19. If the variable is set to zero (0), a two-position dry contact (switch or relay) is used to provide a continuously closed contact, thus arming the panel, or a continuously open contact, thus disarming the panel. To wire a Form B (SPST-NO) contact as a two-position switch, see the Model 1020 Dual LEM drawing on page 13. Note: A Clear-to-Arm status is available from the CLEAR TO ARM panel voltage output 3 and output C-LEM 3. A System Armed status is available from the SYSTEM ARMED panel voltage output 4 and output C-LEM 4.

**NOTPT2:** This zone type is *not active* when the panel is in PART ARM 2 mode but *is active* when the panel is in PART ARM 1 or FULL ARM mode at which time the zone responds as an instant-acting NIGHT zone. This zone type is used with space or interior protection that must be inoperative when the panel is turned on and the customer is remaining within the protected area (the "home/away" philosophy of a residential panel).

**DOUBLE:** This DOUBLE-knock zone type is a special type of NIGHT intrusion zone. Two activations must occur within a specified time period in order to cause an alarm. This period is the value of the Double/Twin Time variable (see page 50) as entered in the panel by the installer during set-up. The same zone or another DOUBLE-knock zone may provide the second activation. This zone type is only active when the panel is in the FULL ARM mode. **When the**

## ZONE TYPES cont.

**double-knock timer is started, the second activation must occur within the specified time period or the timer will reset.** Use this option for motion detectors or inertia detectors that could create false alarms by being tripped once but that will be tripped more than once during the course of a genuine intrusion. (See also TWIN zone type, below.)

**EXIT:** This zone type is used to monitor the final exit and entry points, usually the main entrance door, employee entrance, etc. When the panel is placed in PART ARM 1 mode, this zone is inoperative and unrestricted exit or entry is possible. When the panel is placed in PART ARM 2 or FULL ARM mode, the exit door must be closed by the time the exit timer (see Exit Time delay variable, page 50) expires to avoid an IMPROPER CLOSING alarm. When you enter the premises through an exit door, the piezo-sounder will beep and the panel must be disarmed or placed in PART ARM 2 mode before the entry timer (see Entry Time delay variable, page 50) expires to avoid a full alarm condition. Note: A door chime feature is available during DISARM and PART ARM 1 modes (see page 61).

**FIRENO:** This zone type is used with smoke detectors, manual-pull stations, fire alarm thermostats, fire hall relay contacts of evacuation alarm panels, etc. A normally open contact is wired as a two-wire, single end-of-line resistor loop. **Contact closure** will operate FIRE ALARM panel relay output 2 and output C-LEM 2 and cause the event to be logged. If the Alert & Display variable (see page 50) is set to one (1) for an attended site (default value), then the piezo-sounder will beep and the display will show the flashing alert message **\*\* FIRE ALARM \*\***, alternating with a flashing zone description. The loop wiring of a FIRENO zone is also supervised for trouble conditions. A break in the loop wiring (disconnect) will operate FIRE TROUBLE panel voltage output 5 and output C-LEM 5 and cause the event to be logged. As before, if the Alert & Display variable is set to one (1), then the piezo-sounder will beep and the display will show the flashing alert message **\*\* FIRE TROUBLE \*\***. When **all** FIRENO loops are normal (not disconnected or shorted), FIRE TROUBLE panel voltage output 5 and output C-LEM 5 will restore. If the Alert & Display variable is set to zero (0) for an unattended site, FIRE ALARM panel relay output 2 and output C-LEM2 will also reset. **Note: For monitoring the trouble relay on a fire alarm panel, see the zone type FIRTBL below.**

**NOTPT1:** This zone type is *not active* when the panel is in PART ARM 1 mode but *is active* when the panel is in PART ARM 2 or FULL ARM mode at which time the zone responds as an instant-acting NIGHT zone. This zone type is used with space or interior protection that must be inoperative when the panel is turned on and the customer is remaining within the protected area (the "home/away" philosophy of a residential panel).

**24HOUR:** This zone type is used with foil, fine wire, emergency doors, etc. When the panel is in DISARM mode, an alarm on this zone will operate INTRUSION ALARM panel output relay 1 and output C-LEM 1 and 24HOUR output C-LEM 18, which may be used for local annunciation (buzzer, lamp, etc.), and cause the event to be logged. If the Alert & Display variable (see page

## ZONE TYPES cont.

50) has been set to one (1) for an attended site, then the piezo-sounder will beep and the display will show the flashing alert message **\*\* INTRUDER ALARM \*\***, alternating with a flashing zone description. When the panel is in PART ARM 1, PART ARM 2, or FULL ARM mode, this zone responds as an instant-acting NIGHT zone.

**INTRNL:** This zone type is similar to the NOTPT1 and NOTPT2 zones; however, it is *not active* when the panel is in either PART ARM 1 or PART ARM 2 mode but *is active* when the panel is in FULL ARM mode at which time this zone responds as an instant-acting NIGHT zone. Use these three zone types (NOTPT1, NOTPT2, INTRNL) to configure a system for "home", "sleep", and "away" operation.

**FIRENC:** This zone type is identical in operation to the FIRENO zone type except that the input loop is wired normally closed and opens on alarm. A break in the loop wiring (disconnect) or a short in the loop wiring will result in a trouble condition.

**KEY:** This zone type is used when manual control of exit and entry timers is desired (e.g., high-risk customers such as jewellery stores). A two-position keyswitch or similar secure device must be installed outside the protected area. Then, when the panel is armed and the customer has exited from the premises, he or she must operate this switch in order to zero the remaining exit time and to fully arm the system. In a similar manner, the switch must be re-operated in order to start the entry timer before the customer re-enters the premises. Note: The main exit/entry door should be assigned as a FOLLWR zone type (not EXIT zone type) to create an instant-acting alarm if an intrusion occurs. As well, the Entry Time (see page 50) and Exit Time (see page 50) delay variables should be set to a longer time than for normal entry or exit, say five minutes (300 seconds). This is important in a KEY zone because the keyswitch is outside the protected area; hence, when the exit door is closed, the piezo-sounder beeping inside cannot always be heard by the customer outside and there is nothing to prompt a speedy arming on exit or disarming when entering.

**TELFLT:** This zone type is used to monitor the relay output of a dialler telephone line-cut module. An open on this zone will operate TELFLT output C-LEM 15 and cause the event to be logged. If the panel is in the FULL ARM mode, the Bell Delay value (see page 51) will be reduced to two seconds. If the Alert & Display variable (see page 50) is set to one (1) for an attended site, the piezo-sounder will beep and the display will show the flashing alert message **\*TELCO FAULT\***, alternating with a flashing zone description. When the TELFLT zone is restored, output C-LEM 15 will be reset and the event will be logged.

**MONITR:** This zone type is used to monitor cold storage room doors, internal doors, fire/smoke doors, etc., that should not be open for longer than a preset period of time. You may assign multiple zones as a MONITR zone; however, there is *only one monitor timer*. If the timer is started by one MONITR zone and another MONITR zone is opened soon thereafter, the timer will not be restarted by the second zone, thereby giving an erroneous open time for that zone.

## ZONE TYPES cont.

When the panel is in DISARM mode, an open on the MONITR zone that exceeds the time allowed in the Mon/Firtbl Delay variable (see page 51) will operate MONITOR output C-LEM 11 and cause the event to be logged, the piezo-sounder to beep, and the display to show the flashing alert message **\*\*MONITOR ALARM\*\***, alternating with a flashing zone description. When the panel is in FULL ARM mode, this zone responds as an instant-acting NIGHT zone.

**NIGHT:** This zone type is an an absolutely instant-acting, intrusion zone. When the panel is in FULL ARM, PART ARM 1, or PART ARM 2 mode, a violation of this zone will cause an immediate full alarm. TIMED BELL panel relay output 7 and output C-LEM 7, INTERNAL BELL output C-LEM 10, and central/monitoring station INTRUSION panel output relay 1 and output C-LEM 1 will operate and the event will be logged. When the panel is in DISARM mode, a TAMPER alarm (short on loop wiring) or DISCONNECT alarm (open on loop wiring or removal of D-LEM/ Q-LEM/COMBO LEM cover) will operate TECHNICAL FAULT panel voltage output 6 and output C-LEM 6 and cause the piezo-sounder to beep, the event to be logged, and the display to show the flashing alert message **\*ZONE TAMPER ALARM\***, alternating with a flashing zone description. Note that some other zone types described in this section respond as instant-acting NIGHT zones when the panel is fully armed.

**FIRDR1:** This zone type is used with fire exit doors that should never be opened when the premises is occupied. *Violation of this zone is displayed locally and transmitted to the central/ monitoring station.* There is also available a companion zone type, FIRDR2, which only displays locally during the disarmed period (see below). When the panel is in DISARM, PART ARM 1, or PART ARM 2 mode, an open on this zone will operate FIREDR group output C-LEM 14 and FIREDR individual-zone output C-LEM (20 + the zone number: e.g., 20+1, 20+2, 20+3, etc., to avoid conflict with the preprogrammed outputs 1 through 19, see page 27) and cause the piezo-sounder to beep, the event to be logged, and the display to show the flashing alert message **\*FIRE DOOR OPENED\***, alternating with a flashing zone description. When the panel is in FULL ARM mode, this zone responds as an instant-acting NIGHT zone.

**PANIC:** This zone type should be used with *latching* panic buttons to ensure that activation will be detected. Activation at any time will operate CONTINUOUS BELL panel relay output 7 and output C-LEM 7 and PANIC output C-LEM 9 and cause the piezo-sounder to beep, the event to be logged, and the display to show the flashing alert message **\*\*PANIC ALARM\*\***, alternating with a flashing zone description. PANIC is an audible HOLDUP zone!

**HOLDUP:** This zone type should be used with *latching* holdup buttons to ensure that activation will be detected. An open at any time will operate HOLDUP output C-LEM 13 and cause the event to be logged but piezo-sounder will not beep. Note: Since the panel will display a zone description any time a zone is violated, you should program a zone description that avoids the use of the word HOLDUP; choose some innocuous phrase such as TEST ZONE X. HOLDUP is a silent PANIC zone!

## ZONE TYPES cont.

**TECH:** This zone type is used to provide supervisory monitoring of non-burglary conditions (e.g., freezer monitor, boiler flame-out, building temperature, etc.). You may use normally closed switches (2 EOL) or normally open switches (1 EOL) or a mixture of both. If the Audible Tech variable (page 50) is set to one (1) *and* the Alert & Display variable (see page 50) is set to one (1) for an attended site, then the piezo-sounder will beep and the display will show a flashing zone description. A TECH zone alarm can have two distinct outputs: you may use an *individual* output C-LEM to give a one-for-one dry contact that follows the state of the zone input (e.g., alarm equals contact closure, restore equals contact open) or you may choose to have a *group-following*

L output C-LEM 12 that will respond to any zone labelled TECH. The *group-following* output C-LEM will reset only when *all* TECH zones are normal. **To avoid conflict with the pre-programmed outputs 1 through 19 (see page 27), TECH zone individual output C-LEMs have been offset by 20 plus the zone number.** For example, TECH zone 4 will operate individual output C-LEM 24; TECH zone 8 will operate individual output C-LEM 28; etc. When TECH zone 4 restores, output C-LEM 24 will also reset. The group-following output C-LEM is rigidly assigned. For example, if TECH zone 6 alarms, the group-following TECH output C-LEM 12 will operate; however, if TECH zone 4 alarms at a later time, there will be no further action from output C-LEM 12 since it is already operated. When *all* TECH zones restore, output C-LEM 12 will reset.

**FIRDR2:** This zone type is used with fire exit doors that should never be opened when the premises is occupied. *Violation of this zone is only displayed locally.* A companion zone type, FIRDR1 (see above), is also available. When the panel is in DISARM or PART ARM 1 mode, an open on this zone will operate FIREDR group output C-LEM 14 and cause the piezo-sounder to beep and the display to show a flashing zone description; however, the event will not be logged *nor* transmitted to the central/monitoring station. In DISARM or PART ARM 1 mode, then, response is solely the responsibility of the customer. When the panel is in PART ARM 2 mode, an alarm will be logged and the central/monitoring station will be alerted as well. When the panel is in FULL ARM mode, this zone responds as an instant-acting NIGHT zone.

**FIRTBL:** This zone type is used to monitor the *trouble-relay contacts* of a local fire alarm control panel. **IT IS NOT A FIRE ALARM ZONE INPUT AS DESCRIBED IN THE FIRENO/NC ZONE TYPE ABOVE!** Because many fire alarm control panels respond immediately to local AC power failures, a delay timer has been incorporated into the zone. The time value is selected in the Mon/Firtbl Delay variable (see page 51). The default value is 30 seconds but it may be reduced to 0. Note that this one timer is used for both MONITR zones and FIRTBL zones. If both zone types are to be used, then determine a common time value suitable for both applications. An open on this zone will start the timer. If the zone restores before the time expires, the timer is reset and no further action occurs. If the zone remains open at the expiry of the time, FIRE TROUBLE panel voltage output 5 and output C-LEM 5 will operate and the event will be logged. If the Alert & Display variable (see page 50) is set to one (1) for an attended site, the piezo-sounder will beep and the display will show the flashing alert message **\*\*FIRE**

## ZONE TYPES cont.

**TROUBLE\*\***, alternating with a flashing zone description and the warning message **++CALL SERVICE++**. When all FIRTBL zones are normal, FIRE TROUBLE panel voltage output 5 and output C-LEM 5 will reset. A tamper or a disconnect on this zone will operate TECHNICAL FAULT panel voltage output 6 and output C-LEM 6 and cause the piezo-sounder to beep, the event to be logged, and the display to show the flashing alert message **\*ZONE TAMPER ALARM\***, alternating with a flashing zone description.

**TWIN**: This zone type is a special type of NIGHT zone and is similar to the DOUBLE-knock zone type (see page 28); however, *two TWIN zones must open* within the time allowed by the Double/ Twin Time variable (see page 50) to cause an alarm. This zone type is only active when the panel is in PART ARM 2 or FULL ARM mode. You may therefore twin (pair) zones with detectors of different types (e.g., a PIR and an ultrasonic covering the same area). As with a DOUBLE-knock zone, when one TWIN zone operates, the double-knock timer is started and a second TWIN zone *must operate* within the specified time period or the timer is reset. Note: If only one zone is assigned as a TWIN type, **it will never create an alarm!** Also, you may have more than two TWIN zones but, if one starts the timer, an open on *any* other TWIN zone will complete the event and result in a full alarm.

**GATE**: This zone type is used to monitor the gate valve or the post indicator valve (PIV) in a sprinkler system. When a gate valve closes (i.e., the switch contacts open), GATE VALVE output C-LEM 16 will operate and the event will be logged. If the Alert & Display variable (see page 50) is set to one (1) for an attended site, then the piezo-sounder will beep and the display will show the flashing alert message **\*SPRINKLER SUPERVY\***, alternating with the warning message **++CALL SERVICE++** and a flashing zone description. During service to the sprinkler riser, the gate valve switch may have to be operated a number of times in succession. To avoid unnecessary traffic to the central/monitoring station, a Supvry Shutdown variable (see page 52) may be programmed to limit the number of signals.

**PRESR**: This zone type is used to monitor the pressure switch on a sprinkler riser. When a pressure drop occurs, PRESSURE output C-LEM 17 will operate and the event will be logged. If the Alert & Display variable (see page 50) is set to one (1) for an attended site, then the piezo-sounder will beep and the display will show the flashing alert message **\*SPRINKLER SUPERVY\***, alternating with the non-flashing warning message **++CALL SERVICE++** and a flashing zone description. In the course of servicing the sprinkler riser, the pressure switch may have to be operated a number of times in succession. To avoid unnecessary traffic to the monitoring station a Supvry Shutdown variable (see page 52) may be programmed to limit the number of signals.

**FLOW**: This zone type is used to monitor the normally open flow switch on a sprinkler riser. Contact closure causes the retard timer (see Retard Time variable, page 51) to count down. If the switch contact is still closed at the expiry of the retard time, the panel will execute the FIRENO routine (see page 29). If the switch opens before the timer finishes counting down, the retard timer will reset and no further action will occur.

## POWERING UP THE PANEL

### INITIAL ACTIVATION OF THE PANEL

The control panel as received from the factory has been given a COLD START and all settings will be at their default value. The next time that power is applied to the panel, it will execute a WARM START (see page 35). On powering up, you will be concerned with entering the customer's name and address and initializing the LEM LINE. Once powering up is finished, you will be ready to program the panel.

When power is first applied to the control panel, the display will show the following: **RAM PROTECTED!**. Next, the display will show the operating system version number and date: **MXOS2M44 27AUG97**; followed by the copyright message: **(C) EUROPLEX 1989** and finally the application program version and date: **M100 1A 250U 8SEP97**. This last message will be displayed for about three seconds during which time an option to COLD START the panel will be available.

### COLD START WITH ZAP

It may sometimes be necessary to clear the panel's RAM memory in the field. For example, if the panel has been removed from a previous location and is to be installed in a new location or if severe transients (lightning, etc.) have caused corruption of the memory, it will be necessary to start anew. **A COLD START will clear the whole of the memory, destroying all existing log, zone, and user files.**

To select a COLD START, press the FULL ARM key within the three seconds allowed above. (If the FULL ARM key is not pressed within these three seconds, the panel will execute a WARM START, see page 35. To return to a COLD START option, press the CPU reset button.) If a COLD START is chosen, then the piezo-sounder will beep and the display will show **ZAP?**.

Press the YES key to accept the selection. (If you decide to leave the RAM memory unchanged at this stage, press any other key than the YES key. You will then abort the COLD START and instead execute an AUTO START, see page 37). If the YES key is pressed, the display will show **RAM=0000** for about five seconds, indicating that all RAM memory is being zeroed, followed by **ENTER NAME/ADDRESS ?**. Press the YES key and the display will show a flashing cursor, **^**, in the farthest-left position.

It is important that you enter the name and address of the site as this will be printed in the heading of the system log, literal print-out, and on-line report and will provide a useful record for all print-outs. Refer to page 4 for information on how to enter the necessary characters. Once the name and address information is entered, position the cursor up and press the RETURN key.

## POWERING UP THE PANEL cont.

The display will now show **COLD START** and, in another two seconds, **PROM CHKSUM=nnnnH**. The piezo-sounder will beep. Press the RETURN key to continue and the display will show **ON-LINE O-->N**. Proceed to LEM-LINE INITIALIZATION (see below).

Note: If you do not select yes to the ZAP? function during a COLD START, you will not be given the chance to enter a name and address. If you wish to return to a name and address query, you must select a SOFT START (see page 36) to restart the panel. See SYSTEM RESET START below for the procedure to follow.

### SYSTEM RESET START

When power is applied to the control panel, the display will show the usual start-up messages for a moment. If a COLD START is not initiated, then a SYSTEM RESET START will be effected. On a SYSTEM RESET START, if no name and address entry has previously been made, the display will stop at **ENTER NAME/ADDRESS ?**. Press the YES key and a flashing cursor, ^, will appear in the farthest-left position.

If a name and address has previously been entered, the panel will by-pass this query. To change an entry or correct it in this case, you must select the SET DATA FORMAT function (see pages 55 and 56). If you fail to enter a name and address when requested, you must use a SOFT START (see page 36) to restart the panel to return to this query.

It is important that you enter the name and address of the site as this will be printed in the heading of the system log, literal print-out, and on-line report and will provide a useful record for all print-outs. Refer to page 4 for information on how to enter the necessary characters. Once the name and address information is entered, position the cursor up and press the RETURN key.

Enter the name and address information and press the RETURN key. The panel will show **WARM START** and then **ON-LINE O-->N**. Proceed to LEM-line initialization below.

### LEM-LINE INITIALIZATION

An initialization of the LEM line brings any newly connected zones on line; otherwise, they will be ignored by the panel. When the display shows **ON-LINE O-->N**, **O** represents the original (old) number of zones on line prior to powering up and **N** represents the current (new) number of zones on line. The piezo-sounder will sound a single beep if there is no change in the total number of inputs (i.e., Old = New) or a multibeep if there has been a change. In either case, press the YES key to accept the initialization or the NO key to repeat the initialization check. If the NO key is pressed, account for the missing inputs and then press the YES key.

## POWERING UP THE PANEL cont.

Note: Any LEM input loops in the disconnect state or short circuited will **not** be included in the count or be recognized by the panel when the program continues.

Remember that the LEM cover tamper switch is in series with terminal 5 (the even-numbered input) of any LEM.

Loop states are categorized as:

DISCON	- Loop open circuited. Loop resistance = infinity
OPEN	- Alarm contact open. Loop resistance = 4K4 ohms
CLOSED	- Alarm contact closed. Loop resistance = 2K2 ohms
SHORT	- Loop short circuited. Loop resistance = 0 ohms

The initialization routine checks the resistance of the loops. If the values returned are outside the allowed ranges, the zone number of the offending input will be displayed. For example: **NIGHT 3 = 22** indicates the analogue value of **22** from zone **3** is out of range. This is a problem that **must** be corrected. Usually a wiring fault or the wrong value of end-of-line resistor is responsible. If the panel sees a response from zone numbers 101 to 108, **ILLEGAL LEM NUMBER** is displayed as these zone addresses are used by Model 3210, 3220, and 3230 remote keypads. All zones that have allowable values at or near the threshold of acceptability will be counted and the total will be displayed at the end of this routine. Excessive *capacitance* and/or *resistance* of the cable can also be a problem if more than 2 km of cable are connected or cable with high capacitance (i.e., shielded cable) is used. Individual responses from the LEM inputs can be checked in the SINGLE-ZONE MONITOR option of the SERVICE MODE mode (see page 44). When the correct number of zones is displayed, press the YES key to proceed to the main program..

L At this time, the display will show **5 DIGIT CODES** ?. Press the YES key to accept the five-digit code option or press the NO key to choose the four-digit code option. See the SET IDS/OPTIONS function on page 47 for further information. If neither key is pressed within three seconds, the panel will default to the four-digit code option.

The panel will now show **BUSY...RE-SCHEDULING** for a few seconds. Next, **DATE and TIME** will appear, alternating with some flashing alert messages. If any of the zones are open (in alarm), then **ZONE TYPE ZONE NUMBER OPEN** will also be displayed. For information on how to acknowledge the alert messages, refer to page 61. This confirms the operation of the hardware and you may now proceed with programming the control (see page 39).

### SOFT START - LEM-LINE RE-INITIALIZATION

If a re-initialization of the LEM line is required, select the RESTART SYSTEM function (see page 54). To select this function, enter the Service user code and then press the R key (shift 7). A

## POWERING UP THE PANEL cont.

reboot, or SOFT START, of the panel will be effected. The display will show the usual start-up messages for a few seconds. From this moment on, the procedure is the same as for a SYSTEM RESET START (see page 35).

### AUTO START

The panel contains a "watch-dog" timer. Should there be a major disturbance to the hardware (e.g., electrical storm, static, etc.), this timer will reset and force the panel to effect an AUTO START. A flashing alert message will appear that must be acknowledged (see page 40).

### P.CODE START

As the panel is executing its instructions from the main program EPROM, it will check the EPROM checksum against a stored value. If it detects a difference, it will restart the program and indicate this by displaying **P. CODE START**. An alert message will appear that must be acknowledged (see page 40). This situation is very rare.

### PROGRAM SELF-TESTS

During the start-up routine, the panel will perform several comprehensive self-tests and display a fault warning message if any test fails. The display will show **RAM FILE ERROR** and the piezo-sounder will beep. Press the RETURN key to acknowledge the condition and then continue on. For the sake of clarity and because such failures are rare, these tests have not been included in the previous discussion.

The self-checks performed are for RAM function and a RAM data checksum. The flashing warnings displayed are:

**RAM FAIL AT nnnn** - indicates a memory-component fault. The printed circuit board has to be replaced.

**LOG DATA LOSS!** - indicates that the log data is corrupted. If the log is printed or displayed, then certain entries may yield garbage displays. The dates and/or times of logged events may also be corrupted. The log error message is cleared when acknowledged and no further action is required.

**LIT DATA LOSS!** - indicates corruption of the system literals. The corruption may be total or only partial. The panel will check all 750 literals in the program and any that are corrupted will be defaulted back to their factory settings. The defaulted literals are displayed and printed. If the panel can complete this routine, print a copy of the system literals (see page 53) and compare it

## **POWERING UP THE PANEL cont**

with an old record. Depending on the severity of the corruption, a recovery may not be possible and a COLD START with ZAP will have to be performed (see page 34).

**IDS/OPTIONS ERROR** - indicates corruption of the user identification codes or options. The panel may default all identification codes and options to their factory settings. All user identification codes and options may need to be reprogrammed.

## PROGRAMMING THE PANEL

### FUNCTIONS AND MODES

There are 26 functions or modes available in the control panel. Access to these by each of the 248 general users is assigned by the Master user (see page 47). Activities pertaining to the Service

L user have to do with installation and service and are only accessed by him or her. **Note that the Service user code can now be entered when the control is in FULL ARM mode.**

When the control panel is initially powered up, the Service user will automatically be assigned code 1010 and the Master user will be assigned code 1020. These are the default codes to allow access into the panel. Both codes can be changed later. The following table shows the selection of program functions and modes. To gain access, enter the appropriate user code, followed by the required function, number, or letter key.

FUNCTION OR MODE	USER NUMBER		KEYBOARD DESIGNATION	PAGE NO.
OPTIONS AVAILABLE/HELP	1	2	HELP	40
ACKNOWLEDGE ALARMS	1	2	0	40
DISARM	1	2	DISARM	40
PART ARM 1		2	PART ARM 1	41
PART ARM 2		2	PART ARM 2	41
FULL ARM	1	2	FULL ARM	41
DOOR ACCESS	1	2	5	41
NEW CLOSING TIME		2	6	42
9 KEY (used for custom applications)	1	2	9	42
SYSTEM LOG	1	2	YES	42
SINGLE-ZONE SHUNT	1	2	NO	43
SERVICE MODE	1		A (Shift YES)	43
BLOCK SHUNT/CLEAR		2	B (Shift NO)	46
SET IDS/OPTIONS	1	2	C (Shift DISARM)	47
ASSIGN ZONES/VARIABLES	1		D (Shift PART ARM 1)	49
LITERAL EDIT	1		E (Shift PART ARM 2)	53
DISABLE MODE	1		F (Shift FULL ARM)	53
DAYLIGHT SAVING TIME CHNGE (IMMEDIATE) COMMAND MODE	1	2	H (Shift HELP)	53
RELAY/C-LEM TEST	1		I ( Shift 1)	54
PRINT REPORTS	1		O (Shift 5)	54
RESTART SYSTEM/SOFT START	1		P (Shift 6)	54
SET DATA FORMAT	1		R (Shift 7)	54
SET DATE/TIME	1	2	S (Shift 8)	55
SET TIME COMMANDS	1	2	T (Shift 9)	60
TIME ADVANCE	1	2	U (Shift BACKSPACE)	60
			! (Shift Shift YES)	60

Some functions or modes are self-completing (i.e., they exit automatically). Others will require further action. For the NEW CLOSING TIME, SET DATE/TIME, and SET TIME

## PROGRAMMING THE PANEL cont.

COMMANDS functions, enter a military (24-hour) time and press the RETURN key to exit. Other functions will display a flashing sub-menu. To select from these sub-menus, follow the guidelines on the keyboard leading to the DISARM, PART ARM 2, or HELP keys and press the one that is appropriate. For example, in SERVICE MODE mode, a sub-menu of three choices will appear. These will be **REPORT--TEST-MONITOR**. If you wish to choose **REPORT**, then press the DISARM key; if **TEST**, then press the PART ARM 2 key; and if **MONITOR**, then press the HELP key. Having made your choice, follow the instructions that appear on the next display. To exit, press the NO key when there are no further entries to be made. Then, when the display shows **QUIT ?**, press the YES key to exit, or any other key to force a redisplay of the sub-menu.

**IMPORTANT!! Do not** leave the panel with a sub-menu showing. Anyone could make a selection and gain access to the premises later. Always complete your selection and exit to date and time.

### EXPLANATION OF FUNCTIONS AND MODES

- L Note that a four-digit code entry in the four-digit code option or a five-digit code entry in a five-digit option will be presumed in the following explanation of functions and modes. Should a four-digit code be entered when the five-digit code option has been chosen, then you must press the RETURN key to complete the entry.

**OPTIONS AVAILABLE (HELP KEY):** This function is included to help the user who is not sure of the system options available. Enter your user code and then press the HELP key. The panel will display **SELECT AN OPTION...**, followed by the first option available. The option will have a ? beside it. If you wish to select this option, then press the YES key. If you do not wish to select this option, then press the NO key to continue on to the next available option. This procedure must be repeated until an option is chosen. To exit from this function without choosing an option, repeatedly press the HELP key until you see **CLEAR DISPLAY**. Press the YES key.

**ACKNOWLEDGE ALARMS (0 key):** This function is used to acknowledge receipt of an alarm condition (e.g., **\*\*FIRE ALARM\*\***). Enter your user code and then press the 0 (zero) key. This action will stop the flashing display, silence the piezo-sounder, and turn off the bells. A tamper or disconnect condition on any zone will also create an alarm that is logged in the system log. When this happens, both the zone description and zone state are displayed. This may be acknowledged to stop the piezo-sounder.

**DISARM (DISARM key):** This is the normal daytime or open-period operating mode. To disarm the panel, enter your user code and then press the DISARM key. When the panel is in DISARM mode, the date and time will alternate with a display of any zones that are open (in alarm). If a zone description has been programmed, then the panel will display the actual zone

## PROGRAMMING THE PANEL cont.

description (e.g., **1. SIDE DOOR**) instead of the zone type, number, and state (e.g., **NIGHT 1 OPEN**). All shunted zones are cleared and all panel relays, most C-LEMs, and panel voltage switches are reset when this mode is selected or reselected. (The exceptions are FIRE TROUBLE panel voltage output 5 and output C-LEM 5, TECH output C-LEM 12, HOLDUP and DURESS output C-LEM 13, GATE VALVE output C-LEM 16, PRESSURE DROP output C-LEM 17, and SMOKE DETECTOR reset C-LEM 19, all of which reset when the appropriate zone resets.)

**PART ARM 1 (PART ARM 1 key):** When the panel is in PART ARM 1 mode, FOLLWR, EXIT, NOTPT1, and INTRNL zones **will not cause an alarm** if they open, but will cause a full alarm if tampered with or disconnected. All other burglary zone types respond as they would in the FULL ARM mode. This mode allows unrestricted access through the exit/entry door and is the equivalent to the "home" mode of operation of a residential panel. Enter your user code and then press the PART ARM 1 key.

**PART ARM 2 (PART ARM 2 key):** When the panel is in PART ARM 2 mode, FOLLWR, NOTPT2, and INTRNL zones will **not** cause an alarm if they open; however, if an exit/entry door is opened, the entry timer (see Entry Time delay variable, page 50) will start and the DISARM or PART ARM 2 key must be pressed before the entry timer expires to avoid a full alarm. This is equivalent to the "sleep" mode of operation of a residential panel. All other burglary zone types respond as they would in the FULL ARM mode. If the panel is in the PART ARM 2 mode and you wish to leave the premises, enter your user code, press the PART ARM 2 key if someone is remaining in the premises, or press the FULL ARM key if the premises will now become vacant. Both actions will start the exit timer (see Exit Time delay variable, 50). The timer will start beeping immediately if FULL ARM mode is chosen. If PART ARM 2 mode is chosen, there will be no beeping immediately but the exit timer **will be counting down silently**; as soon as the exit door is opened, the beeping will start, indicating that the timer is operating! **Do not delay unnecessarily when leaving!!**

**FULL ARM (FULL ARM key):** This is the nighttime or closed-period operating mode. In this mode, the display may be blank depending on the setting of the Full Arm Display variable (see page 51). Enter your user code and then press the FULL ARM key. If any zones are open, the display will show **CANNOT ARM**. If all zones are closed, the piezo-sounder will beep to indicate that exit time is in progress; when an EXIT zone or a FOLLWR zone is opened, the beeping rate will change until that zone is closed. During this exit and the subsequent entry time, an open (alarm) on any other zone will cause an instant, full alarm and the open zone will be logged in the system log.

**DOOR ACCESS (5 key):** This function is used to provide simple door access. The field of 250 users has been split up into five blocks of 50 users each (i.e., 1-50, 51-100, 101-150, 151-200, and 201-250). A C-LEM address of 41, 42, 43, 44, or 45 has been assigned to each block. If you are a user in block 1 to 50, enter your user code and then press the 5 key. This action will be logged and C-LEM 41 will operate for five seconds and then release. An electric door strike or magnetic door lock can be connected to the C-LEM relay output. Similarly, a user in block 51 to 100 will operate C-LEM 42; etc. The block sizes can be changed to suit the need. Consult the factory for assistance.

## PROGRAMMING THE PANEL cont

**NEW CLOSING TIME (6 key):** This function is only used if the panel has been programmed for the Late-to-Close Warning feature in the Closing Warning variable (see page 50). The Master user and selected general users may program a new closing time if they intend to stay later than the regularly scheduled closing time for that day. New closing times can be entered at any time of the day before a \*PAST CLOSING TIME\* alarm is to occur. Note that the **alarm** will occur at the expiry of the time programmed in the Closing Delay variable (see page 50); the **warning** itself will be given at the regularly scheduled or newly chosen closing time. The new time entered is only valid for the day in question and does not alter the regular, daily scheduled closing time. Enter your user code and then press the 6 key. The panel will display **NEW CLOSING TIME** for a moment and then will display the previous closing time in a message similar to

**19:55/[1 NEW CLOSNG]**. The cursor will be flashing on the first digit. Enter a new closing time using military (24-hour) time. Press the RETURN key to complete the entry. The piezo-sounder will beep if an illegal numeric entry has been made and the display will show **\*\* INVALID ENTRY \*\***, followed by the original entry. Enter the correct time and press the RETURN key. The panel will display **BUSY .. RE-SCHEDULING** and in a moment will return to date and time. If the panel is **not armed** by the newly programmed closing time, the piezo-sounder will beep and the panel will display **CLOSING TIME SOON !**. At this time, either arm the panel or repeat the above procedure.

**9 KEY (9 key) :** This is a spare key that can be programmed for custom functions (e.g., shunt a special block of zones, turn on a C-LEM, etc.). Contact the factory for a programming form and cost estimate for code development.

**SYSTEM LOG (YES key):** This function is used to print or display the historical log. Enter your user code and then press the YES key. In a polled [DVACS<sup>(tm)</sup>] installation without a Model 3302R3 port splitter, the display will briefly show **SYSTEM LOG** and then the log will be scrolled on the 20-character display. In a non-polled installation (local printer) or a polled installation with a Model 3302R3 port splitter, the display will show **PRINT LOG ?**. Press the YES key to make a hard-copy record of the system log. While the printing is in progress, the display will show **PRINTING SYSTEM LOG**. If a printed copy is not required, press any other key. The display will briefly show **SYSTEM LOG** and the log will then be scrolled on the display. To abort the system log at any time, press the NO key. The format of the displayed output is as follows: Starting with the last event and working back in time, the panel will show three messages for each alarm entry:

Message 1 is **DATE\*\*TIME**

Message 2 is **ZONE NUMBER or USER NUMBER**

Message 3 is **ZONE DESCRIPTION or ACTION TAKEN BY USER**

The date and time are separated by **\*\*** to distinguish an historical log display from the normal DISARM mode display. The content of the second and third messages will depend on whether it

## PROGRAMMING THE PANEL cont.

was a user action (e.g., SET DATE/TIME), in which case the user number will be the second message and action taken will be the third message, or a zone changing state, in which case the zone number will be the second message and the zone description will be the third message. The alarm log is capable of storing 300 of these three-part entries. While the log is being displayed, you may press the RETURN key to advance each line entry on the display. You may also press the DISARM (+) key to move just the time entry back in time more quickly (i.e., to the older log entries) and then you may press the PART ARM 1 (-) key to advance just the time entry forward in time more quickly (i.e., to rewind the log to the most recent entry). When you stop pressing these keys, the log will again continue its slow scroll back in time. This will allow you to easily review any display. When all entries have been displayed, the word **FINISHED** will appear and the panel will return to date and time. Press the NO key at any time to abort the system log.

**SINGLE-ZONE SHUNT (NO key):** This function provides a simple method of shunting when only a single zone is to be shunted or the total number of zones to be shunted is quite small. Enter your user code and then press the NO key. The display will show **SHUNT ZONE 0**. Enter the number of the zone that is to be shunted and press the RETURN key. The display will then show the description of the zone (e.g., † **3. MANAGER'S OFFICE**), if one exists, or, if no description exists, the display will show the zone type and zone number (e.g., † **NIGHT 3**). Having a zone description allows the user to see exactly which zone has been shunted. The flashing † to the left of the description indicates that the zone is currently shunted. If an incorrect zone number has been entered, that zone can be unshunted by pressing the YES key. (Pressing the YES key, in fact, toggles the shunt on and off. As the YES key is pressed, the flashing † will come and go indicating whether a zone is shunted or not.) The DISARM (+) key can be used to select higher zone numbers and the PART ARM 1 (-) key can be used to select lower zone numbers. By using the DISARM (+), PART ARM 1 (-), and YES keys, you can quickly step through a range of zones and examine or change their status. If the zone displayed is the one to be shunted, then press the RETURN key and the panel will exit from this mode. As the exit occurs, the panel beeps and then briefly displays the number of shunts in place. To exit at any time, press the RETURN key or the NO key.

**SERVICE MODE (A key):** To select this mode, enter the Service user code and then press the A key (shift YES). The display will show a flashing sub-menu: **REPORT--TEST-MONITOR**.

**ON-LINE REPORT** - The on-line report displays all zones that are connected to the panel and whose state was not disconnected or shorted at the last LEM-line initialization. The report starts with the lowest-numbered zone and increases numerically until all the on-line zones have been reported. To select the on-line report, press the DISARM key. In a polled [DVACS<sup>(tm)</sup>] installation without a Model 3302R3 port splitter, the panel cannot print a report and will immediately start displaying the report. In a non-polled installation (local printer) or a polled installation with a Model 3302R3 port splitter, the display will show **PRINT ON-L REPORT ?**.

Press the YES key to make a hard-copy record of the on-line report. While the printing is in

## PROGRAMMING THE PANEL cont.

progress, the display will show **PRINTING ON-L REPORT**. If a printed copy is not required, press any other key. The on-line report will now be scrolled on the display. As in the SYSTEM LOG function above, you may use the RETURN key and the PART ARM 1 key to advance or rewind the display. The NO key will abort the report. When the display shows **QUIT ?**, you may chose to return to the sub-menu by pressing the NO key or exit this function by pressing the YES key.

**WALKTEST** - This option, selected by pressing the PART ARM 2 key, is designed to ensure that all zones and their associated detectors are working correctly [i.e., reporting open (alarm) and closed (restored) conditions]. If possible, connect a printer to the panel when performing a walktest for a concise, date-stamped report showing the name and address of the installation, the number of zones tested, and a list of any untested zones.

In this option, the panel will display **WALKTEST** for a moment, followed by **TEST 1** (if zone 1 is on line!). To identify zone 1, press the HELP key and the display will briefly show the zone description. When zone 1 is activated, the panel will report this by displaying **TEST 2 : 1 CLOSED**. It has now set up for zone 2 and is waiting until that zone is activated before proceeding. (In the phrase **TEST 2 : 1 CLOSED**, **2** represents the zone on the system that is **to be tested** and **1** represents the **last** zone operated.)

If zones other than the one requested by the display are activated, their number and state (open or closed) will be shown; however, the panel will not ask for them when their position in the sequence occurs. If a zone cannot be tested, it may be disregarded by pressing any key. The NO key is used to exit.

TIMED BELL panel relay output 7 can be turned on very briefly (less than one second) on every zone change by pressing the FULL ARM key. Pressing the FULL ARM key again will cancel this function. This is useful to the serviceperson when working alone.

**SINGLE-ZONE MONITOR** - This option allows the user to examine any zone and display its state and analogue value. Once the zone number is entered, say 14, and the RETURN key pressed, it is possible to increment [press the DISARM (+) key] or decrement [press the PART ARM 1 (-) key] the zone number without having to exit and re-enter this option. The display is shown as follows:

- NIGHT 14 CLOSED [28]**, if the input is On Line
- NIGHT 14 CLOSED \*28\***, if the input is Not On Line
- NIGHT 14 CLOSED /28/**, if the input is Disabled
- \*NIGHT 14 CLOSED [28]**, if the input is Manually Shunted
- /NIGHT 14 CLOSED [28]**, if the input is Program Shunted
- +NIGHT 14 CLOSED [28]**, if the input is both Manually & Program Shunted

## PROGRAMMING THE PANEL cont.

- L The analogue value displayed will increase on systems with long cable runs *due to wire resistance and increased cable capacitance*.

The piezo-sounder is used in this option to indicate the state of the LEM input under test. The relationship between the beeping sound and the state of the input is as follows:

STATE OF INPUT	PIEZO-SOUNDER
CLOSED	Off
OPEN	Long beep
SHORT	Short beep
DISCON	Continuous

### NOTES:

1. The piezo-sounder may be turned off by pressing the PART ARM 2 key. Press this key again to re-enable the piezo-sounder.
2. The zone description for any zone may be displayed by pressing the HELP key.
3. As in the WALKTEST option above, you may press the FULL ARM key and TIMED BELL panel relay output 7 will trip briefly every time the displayed zone changes state.

### TROUBLE-SHOOTING INPUT LOOPS:

The following section is included to give the installer guidance in trouble-shooting zone inputs. Zone 5 (an odd numbered zone, therefore connected to terminals 6 and 7 of a LEM addressed to 3) has been chosen.

1. In the SINGLE-ZONE MONITOR option, if a 2K2-ohm resistor is connected between terminals 6 and 7, the display will show **NIGHT 5 CLOSED [28]**.
2. If the circuit is opened between terminals 6 and 7, the panel will show **NIGHT 5 DISCON [89]**.
3. If a short circuit is placed across terminals 6 and 7, the panel will show **NIGHT 5 SHORT [3]**.
4. If two resistors in series are connected to terminals 6 and 7, the panel will show **NIGHT 5 OPEN [42]**.

The number in square brackets represents the analogue value of the signal coming from the LEM

## PROGRAMMING THE PANEL cont.

zone input and should be within  $\pm 2$  of this value. By examining different inputs, you will be able to determine the analogue values for all zones and these can be printed or recorded for future reference when trouble-shooting faulty zones. A table of acceptable analogue values follows:

INPUT COND.	MIN.	MAX.	TYP.
SHORT	0	21	3
CLOSED	22	36	28
OPEN	37	55	42
DISCON	56	90	85

These readings will remain near the typical values unless the **resistance** of the LEM trunk increases due to excessive length (around 1500 meters) or until the limit of cable **capacitance** is reached, at which point they will increase as extra cable is added. The system assumes a nominal cable capacity of 50 pf/m to allow 2-km maximum length.

During initialization, zones with marginal responses will also be displayed. Zones with values that are outside of the min./max. range will be individually displayed. (See LEM-LINE INITIALIZATION on page 35 for further information.)

**BLOCK SHUNT/CLEAR (B key):** This function allows the user to shunt a single zone or blocks of zones, clear existing shunts, or re-apply a previously determined pattern of shunted zones with one key. Zones that are shunted **will still report a tamper or disconnect state**. Enter your user code and then press the B key (shift NO). The display will show a flashing sub-menu: **MEMORY--SHUNT--CLEAR**.

**SHUNT** - To shunt a zone or block of zones, press the PART ARM 2 key. The display will show **SHUNT FROM 1**. Enter the number of the first zone to be shunted and press the RETURN key. The next message displayed will be **SHUNT TO #**. If only one zone is to be shunted, then press the RETURN key; otherwise, enter the number of the last zone in the block of zones to be shunted and press the RETURN key. If you have shunted a single on-line zone or block of zones, the piezo-sounder will beep and the display will show **# SHUNTS**, followed by **QUIT ?**. If you have shunted a non-existent zone, **QUIT ?** will be displayed. Press the YES key to exit or any other key to return to the sub-menu. The display will now continuously show the total number of zones shunted.

**CLEAR** - To clear the shunts, press the HELP key when **MEMORY-- SHUNT--CLEAR** is displayed. The message **CLEAR FROM 1** will then appear. The procedure for clearing is the same as for shunting. Follow the steps described above. Shunted zones are automatically cleared on entry to DISARM mode following a previous arming.

**MEMORY** - Shunted zones are cleared automatically after one use: that is, when the panel is disarmed, all shunts are removed. However, the system remembers which zones were shunted and the MEMORY feature allows these shunts to be re-activated with the press of a single key.

## PROGRAMMING THE PANEL cont.

This feature is very useful when the same group of zones are regularly being shunted. Zones can only be cleared from the shunt memory by using the CLEAR option described above. Press the DISARM key to select the MEMORY option. The display will show **PRE-PROGRAMMD SHUNT** and then the number of shunts, if any. The piezo-sounder will beep and then the display will show **QUIT ?**. If there are no shunts programmed, the display will immediately show **QUIT ?**. The total number of shunted zones is continuously displayed.

**SET IDS/OPTIONS (C key):** Both the Service user, user number 1, and the Master user, user number 2, can select this function to set identification codes for the 248 general users. These two users can also assign functions and modes to other users but each will be presented with a different list of functions and modes to choose from. General users, if authorized, can then re-assign their functions and modes to others. At any point, should a general user attempt to enter a function or mode other than that permitted in his or her list, the display will show **\*\* INVALID ENTRY \*\***. Enter your user code and then press the C key (shift DISARM). The panel will display a flashing sub-menu: **IDS--OPTIONS-NAMES**.

**IDS (IDENTIFICATION CODES)** - To select or change identification codes (IDS), press the DISARM key. The panel will display **ENTER USER NO. 1**. If user number 1 is to be chosen, press the RETURN key. If a user other than number 1 is to be chosen, enter his or her number and then press the RETURN key. The next message displayed will be **ENTER CODE \_ \_ \_ \_ \_**. User codes can have four or five digits. The five-digit code capability must be enabled by the installer during the powering-up sequence (see page 36). Otherwise, the control panel will default to the four-digit capacity. Four-digit codes are acceptable if the five-digit option has been chosen but, in this case only, the RETURN key must be pressed to complete the entry. If you have elected to use four-digit codes, enter any numeric code from **1000** up to **9999**. (Note that, unlike

L in the previous software, *numeric codes 1 to 0999 are not allowed*. This is because the new Duress alarm feature described on page 61 uses a lead 0 numbering scheme.) If you have elected to use five-digit codes, enter any numeric code from **1000** to **32767** but remember that four-digit codes with a five-digit option will require the use of the RETURN key. As a security feature, user codes are never displayed as they are entered because they may be seen by others near the panel or at a remote keypad. Instead, a \* will be displayed for every digit entered. After a code is assigned, you must press the RETURN key to advance to the next user number. If this user requires a code, then press the RETURN key and follow the procedure described above. Note: **No two user codes can be the same!!** The panel will test for duplicate codes. If one is entered, the piezo-sounder will beep and the display will show **USER # DUPLICATE**. To exit, press the NO key when the display shows **ENTER USER NO. #**. The **QUIT ?** message will appear and you may press the YES key to exit or any other key to return to the sub-menu.

L **REMOVING A USER CODE:** Select IDs as above, enter the user number in question, press the RETURN key, enter single \* (PART ARM 2) for the code, and then press the RETURN key again. This will delete the old code. Press the NO key to quit and the YES key to exit.

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**RESETTING USER 1 AND 2 IDS:** If through the course of staff changes, etc., the Service user's **code** or the Master user's **code** has been lost, then **these two user codes only** may be reset to the factory default value (i.e., Service user 1 will again have code 1010 and Master user 2 will again have code 1020). New codes may then be assigned. All other user codes will remain unchanged!

To perform this reset procedure, open the panel door and press the CPU reset button to the left of the display. Quickly close the door and press the PART ARM 2 key when the display shows **M100 1A 250U 8SEP97**. The piezo-sounder will beep and the display will show **RESET USER 1&2 IDS ?**. Press the YES key to reset the Service user's code to 1010 and the Master user's code to 1020 or the NO key to leave them unchanged.

**OPTIONS** - To select OPTIONS, press the PART ARM 2 key. The panel will display **ENTER USER NO. 1**. Enter the number of the user to whom you wish to assign the options and press the RETURN key. The panel will now display **DISARM NO**. If you do not wish to allow this general user to disarm the panel, press the RETURN key. The flashing **NO** will remain and the next option will follow. If this option is to be allowed, then press the YES key. This changes the **NO** to a **YES** on the panel to confirm your choice. The next option will then appear, along with **NO**. This procedure must be repeated for this user for all 11 options listed below. The PART ARM 1 (-) key may be used to return to a previous option. Hint: If you are only changing a few options, you may wish to exit before all 11 options have been displayed. Press the HELP key and the next user will appear. To exit from this option, press the NO key whenever the display shows **ENTER USER NO. #**. The display will now show **QUIT ?** and you may press the YES key to exit or any other key to return to the sub-menu.

The following is a list of all possible options presented to the Master user, user number 2:

DISARM	BELL TEST	SINGLE-ZONE SHUNT
PART ARM 1	NEW CLOSING TIME	SET DATE/TIME
PART ARM 2	CLEAR DISPLAY	SET IDS/OPTIONS
FULL ARM	SYSTEM LOG	

If the Service user, user number 1 is at the keyboard and has entered his or her user code and selected SET IDS/OPTIONS, the procedure for assigning identification codes is the same as above; however, in the OPTIONS option, a different list is presented.

DISARM	SINGLE-ZONE SHUNT	SERVICE MODE
FULL ARM	SET DATE/TIME	DISABLE MODE
CLEAR DISPLAY	ASSIGN ZONES/VARS	LITERAL EDIT
SYSTEM LOG	SET IDS/OPTIONS	

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**NAMES** - To select NAMES, press the HELP key. The display will show **ENTER USER NO. 1**. If user number 1 is to be chosen, press the RETURN key. If a user other than number 1 is to be chosen, enter his or her number and then press the RETURN key. The display will show a flashing cursor,  $\wedge$ , in the farthest-left position. Enter a user's name up to a maximum of 20 characters. (See page 4 for information on how to select the letters of the alphabet.) When the entry is complete, make sure that the cursor is at normal shift (up) and then press the RETURN key. The display will now show the next user number. If this user's name is to be entered, press the RETURN key and follow the procedure described above. To exit, press the NO key when the display shows **ENTER USER NO. #**. The **QUIT ?** message will then appear and you may press the YES key to exit or any other key to return to the flashing sub-menu.

**ASSIGN ZONES/VARIABLES (D key):** This function is used to enter the actual location of each zone or a description associated with it (e.g., 1. FRONT DOOR, 6. FACTORY PASSIVE, etc.). To select this function, enter the Service user code and then press the D key (shift PART ARM 1). The panel will display a flashing sub-menu: **DESCS---TYPES--VARS**.

**ZONE DESCRIPTIONS** - To select ZONE DESCRIPTIONS, press the DISARM key. The panel will display **ENTER ZONE NO. 1**. If this is the desired zone, then press the RETURN key; otherwise, enter the number of the required zone and then press the RETURN key. The display will then show a flashing cursor,  $\wedge$ , in the farthest-left position. Enter the zone number, followed by a zone description up to 18 characters long. (See page 4 for instructions on the use of the keyboard.) When the entry is complete, make sure that the cursor is at normal shift (up) and then press the RETURN key. The panel will display **ENTER ZONE NO. #** for the next zone in the sequence. Proceed as described above. To exit, press the NO key whenever the display shows **ENTER ZONE NO. #**. The **QUIT ?** message will appear and you may press the YES key to exit or any other key to return to the sub-menu.

**ZONE TYPES** - To select ZONE TYPES, press the PART ARM 2 key when the flashing sub-menu is displayed. The panel will then display **SET FROM 1**. If the required zone is number 1, then press the RETURN key; otherwise, enter the number of the required zone and press the RETURN key. The panel will display **SET TO #**. If a range of zones is required, enter the upper limit and press the RETURN key; otherwise, just press the RETURN key. The panel will respond with **NIGHT ?**. In the same manner as with the OPTIONS option (see page 48), select the appropriate zone type to be allocated to this zone or group of zones. To exit, press the NO key whenever the display shows **SET FROM 1**. The **QUIT ?** message will appear and you may press the YES key to exit or any other key to return to the sub-menu.

**SYSTEM VARIABLES** - To amend system variables, press the HELP key when the flashing sub-menu is displayed. The system variables will now be presented. In response, enter time

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values in seconds (e.g., 10 minutes = 600 seconds) or select a condition specified by a numeric entry. Note: The time entries can range from 1 to 9999 seconds and 0 seconds means infinite time (forever). If no entry is required, press the RETURN key to advance to the next item. Use the PART ARM 1 (-) key to return to the previous entry.

ENTRY TIME 30: This is the delay time in seconds that a user is allowed to disarm the panel after an exit/entry door is opened. (**Do not** enter 0.)

EXIT TIME 30: This is the delay time in seconds that a user is allowed to exit the premises via the FOLLWR and EXIT zones from the moment the system is placed in FULL ARM or PART ARM 2 mode. (**Do not** enter 0.)

AUDIBLE TECH ? 0: This variable allows for an audible alert from a TECH zone. Change this value to a 1 to cause the piezo-sounder to beep when an alarm occurs on a TECH zone.

CLOSING WRNING ? 0: This variable allows a Late-to-Close Warning to be given. Enter 1 if you wish to turn on the Late-to-Close Warning feature. Having done this, you may change the Closing Delay variable from its default value (see below). An alert message **CLOSING TIME SOON !** will then be displayed if the premises has not been armed by the closing time scheduled for that day. The piezo- sounder will also start beeping. At any time within the closing delay period, you may arm the panel or give yourself additional time by selecting the NEW CLOSING TIME function (see page 42). The closing times for each day of the week are programmed by using the SET TIME COMMANDS function (see page 60).

CLOSING DELAY 900: This variable sets in seconds the delay time allowed after the regularly scheduled or newly chosen closing time for that day. It is used in conjunction with the Late-to-Close Warning feature (see page 61).

SHUNT LIMIT 99: This is the highest zone number that can be shunted. Important zones like FIRENO, PANIC, or HOLDUP should be assigned high zone numbers and this limit lowered to prevent the accidental shunting (bypassing) of those zones.

ALERT & DISPLY? 1: This variable is used to enable the control panel and the remote keypad displays to show warning and alert messages. If the panel is installed in an unattended location (e.g., a sprinkler room), then warning and alert messages will be unnecessary. Enter a 0 to turn off the alert procedure.

DOUBLE/TWIN TIME 900: This is the time in seconds within which the two activations of a Double-knock or the alarming of two TWIN zone types must occur in order to cause a full alarm.

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FULL ARM DISP 0: This variable controls the action of the display in the FULL ARM mode. It can be set to one of the following values:

- 0 - The display remains blank.
- 1 - ALERT messages only are displayed.
- 2 - ALERT and WARNING messages are displayed.
- 3 - ALERT messages, WARNING messages, OPEN zones, and DATE/TIME are displayed.
- 4 - All of the above plus OPEN zones display zone state and zone description.

For example: If, while the panel is armed, an immediate display of an alarm is required, then set the variable to 1.

MON/FIRTBL DELAY 10: This is the delay time in seconds that a MONITOR or FIRTBL zone type can remain open (in alarm) before the panel responds.

BELL DELAY 1: When an alarm occurs, this is the time delay in seconds between the immediate operation of INTRUSION panel relay output 1 and output C-LEM 1 and the activation of TIMED BELL panel relay output 7 and output C-LEM 7. (**Do not** enter 0.)

LOG OUTPUTS? 0: When a panel relay output or an output C-LEM is operated or reset, this action can be stored in the system log and simultaneously be printed on the system printer. As this action creates unnecessary, wasteful log data, it should only be used in certain instances. If needed, set this variable to 1.

PART 1/2 DISPLY 0: If the panel is to be used in the PART ARM 1 or PART ARM 2 mode, it is advisable to indicate this fact on the panel for the benefit of people remaining in the protected area. Set this variable to 2 to allow this to happen. The chart for the Full Arm Display variable above also applies.

RETARD TIME 3: This variable is used to set the amount of retard time that must expire before a FLOW zone type will create an alarm. The allowable values are 1 second to 60 seconds. Values entered outside this range will default to the minimum (3) or maximum (60) values.

RETRIGGER 1: This variable controls the retriggering of the external bell relay during an alarm. It can be set to one of the following values:

- 0 - The bell relay will reset after the bell time expires and **will not** retrigger on any further zone violations.
- 1 - The bell relay will reset after the bell time expires and **will** retrigger when a zone is violated.
- 2 - The bell relay will reset after the bell time expires **only** if all zones on the system have closed (restored). If any of the zones are open (in alarm), then the bell relay will remain operated.

## PROGRAMMING THE PANEL cont.

BELL RUN TIME 900: This is the time in seconds that TIMED BELL panel relay output 7 and output C-LEM 7 will operate before an automatic shutdown.

- L REMARM TOGGLE? 1: This variable is used in conjunction with the REMARM zone type (see page 28). If it is left as 1, then momentary short circuits to the end-of-line resistor from dry contacts toggle the armed/disarmed mode of the panel. If it is changed to 0, a two-position dry contact can provide both a continuous closed contact to arm the panel and a continuous open contact to disarm the panel.
- L FORCED REMARM? 0: This variable is used in conjunction with the REMARM zone type (see page 28). If it is left as 0 and the panel is armed using a REMARM zone and one or more zones are in alarm, then the panel will not arm. If it is changed to 1 and the panel is armed as before and one or more zones are in alarm, the panel will arm and the message \*IMPROPER CLOSING\* will be logged and sent to the central/monitoring station.
- L ENABLE DURESS? 0: The old DURESS function has been changed. This variable is used to activate the Duress alarm feature. Leave the variable at 0 to deny the Duress alarm feature or change it to 1 to enable the Duress alarm feature. To create a duress alarm, the user must enter a zero (0) and then their code and then press a *valid* function key (e.g., DISARM). It does not matter what the function is because that function will be executed and a duress alarm sent as well.  
  
ARM/DISARM ALRT? 0: This variable is only to be used with a central/monitoring station that is **not equipped with an automation computer**. If the station operator is to be alerted when the customer has armed or disarmed his or her system (e.g., for purposes of manually preparing an opening/closing summary), then set this variable to 1. **(Do not set this variable to 1 when using an automation computer.)**
- L COMMS TEST 0: This variable is used to cause a periodic communications test to be sent to the central/monitoring station. Such a test can be used to prove the integrity of the system in low traffic applications such as fire alarm panel monitoring, sprinkler riser monitoring, building temperature monitoring, etc.. To select the frequency of the testing, you must enter a numeric value (e.g., 0= No test, 1= Every day, 2= Every second day, 3= Every third day, etc.). The test will occur at 03:00 hours and this time can be changed by using the SET TIME COMMANDS function (see page 60).
- L SUPVRY SHUTDOWN 0: This variable is used to allow a fixed number of alarm and restore signals from a sprinkler riser (gate valve, post indicator valve, or pressure drop switches) to be sent to the central/monitoring station, after which no more signals are sent for a period of 90 minutes (5400 seconds) or unless the service technician manually resets the timer either by simply pressing the DISARM key once or by entering his or her code and then pressing the DISARM key. This shutdown does not apply to the FIRENO, FIRENC, or FLOW zones!

## PROGRAMMING THE PANEL cont.

- L AC FAIL DLY TIME 1: This variable is used to allow an extra amount of time to occur before the control panel reports an AC power failure. The normal delay period is six seconds. This consists of five seconds built in to the panel's operating system plus the one second default value of this variable. You may select any value from 1 to 9999 seconds, which, added to the internal five seconds, will form the new delay time. A value of zero (0) will default back to a one (1).

### SYSTEM VARIABLES RECHECK:

When the **AC FAIL DLY TIME 1** variable is displayed, press the PART ARM 1 (-) key to check the variables. This will start a reverse scroll through the list. When the entire list has been checked, press the NO button and the display will show **QUIT ?**. Press the YES button to exit or the NO button to return to the flashing sub-menu.

**LITERAL EDIT (E key):** This mode is used by the serviceperson to modify text phrases, command strings, zone responses, etc. Programming instructions are explained in the ENHANCED PROGRAMMING MANUAL. To select this mode, enter the Service user code and then press the E key (shift PART ARM 2). Sub-menu selections are summarized in the INSTALLER SET-UP BOOKLET.

**DISABLE MODE (F key):** This mode is used by the serviceperson to disable zones. The steps are similar to those followed in the BLOCK SHUNT/CLEAR function (see page 46); however, the main difference is that disabled inputs are treated as if they were **no longer on line** (i.e., **no change of any state** is reported). To select the DISABLE mode, enter the Service user code and then press the F key (shift FULL ARM). If some zones are already disabled, the message **CLEAR ALL DISABLES ?** will appear. Respond by pressing either the YES or NO key. Pressing the YES key will remove all disables, while pressing the NO key will leave the disables in place. Both selections will cause the display to show **DISABLE FROM 1**. Press the NO key to exit or proceed with the rest of this section to disable more zones. Enter the first zone number to be disabled and then press the RETURN key. The display now will show **DISABLE TO #**. Enter the last zone number to be disabled, which may be the same as the first, and then press the RETURN key. The panel display will show **N DISABLES**, where **N** is the number of zones disabled. Exit is automatic.

Disabled zones are not cleared on entry to the DISARM mode but the number of disables, if any, is displayed each time any arming or disarming mode is entered.

**DAYLIGHT SAVING TIME CHANGE (H key):** Any time during the week that the Daylight Saving Time change occurs, enter your user code and then press the H key (shift HELP). When this mode is selected, the display will continuously show **HOURLY CHNGE ON SUNDAY** and the time will advance or retard by one hour at 2 a.m. on the following Sunday morning. The panel will figure out whether to advance or retard the hour by looking at the current month. The hour change may be cancelled by reselecting this mode. Once selected, the message **HOURLY**

## PROGRAMMING THE PANEL cont.

**CHANGE ON SUNDAY** will be automatically cleared when the hour change takes place. If this mode is entered in error, re-enter your user code and press the H key. The display will show **CANCEL HOUR CHANGE** for a moment and the message will be removed.

**(IMMEDIATE) COMMAND MODE ( I key):** This mode is used by the serviceperson to program a command that will be executed by the control panel when the RETURN key is pressed. Command strings should only be entered by experienced personnel as improperly entered data can cause havoc with the panel. To select this mode, enter the Service user code and then press the I key (shift 1).

**RELAY/C-LEM TEST (O key):** This function allows all outputs on the panel to be examined and tested. Enter the Service user code and then press the O key (shift 5). The display will show **OUTPUT 1 ON**. The current state of the output, on or off, is indicated and the state may be changed by pressing the YES key. Use the DISARM (+) key to advance to the next output and the PART ARM 1 (-) key to back up to the previous output. Press the NO key to quit. The outputs will remain as set. To reset any changed outputs to their normal state, you must disarm the panel.

**PRINT REPORTS (P key):** This function allows all system reports to be printed. The following reports are available:

- |                           |                   |
|---------------------------|-------------------|
| 1. SYSTEM VARIABLES       | 4. ON-LINE REPORT |
| 2. USER NAMES AND OPTIONS | 5. SYSTEM LOG     |
| 3. CHANGED LITERALS       |                   |

Enter the Service user code and then press the P key (shift 6). The display will show **PRINT ALL REPORTS ?**. Press the YES key to print all the reports or press the NO key to exit. If the YES key is pressed, reports 1, 2, and 3 will be printed. The display will show **PRINTING VARIABLES**. After the variables have been printed, the display will show **PRINT USER IDS ?**. If the YES key is pressed, the display will show **ENTER CODE \_ \_ \_ \_**. If you wish the user list to include all user codes, then enter the Master user's code and press the RETURN key. If no code or the wrong Master user's code is entered, then the list will not contain the user codes. The panel will then prompt the user with **PRINT ON-L REPORT ?**. Press any key to proceed. The panel will print the on-line report and then the system log. Press the NO key to abort these at any time. Note: this option is not available with DVACS<sup>(tm)</sup> unless the Model 3302R3 port splitter is installed.

**RESTART SYSTEM/SOFT START (R key):** This function is used to restart the panel without having to open the cabinet door and press the CPU reset button. This capability is essential if the serviceperson is changing the LEM count and requires a re-initialization of the LEM line. Enter the Service user code and then press the R key (shift 7). All outputs will immediately be reset and the usual start-up messages will be displayed. When the display shows **INITIALIZE LEM**

## PROGRAMMING THE PANEL cont.

**LINE?**, press the YES key. The display will show **ON-LINE O-->N**, where **O** is the old zone count and **N** is the new zone count. From this moment on, the procedure is the same as for LEM-LINE INITIALIZATION (see page 35).

**SET DATA FORMAT (S key):** This function allows the panel communications to be configured for connection to a number of devices including a printer, an autodial modem, a computer, and the DVACS<sup>(tm)</sup> network. Enter the Service user code and then press the S key (shift 8). There are many options to be chosen; the actual options presented will depend on the device being configured. Some options require a yes or no selection (e.g., **TRANSMIT NAME YES**, where the flashing **YES** indicates the current setting). Others will require a numeric entry.

L The display will show **COMMS MODE 0**. The following chart summarizes the choices:

- 0 - Used in a polled environment (e.g., DVACS<sup>(tm)</sup>, PANELMAN, autodial modem, etc.).
- 1 - Used when a serial-input logging printer is directly connected to the panel.
- 2 - Used when the panel is both polled and a Model 3302R3 port splitter is connected to the panel to permit simultaneous use of a logging printer.

If **0** is the desired selection, press the RETURN key. The display will show **SYSTEM ID 0**. Proceed to where SYSTEM ID is shown below in bold type. If a logging printer *only* is desired, enter a 1 and then press the RETURN key. The word length (data bits), parity, and baud rate will be chosen later. When configured for a printer only, the RX panel input is used as a "busy input" from the printer and should normally be held high (+ve) to allow real time events (e.g., arming, disarming, zone shunting, etc.) to be printed. If the printer does not provide a busy output, RX should be linked to +12 volts DC via a 2K2-ohm resistor (see chart below). If a logging printer *and* polling is desired, enter a 2 and then press the RETURN key. The logging printer word length (data bits) and baud rate are fixed at eight data bits and 2400 baud respectively. The *printer parity* must match the polling application (i.e., even parity for DVACS<sup>(tm)</sup>, no parity for autodial modem). At this time, RX becomes the receive data line. See complete instructions accompanying the EUROPLEX Model 3302R3 port splitter.

### COMMS MODE 1: LOCAL PRINTER CONNECTION

APLEX	PRINTER
37/J21 -ve (Gnd) .....	7 (Gnd)
39/J23 Tx .....	3 (Rx)
40/J24 Rx .....	4 (RTS) On/Off line **

\*\* The On-/Off-line output may vary between printers. The above is valid for the Citizen Model GSX 190 dot-matrix printer (EUROPLEX product code 1510). Consult your serial-interface manual for other printers.

## PROGRAMMING THE PANEL cont.

If the Comms Mode was changed to a 1 or 2 and the RETURN key was pressed, the display will show **TRANSMIT NAME NO**. If the name and address of the installation are *not* to be printed at the start of *any* data sent to the printer, press the RETURN key to proceed. However, if you wish this information to be printed, press the YES key. The display will show **ENTER NAME/ADDRESS** for a moment and then the current name and address, if any. This can be edited or entered as required. This feature is intended for installations where a number of APLEX control panels share a common printer and printing the name allows identification of the data from each control panel. Press the RETURN key to proceed.

The display now shows **SYSTEM ID 0**. This is the APLEX polling address and is used when communicating with the EUROPLEX Model 1431/1432 autodial modem, PANELMAN software (product code 3305AP3), or when connected to the DVACS<sup>(tm)</sup> network. Any commands sent to a APLEX control panel contain the system ID and the panel will only respond if the ID in the command matches its own system ID. All panels on a common network [as in the case of the DVACS<sup>(tm)</sup> network] must have a *unique* system ID. Allowable addresses are 1 to 255. If you are using the Model 1431/1432 autodial modem or the PANELMAN program, set this address to 1. If you are using a logging printer only, then leave this value at 0. Press the RETURN key to proceed.

L The display will now show **ACCESS CONTROL 543**. This value, from 0 to 543, controls the types of remote commands that can be sent to a APLEX control panel in a polled environment (e.g., when used with a DVACS<sup>(tm)</sup> network or PANELMAN program) and can be used to restrict remote-control capability on high-security installations. A value of 543 allows **all** commands to be sent and a value of 0 allows only polling. To select a value for access control, consult the table below. If a logging printer only is to be used, this value may be left at 543. Otherwise, decide which commands are to be allowed and add the numbers in the right-hand column of the table for those commands. This number is the access control value. Enter this number into the control panel and press the RETURN key to proceed.

CONTROL FUNCTION	SELECT
Output Control - turn on/off outputs	1
Input Control - shunt/unshunt zones	2
Write Commands - IDs/options, time, etc	4
Read Commands - zone state, output state, literal	8
Write DISARMed - write commands allowed in DISARM mode	16
Read Commands - Ids/options	<u>512</u>
	543

For example: Suppose that only read commands (read zone states, read output states) and write commands (set IDs, options, time, etc.) are allowed when the APLEX control panel is in DISARM mode. Then set the access control to 24 (8 + 16). Press the RETURN key to proceed.

## PROGRAMMING THE PANEL cont.

The display will now show **LOG FILTER**. All data reported to a central/monitoring station, either on the DVACS<sup>(tm)</sup> network or through an autodial modem, is obtained from the log that contains a record of *all activity*. The log filter provides a means of filtering this data such that only the required data is reported. The panel defaults to reporting *all logged data*. The log filter can be set to meet the installation requirements by adding up the values, shown in the right-hand column in the table below, of the various data types that are to be reported.

LOG DATA TYPE	SELECT
1 - Zone activations	1
2 - Status changes	2
3 - User actions	4
4 - Output switching	8
5 - Variable values	16
6 - Single-byte variable	32
7 - User-defined message format	64
8 - Date change (never reported)	N/A
9 - Not used	256
10 - Zone shunting	512
11 - Zone unshunting	1024
12 - Zone disabling	2048
13-15 - Not used	<u>4096</u>
	8191

For example: If only zone activations are to be reported, set the log filter to 1. If zone activations and user actions are required, set the log filter to 5 (1 + 4). The default value is all choices (8191). Enter the new value or press the RETURN key to proceed.

The display will now show **DIAL MODE 0**. Press the RETURN key to leave the value at 0 for logging printer only and DVACS<sup>(tm)</sup> operation and the display will show **DATA BITS =8 ?**; in this case, proceed to page 59 where this display is shown in bold type; otherwise, an autodial modem may be connected to the APLEX control panel to allow remote communications over the switched telephone network. A number of choices allow data to be sent to a remote printer or computer. If an autodial modem is connected, set DIAL MODE 0 to 1 or 3. Enter the appropriate value as determined from the following chart and press the RETURN key to proceed.

0 - No autodial modem connected.

1 - A logging printer is connected to an autodial modem at the remote location. When any event is logged by the panel, *but not filtered* by the log filter, the remote location will be dialled immediately and any logged data will be sent to the remote printer. When all the data is sent, the panel will instruct the autodial modem to hang up.

## PROGRAMMING THE PANEL cont.

2 - Allows incoming calls, e.g. PANELMAN.

3 - Allows incoming and outgoing calls. A personal computer with the PANELMAN program or a EUROPLEX Model 1430 autoanswer modem/polling multiplexer interface. The following options appear for dial modes 1, 2, and 3 but they are relevant for dial mode 3 only. The display will show **ACCESS MODE 0**. Leave this value unchanged if unrestricted access is to be allowed when *dialling remotely* into the panel using the PANELMAN program. If you wish to *restrict access* by means of a password, enter a 1. If you wish to have the panel *dial back to you* after you have previously established contact with the panel, enter a 2. Press the RETURN key and the display will show **ACCOUNT #A 0**. The numbering scheme for a control panel when used with the autodial modem is from 000-000 to 099-254. This six-digit value has been broken down into two three-digit values, account #a and account #b. Enter a three-digit value ranging from 000 to 099 in the account #a window. Note that a value up to 127 can be entered in account #a; however, this will create a six-digit account number and most central/monitoring station automation computers cannot handle account numbers greater than five digits. Press the RETURN key and the display will show **ACCOUNT #B 0**. Enter a three-digit value ranging from 000 to 254 and then press the RETURN key.

The display will momentarily show **ACCESS CODE** followed by a blank screen with the cursor flashing at the left. If you have chosen password protection (access mode 1) when dialling into a control panel, enter your password here; otherwise, press the RETURN key. The password may be an alphanumeric string up to 127 characters long. You may have a unique password for every panel because the PANELMAN program will store the password on a per customer basis. Press the RETURN key to proceed.

The display will show **DIAL LIMIT 5**. This value may be changed to reflect the number of times that an attempt is made to call out to the central/monitoring station. The maximum allowed value is 15. The panel will check both stored telephone numbers in attempting to dial out and, if the dial limit is reached, the flashing alert message **CALL NOT ANSWERED** will be displayed. Enter a new value or press the RETURN key to proceed.

The display will show **ENTER DIAL COMMAND** for a moment, followed by the dial command **AT E0 X2 S0=8 DP**. This command is sent to the autodial modem ahead of the telephone number and tells the autodial modem to listen (AT), turn the echo off (E0), wait for dial tone (X2), set the autoanswer to eight rings (S0=8), and choose the dialling method to use (default command is DP for pulse dialling). You may edit this command as necessary; however, you should check with the factory to ensure that you are using the correct command structure. The most common change will be to edit DP to DT for tone dialling. For more details on dial commands, consult any commercial autodial modem manual. Press the RETURN key to proceed.

The display will now show **ENTER TEL. NO. 1**, followed in a moment by a blank screen. Enter the telephone number of the autodial modem at the remote location. A two-second pause

## PROGRAMMING THE PANEL cont.

between numbers can be included by entering a comma (shift shift PART ARM 1) (e.g., 9,4167548992). Press the RETURN key to proceed.

The display will now show **ENTER TEL. NO. 2**. If an alternative location is available for use when no connection can be made with the first number, then enter that telephone number; otherwise, either leave this entry blank or re-enter the first number. Press the RETURN key to proceed.

If access mode 2 (the dial-back option) was chosen above, the display will now show **ENTER DIAL-BACK NUM**, followed in a moment by a blank screen. Enter a telephone number that the panel can call to allow linking to the PANELMAN program. Press the RETURN key to proceed. The display will now show **TRANSMIT NAME YES** or **TRANSMIT NAME NO**. Press the YES key to select yes, the NO key to select no, or the RETURN key to maintain the current setting. If no is selected, the display may show **DATA BITS =7 ?** or **DATA BITS =8 ?** (proceed to the next paragraph). If the panel is in dial mode 1 and yes is selected, the name and address of the installation will be transmitted to a remote printer every time that data is sent. This allows any EUROPLEX 3000 series control panel to access a common remote printer by ensuring that the data from each panel can be uniquely identified on the printout. When yes is selected, the display will show **ENTER NAME/ADDRESS** for a moment and then the current name and address, if any. This can be entered or edited as required. Press the RETURN key to proceed.

The display may now show **DATA BITS =7 ?** or **DATA BITS =8 ?**. When the panel is sending or receiving data, it will transmit or listen for a seven-bit or eight-bit data word. In some applications, the word length must be changed. If the panel is in dial mode 1, the word length of the remote printer may be already set as seven bits long. When the panel is in dial mode 3, the word length *must* be eight bits long for either remote or local use with PANELMAN program and for remote communication with the EUROPLEX Model 1430 autoanswer modem/polling multiplexer interface. Press the RETURN key to accept the value shown or press the NO key to change to the other value. If the NO key is pressed to select an eight-bit word, the display will show **PARITY =EVEN**. As above, if the dial mode is 3, *no parity* is required for remote use with PANELMAN program or with the the Model 1430 autoanswer modem/polling multiplexer interface. Press the YES key to accept even parity or press the NO key to select no parity. If the NO key is pressed, the display will show **PARITY =NONE** for a moment (if the NO key was pressed previously to change an eight-bit word to a seven-bit word, the parity is automatically set to even).

The display may now show **BAUD RATE =150 ?**. This is the default communication speed.

Depending on the application, this may be changed to other speeds by pressing the NO key and then pressing the RETURN key when the desired value appears. To leave this value unchanged, press the RETURN key. The panel now returns to date and time.

## PROGRAMMING THE PANEL cont.

**SET DATE/TIME (T key):** In this function, the existing date and time will be displayed using a numeric format. A flashing cursor will indicate the first of the characters that are to be updated and the BACKSPACE and YES (forwardspace) keys may be used to position the cursor. To select this function, enter your user code and then press the T key (shift 9). The display is in the format MM/DD/YY HH:MM:SS and the date and time must be entered in this way. Therefore, to enter Feb. 14, 1987, 2:46 p.m., enter 02/14/87 14:46:00. Use either the YES key to forwardspace to the next number location or the FULL ARM key to enter a forwardslash (/) and the HELP key to enter a colon (:). Then press the RETURN key. Note that 24-hour military time is used and **\*\* INVALID ENTRY \*\*** will be displayed if the correct format is not used. The display will show **ENTER DAY NO. 1**. Since the panel can perform time tasks, it must be told what day of the week it is. Enter 1 = Sunday, 2 = Monday, 3 = Tuesday, 4 = Wednesday, etc. Press the RETURN key and the panel will exit to the date and time.

**SET TIME COMMANDS (U key):** This function provides a convenient method for setting all time commands on the panel. Enter your user code and then press the U key (shift BACKSPACE). The display will momentarily show **SET TIME COMMANDS**. A time command is a literal that contains a time (hour:min.) and an action that is executed at that specified time. The panel contains a number of default time commands (daylight saving time change, closing times, comms test time, etc.). This function will search through all system literals and display any time commands it finds. When a time command is displayed, only a numeric entry

L is allowed and only the time part of the literal can be modified. Enter **24 00** as a time value **if you do not want a particular time task to execute**. Once the time is correct, press the RETURN key to proceed to the next time command. Repeat this process until all times have been reviewed. Press the NO key at any time to exit from this function.

**TIME ADVANCE (! key):** This function is used to test time tasks in the panel without waiting for the real time to occur. Enter the Service user code and then press the ! key (shift shift YES). The time clock in the panel will now be reset to five seconds before the first chronological time task. The panel will display **TIME ADVANCE** and the task will execute. This procedure must be repeated for each time task. When all tests are finished, the original date and time and day of the week **must be re-entered** (see SET DATE/TIME above).

## NOTES CONCERNING PANEL OPERATION

### ACKNOWLEDGING AND RESETTING OUTPUTS

**ACKNOWLEDGING ALARMS** - Whenever the piezo-sounder is beeping or audible bells are sounding (e.g., fire alarm or intrusion alarm), they can be silenced by acknowledging the alarm. To do this, enter your user code and then press the 0 (zero) key. The panel will momentarily show **CLEAR DISPLAY** and then return to date and time.

**RESETTING OUTPUTS** - Whenever an alarm condition results in a panel relay or C-LEM being operated, selected outputs can be turned off by acknowledging alarms (see above) or by fully disarming the panel. To fully disarm the panel, enter your user code and then press the **DISARM** key.

### DOOR CHIME FEATURE

- L A door chime feature is available that will annunciate the opening of any exit/entry door by causing the piezo-sounder to beep for three seconds. The beeping will only occur when the door is opened and not if the door is left open or subsequently closed.

Press the **PART ARM 2** key twice in three seconds and the display will show **DOOR CHIME ON**. If you do not wish the piezo-sounder to beep, press the **PART ARM 2** key twice again and the message will disappear indicating that the door chime is turned off.

### DURESS ALARM FEATURE

- L A Duress alarm feature is available that will allow the user to transmit a duress alarm to the central/monitoring station while simultaneously executing a *valid* function or mode change. The duress feature must be activated by the serviceperson (see Enable Duress variable, page 52).

To create a duress alarm, enter a zero (0) before your code and then press a valid function or mode key (e.g., 0 + 1234 + **DISARM**). The function will be executed and a silent duress alarm sent to the central/monitoring station.

### LATE-TO-CLOSE WARNING FEATURE

The APLEX Model 3100E control panel allows for a Late-to-Close Warning feature that, in conjunction with a programmed Closing Delay variable, gives the customer extra time to exit after a regularly scheduled or newly chosen closing time; no alarm will be created until the expiry of the delay time. An audible and a visual display warning is given to alert the customer at the beginning of the delay time. The following is a description of the steps that a serviceperson must take to activate this feature and the steps the user must take when presented with the warning.

## NOTES CONCERNING PANEL OPERATION cont.

**SET-UP BY THE SERVICEPERSON** - To select the Late-to-Close Warning feature, enter the Service user code and then press the D key (shift PART ARM 1). Select **VARs** from the flashing sub-menu. Press the RETURN key until the display shows **CLOSING WRNING 0**. Enter 1 for the Late-to-Close Warning feature. Press the RETURN key and then, if desired, enter a new value in the next variable, **CLOSING DELAY 900**. The default value is 900 seconds or 15 minutes. Press the NO key to exit. The serviceperson must next set or confirm the closing times for each day of the week. Enter the Service or Master user code and then press the U key (shift BACKSPACE). This will access the SET TIME COMMANDS option. Press the RETURN key until **17:55/[SUNDAY CLOSE]** appears on the display. Using the number keys only, enter the required closing time for SUNDAY. If you are not open on a Sunday, enter 24 00 to disable the time task or leave the default value unchanged since the panel **will not create a closing alarm** if you are already closed. Press the DISARM (+) key to select the next entry, which is Monday, and enter the closing time as necessary. Similarly, enter the relevant times for the remainder of the week. The PART ARM 1 (-) key may be used to reverse scroll through the selections.

The panel can now alert the customer to the fact that closing time has arrived; however, the Closing Delay will allow the amount of time assigned to that variable to elapse before an actual **\*PAST CLOSING TIME\*** alarm is sent. Within that time, the following actions must be taken.

**OPERATION BY THE USER** - If the premises is not armed before the regularly scheduled closing time for that day, the piezo-sounder will beep and the panel will display the flashing alert message **CLOSING TIME SOON !**. The user now has the fixed amount of time of the Closing Delay to arm that area or to choose a new closing time by entering the NEW CLOSING TIME function. To enter a new closing time, enter your user code and then press the 6 key. The panel will display **NEW CLOSING TIME** for a moment and then **19:55/[1 NEW CLOSING]**. Enter the revised closing time (military format) and press the RETURN key. If an illegal numeric entry has been made, the piezo-sounder will beep and the display will show **\*\* INVALID ENTRY \*\***, followed by the original entry. Enter the correct time and press the RETURN key. The panel will display **BUSY .. RE-SCHEDULING** and in a moment will return to date and time. The panel is now reprogrammed with a new closing time. The new time entered is only valid for the day in question and does not alter the regular, daily scheduled closing time. If the premises is not armed by the new closing time, then the same procedure as above will apply. If a closing warning is not acknowledged by the end of the closing delay time, then the **\*PAST CLOSING TIME\*** alarm will be sent.

## SLOW ENTRY ALARM FEATURE

When the panel is in FULL ARM or PART ARM 2 mode, an entry through an EXIT zone will cause the piezo-sounder to start beeping. This is to remind the user to disarm the panel. If the user waits too long, the entry time will expire and a full alarm will occur. When the panel is finally

## NOTES CONCERNING PANEL OPERATION cont.

disarmed, the display will show the flashing alert message **\*SLOW ENTRY ALARM\***, alternating with a flashing zone description.

### SMOKE DETECTOR RESET FEATURE

If you are using smoke detectors that latch up in alarm and require temporary removal of DC power to allow them to reset, then you may use C-LEM 19 to provide this power interruption. Connect the power feed to the smoke detectors through the normally closed contacts of the C-LEM (see page 22).

When a fire alarm occurs and the panel is disarmed or the alarm condition is acknowledged, FIRE ALARM panel relay output 2 is turned off and output C-LEM 19 will operate for approximately five seconds and then reset. This will interrupt the power to the smoke detectors allowing them to reset.

### SPRINKLER TRANSFORMER

If the APLEX control panel is used to monitor a sprinkler riser or a fire alarm panel, then the EUROPLEX Model 1055 sprinkler transformer **must be used** to provide AC power to the panel.

## NOTES CONCERNING AUTODIAL MODEMS

### AUTODIAL MODEMS

This section describes the connection and operation of a typical Hayes<sup>(tm)</sup>-compatible autodial modem to the APLEX control panel and the connection of a second modem to a serial-input printer to allow off-site monitoring of the panel's operation.

### SMART MODEM SET-UP

The following information pertains to the SMARTTEAM<sup>(tm)</sup> MicroModem 1200, Hayes<sup>(tm)</sup>-compatible, self-powered autodial modem. Remove the front cover of each of the modems to allow access to the DIP switch. Set the DIP switches for the panel modem and the printer modem as follows:

DIP SW.	FUNCTION	APLEX END	PRINTER END
1	Word Resp.(Verbose)	OFF	OFF
2	No Echo	ON	ON
3	Autoanswer	ON	OFF
4	Carrier Detect	ON	ON
5	Bell 103/212	OFF	OFF
6		OFF	OFF
7		OFF	OFF
8		OFF	OFF

Other autodial (smart) modems may be used provided that the functions can be set up as described above.

### REMOTE PRINTER SET-UP WITH SMART MODEM

Configure the printer for a data format of seven data bits, even parity, one stop bit, and a baud rate of 1200. Set the printer to add a line-feed character when it receives a carriage-return character. Do not select eight data bits and even parity as most modems will not support this setting.

### CONNECTION OF MODEMS TO THE PANEL AND THE PRINTER

1. Connecting the APLEX control panel to the autodial modem.

A DB-25F (female) plug must be prepared to allow the autodial modem to be plugged in. A modular, "telephone-style" plug is used to connect the autodial modem to the switched telephone network and the "house" phone is plugged into the autodial modem using another modular-style cord.

## NOTES CONCERNING AUTODIAL MODEMS cont.

APLEX	MODEM
-ve(Gnd) .....	7 (Gnd)
+12 VDC .....	4 (RTS)
Tx .....	2 (Rx)
Rx .....	3 (Tx)

### 2. Connecting the remote printer to the autodial modem.

The MicroModem 1200 is equipped with a DB-25 male plug and simply plugs into the printer socket from which it derives its power. It is recommended that the printer be powered from an uninterruptable power supply (UPS). The telephone line plugs into the autodial modem using a modular-style cord.

### AUTODIAL OPERATION

When the APLEX control panel wants to send data to a printer, it dials the programmed number and then waits until the autodial modem at the printer end signals that a connection has been made. At this time, data is sent to the printer and the autodial modem at the panel end hangs up. If no reply is received from the first number, the APLEX panel will then dial the second number. If no number is programmed, it will then redial the first number. The panel will make five attempts to make a connection. If these attempts are unsuccessful, then the message **CALL NOT ANSWERED** appears as an alert message that must be acknowledged by the customer and the event is logged. Similarly, each time a new log entry (alarm, etc.) occurs, the autodial procedure is repeated.

In the event of a communications failure caused by autodial modem power failure, loss of carrier, etc., during transmission of data between the APLEX control panel and the printer, the panel will stop sending data and will backtrack by two entries to ensure that no data has been lost. It will then wait a number of seconds, redial the number, and if a connection is made, recommence transmission of the data.

## NOTES CONCERNING DVACS<sup>(tm)</sup> TECHNOLOGY

### DVACS<sup>(tm)</sup> - DIGITAL/VOICE ACCESS and CONTROL SYSTEM

Where the service is provided, the APLEX control panel may be connected to a Schedule 3A Data Channel equipped with the DVACS<sup>(tm)</sup> option for on-line central/monitoring station service with companies using the EUROPLEX Model 4100/4300 polling multiplexer. The following connections must be established between the panel and the F1F2 subset:

APLEX	F1F2 SUBSET
-ve(Gnd)	<-----> Gnd (Yellow of six cond.)
Tx	-----> Rx (White of six cond.)
Rx	<----- Tx (Orange/Blue of six cond.)

Select the serial-data set-up using the procedure on page 55.

The following data configuration is required for DVACS<sup>(tm)</sup>:

<b>COMMS MODE</b>	<b>0</b>	
<b>SYSTEM ID</b>	<b>#</b>	where # is the polling address, 1 to 127.
<b>ACCESS CONTROL</b>	<b>#</b>	where # can have values 0 to 543.
<b>LOG FILTER</b>	<b>#</b>	where # can have values 0 to 8191.
<b>DIAL MODE</b>	<b>0</b>	
<b>DATA BITS =</b>	<b>8</b>	
<b>BAUD RATE =</b>	<b>150</b>	

You must obtain the polling address from your alarm company and only they can set your customer on line. Note: When the alarm company gives you an address, it **must be a three-digit number** (e.g., C4046 only uses the **last three digits**, 046, as the SYSTEM ID; 875022 only uses the **last three digits**, 022, as the SYSTEM ID). After you have completed the data configuration, call up the central/monitoring station personnel and ask them to set your customer on line.

A service diagnostic is available for use with the DVACS<sup>(tm)</sup> installation. Press the HELP key twice within three seconds. Do not enter your user code! The display will show **POLL TIME = #**. The # value indicates the time **between** polls. If this value is 0, then no polling is occurring. Either the customer address is not on line, the wiring connection from the F1F2 subset to your panel is incorrect, or the link between the customer's F1F2 subset and the central/ monitoring station is out of service. Typical times will be 150 minus the time between polls (i.e., on a ten-customer circuit, the poll time would show **140**). This represents the difference in time between 150 seconds and the time a poll command was received (i.e., 10 seconds). To turn this diagnostic off, press the HELP key twice again or the poll time message will automatically disappear after a period of time equal to the bell cut-off time [i.e., if the bell cut-off time is 15

## NOTES CONCERNING DVACS<sup>(tm)</sup> TECHNOLOGY cont.

minutes (900 seconds), then the message will disappear 15 minutes after it is first turned on]. Press the HELP key twice again and the process will repeat itself. Note: This diagnostic only indicates *receipt of the correct polling address* from the station. If there is a wiring problem from the transmit line of the panel TX to the F1F2 subset, or a defective EIA (RS-232) portion of the F1F2 subset, then the panel will still indicate an off-line condition in the central/monitoring station.

If the APLEX control panel will not go on line, perform the following extremely effective test: At the subset, unplug the cord labelled F1F2. The loop and carrier leds should extinguish. Check for the following voltages **as measured on the APLEX panel's Comms/J terminal strip**:

### F1F2 List 1 Subset

37 (-ve) to 39 (Tx) -0.5 VDC  
37 (-ve) to 40 (Rx) +10 VDC

### F1F2 List 3 Subset

37 (-ve) to 39 (Tx) 0 VDC  
37 (-ve) to 40 (Rx) -9 VDC(steady)

Plug the cord back into the subset jack labelled F1F2. Remeasure the APLEX control panel's Comms/ J terminal strip:

### F1F2 List 1 Subset

37 (-ve) to 39 (Tx) -0.5 VDC  
37 (-ve) to 40 (Rx) -5 VDC (pulsing +ve)

### F1F2 List 3 Subset

37 (-ve) to 39 (Tx) 0 VDC  
37 (-ve) to 40 (Rx) -9 VDC (pulsing +ve)

These measurements indicate that the F1F2 subset is functioning properly. Reconfirm with the telephone company that the hub card leg is turned up (in service) and then request the alarm company to set your control panel on line again.

## PRINTING AND DVACS<sup>(tm)</sup>

In this manual, reference has been made to the printing of the system log, on-line reports, etc. Printing these items is not possible when the panel is set up for DVACS<sup>(tm)</sup> because the serial port has been used with the DVACS<sup>(tm)</sup> data channel. To print a log, report, etc., lever up the Comms/J terminal strip from the panel and remove it from the header pins. Prepare a printer cable, complete with its own terminal strip, and press this terminal strip onto the panel header pins (see page 55). This procedure will avoid the problem of incorrect re-installation of the DVACS<sup>(tm)</sup> F1F2 subset. If you choose not to use a printer cable equipped with its own terminal strip, then remove the signal ground negative (-ve) and TX and make the connections to the printer. Do not leave the DVACS<sup>(tm)</sup> signal ground paralleled with the printer signal ground as this will damage the F1F2 List 1 subset. This is not a problem with the F1F2 List 3 subset.

## **NOTES CONCERNING DVACS<sup>(tm)</sup> TECHNOLOGY cont.**

If your customer has been using a local printer and has lost the use of it because of DVACS<sup>(tm)</sup> operation, then you may install a Model 3302R3 port splitter. This device splits the panel serial-communications port into two separate ports. One port on the Model 3302R3 is then reconnected to the F1F2 subset and the other port would be connected to the local serial-input printer. Real-time events from the panel and the printing of reports will now be logged on the printer.

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