

SILENT KNIGHT
MODEL 4724
CONTROL EXPANDER
INSTALLATION MANUAL
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1 INTRODUCTION

The Model 4724 Control Expander is a plug-on unit that provides greatly enhanced software features, event storage memory and user-friendly operation for the Model 4720 Control/Communicator. The 4724 replaces the control microprocessor on the 4720 or on the Model 4721 Area Control Software. It allows full use of up to two zone expanders: 64 zones for each 4120 or 4130, or 60 zones for each 4110, for a system maximum of 144 zones.

The 4724 supports the Model 4181 (PL513) Power Line Control Interface, which controls X-10 modules at various locations, making it possible to turn lamps and other appliances on and off using the keypad, preprogrammed times, or system status.

The Model 4724 hardware is powered by the 4720 hardware, and supports the same expansion devices as the 4720. The 4724 can be added to existing 4720/4721 installations.

FEATURES

- * Support of up to 128 expansion zones, which have all the same options as internal zones.
- * 45 additional zones provided by the fact that each keystation panic key reports as a separate zone.
- * Ability to report up to 256 zones, allowing for support of future hardware enhancements.
- * Availability of up to 256 user codes (or cards), programmable to allow control of selected functions. Secondary user code (CODE 2) option allows codes to be enabled temporarily for users such as guests and babysitters.
- * High-security code option that requires selected users to enter a second code to gain access to restricted areas.
- * 32 time windows for programming time restrictions and automatic arming and disarming times. Time windows can also be used to activate X-10 or 4180 auxiliary outputs.
- * Holiday schedule can be programmed for 16 holiday dates.
- * Two dates can be supplied to adjust for daylight savings time automatically.
- * Event memory that stores at least the last 500 events, including alarms, troubles, bypasses (shunts), restores, openings, closings and tests. Event memory can be viewed at a keystation or uploaded to a personal computer using the 5540 software.
- * Use of both door/card access and intercom/phone modules on the same installation. Each station is selected for either door or intercom operation.
- * Separate "door access" and "door left open" timers for each door.
- * Control of up to 32 standard X-10 Power Line Control Interface modules. Outputs can be activated by time events, zone status, alarms, keypads, or virtually any internal condition or combination of conditions.
- * Support of two Model 4180 Status Display Modules for a total of 32 outputs that can be programmed to annunciate status conditions such as armed, alarm, trouble, and tests.
- * Support of Model 4150 Auxiliary Control, including display of analog inputs (such as temperature and humidity) and relay outputs.
- * Built-in programmer with English-language prompts.
- * Fully programmable using built-in programmer or Model 5540 Downloading Software.
- * Enhanced split system (area control) capability, allowing separate control of system functions in up to 8 different areas of the building.

2 INSTALLATION

NOTE: Maximum current draw for the Model 4724 is 50 mA.

2.1 INSTALLATION of 4724

TOOLS NEEDED: Philips screwdriver; and small, flat-blade screwdriver or chip puller.

CAUTION: Before you begin, remove power from the 4720 by disconnecting the AC power and battery.

1. Carefully remove the control microprocessor from its socket by inserting the flat-blade screwdriver under each end of the microprocessor and prying it out slowly. Press the control microprocessor chip into the socket on the 4724 circuit board.
2. Insert the socket adapter (P/N 130315) into the control microprocessor socket. Pin 1, marked on the 130315, goes in the upper left hand corner of the socket. Make sure the pins are all aligned, then press the adapter in, making sure the adapter is fully seated (this requires a fair amount of pressure).
3. Remove the lower left hand mounting screw from the 4720 panel (to the left of the lower terminal strip). The screw will no longer be used.

NOTE: If an earth ground wire was attached at this screw, move the wire to another mounting screw.

4. Place the 4724 circuit board over the pins on the socket adapter. The plastic mounting bar should extend down to the left over the mounting hole. Carefully press the 4724 onto the socket adapter, making sure the pins align with the rear entry connector. The 4724 will rest level on the 4720, with the mounting hole aligned with the hole in the mounting bar.
5. Fasten the 4724 to the 4720 by placing the long 6-32 Philips screw (provided) through the mounting bar into the mounting hole, and tightening the screw.
6. Remove the 4793 dialer chip from the 4720 circuit board and replace it with the provided 4725 dialer chip. Be sure to observe proper orientation of the chip.
7. Reconnect power to the 4720 and turn on. The normal power-up display is **TIME?**.

The 4791 EEPROM chip on the 4720 is not used by the 4724, and may be removed if desired. The 4724 has its own EEPROM.

2.2 MODEL 4181 X-10 POWER LINE CONTROL MODULE

2.2.1 INSTALLATION

The optional Model 4181 X-10 Power Line Interface provides remote and automatic control of lighting and appliances in an installation. When X-10 modules are used with the 4724, the control panel can provide automatic control based on internal status and key commands. The 4181 (PL513) allows the 4724 to support up to 32 of the X-10 light or appliance modules. The 4181 also provides the 4724 with power line synchronized real time.

Plug the Model 4181 into a 12-V_{AC}, 60-Hz wall outlet close to the panel. Use a 4-wire modular phone cable (P/N 130071, supplied) to connect the 4181 to the modular jack (P5) on the 4724, as shown in figure 2.2.1A. The maximum length of the cable is 20 feet. The 4181 is optically isolated from the power line.

NOTE: *The modular connectors on both the 4724 and the 4181 must NOT be connected to a phone line or anything other than each other. The X-10 light and appliance modules may be distributed throughout the building.*

To install the X-10 modules, plug them into outlets close to the appliances you want them to control.

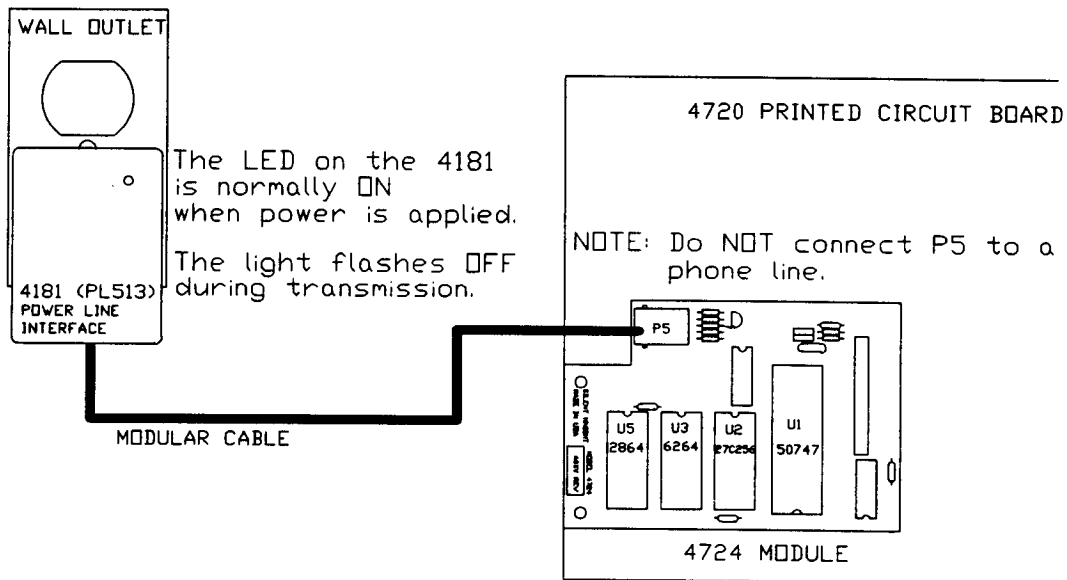


FIGURE 2.2.1A: MODEL 4181 CONNECTIONS

2.2.2 SUPPLIERS OF X-10 MODULES

X-10 compatible modules can be obtained from many suppliers. Some of these suppliers are listed below, along with the names they use for these modules:

- X-10 Powerhouse System (formerly BSR System X-10)
- Radio Shack Plug 'n Power System
- Sears Home Control System
- Stanley Automatic Openers *LightMaker* Home Controls
- Leviton Decora Electronic Controls

2.3 SOFTWARE UPDATES

When placing the Model 4724 into an existing 4720 installation, you must replace the software listed in table 2.3A, to support the additional capabilities provided by the 4724.

The new dialer chip is supplied with the 4724. To purchase the other new revisions, contact:

Silent Knight Technical Support
7550 Meridian Circle
Maple Grove, MN 55369-4927
1-800-328-0103
1-612-493-6455

Before removing an old chip, note the position of the notch. Using a flat-blade screwdriver, gently lever the chip out of its socket. Insert the new chip into the socket, making sure the notch is in the correct position. Avoid bending any of the pins.

TABLE 2.3A: REQUIRED SOFTWARE REPLACEMENTS

DEVICE	CHIP TO BE REPLACED	SOFTWARE REV. DATE REQUIRED	ADDITIONAL CAPABILITY SUPPORTED
Dialer Micro (supplied)	4793	New chip: 4725, Rev. 900301 or later	Reporting of zone #'s greater than 99; answering machine bypass.
5255 On-Site Printer	9063	900301 or later	Annunciation of zone and code ID #'s greater than 99; 4150 status printout.
4150 Auxillary Control	9060	900301 or later	Transmission of relay statuses to the 4724 to permit display and annunciation on 4180 and X-10 outputs.

3 KEYSTATION OPERATION

3.1 KEYSTATION DESIGNATIONS

The Model 4724 Control Expander allows the system to use both door/card access (up to 255 cards) and intercom features in the same installation.

Each keystation location (up to 15) has several programmable options. Keystations designated as Door stations will allow codes to be used for door access. A programmable option allows single-swipe access and disarm at Door stations. The EXIT feature on door access keystations can be programmed to generate a report and printout. Each card (code) must be assigned a group of areas to which it is granted access. The card will work only at stations assigned to one or more of the same areas.

Keystations NOT selected as Door stations will allow cards to be used for arming and disarming, but not door access. Cards swiped at these stations will arm or disarm the system, depending on the card's current privileges.

Keystations designated as Intercom stations will be able to use the intercom features, but will not have door-access capabilities. Intercom keystations can not be used for door access.

NOTE: Any station may access Model 4150 relays or X-10 modules.

Alarms and keystation troubles are annunciated by location. Emergency keys report as separate zones for each station. Table 3.1A lists the zone reported for each keystation.

The zone numbers may be found by table 3.1A or from the formula:

$$\text{Zone} = (\text{STATION ID \#}) \times 4 + 145 + \text{KEYNUM}$$

KEYNUM is 1 for POLICE, 2 for EMERGENCY, and 3 for FIRE. The STATION ID is set to 0-15 using the DIP switches on the back of each keystation.

TABLE 3.1A: PANIC KEY ZONES

		ZONE GENERATED BY KEY							
STATION:		0	1	2	3	4	5	6	7
KEY:	POLICE	146	150	154	158	162	166	170	174
	EMERG	147	151	155	159	163	167	171	175
	FIRE	148	152	156	160	164	168	172	176
STATION:		8	9	10	11	12	13	14	15
KEY:	POLICE	178	182	186	190	194	198	202	206
	EMERG	179	183	187	191	195	199	203	207
	FIRE	180	184	188	192	196	200	204	208

When one keystation is in use and access is attempted at another location, the second location will receive a "SYSTEM BUSY" message. However, the system will respond to a panic key activation or exit request at the second location. Keystations are assigned to a group of areas for area control (see section 4).

Keystations can also be used to view the status of analog inputs and relay outputs, and to turn X-10 modules on and off.

3.2 KEYSTATION FUNCTIONS

The Model 4724 Control Expander provides the following additional keystation function:

- VIEW STATUS -** To view the status of the analog inputs and relay outputs (controlled by the Model 4150 Auxiliary Control), press **(5) STATUS**. The analog inputs will be shown on the keystation display along with the programmed description. If a 5255 or 5260 printer is connected to the system (see section 7.4), the status will also be printed.
- TOGGLE X-10s -** To toggle Model X-10 Modules on and off, press a number from 11-42, then **(DOOR)** or **(CODE2)**, followed by **(1)** for ON and **(0)** for OFF. Numbers 11-26 activate modules 1-16 from house code 1. Numbers from 27-42 activate modules 1-16 from house code 2. The house codes for each section are programmed into the EEPROM. The display shows the actual house code and module address activated.
- DISPLAY EVENTS -** To display the event memory, press **(1) ALARM MEM**. The events will be displayed starting with the oldest event and continuing to the newest event. The event is displayed along with the date and time it occurred.
- When VIEWING ALARM MEMORY in a 4724 system, an additional step is needed to display the events: After pressing **(1) ALARM MEM** you must enter a START DATE to begin the event display. Press the digits of the month and day, then press **(TEST)**. All events on or after this date will be shown. To show all the events in memory, enter the digits **(0) (0) (0) (0)** (00/00) as the date.
- CLEAR EVENTS -** To clear the event memory, press **(1) (0) TEST** and enter a code with program mode access. Press **(1)** to erase the memory or **(0)** to quit and press **(TEST)** to continue.
- ZONE DISPLAY -** Press **(1) STATUS** to display all zone locations assigned to the same areas as the keystation.
- KEYSTATION DISPLAY -** Press **(2) STATUS** to view the keystation location
- SOFTWARE REVISION -** Press **(4) STATUS** to view the 4724 software date.

4 AREA CONTROL

An area is a part of a building that is being treated as a subsection of the total system. The Model 4724 allows an installation to be divided into up to 8 areas. There are 2 possible levels of system operation using areas.

4.1 LEVELS OF AREA CONTROL

4.1.1 SIMPLE SYSTEM

At this level of operation, the area programming is used only to divide system door access into separately accessed areas. Codes and keystations are programmed to determine which codes can be used to gain door access at each keystation. Arming and other functions operate at all stations and apply to the entire system.

4.1.2 SPLIT ARMING

Split arming offers high degree of independent operation for each area. Each area can be independently armed and disarmed. Each area has its own entry and exit timer. Entry or exit zones assigned to that area will be disabled during the entry or exit time for the area. The programmed entry and exit times are shared by all areas.

Interior and instant operation are also controlled separately for each area. Each area has its own interior zones and interior active status. Each area has its own instant status, which disables the entry and exit timers for that area.

Code2 operation applies separately for each area. When the Code2 feature is activated, Code2 restricted access codes may disarm the area once. Normally Code2 restricted codes can never disarm the system.

Each area can be armed and disarmed using only keystations and codes that have been assigned to that area.

4.2 AREA ASSIGNMENTS

Each **zone** can be assigned to any one of the 8 areas. Any number of zones may be assigned to a particular area. This allows the installer to assign zones to areas after the system has been wired, regardless of the type of hardware used in each zone. Chime zones only sound at keystations in the same area. Entry and exit zones are activated by area also. There are separate entry/exit timers for each area.

Each **code** can be assigned to any or all of the 8 areas. The code can be used only at keystations that are also assigned to the same area or areas.

Each **keystation** can be assigned to one or more areas, and more than one keystation may be assigned to each area. Each keystation will display global system troubles and the status of any areas to which it is assigned.

The Model 4180 Status Display Module can be programmed to activate **speakers and bells** for alarm and trouble conditions that occur anywhere in the system, or only for those that occur in specific areas.

The only items that **report** by area are **openings** and **closings**.

5 DUMPING EVENT MEMORY TO CENTRAL STATION

The 4724's event memory can be transmitted to the central station to be saved as a permanent record. Currently, this must be done using the Model 5540 Downloading Software. In the future, it will also be possible to transmit the information to the Model 9000 Digital Alarm Receiver.

5.1 UPLOADING EVENT MEMORY VIA THE MODEL 5540 SOFTWARE

The 4724's event memory can be uploaded using a procedure similar to the one used to upload programmed options. The procedure is explained in section 8.3.

5.2 TRANSMITTING EVENT MEMORY TO THE MODEL 9000 RECEIVER

In the near future, it will be possible to select an option (AUTO DUMP CS) that causes the event memory to be dumped to the central station whenever an auto test occurs. The Model 9000 receiver will require updated software.

6 USING THE 4724 BUILT-IN PROGRAMMER

The 4724 includes a built-in programmer that can program all system operating parameters. The programmer is simple to use and includes help displays for entering data. The 4724's built-in programmer can be accessed using any 4000 series keystation. Figure 6A is a diagram of the built-in programmer's menu structure.

Before you begin programming, write your option selections down in the programming record in the Appendix. For descriptions of the options available with the 4724 Control Expander, see section 7.

Programming can also be done using the Model 5540 Downloading Software. See section 8 for instructions.

6.1 ENTERING THE PROGRAM MODE

To go into the programming mode, press **1 1 TEST**, followed by a valid code.

Code 0 (installer's code) is granted access to all system options. (The factory programmed value for code 0--the installer's code--is 1234.) Other codes are granted access to 5 of the program areas if the PG or "program" access option is enabled for that code. When the program mode is active, the display lists the available menus one by one.

Press the number of the menu that includes the options you wish to program. Press the **TEST** key. The first line of the keystation display will show the option name and the most recently programmed value for that option. The second line will show the available choices.

To exit the current menu, press the **MUTE** key. To leave the programming mode at any time, press **MUTE** repeatedly, until you no longer see the scrolling key prompts.

NOTE: Do NOT follow the above procedure to program new secret codes for codes 0 and 1. INSTEAD, press **7 TEST** (see section 6.6).

6.2 STEPPING THROUGH THE PROGRAM

By pressing the **TEST** key, you may view the current option settings in a menu. The option description appears on the top line, followed by the current setting. The bottom line shows what keys can be used at that step of the program. In some cases, the key name will be followed by a word that explains how the key is used.

EXAMPLE: **TEST - ENTER** means you use the **TEST** key as you would use the **← Enter** key on a computer—to enter data into the program.

Press **TEST** again to proceed to the next option without changing the one you just viewed.

Some of the menus (**ACCESS**, for example) repeat options for many numbered items. The first step in the loop may allow you to choose which numbered item you wish to program. The menu will automatically advance to the next numbered item when it reaches the end of the options for the current item.

6.3 PROGRAMMING THE OPTIONS

For some options, the available choices are numbered, and appear on the bottom line of the display. To program an option, key in the number of the desired choice. The top line of the keystation display will show the new value.

For YES/NO options, press **0** for NO and **1** for YES.

Press **TEST**. The display will advance to the next option.

6.4 CORRECTING ERRORS

To **CORRECT AN ERROR** you made if you have **NOT** yet touched the **TEST** key, press **CLEAR**. The LCD will show 0 or the first choice. Key in the correct data, then press **TEST**.

If you begin to program the wrong option, and you have not yet pressed the **TEST** key, press the **CHIME** key. This will cancel the new data and restore the default data. Press the **TEST** key to advance to the next option.

NOTE: The **CHIME** key will restore the factory-programmed default value to any option.

6.5 ENTERING TEXT

There are several menus that require text and other characters to be entered (for example, zone location descriptions). The display will show the current programmed text on the first line of the display, with an underscore character (or "cursor") denoting the end of the programmed text. The second line will show the option name momentarily, followed by numbered groups of symbols.

6.5.1 GENERAL FORM

To enter text or characters, follow the procedure below, referring to table 6.5.1A.

1. Find the character you want in the area below and to the right of the double lines.
2. Press the digit to the left of the vertical double line in the same row.
3. Press the digit above the horizontal double line in the same column.

The character will appear on the top line of the display. Continue selecting characters this way until you have finished programming the message.

To erase the last character, press the **STATUS** key. Pressing the **BYPASS** key will move the cursor to the right, entering a blank space after the last character. Pressing the **CLEAR** key will erase the text and place the cursor at the beginning of line 1.

If you select the wrong group of letters when you press the first digit, press **MUTE** to return to step 2.

Hints:

1. To enter capital letters, press the number that corresponds to the letter's position in the alphabet, e.g., **0 1** for "A" and **2 6** for "Z".
2. To enter numbers as part of the text, press **6** followed by the desired number, e.g., **6 0** for "0", and so on.

3. The numbers 92-95 will cause a "beep" character of varying duration to be entered into the text. If beeps are inserted into the text, the keystation will beep whenever the text is displayed. The cursor does not move when a beep is entered into the text.
4. The **#** and ***** keys can be entered directly for phone numbers.

TABLE 6.5.1A: TEXT AND CHARACTERS

SECOND DIGIT→ FIRST DIGIT ↓	0	1	2	3	4	5	6	7	8	9
0	@	A	B	C	D	E	F	G	H	I
1	J	K	L	M	N	O	P	Q	R	S
2	T	U	V	W	X	Y	Z	[\ or ¥]
3	'	a	b	c	d	e	f	g	h	i
4	j	k	l	m	n	o	p	q	r	s
5	t	u	v	w	x	y	z	{		}
6	0	1	2	3	4	5	6	7	8	9
7	(BLANK)	!	"	#	\$	%	&	'	()
8	*	+	,	-	.	/	:	;	^	_
9	→	←	BEEP 0.05 sec.	BEEP 0.1 sec.	BEEP 0.5 sec.	BEEP 1 sec.				

6.5.2 DISPLAY MACROS

There are several "macro" message characters that activate special displays that may be embedded within any message. Be aware that the displays take a certain number of characters each.

When using the 5540, the macro characters are preceded with a \ (backwards slash) character. In the built-in programmer, macro characters are preceded by the character: ¥ To enter this character, press **2** **8** on the keypad.

MACRO:	FUNCTION:	DISPLAY:	WIDTH:
\T	TIME	DAY HH:MM AM	9 + day field
\M	24HR TIME	DAY HH:MM	6 + day field
\D	DATE	MM/DD/YY	8
\A	ARMED AREAS	12345678	8

EXAMPLE: To display **NRVID** with the armed areas on line one of the LCD, enter **ARMED:\A** for system message 57. To display **DNTE** with the current date on line 2, enter **DATE:\D** for system message 58.

As you are programming, you will see the shortened form of the message. During normal use, the actual message will appear.

6.6 PROGRAMMING SECRET CODES

To access the **SECRET CODES** menu, press **7** **TEST** then enter code 0. This menu is useful if you only want to change secret codes, without going through all the options in the **ACCESS** menu (section 7.1).

To reprogram code 0 (installer's code) or code 1 (main user's code), you must use this menu. These two codes cannot be changed in the **ACCESS** menu.

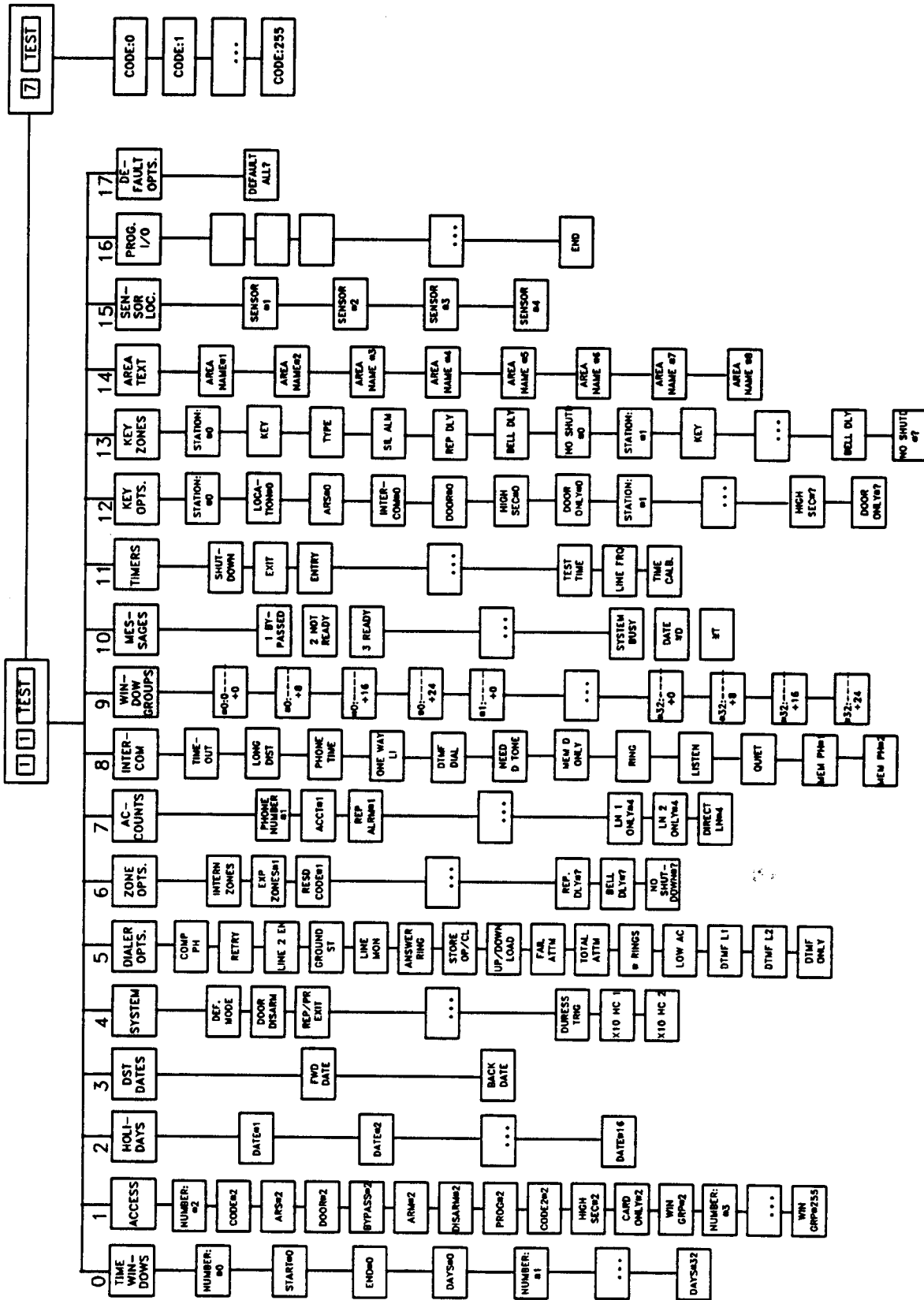


FIGURE 6A: BUILT-IN PROGRAMMER MENUS

7 PROGRAMMING OPTIONS DESCRIPTION

This section explains the options that can be programmed for the 4000 Series system when the Model 4724 Control Expander is installed. The options are listed here as they appear on the keypad display when the built-in programmer is used. The menu structure for the Model 5540 Downloading Software is slightly different. The selections shown below are the factory-programmed default values.

Note that this section shows ALL of the available options. However, some options will determine whether or not another option is available.

EXAMPLE: If you select NO for the AUTO TEST option, the DAILY TEST, TEST DAY, and TEST TIME options will not function.

Before you begin programming, read through the options, then turn to the programming record (Appendix) and write down the selections you plan to make. The procedure for using the built-in programmer is explained in section 6. Instructions for using the Model 5540 Downloading Software can be found in section 8.

NOTE 1: After installing the 4724, you must reprogram all the options, even if the options had been programmed previously. This is because the 4720 EEPROM, on which the options were originally programmed, is no longer used.

NOTE 2: When the 4724 is installed, options can be programmed using the 4724's built-in programmer (accessed through any 4000 series keystation), or the Model 5540 Downloading Software. The Model 5520 Desk Top Programmer can not be used with the Model 4724.

7.0 TIME WINDOWS (MENU 0)

The 4724 provides 32 available time windows (time periods), each specified by days of the week and a starting and ending time. Each access code can be programmed to be used during any combination of the 32 time windows (ACCESS, menu 1).

Opening and closing can be enabled by a programmed combination of the 32 time windows. Each time window can also be enabled on holidays. Up to 16 calendar days can be designated as holidays (HOLIDAYS, menu 2).

For auto-arming, there is a programmable delay period during which the user may extend the delay or cancel the auto-arm. During the delay, the time remaining will be displayed at the keystations along with an audible warning. This delay is programmed in TIMERS (menu 11).

These features replace the NORMAL/SPECIAL and CLOSED DAYS option previously used with the 4720. Time windows can be programmed by the end user, to provide optimum system flexibility.

NUMBER:#0

Select the time window to program.

START#0:00:00

Using military time, key in the beginning time for the window.

END#0:00:00

Key in the ending time for the window.

NOTE: Time windows may cross midnight.

DAYS#0:SMTWTFSH

Select the days on which the window will be active by toggling the digits 0 through 7 on and off.

EXAMPLE 1: If you want time window 0, which has been programmed to last from 7:00 to 8:30 AM, to be in effect on weekdays, select:

-MTWTF-

by toggling keys 1 through 5 ON and keys 0, 6 and 7 OFF.

EXAMPLE 2: If you want time window 3, which has been programmed to last from 8:00 to 9:00 AM, to be in effect on Sundays and holidays, then when you program **DAYS#3:SMTWTFSH**, select:

S—H

by toggling keys 0 and 7 ON and keys 1 through 6 OFF.

NUMBER:#1

Select the next time window to program. Continue programming the options for up to 32 time windows.

NOTE: *The easiest way to disable a time window is to go to the DAYS option (TIME WINDOWS, menu 0) and deselect all days by pressing*

7.1 ACCESS (MENU 1)

Access options and secret codes can be programmed by the end user.

NOTE: *There are no programming steps for code 0 (installer's code) and 1 (main user's code) functions, because they are fixed. Code 0 can always activate all features, including the hex programming mode. Code 1 can activate all control functions (arming, disarming, bypassing, etc.), and can program all user-programmable options.*

The secret codes for codes 0 and 1 are programmed in the mode (see section 6.5).

NUMBER:#2

Select the access code for which you want to program the options. Enter the identifying number--code 2, code 3, etc.--not the secret code.

CODE#2:000000

Program the secret code for this access code. The code can be from 4 to 6 digits in length. If you will be using the high security code, it must be entered as the secret code for access code 255.

NOTE: *Do not begin any codes with the same two digits that are used for the duress trigger. The duress trigger is programmed under SYSTEM (menu 4).*

ARS#2:12345678

Select the areas to which this code may gain access by toggling the digits through ON and OFF.

DOOR#2:YES

If this option is selected, this code will be able to gain access to doors (within the areas selected in the previous option). Press for NO, for YES.

BYPASS#2:YES

If this option is selected, this code will be able to bypass (disable) intrusion zones.

ARM#2:YES

This option enables the code to be used to arm (close) the system.

DISARM#2:YES

This option enables the code to be used to disarm (open) the system.

PROGRAM#2:YES

This option enables the code to be used to program the secret codes for user codes 2-255, and the user-programmable options (time windows, holidays, access options, and daylight-savings time adjust dates).

CODE2#2:NO

When this option is selected, the code becomes a restricted code, for use by guests, babysitters and other temporary users. This means that when the key is pressed, the code can disarm the system once. Normally Code2 restricted codes can never disarm the system.

HIGH SEC#2:NO

When this option is selected, the code becomes a high security code, which will require the high security code for door access. The high security code (code 255) is entered on the keypad after the primary code.

CARD ONL#2:NO

The CARD ONLY option allows access to a door to be gained only by a card, not by a keypad.

WIN GRP#2:32

Select the time window group (programmed in **WINDOW GROUPS**, menu 9) during which each access code may be used. To make it possible to use a particular code all the time, select **ALWAYS** (**3** **2**). To make it impossible to use a particular code at any time (for example, because the card has been lost) select **NEVER** (**3** **3**).

EXAMPLE: Suppose you have programmed time window 1 for 8:00 AM to 5:00 PM Monday through Friday, and you have programmed time window 2 for 10:00 AM to 5 PM on Saturdays (**TIME WINDOWS**, menu 0). Then, suppose you have assigned windows 1 and 2 to window group 4 (**WINDOW GROUPS**, menu 9).

If you want the code to be able to gain access and/or use a keystation during the times from 8:00 AM to 5:00 PM on weekdays, and from 10:00 AM to 5 PM on Saturdays, then select (**4**) for the WIN GRP option. Any group may be assigned to any code, and to more than one code. A code may be assigned to only one window group.

7.2 HOLIDAYS (MENU 2)

Up to 16 calendar days can be designated as holidays. Holidays can be programmed by the end user.

DATE#1:01/01

Key in the date (month and day) you want to assign as the first holiday. Use leading zeros before single-digit data.

DATE#2:01/01

Key in the month and day you want to assign as the second holiday.

7.3 DST DATES (MENU 3)

The daylight-savings adjustment dates can be programmed by the end user.

FWD DATE:00/00

Key in the month and day when you want the time to be set one hour forward automatically, for the spring (forward) daylight-savings time adjustment.

BACK DATE:00/00

Key in the month and day when you want the time automatically to be set one hour back, for the fall (back) daylight-savings time adjustment.

NOTE: To disable holidays or DST dates, enter **00/00** for the date.

7.4 SYSTEM (MENU 4)

DEF. MODE:FORCE (default mode)

This option is used to determine what the system will do when it times out of the **PROGRAM** mode. This would occur after power has been lost, then restored to the panel, if no one is present to control the system. Key in the number shown beside the desired selection in table 7.4A.

EXAMPLE: All power is lost at the panel (AC and DC). When the power is restored, the panel will enter the **SET TIME** mode. If no action is taken by the user after 4 minutes, the panel will enter the **DEFAULT** mode.

TABLE 7.4A: DEFAULT MODE SELECTIONS

SELECTION	DEFAULT MODE
0	The system will default to the DISARMED mode and will NOT generate an OPEN report to the central station.
1	The system will default to the DISARMED mode and WILL generate an OPEN report.
2	The system will default to the ARMED mode and will automatically bypass (shunt) any zones that are <i>not ready</i> to be armed. The unit will also generate a CLOSE report.
3	The unit will default to the ARMED mode. If any zones are <i>not ready</i> to be armed, they will go into the ALARM condition and the appropriate report will be sent to the central station. If all of the zones are <i>ready</i> , only a CLOSE report will be generated.

DOOR DISARM:NO

This option causes the areas assigned to a particular access code to disarm automatically when door access is granted to that access code.

NOTE: This option is effective only if the code has been programmed with the capability to disarm (ACCESS, menu 1).

REP/PR EXIT:NO

This option causes all door exit events to be printed and reported to the central station. Exit requests are printed and reported as DOOR ACCESS ID 0.

PR DOOR:NO

This option causes all door access events to be printed.

NOTE: If you also select REP DOOR (see section 5.7), door access events will be printed and reported to the central station.

BELL TST PU:NO (bell test at power-up)

This option causes the system to sound a 2-second bell test whenever the system is reset.

DIALER:YES

The dialer must always be selected for normal operation. It can be disabled for troubleshooting, or while training end users. When the dialer is disabled, there is no battery or AC detection.

PRINTER:NO

Select this option if you are using a Model 5255 On-Site Printer or Model 5260 Printer Interface.

ZONE EXP1:NO

If at least one zone expander is to be used with the system, this option must be selected.

ZONE EXP2:NO

If 2 zone expanders are to be used with the system, both ZONE EXP1 and ZONE EXP2 must be selected.

INTERCOM:NO

Select this option if you are using the Model 4140 Intercom/Speakerphone.

AUX CONTROL:NO

Select this option if you are using the Model 4150 Auxiliary Control Module.

SPLIT ARM:NO

This option enables the area control system.

NOTE: This option must be selected for the area control features to work.

INST INTR:NO

When this option is selected, all delayed zones become instant zones whenever any intrusion alarm occurs.

FORCE ARM:NO

This option causes any zones that are *not ready* to be bypassed (shunted) when the system is armed. Upon arming, the 4724 will generate a "CF" (forced closing) report.

NOTE: Since force arming may automatically cause zones to be bypassed, the AUT UNBYPASS option should be selected if the FORCE ARM option is enabled.

INTR INTRU:NO

When this option is selected, all interior zones will automatically be enabled when there is an intrusion alarm.

INTR FLWRS:NO (Interior followers)

Selecting this option causes interior zone annunciations and reports to be delayed when an entry zone is violated.

INTR LOCK:NO

This option disables the INTERIOR and INSTANT keys whenever the system is armed (after the exit delay). This prevents anyone from disabling the interior zones while the system is armed.

AUT INTR OFF:NO

When selected, this option will automatically disable the interior zones when the system is disarmed.

AUT INTR ON:NO

When this option is selected, the interior zones will automatically be enabled when the panel is armed. The system will not arm unless the interior zones are *ready*. If the interior zones are subsequently turned off by the user, a Forced Close report will be generated.

EXIT BEEPS:NO

This option causes an audible warning tone to be sounded during the exit delay.

SIL NGHT TRB:NO (silent night trouble)

When this option is selected, audible trouble tones will not be sounded while the panel is armed.

KEY BEEP SPK:NO

If the installation includes a keystation without a PZT beeper, you can use this option to send the "beeps" from the keypad to the internal speakers--however, they will sound at all internal speakers.

E/E BEEP PZT:YES

Select this option if you wish to have the entry/exit tones sounded on the PZT beeper. (These tones are always audible on the internal speakers.)

SWINGER BYPS:YES

When this option is selected, the system will automatically bypass any zone that generates 4 alarms within a specified time period (programmed in TIMERS, menu 11).

DELAYED BYPASS:YES

When this option is selected, the system will not report bypasses to the central station until the panel is armed.

AUT UNBYPASS:NO

This option will automatically unbyypass the bypassed zones when the panel is disarmed, to allow trouble conditions to be reported.

NOTE: Since force arming may automatically cause zones to be bypassed, the AUTO UNBYPASS option should be selected if the FORCE ARM option is enabled.

BYPASS CODE:NO

Selecting this option makes it impossible to bypass or unbyypass a zone without first entering an access code, even if the panel is disarmed.

ACCESS WINDW:NO

If this option is selected, all access codes are restricted to the time windows that have been assigned to them (ACCESS, menu 1). Selecting NO disables all time restrictions.

If you will be using access windows, see section 7.1. The access windows restrict all functions that require an access code to certain times and days.

REP DO/DF:NO (report door open/door forced)

Selecting this option causes the system to send a report every time the door sensor is violated without using door access. It will report if the door is forced open or left open.

REP ALL O/C:NO

This option causes the system to report all openings and closings.

REP EXC O/C:NO (report openings/closings at 'exceptional' times)

When this option is selected, the system will report openings and closings only if they occur outside of specified time windows.

REP OT/CT:NO

Selecting this option causes the system to send an open trouble or close trouble report to the central station if you fail to arm or disarm during a specified time window.

REP DG:NO (report door access granted)

This option causes the system to send a report indicating that the door was accessed using a valid code number. The event is also printed.

REP BYPS ID:NO

When this option is selected, the user ID will be reported when anyone bypasses a zone (an updated 9000 SIA card is required). This will only occur if the option BYPASS CODE has been selected.

AUTO DUMP CS:NO

Selecting YES causes the event memory to be dumped to the central station during an auto test. This option requires updated 9000 software, which will be available soon. Currently, the 5540 Downloading Software must be used to dump event memory to the central station (see sections 5 and 8).

SPLIT BYPS:NO

Codes 2 through 144 can bypass only their corresponding zones. (Code 2 can bypass only zone 2; code 3 can bypass only zone 3, etc.)

NOTE: Codes 0 and 1 can bypass all zones, regardless of how this option is programmed.

CHIME PZT:NO

When this option is selected, the chime tone will be heard at all keystations assigned to the same area as the chime zone. (If this option is not selected, the chime will be heard only at the speakers.)

MAX SKEY ID:1 (maximum supervised keystation ID)

For this option, enter the highest keystation ID number that will be supervised. Keystations with higher numbers may be used but they will not display area entry/exit or LED information. You must give your supervised keystations ID numbers in sequential order starting at 1 (see the Model 4720 installation manual, P/N 150476).

NOTE 1: Keystations must be supervised to be fully functional.

NOTE 2: Keypad supervision will work only with 4-wire or PLC keystations. Stations with higher ID numbers can still be used, but will not be supervised.

DISPLAY RATE:3s

Select a speed in the range of 1-4 seconds. This option controls the rate at which all displays are updated.

FAST RESTORE:NO

When this option is selected, the system reports restores as soon as the alarm has been restored, instead of waiting for the shutdown time.

DURESS:NO

This option allows the use of the duress feature of the 4724. The duress trigger is a two-digit code that the user can enter to notify the central station that an intruder has forced the user to enter an access code. The duress trigger is programmed later in this menu.

RING B CLOSE:NO (ring back at closing)

When this option is selected, there will be a short bell test after kiss-off when a closing report is sent.

BELL TST ARM:NO

Selecting this option causes a 2-second bell test every time the system is armed.

AUX CODE:NO

When this option is selected, it will be necessary to use an access code to toggle auxiliary control (Model 4150) relays or X-10 modules.

AUTO CLOSE:NO

Selecting this option causes the system to arm itself automatically if the panel is not armed at the end of any time window in the auto close window group (CL WIN GRP).

AUTO OPEN:NO

Selecting this option causes the system to disarm itself automatically if the panel is not disarmed at the end of any time window in the auto open window group (OP WIN GRP),

NOTE: *For both AUTO CLOSE and AUTO OPEN, there must be at least a one-minute break between the end of one auto close (open) time window and the beginning of the next one. Otherwise, the system will not arm (disarm) until the end of the second time window.*

EXAMPLE: Suppose you select window group 1, to which you've assigned the time windows shown below, for OP WIN GRP.

- Time window 3 - Monday-Friday, 7:00-8:00 AM
- Time window 4 - Monday-Friday, 1:00-2:00 PM
- Time window 5 - Saturday, 9:00-10:00 AM
- Time window 6 - Saturday, 10:00-11:00 AM

On Monday through Friday, if no one has disarmed the system by 8:00 AM, the system will disarm automatically at 8:00 AM (end of window 3). If someone arms the system later in the morning (before leaving the office for lunch, for example) and no one disarms it by 2:00 PM, the system will disarm automatically at 2:00 PM (end of window 4).

On Saturday, if no one has disarmed the system by 10:00 AM (end of window 5) the system will NOT disarm automatically, because another time window (window 6) in the open window group follows immediately. If the system has not been disarmed manually by 11:00 AM (end of window 6), it will disarm automatically at that time.

OP WIN GRP:32

For this option, select the window group during which the system can be disarmed. At the end of this time period, the system will automatically disarm (open) 1) if it has not already been disarmed by a user, and 2) if AUTO OPEN has been enabled (see section 5.4).

CL WIN GRP:32

For this option, select the window group during which the system can be armed. At the end of this time period, the system will automatically arm (close), if it has not already been armed by a user, and if AUTO CLOSE has been enabled (see section 5.4). If arm delay is programmed to be greater than 0, the arm delay begins at the end of the close window group.

NOTE: *The two options described above make it possible to have more than one opening and closing period in a day.*

AREAS:_____

Choose areas that can auto open/close.

DURESS TRIG:99

If the DURESS option has been selected, you must enter a 1- or 2-digit code that will activate a duress alarm. The digits entered MUST NOT be the same as the beginning digits of any access code.

X-10 HC 1:A

This option one allow you to choose the house codes for the first 16 of the 32 allowable X-10 modules. There is a choice of 16 letters, from which 1 house code can be selected for this option. Enter the number next to the desired letter in table 7.3B.

The house code you select should be different from those of any other X-10 modules that may be in the building, that you do not wish to be connected to the 4000 system.

X-10 HC 2:B

Select the second house code. This house code will apply to the last 16 of the 32 allowable X-10 modules.

TABLE 7.3B: HOUSE CODES

SELECTION	HOUSE CODE
0	A
1	B
2	C
3	D
4	E
5	F
6	G
7	H

SELECTION	HOUSE CODE
8	I
9	J
10	K
11	L
12	M
13	N
14	O
15	P

7.5 DIALER (MENU 5)

COMP PH

If you will be using the downloading feature, you must enter the phone number that the computer will be connected to. The number entered may be up to 16 digits long.

If a pause is needed, such as after dialing "1" for a long distance number, enter an "A" (ⓐ 1). If an internal phone system is being used in which you must dial a special digit to establish an outside line (and wait for a second dial tone), enter a "D" (ⓐ 4) after the digit to establish the outside line. The procedure for entering alphabetic and other characters is explained in section 6.5.

NOTE: The ⓐ and ⓐ keys can be entered directly.

EXAMPLE: If you must dial "9" before being able to dial the outside number of 555-3333, you would enter "9D555-3333",

or:
ⓐ 9 ⓐ 4 5 5 5 3 3 3 3

RETRY:NO

If this option is selected, the system will try again to send a report 15 minutes after it has failed its maximum number of attempts. If it fails all attempts again, it will not try another time.

LINE 2 EN:NO (line 2 enable)

Select this option if you are using two phone lines (requires the use of the Model 4175 Dual Phone Line Monitor).

GROUND ST:NO

Select this option if you are using a ground start telephone network.

LINE MON:NO

Select this option if you will be using the Model 4175 Dual Phone Line Monitor. You can monitor line 1 only, if you do not have a second phone, but you cannot have both a monitored line and an unmonitored line.

ANSWER RING:YES

Select this option if you wish to have the computer call the panel and download in the same call. If you do not select this option, the communicator will wait until the phone stops ringing, then dial up the computer for maximum security.

STORE OP/CL:NO

If this option is selected, the system will store opening and closing events until the next report is sent. At that time, it will transmit all the events to the central station.

UP/DOWNLOAD:YES

Select YES to enable remote uploading and downloading. When the panel receives a signal for downloading it will dial the computer phone number and use the account number that is programmed for account number #4.

FAIL ATTM:5

Enter the number of attempts (1-15) that the communicator will try to dial out before it gives a dialer-failed signal.

TOTAL ATTM:10

Enter the overall number of attempts (1-15) that the communicator will try to dial out using all phone numbers. Select 0 for both FAIL ATTM and TOTAL ATTM for a local-only system.

RINGS:10

This option is used in conjunction with the downloading feature. You would program the number of times (1-15) that your phone will ring before the communicator will dial out or answer for downloading information. If you do not wish to use this feature, enter a "0". If you also selected ANSWER and REP. ALL O/C, the panel will answer after 4 fewer rings (than the programmed number) if the system is armed (but see note below).

NOTE: The panel will never answer until it detects at least 2 rings.

LOW AC:4h

For this option, program the number of hours (1-15) that the AC power must be OFF before a low-AC report is generated.

DTMF L1:NO

If this option is selected, line 1 will use Touch-Tone^R dialing. If you do not select this option, the phone line will use rotary type dialing only.

NOTE: If you have selected DTMF L1, the dialer will alternate between Touch-Tone^R and rotary dialing on subsequent attempts.

DTMF L2:NO

If this option is selected, line 2 will use Touch-Tone^R dialing.

DTMF ONLY:NO

If this option is selected, Touch-Tone^R dialing will be used any time the system is dialing out.

7.6 ZONE OPTIONS (MENU 6)

INTERN ZONES:16

Enter the number of internal zones used (zones built into the 4720 panel). This will let the system know where to start the expansion zones.

EXP ZONES#1:0

Enter the number of zones used on expander #1.

RESD CODE#1:0123

Select the residence code to be used with RF zone expander 1. This code must be the same as the residence code programmed into the transmitters (see the section on expansions zones in the 4720 installation manual, P/N 150476). Skip this step if NOT using an RF zone expander.

EXP ZONES#2:0

Enter the number of zones used on zone expander 2.

RESD CODE#2:0223

If zone expander 2 is an RF zone expander, enter its residence code. Skip this step if NOT using an RF zone expander.

ZONE:#1

Select the zone for which you want to reprogram the options.

DAY TRBL#1:NO

If this option is selected, the zone will be supervised only while the zone is disarmed. Day trouble loop response is always .062 seconds. Day troubles will not restore until silenced from a keystation. Typical day trouble zones are window foils or emergency exits. If you select DAY TRBL for a zone, you must also select N.C. for that zone.

24HR TRBL#1:NO

Select this option for any zone that will be supervised 24 hours a day, such as a fire zones (all supervised zones require a 15-KΩEOL). 24-hour trouble loop response is always 10 seconds. A 24-hour trouble will restore as soon as the loop is restored. Do NOT pick both 24HR TRBL and DAY TRBL

N.C.#1:NO

Select this option if the zone will be using normally closed contacts (all N.C. zones require a 15-KΩEOL).

N.O.#1:YES

Select this option when the zone will be using normally open contacts.

NO EOL:NO

Select this option only if the Model 4100 or Model 4101 sensor is being used with a Model 4110 Zone Expander (N.C.). An end-of-line resistor is not used with these sensors.

SPEED#1:06s

This option determines the speed at which the zone will respond to an alarm or trouble condition. Select the number shown next to the desired zone response speed in table 7.6A.

TABLE 7.6A: LOOP RESPONSE TIMES

SELECTION #	LOOP RESPONSE TIME
0	0.01 seconds
1	0.06 seconds
2	1 second
3	10 seconds

24HR#1:NO

Select this option if the zone will be monitored for alarm conditions 24 hours a day (for example, if it is a fire, medical or tamper zone).

EXIT#1:NO

Select this option if the zone will have an exit delay time, or if it is an interior zone that is in the exit corridor.

ENTRY1#1:NO

The system has the capability of having two separate entry delay times. Select this option if the zone will be controlled by entry delay 1.

ENTRY2#1:NO

Select this option if the zone will be controlled by entry delay 2.

INTERIOR:NO

Interior zones can be bypassed as a group using the interior key. Select this option if the zone will be an interior zone.

BYPASS#1:NO

Select this option if you want to be able to bypass (shunt) the zone. If you do not select this option for a particular zone, you will not be able to bypass that zone.

NOTE: Fire zones must NOT be bypassable.

CHIME#1:NO

This option makes is used to enable the chime function for a particular zone. When the chime function is enabled, the **CHIME/INTERIOR** key can be used to turn a door chime on and off when the system is disarmed.

AREA#1:1

Key in the number of the area to which you want to assign the zone. A zone may be assigned to only 1 of 8 areas.

TYPE#1:FIRE

Enter the number corresponding to the desired zone type in table 7.6B.

TABLE 7.6B: ZONE TYPES

SELECTION #	ZONE TYPE
0	HOLDUP
1	FIRE
2	MEDICAL
3	PANIC
4	BURGLARY
5	TAMPER
6	GAS
7	UNDEFINED ¹
8	WATER ¹
9	HEAT ¹
10	COLD ¹
11	LOCAL ¹
12	UNUSED ^{1,2}
13	DOORBELL ¹
14	UNUSED
15	UNUSED

**1NOTE: These zones will be displayed as AUXILIARY on the LCD. If LOCAL is selected, the panel will not dial out.*

**2NOTE: Do NOT select 14 or 15 as a zone type. They are there to allow additional zone types to be made available in the future. 12 can be selected to create a zone that does not cause an alarm.*

LOCATION#1

For this option, enter the location description of Zone 1 such as **BEDROOM** or **GARAGE**. You may use any description that you want but the description must not be more than 16 characters in length including spaces. See section 6.5 for instructions on entering text.

SIL. ALM#1:NO (silent alarm)

When this option is selected, alarm conditions will not be annunciated audibly, but will be reported to the central station.

NOTE: Holdup zones must be selected as SIL. ALM.

REP. DLY#1:NO

Select this option to create a delay between the time that an alarm condition is sensed by the zone and the time that the system reports the alarm. The delay time is programmed in TIMERS (menu 11).

BELL DLY#1:NO

If this option is selected, there will be no bell output unless the dialer fails.

NO SHUTDOWN#1:NO

If this options is selected, the bell will not shut down until the panel is disarmed.

ZONE:#2

Select the next zone for which you will program options. The options will repeat for all 144 zones.

7.7 ACCOUNTS (MENU 7)

PHONE NUMBER#1:

Enter phone #1, up to 16 digits. Enter "A" for a pause, "D" for a second dial tone.

ACCT#1:000000

Enter account #1, (6 digits maximum).

REP ALRM#1:YES

Select this option if you want alarms to be reported to phone #1.

REP TRBL#1:YES

Select this option if you want trouble conditions to be reported to phone #1.

REP BYPS#1:NO

Select this option if you want bypassed (shunted) zones to be reported to phone #1.

REP RSTR#1

Select this option if you want restorals to be reported to phone #1. Restores will report only to the same numbers that the alarm or bypass reported to.

REP OPRST#1:NO (report open reset, phone #1)

Select this option if you want the system to report to phone #1 when the system is disarmed from an alarm condition. If you will select the next option (REP OP/CL#1) for phone #1, you must also select REP OPRST#1.

REP OP/CL#1:NO

Select this option if you want the system to send normal and exceptional open and close reports to phone #1.

REP DOOR#1:YES

Select this option if you want door access information to be reported to phone #1.

REP TEST #1:YES

Select this option if you want test signals and event memory information to be reported to phone #1.

MUST REP#1:YES

If this option is selected, the system MUST report to phone #1. If this option is not selected, phone #1 will only be used as a backup if an event cannot be reported to another number.

NOTE: The MUST REPORT numbers must be the lower numbers (before the backups). Your choices are: 1, 1&2, 1&2&3, 1&2&3&4.

FORMAT#1:SIA8

Select the digit shown in table 7.6A next to the format that account 1 will use. The compatible Silent Knight receivers are shown in parenthesis.

TABLE 7.6A: REPORTING FORMATS

SELECTION	FORMAT AND COMPATIBLE RECEIVER
0	SIA8 (9004, 9004I)
1	FSK1 (8520)
2	FSK2 (9002)
3	BFSK 1400 Hz (9002)
4	BFSK 2300 Hz (9002)
5	SIA20 (9004I)

NOTE 1: SIA8 and SIA20 are the only formats that can report event memory and zone numbers higher than 99.

NOTE 2: Do not select SIA20 unless the receiver has a 9004I card. The 9004 card can only accept SIA8 (formerly SEIA8).

ATTEMPTS #1:1

Enter the number of attempts (1-15) that the communicator will try to report to this account # before switching to the next number (typically 1 attempt).

LISTEN IN#1:0

Enter, in seconds, the length of time the central station can listen in to the site on this account number (20 - 255 seconds; 0 if not used).

Select this option to allow the central station to listen in to the site on this account number.

L ALM/TST#1:NO

Select this option to enable the listen-in function only with alarms and tests on this number.

LN 1 ONLY#1:NO

Select this option if you wish to use phone line 1 ONLY with phone #1. You would typically do this only if using a direct line, or if using a WATTS line.

LN 2 ONLY#1:NO

Select this option if you wish to use phone line #2 ONLY with phone #1.

DIRECT LN#1:NO

Select this option if you will be connecting the system directly to a Model 9000 Digital Alarm Receiver without using the switched telephone network. You must also select a SIA (formerly SEIA) format (requires a Model 9103 line card).

PHONE NUMBER#2

Enter phone #2.

Repeat the above steps for accounts/phone numbers 2, 3, and 4.

NOTE: Account #4 will be sent to the downloading computer. Model 4150 analog reports will be sent to phone #4 using account #4. Account #4 must be a SIA format when using the 4150.

7.8 INTERCOM (MENU 8)

Skip this menu if you are NOT using the Model 4140 Intercom/Telephone Controller.

TIMEOUT:30s

Enter (in seconds) the amount of time the intercom function will be active.

LONG DIST:YES

When this option is selected, the telephone function may be used for long distance calls.

PHONE TIME:NO

Select this option if you want the phone feature to have a limited length for calls. The phone time-out will be the same length selected for intercom time-out.

ONE WAY LI:NO

Select this option if you will be using the one-way listen-in feature, which allows central station personnel to listen to the installation without being heard. If you select NO, it will be possible for people at the installation to hear the central station personnel.

NOTE: Listen-in to duress or holdup will automatically be one-way, regardless of how this option is programmed.

DTMF DIAL:YES

Select this option if you will be using Touch-Tone^R dialing with the telephone feature.

NEED D TONE:NO

Select this option if you wish the phone feature to wait for a dial tone before dialing.

MEM D ONLY:NO

If you select this option, only the two memory phone numbers can be dialed.

RING:12345678

Select the intercom/telephone stations (1-8) where the telephone will ring when there is an incoming call, by toggling the digits ① through ⑧ ON (digit displayed) and OFF.

LISTEN:12345678

Select the intercom/telephone stations (1-8) that will be audible at the central station during listen-in. The listen-in feature will be ONE WAY during holdup alarms.

QUIET:_____

Select the intercom/telephone stations (1-8) at which you do not want key beeps or alarm or trouble sounds to be annunciated. Alarm and trouble sounds will still be annunciated by accessory speakers and bells.

NOTE: To use this option, you must have the Model 4140 with software revision 900212 or later.

MEM PH#1

Enter the telephone number for memory dial location #1 (up to 12 digits).

MEM PH#2

Enter the telephone number for memory dial location #2 (up to 12 digits).

7.9 WINDOW GROUPS (MENU 9)

Any of the 32 available time windows may be assigned, in any combination, to any of the 32 available window groups. The end user can program only the time windows themselves. Window group assignments must be set up by the installer.

#0:0_____+0

In this step and the next three steps, you'll assign time windows to window group #0. First, select time windows in the range 0 - 7, by toggling the digits ① through ⑦. (The time windows were programmed in TIME WINDOWS, menu 0.)

#0:_____+8

Using the digits ① through ⑦, select time windows in the range 8 (①+8) through 15 (⑦+8).

#0:_____+16

Using the digits ① through ⑦, select time windows in the range 16 (①+16) through 23 (⑦+16).

#0:_____+24

Using the digits ① through ⑦, select time windows in the range 24 (①+24) through 31 (⑦+24).

#1:_____+0

Assign time windows to window group 1 following the same procedure as in the previous four steps.

7.10 MESSAGES (MENU 10)

These messages have been placed in the EEPROM chip as default values. Section 6.5 explains how to enter text and other characters, if you wish to change the messages. Remember to use words that have a similar meaning as the default word. Table 7.10A shows the factory programmed messages.

EXAMPLE: One of the first default values is the word "BYPASSED". If for some reason you do not like this word, you may want to change it to "REMOVED". Then, when you bypass a zone, the LCD will show

REMOVED

System messages 57 and 58 are the normal display on all the keystations. These two messages, one for line one and one for line two of the display, can be customized to fit the installation. Normally the macros to display time and date are used but any message can be displayed if desired.

NOTE: For all options including the system messages, pressing the **CHIME** key will restore the factory-programmed default for that option.

TABLE 7.10A: FACTORY PROGRAMMED MESSAGES

MESSAGE #	FACTORY PROGRAMMED MESSAGE
1	BYPASSED
2	NOT READY
3	READY
4	TROUBLE
5	LOW BATTERY
6	SILENCED
7	OPEN
8	SERVICE
9	WALK TEST
10	DATE
11	TIME
12	INTERCOM
13	PHONE
14	DOOR
15	ARMED
16	CODE2
17	INSTANT
18	COMPLETE
19	PERIMETER
20	RESTRICTED
21	TRY AGAIN
22	ENTER
23	CODE
24	SEC TO
25	EXIT
26	ALARM
27	DEVICE
28	STATION
29	SUN
30	MON
31	TUE
32	WED
33	THU
34	FRI
35	SAT
36	REPORTING
37	LISTENING
38	UP/DOWNLOAD
39	ZONE
40	PAPER

(Table 7.10A continued on next page)

(TABLE 7.10A CONTINUED)

41	(NOT USED)
42	DATA LOST
43	FAILED
44	BATTERY
45	AC
46	LINE 1
47	LINE 2
48	HOLDUP
49	FIRE
50	MEDICAL
51	PANIC
52	INTRUSION
53	TAMPER
54	GAS
55	AUXILIARY
56	SYSTEM BUSY
57	DATE: ¥D (See note.)
58	¥T

NOTE: Characters preceded by ¥ are "display macros" (see section 6.5.2). ¥D causes the actual date to be displayed as part of the message. ¥T causes the time to be displayed.

When using the 5540 Downloading Software, \ replaces the ¥ character.

7.11 TIMERS (MENU 11)

SHUTDOWN:90s

Decide the number of seconds that you want the audible alarms to be active. Then divide this number by 10 and enter the result (1-255).

EXIT:30s

Enter (in seconds) the length of the exit delay (1-255).

ENTRY1:30s

Enter (in seconds) the length of the entry delay for zones controlled by entry delay 1 (1-255 seconds).

ENTRY2:60s

Enter (in seconds) the length of the Entry Delay for zones controlled by entry delay 2 (1-255 seconds).

SWINGER BYP:4h

Enter (in hours) the length of the swinger window (1-24 hours). If the SWINGER BYPS option has been selected (SYSTEM, menu 4), a swinger bypass (shunt) will occur on the 5th trip when a zone has caused 4 alarms within this time period.

RF SUPRV:24h

Enter the supervision interval in hours (2-24 hours).

EXAMPLE: If you enter a "3", the system will check for supervisory transmissions from the RF transmitters every 3 hours.

DOOR STRK:6 .8s

In this step, you'll program the length of time that the doorstrike stays activated (0.8-12 seconds). Select the number shown next to the appropriate time period in Table 7.11A. The display will always show **8** to indicate that the programmed length of time is 0.8 seconds times the number you select.

NOTE: This time period is the maximum length of time the doorstrike will remain activated, allowing someone to open the door. If a door contact is connected to the keystation, the doorstrike will turn off 1 second after someone opens the door. If no door contact is connected to the keystation, the doorstrike will remain activated for the programmed length of time, regardless of whether the door has been opened during that time.

TABLE 7.11A: DOORSTRIKE ACTIVATION PERIOD

SELECTION	LENGTH OF TIME (MULTIPLES OF 0.8 SECONDS)
1	0.8
2	1.6
3	2.4
4	3.2
5	4.0
6	4.8
7	5.6
8	6.4

SELECTION	LENGTH OF TIME (MULTIPLES OF 0.8 SECONDS)
9	7.2
10	8.0
11	8.8
12	9.6
13	10.4
14	11.2
15	12.0

DOOR OPEN:60s

Enter (in seconds) the maximum time that the door can remain open before the system will send a *door left open* report (1-255 seconds).

REP DELAY:15s

Enter (in seconds) the amount of delay that you wish to have between the time that an alarm condition is sensed and when the system will actually report the alarm (1-255 seconds). Delayed reporting is selectable by zone in **ZONE TYPES** (menu 6).

SMOKE RST:2s

Enter the number of seconds the smoke detector power is turned off after the smoke detector has been reset (1-15 seconds)

MENU TIME:10s

For this option, you enter the area arm menu time (0-255 seconds).

In a split arming system, the user goes into the **AREA ARM** menu by entering an access code. The LCD shows a continuous display of key prompts to help the user arm and disarm individual areas. If a key is not pressed during the time period you have programmed in the MENU TIME option, the system exits the **AREA ARM** menu.

ARM DELAY:0m

Enter (in minutes) the length of the delay (0-255 minutes) before auto close occurs (see **TIME WINDOWS**, menu 0). (The delay is added at the end of the auto close time period.) If you select 0, there will be no delay.

LOG 4150:0h

Enter the number of hours between automatic printouts of the 4150 sensor readings (0-255). To disable the automatic printout function, enter 0.

AUTO TEST:NO

If you will be using one of the test features below, you **MUST** select this option.

TEST DAY:SUN

This option allows you to select which day of the week the system will send a test report to the central station. Enter the number next to the appropriate day in table 7.11B. Only 1 day may be selected. To send a test every day, select **(8)**.

TABLE 7.11B: TEST DAY CHOICES

SELECTION	DAY
0	Sunday
1	Monday
2	Tuesday
3	Wednesday
4	Thursday

SELECTION	DAY
5	Friday
6	Saturday
7	None
8	Daily

TEST TIME:00:00

Enter (in military time) the time of day that you wish to send a test report to the central station.

LINE FRQ:60

Enter the power line frequency to be used to keep system time (requires the Model 4181 Power Line Interface). To disable power line sync, enter (0).

NOTE: Standard power line frequencies are 60 Hz in the United States, 50 Hz in Europe.

TIME CALB.

This option is used to calibrate real time. It has been preprogrammed at the factory.

CAUTION: Do NOT adjust the time calibration unless the system clock is off by more than 2 seconds in one week.

CENTURY:00

Enter the century (1 9).

7.12 KEY OPTIONS (MENU 12)

STATION:#1

Select the keystation for which you wish to program options.

NOTE: Station 0 options are not used. Begin programming with station 1.

LOCATION#1

Enter the location text for keystation 1. Keystation locations are used to annunciate panic key alarms. The procedure for entering text is explained in section 6.5.

ARS#1_____

Select the areas to be accessed by keystation 1.

NOTE: When a panic key is pressed on a keystation, all areas controlled by that keystation go into alarm.

INTERCOM#1:NO

This option enables the intercom function for keystation 1.

NOTE: Do NOT select DOOR on an intercom station, as this would disable the PHONE key.

DOOR#1:NO

When this option is selected, door access can be gained by entering a secret code on keystation 1.

NOTE: DOOR and INTERCOM currently are not both available on one keystation. It is possible to select NO for both options.

HIGH SEC#1:NO

When this option is selected, the high security code must be entered in addition to the secret code, to gain door access.

DOOR ONLY#1:NO

When this option is selected, keystation 0 can be used only for door access, not for other functions such as arming and disarming.

STATION:#2

Select the next keystation for which options are to be programmed (up to 15 keystations).

7.13 KEY ZONES (MENU 13)

STATION:#0

Select the keystation for which the panic key zones are to be programmed (0-15 keystations).

NOTE: Station 0 options are not used. Begin programming with station 1.

KEY:UNUSED

Select the panic key for which you want to program options. Although the display shows **KEY:UNUSED**, there is no "UNUSED" key. You must select a panic key. Select **1** for the **POLICE** key, **2** for the **EMERG** key, and **3** for the **FIRE** key.

TYPE:

Select a zone type for the key you specified in the last step. Enter the number shown next to the appropriate zone type in table 7.13A.

TABLE 7.13A: ZONE TYPES

SELECTION #	ZONE TYPE
0	HOLD
1	FIRE
2	MEDICAL
3	PANIC
4	BURGLARY
5	TAMPER
6	GAS
7	UNDEFINED ¹
8	WATER ¹
9	HEAT ¹
10	COLD ¹
11	LOCAL ¹
12	UNUSED ^{1,2}
13	DOORBELL ¹
14	UNUSED ²
15	UNUSED ²

***1NOTE:** These zones will be displayed as **AUXILIARY** on the LCD. If **LOCAL** is selected, the panel will not dial out.

***2NOTE:** Do **NOT** select 14 or 15 as a zone type. They are there to allow additional zone types to be made available in the future. 12 can be selected to create a zone that will not cause an alarm.

SIL. ALM:NO

If you select this option, alarms activated by this panic key will be reported to the central station, but no audible alarm will sound.

REP DLY:NO

If you select this option, alarms activated by this panic key will be reported after a programmed delay time. The delay time is programmed in **TIMERS** (menu 11).

BELL DLY:NO

Select this option to create a delay between the time an alarm condition is sensed by a zone of the specified type and the time the alarm bell is sounded.

NO SHUTD#1:NO

If this options is selected, the bell will not shut down until the panel is disarmed.

The display now advances to the next keystation panic zone.

7.14 AREA TEXT (MENU 14)

AREA NAME #1:

Select a name for each area being used (16 characters max.). Area names are displayed when accessing area arming and with the zone status to show which area the zone is in. (Areas were programmed in ZONE OPTIONS, menu 6.) The factory programmed default names are A1 - A8.

7.15 SENSOR LOCATIONS (MENU 15)

SENSOR#1:

Enter a location description for each of the four sensors used with the 4150 Auxiliary Control (16 characters max.)

7.16 PROGRAMMABLE I/O STATEMENTS (MENU 16)

The 4724's programmable I/O capability allows you to configure auxiliary output devices to act as indicators of internal status conditions, or to respond to the internal conditions in some way.

NOTE: It is easier to program the I/O statements using the Model 5540 Downloading Software (section 8.5.2). Because it may sometimes be useful to program them with the built-in programmer, the procedure is explained below. Section 8.5.1 explains the logical operators and provides more information about how I/O statements are used.

The programmable I/O statements in the built-in programmer work by GETting data from the 4724 memory, saving it in a temporary location (STACK), then PUTting it into a 4724 output buffer. The 4724 has room for a maximum of 127 GET and PUT statements. The factory programmed default program is shown in section 7.16.5.

Each program step consists of a combination of GET, PUT, and sometimes other types of statements, the net effect of which is 1) to place a bit (or group of 8 bits) on top of the stack and 2) to take a bit off of the stack, so the stack is empty when the program reaches the END statement. The step may contain an even number of GET and PUT statements, as in the following example:

EXAMPLE: In a nonsplit system (only 1 area), the following 2-statement step will cause X-10 module 1 to turn on if area 1 is armed (the lamp or appliance controlled by X-10 module 1 would then turn on):

```
GET1@B0.0
PUT1@9D.0
```

The first statement GETs a status bit from the 4724 memory address that shows the armed status of area 1. (If the status bit = 0, area 1 is not armed. If the status bit = 1, area 1 is armed.)

The second statement PUTs the bit into the 4724 memory address that determines whether the X-10 module will turn ON or OFF. (If the bit = 0, the X-10 module will be turn OFF. If the bit = 1, the X-10 module will turn ON.)

To generate an output that represents a specific combination of conditions, you program the system to GET data from different locations, perform a logical or arithmetic operation on the data, then PUT the result on the desired output port.

In this case, there may be more than one GET statement associated with one PUT statement. However, the various bits (or 8-bit groups) obtained in the GET statements are combined into one bit (or 8-bit group) as a result of the operations performed on them. Therefore, only one PUT statement is required to empty the stack (see statements 25-28 in the default program, table 7.16.5A).

The 4724 can store up to 32 pieces of data on the stack before performing any operations. Each operation is performed on the last one or two pieces of data that were put on top of the stack, either by a GET statement or as the result of a previous operation.

7.16.1 STEPPING THROUGH THE I/O PROGRAM

When you enter PROGRAMMABLE I/O STATEMENTS (menu 16), line 1 of the display will show the first step of the current I/O program. A typical display is: **1 GET1@B0.0**. The number on the left is the statement number. The command is shown next, followed by the 4724 memory location from which the system is GETting the data.

Line 2 will show the appropriate key prompts.

To advance to the next statement, press the **TEST** key. To go back to the previous statement, press the **STATUS** (**NOT READY**) key. The last statement of the program is always **END**.

7.16.2 PROGRAM OPERATIONS

The 14 program operations are listed in table 7.16.2A, along with the functions they perform.

Of the 14 operations, 5 require additional data: 9:GET1, 10:GET8, 11:GETC, 12:PUT1, and 13:PUT8. To select an operation, key in the number shown beside the operation on the display, then press the **TEST** key. After you select one of these operations, the display will prompt you for the information to be entered. If an address is requested, look it up in table 7.16.2B.

TABLE 7.16.2A: PROGRAMMABLE I/O STATEMENT OPERATIONS

OPERATION	WHAT IT DOES	SCREEN PROMPT THAT FOLLOWS	ADDITIONAL INFORMATION NEEDED
1:AND	Performs the AND operation on the top two items on the stack, then leaves the result (which will determine whether or not an output will be generated) on top of the stack.	Next statement in program.	None.
2:OR	Performs the OR operation on the top two items on the stack, then leaves the result on top of the stack.	Next statement in program.	None.
3:XOR	Performs the XOR operation on the top two items on the stack, then leaves the result on top of the stack.	Next statement in program.	None.
4:ADD	Adds together the top two items on the stack, then leaves the resulting sum on top of the stack. Used for numerical data only.	Next statement in program.	None.
5:SUB	Subtracts the top item on the stack from the item below it. Used for numerical data only.	Next statement in program.	None.
6:NOT	Changes the effect of the top item on the stack--that is, if the top item would have generated an output, the result of the NOT operation (which will now be placed on top of the stack) will not generate an output, and vice versa.	Next statement in program.	None.
7:NEG	Takes the top item on the stack and converts it to the negative of its value. Used for numerical data only.	Next statement in program.	None.
8:EQU	Compares the top two items on the stack and leaves the result on top of the stack. An output will be generated only if the two items are the same.	Next statement in program.	None.
9:GET1	Takes a single status bit from the 4724's memory and places it on top of the stack.	\$@0000	The address of the group of 8 status bits in the 4724's memory.
		BIT #(0-7):0	The single bit to get.
10:GET8	Takes 8 status bits that are grouped together from the 4724's memory and place them on top of the stack. <i>NOTE: This group of 8 bits constitutes a single item on the stack.</i>	\$@0000	The address of the group of 8 status bits in the 4724's memory.

(Table 7.16.2A continued on next page)

(TABLE 7.16.2A CONTINUED)

11:GETC	Takes a constant number and places it on top of the stack.	VALUE:0	Value of the constant (0 - 255) to get.
12:PUT1	Retrieves a single status bit from the top of the stack and transfers it to a single bit position on an output port or memory location.	\$@0000	8-bit output address to which the bit is to be transferred.
		BIT #(0-7):0	Specific location to put the single bit into.
13:PUT8	Retrieves 8 status bits that are grouped together from the top of the stack and transfers them to an 8-bit position on an output port or memory location.	\$@0000	8-bit output address to which the 8 bits are to be transferred.
0:END	Always the last statement in the program. If an END statement is inserted, it becomes the new end of the program.	END	None.

TABLE 7.16.2B: STATUS AND PORT ADDRESSES

NAME	ADDRESS.POINT	OPERATIONS	FUNCTION
AARMED[1-8]	@\$B0-7.0	GET1	Area armed
ACHIME[1-8]	@\$B0-7.3	GET1	Area chime activated
ACODE2[1-8]	@\$B0-7.4	GET1	Area code2 activated
AENTRY[1-8]	@\$B8-F.1	GET1	Area entry activated
AEXIT[1-8]	@\$B8-F.0	GET1	Area exit activated
AINST[1-8]	@\$B0-7.2	GET1	Area instant activated
ALMAREA[1-8]	@\$79.0-7	GET1, GET8	Area in alarm
AREADY[1-8]	@\$B0-7.1	GET1	Area zones ready
ABYPASS[1-8]	@\$B0-7.5	GET1	Area zones bypassed
ATROUBLE[1-8]	@\$B0-7.6	GET1	Area zone trouble
AUDALM	@\$27.7	GET1	Audible alarm
AUDAREA[1-8]	@\$78.0-7	GET1, GET8	Area audible alarm
AUXALM	@\$26.1	GET1	Aux. alarm activated
AUXRLY	@\$6D.0-7	GET1, GET8	4150 relay status
AZONES[1-144]	@\$40a-\$41B.0-7	GET1, GET8	Armed zones
CLGRP	@\$1A.5	GET1	Close time window group
DACT	@\$68.2	GET1	Dialer active
DOOR80[1-8]	@\$18.0-7	GET1, GET8	Toggle with 1-8 door
DOOROPEN[0-15]	@\$491-\$4A0.2	GET1	Keystation door open
DOORSUPR[0-15]	@\$491-\$4A0.1	GET1	Keystation door trouble
DURESS	@\$26.6	GET1	Duress alarm
EMER	@\$2A.1	GET1	Emergency alarm
EXTBELL	@\$29.3	GET1	External bell active
FIRE	@\$28.0	GET1	Fire alarm
HLDAY	@\$2A.0	GET1	Holiday
HZNC[1-144]	@\$2FC-\$30D.0-7	GET1, GET8	Zone high threshold trip
ICOM	@\$6C.0	GET1	Intercom active
INTBELL	@\$29.2	GET1	Internal bell active
INTRU	@\$28.2	GET1	Intrusion alarm
IRDY	@\$24.0	GET1	Zones all ready
IZONES[1-144]	@\$41C-\$42D.0-7	GET1, GET8	Interior bypassed zones

(Table 7.16.2B continued on next page)

(TABLE 7.16.2B CONTINUED)

KEYSUPR[0-15] LISTEN LOWBAT[1-144] LZNC[1-144] MDAY MONTH OPGRP PAPOUT PHONE REPORT RLY[1] RLY[2] RLY[3] RLY[4]	@\$491-\$4A0.0 @\$68.3 @\$3F8-\$409.0-7 @\$2EA-\$2FB.0-7 @\$7 @\$6 @\$1A.4 @\$69.0 @\$6C.1 @\$27.1 @\$8E.0-7 @\$8F.0-7 @\$90.0-7 @\$91.0-7	GET1 GET1 GET1, GET8 GET1, GET8 GET8 GET8 GET1 GET1 GET1 GET1 GET/PUT1,8 GET/PUT1,8 GET/PUT1,8 GET/PUT1,8	Keystation supervision Listen in active Zones low battery Zones low threshold trip Day of month (1-31) Month (1-12) Open time window group Printer out of paper 4140 phone mode Reporting 4180 outputs unit 1, P2 4180 outputs unit 1, P3 4180 outputs unit 2, P2 4180 outputs unit 2, P3
SCR[0-7] BYPASS SILENC SMKPWR SPECL SYSTR P1SEC P500MS TEE[1-8] TER15 TER16 TER18 TEST THR TKEY TMIN	@\$4B8-\$4BF.0-7 @\$25.5 @\$28.3 @\$EE.7 @\$28.1 @\$28.5 @\$5.4 @\$5.3 @\$2D-\$34 @\$EE.4 @\$EE.3 @\$12.2 @\$27.6 @\$2 @\$62 @\$3	GET/PUT1,8 GET1 GET1 GET1 GET1 GET1 GET1 GET8 GET/PUT1 GET/PUT1 GET/PUT1 GET1 GET8 GET8 GET8	Scratch locations* Global zones bypassed Silenced trouble Smoke power on Special alarm System trouble 1-second pulse 1/2-second pulse Area entry/exit/arm timer Output on 4720 term 15 Output on 4720 term 16 Output on 4720 term 18 Bell test mode Hour of day (0-\$23) Key input timer Minute of day (0-\$59)
TOPEN[0-15] TREE TROUBL TSEC TSHUT TSMOKE TWKDAY WALKTEST WARM WINSTAT[0-15] X10[1] X10[2] X10[3] X10[4] ZALM[1-144] ZMEM[1-144] ZONETR ZBYPASS[1-144] ZTR[1-144]	@\$481-\$490 @\$75.7 @\$26.3 @\$4 @\$F @\$C @\$1 @\$3C.2 @\$12.6 @\$A6-\$A9.0-7 @\$9D.0-7 @\$9E.0-7 @\$9F.0-7 @\$A0.0-7 @\$28C-\$29D.0-7 @\$30E-\$31F.0-7 @\$24.1 @\$27A-\$28B.0-7 @\$268-\$279.0-7	GET8 GET1 GET1 GET8 GET8 GET8 GET8 GET8 GET1 GET1 GET1, GET8 GET/PUT 1,8 GET/PUT 1,8 GET/PUT 1,8 GET/PUT 1,8 GET1, GET8 GET1, GET8 GET1 GET1, GET8 GET1, GET8 GET1, GET8	Keystation door open timer EEPROM trouble Any trouble Second of day (0-\$59) Bell shutdown timer Smoke power off timer Day of week (0-6) Walk test mode System reset (trouble) Time window status X-10 output for house code 1, #1-8 X-10 output for house code 1, #9-16 X-10 output for house code 2, #1-8 X-10 output for house code 2, #9-16 Zones in alarm Zone alarm memory Global zones in trouble Zones bypassed Zones in trouble

*NOTE: Scratch locations can be used as counters or as places to save temporary results in a program, if needed.

7.16.3 CHANGING THE PROGRAM

INSERTING A NEW STATEMENT

- To insert a new statement before the current statement, press the **CLEAR** key.
- Line 1 will show **SELECT OP:END**. Line 2 will show the 14 available operations (see table 7.16.2A). Press the number that goes with the desired operation, then press the **TEST** key.

3. The display will either advance to the statement that was current before you inserted the new one, or request more data if needed to perform the operation.
4. Press the **[MUTE]** key if you wish to exit the SELECT OP menu without adding a new statement.

Shown below are three examples of programmable I/O statements that can be used on the 4724 to obtain customized status outputs.

EXAMPLE 1: The following statement will cause terminal 15 on the 4720 to produce an active low output whenever there is a fire alarm in any area.

GET1 @\$28.0, PUT1 @EE.4

EXAMPLE 2: The following statement will cause terminal 16 on the 4720 to produce an active low output whenever there is an intrusion alarm in any area.

GET1 @\$28.2, PUT1 @EE.3

EXAMPLE 3: The following statement will cause the X-10 module address 1 from the first house code to be activated whenever area 1 (or a non-area system) is in entry or exit delay. The module could then be used to activate entry lighting. The unit will be deactivated when the entry/exit delay ends, or the area is disarmed.

GET1 @\$B8.1, GET1 @\$B8.0, OR, PUT1 @\$9D.0

7.16.4 LEAVING THE I/O PROGRAM

To exit the PROGRAMMABLE I/O STATEMENTS menu, follow this procedure:

1. Press **[MUTE]**. The display will show **\$AVE:NO**.
2. If you wish to exit without saving the changes, press **[MUTE]**.
3. If you wish to save the changes to the EEPROM, press **[1]** to view the message: **\$AVE:YIS**. Press the **[TEST]** key to save the changes.

7.16.5 FACTORY PROGRAMMED DEFAULT I/O PROGRAM

Table 7.16.5A shows the factory programmed default I/O program, along with an explanation of what it does.

TABLE 7.16.5A: DEFAULT I/O PROGRAM

STATEMENT	EFFECT
1 GET1 @\$B0.0	Each pair of GET and PUT statements from 1 - 16 causes the armed status of one area to activate one of the 4180 Status Display Module outputs.
2 PUT1 @\$8E.0	
3 GET1 @\$B1.0	
4 PUT1 @\$8E.1	
5 GET1 @4B2.0	
6 PUT1 @\$8E.2	
7 GET1 @\$B3.0	
8 PUT1 @\$8E.3	
9 GET1 @\$B4.0	
10 PUT1 @\$8E.4	
11 GET1 @\$B5.0	
12 PUT1 @\$8E.5	
13 GET1 @\$B6.0	
14 PUT1 @\$8E.6	
15 GET1 @\$B7.0	
16 PUT1 @\$8E.7	

(Table 7.16.5A continued on next page)

(TABLE 7.16.5A CONTINUED)

17 GET1 @\$28.0 18 PUT1 @\$8F.0	Fire alarm condition activates first output on 4180 unit 1, P3.
19 GET1 @\$2A.1 20 PUT1 @\$8F.1	Emergency alarm condition activates second output on 4180 unit 1, P3.
21 GET1 @\$28.2 22 PUT1 @\$8F.2	Intrusion alarm condition activates third output on 4180 unit 1, P3.
23 GET1 @\$26.6 24 PUT1 @\$8F.3	Duress condition activates fourth output on 4180 unit 1, P3.
25 GET8 @\$8E 26 GETC #0 27 EQU 28 PUT1 @\$8F.4	GETs the armed status of all 8 outputs on 4180 unit 1, P2 (8 areas) Generates an 8-bit binary constant with a value of 0. Match between all 8 outputs of 4180 and 8-bit constant of 0 (i.e., all 8 areas disarmed) activates fifth output on 4180 unit 1, P3.
29 GET1 @\$27.7 33 PUT1 @\$8F.5	Alarm condition that would trigger a bell or siren activates the sixth output on 4180 unit 1, P3.
34 GET1 @\$26.1 35 PUT1 @\$8F.6	Auxiliary alarm activates seventh output on 4180, unit 1, P3.
36 GET1 @\$26.3 37 PUT1 @\$8F.7	Any trouble condition activates eighth output on 4180, unit 1, P3.
38 GET8 @\$028C 39 PUT8 @\$90	Alarm condition on any of zones 1 - 8 activates corresponding 1 of 8 outputs on 4180 unit 2, P2.
40 GET8 @\$028D 41 PUT8 @\$91	Alarm condition on any of zones 9 - 16 activates corresponding 1 of 8 outputs on 4180 unit 2, P3.
42 GET8 @\$A6 43 PUT8 @\$9D 44 GET8 @\$A7 45 PUT8 @\$9E 46 GET8 @\$A8 47 PUT8 @\$9F 48 GET8 @\$A9 49 PUT8 @\$A0	\ Statements 42 and 43 cause time windows 0-7 / to activate X-10 modules 1-8 of house code 1. ... \ Statements 48 and 49 cause time windows 24-31 / to activate X-10 modules 9-16 of house code 2.
50 END	

7.17 DEFAULT OPTIONS (MENU 17)

DEFAULT ALL?

If you select this option, ALL OPTIONS WILL RETURN TO THEIR FACTORY-PROGRAMMED DEFAULT VALUES.

7.18 CODES 0 AND 1

The secret codes for access codes 0 (installer's code) and 1 (main user's code) are programmed in a separate menu, and are NOT part of the (1) (1) (TEST) menu structure. See section 6.6 for instructions.

8 USING THE MODEL 5540 DOWNLOADING SOFTWARE

The Model 5540 Downloading Software allows you to use a computer at a remote location to reprogram options and perform other functions for a particular installation. For more specific information, see the Model 5540 Downloading Software Operation section (P/N 150481) of the Model 4720 Installation Manual (150476).

NOTE: *Software revision 3.1 is required for downloading.*

INITIAL DOWNLOAD

During factory programming, the ANSWER RING option was selected (DIALER, menu 5). Once the panel is installed, the downloading computer can call it to download new program data or request status information from the panel. After 10 rings (the factory programmed value for the # RINGS option), the panel will answer the call and downloading will begin.

SUBSEQUENT DOWNLOADS

If the ANSWER RING option is still enabled, the computer can call the panel as described above. Downloading can also be initiated from a keypad at the installation location, by pressing **4** **TEST** followed by code 0 or code 1.

During uploading or downloading, the keypad LCD will display "UP/DOWNLOAD". During the downloading of options to the EEPROM, the LCD will also display address numbers. Downloading of all options takes approximately 12 minutes. Downloading cannot take place while the system is in alarm.

WARNING: During downloading, the system will NOT respond to alarms.

8.1 STARTING AND ENDING

If you have just powered up the computer, enter the word **M O D E M** first. If this has been done since the computer was turned on, enter the word **P A N E L** at the DOS prompt. Then enter your user name and password when the prompts direct you to do so. The **Panel Interface** menu will appear.

To exit the Model 5540 downloading program, press **Esc** repeatedly until you see the prompt that asks if you want to leave the program.

8.2 VIEWING STATUS

The status mode is used to view the status of the 4724, and to control functions as you would from an on-site keystation. The status mode for the 4724 is different from that of the 4720 in that it displays actual keystation data on the remote computer. Therefore, the status mode has access to any status or function that is available on a standard keystation.

Select Request Status on the **Panel Interface** menu.

Initiate an upload, either by dialing the panel from the computer, or by having someone press **4** **TEST** on a keystation at the account location.

The computer screen will begin to show the current keystation display. The lower part of the screen shows a simulation of the keystation. Press the appropriate keys to accomplish the desired functions.

As computer keys are pressed, they are buffered and shown after the "Keys:" heading at the top of the status window. The keystrokes are not actually sent to the panel until **Enter** is pressed on the keyboard. After the keystrokes have been sent, the "Keys:" area is blanked. The display will take up to 4 seconds to respond to the keys sent to the panel due to the relatively slow transmission rate.

EXAMPLES:

Zone status: Press **N** and **Enter** to display *not ready* zones. The zones are displayed along with their location text and area one at a time.

Set time: Press **9** **T** then enter a valid programming code (such as code 0). Press the **Enter** key. The display will show the set time display. Enter the digits for the time, then press **T** to enter the data.

Built in programmer: Press **I** **I** **T** then enter code 0. Press the **Enter** key. The display will show the main menu for the built-in programmer. The programmer is operated just like it is from a keystation. A special feature of the downloading software allows you to program zone locations and system messages directly.

When the display is in the program menu for a text option (the bottom line scrolls groups of symbols—as described in section 6.5), press the **F1** function key on the computer. The display **I I: \ASCII** will change from black to red. Now type in the letters you want to program and press the **↵ Enter** key. The letters will be entered directly into the display. Press **F1** again to return to the normal key mode. (**I I: \ASCII** must be off to emulate the **TEST** key and other functions.)

When the **Esc** key is pressed to terminate the status mode, the system will return to normal operation.

8.3 UPLOADING THE EVENT MEMORY

When the **Panel Interface** menu appears, select **M** to upload the event memory from a particular account and save it on a disk at the central station.

Enter the account number when prompted to do so. The letter "E" will appear, followed by the account number, on four different lines of the Up/Downloads column.

Initiate an upload, either by dialing the panel from the computer, or by having someone press **4 TEST** on a keystation at the account location.

Select **C** to save the upload, then enter the account number to be saved. The event information will be saved under a filename consisting of the account number with the extension .EVT on the end.

NOTE: The 4724's event memory is **NOT** cleared when the information is uploaded.

8.4 PROGRAMMING PROCEDURE

Figure 8A is a diagram of the 5540 menu structure. For instructions on programming auxiliary device outputs using the 5540 software, see section 8.5.

8.4.1 REPROGRAMMING THE OPTIONS

When the **Panel Interface** menu appears, press the **A** key to reprogram any of the options. You will be prompted for an account number to edit.

On the **Edit Account** menu, select the type of options you wish to program.

When you finish programming the options on one of these menus, press **Esc** to get back to the **Edit Account** menu, then choose another set of options to program. After you have reprogrammed all the options you wish, press **Esc** again. Then follow the screen prompts to save and download the new data.

After you have entered the subscriber's phone number, the number will appear on the screen, followed by **Press ESC to Terminate, Waiting for Answer...**

Several seconds will elapse before the call goes through and the screen indicates that downloading is taking place.

8.4.2 PRINTING THE OPTIONS

To print the data from a particular options menu, go to the menu and press the **F3** key.

8.4.3 VERIFYING THE SELECTIONS

To make sure the correct data has been downloaded to the subscriber's panel, you may wish to have the panel send the data back so you can review it.

On the **4724 Panel** menu, select **E** then follow the prompts to upload the data from the 4724 to your computer. To view the uploaded data, select **B** on the **4724 Panel** menu. To save the uploaded data, select **C** on the menu.

CAUTION: Before editing or modifying an upload, you must **SAVE** it.

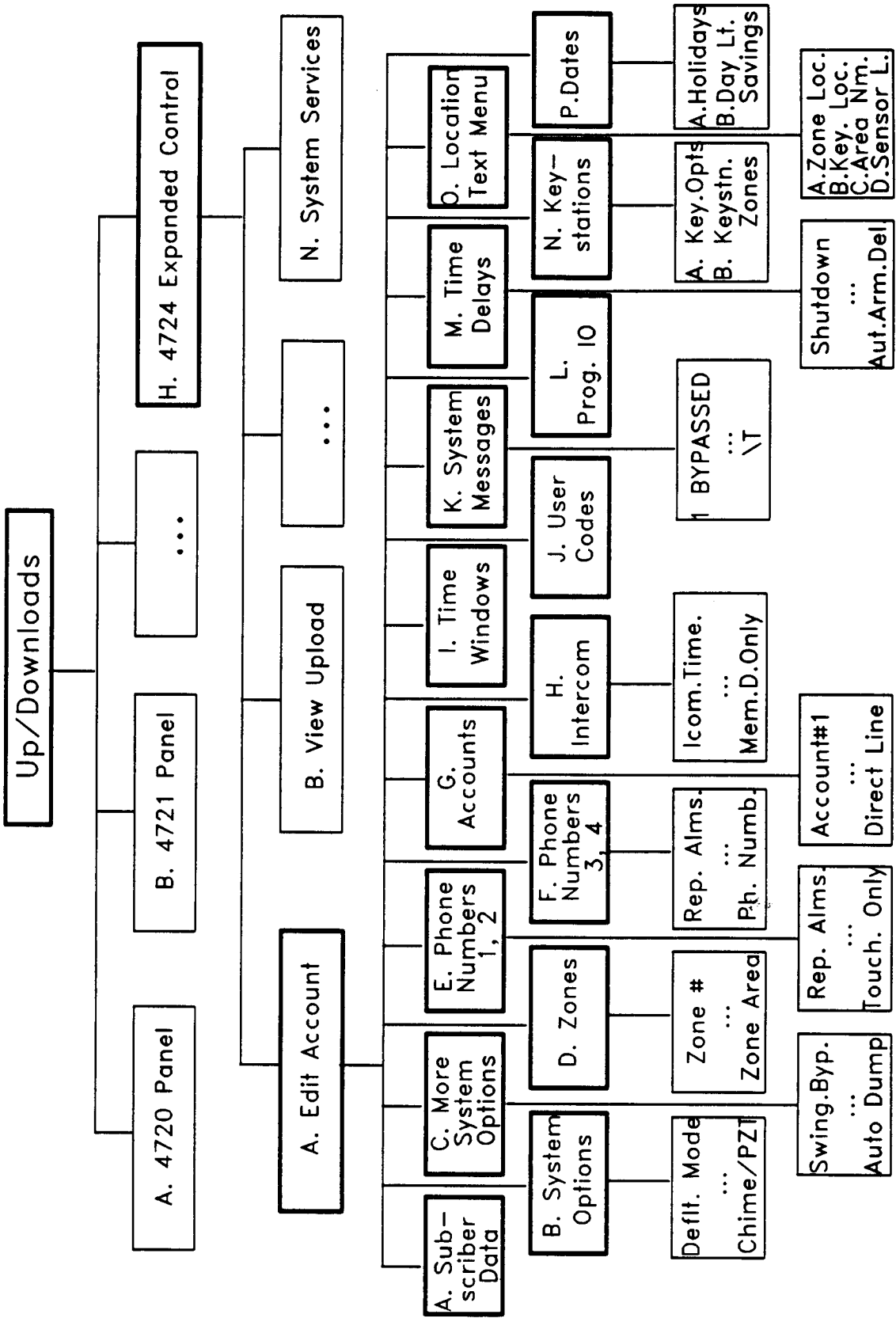


FIGURE 8A: MODEL 5540 MENUS

8.5 PROGRAMMING THE I/O STATEMENTS

8.5.1 WHAT THE I/O STATEMENTS DO

NOTE: It is easier to program the I/O statements using the Model 5540 Downloading Software. Because it may sometimes be useful to program them with the built-in programmer, the procedure is explained in section 7.16.

The 4724's programmable I/O capability allows you to configure auxiliary output devices to act as indicators of internal status conditions, or to respond to the internal conditions in some way. Figure 8.5.1A shows the I/O programming software in relation to the programmable output devices.

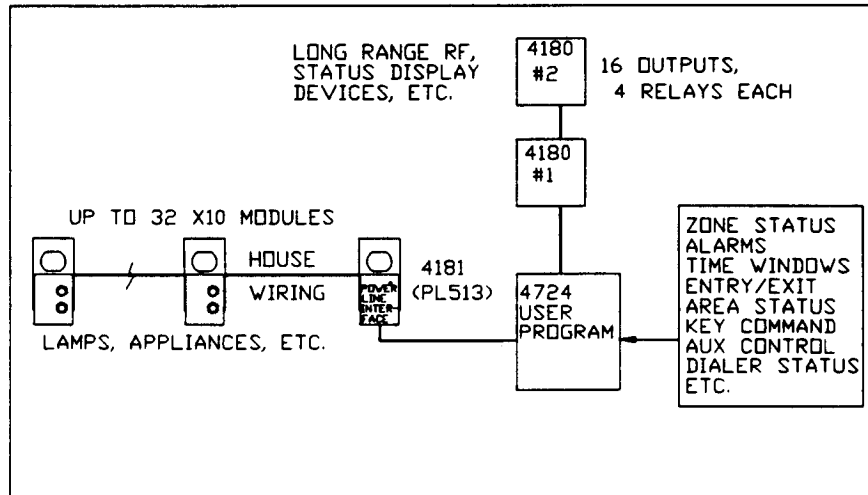


FIGURE 8.5.1A: AUXILIARY DEVICES

Outputs are generated on three types of devices:

1. **Model 4720 panel terminals 15, 16 and 18.** Terminals 15 and 16 are open collector outputs that sink current when activated (negative voltage; -12 V_{DC}, 50 mA max.). Terminal 18 functions as a current source when activated (positive voltage; +12 V_{DC}, 20 mA max.). Figure 8.5.1B shows how each of these terminals would be connected to an output device.

NOTE: The default I/O program sets terminal 15 as a common FIRE alarm output and terminal 16 as a common INTRUSION alarm output.

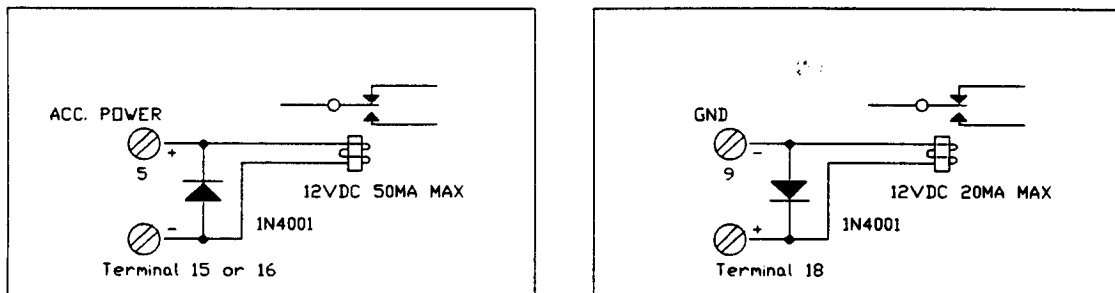


FIGURE 8.5.1B: CONNECTIONS TO TERMINALS 15, 16 AND 18

2. **Model 4180 Status Display Module.** Two modules can be daisy chained to provide up to 32 outputs. Each module has 4 relays, which can be activated by any of the 16 outputs. The top three sections of table 8.5.2B (section 8.5.2) show which relay label identifies each output.
3. **X-10-compatible modules.** The 4724, with the Model 4181 Power Line Interface, can control up to 32 X-10 modules. These modules, which come in many forms, can be used to control lights or appliances. The fourth

section of table 8.5.2B (section 8.5.2) show which X-10 label refers to each X-10 module.

EXAMPLE: If one of the 4180 Status Display Module's relays were connected to an LED, you could program the system to light the LED if the printer ran out of paper.

You can also program a device to produce an output when a specific combination of conditions exists. This is done by performing logical operations, as shown in table 8.5.1A. (The 5540 software and built-in programmer are also capable of using arithmetic operators. These operators are included in table 8.5.1B for your information, in case occasions arise in which you find them to be useful.)

TABLE 8.5.1A: LOGICAL OPERATORS

OPERATOR	OUTPUT IS GENERATED WHEN:
AND	Both condition A and condition B are in effect (for example, area 1 is armed and area 2 is armed).
OR	Either A or B or both are in effect.
XOR	Either A or B is in effect, but not both.
NOT	The specified condition is not in effect (for example, NOT [A AND B] indicates that when both A and B are in effect, an output is not generated).
=	A and B are in the same state (in effect or not effect).

TABLE 8.5.1B: ARITHMETIC OPERATORS

OPERATOR	NUMERICAL OUTPUT* GENERATED IS THE RESULT OF:
+	A + B (B added to A)
-	A - B (B subtracted from A)
*(e.g., a group of LEDs programmed to represent a binary number)	

EXAMPLE 1: You could write a program that would cause an X-10 module to turn on an air conditioner if one signal from the Model 4150 Auxiliary Control Module indicated that the high temperature trip point had been exceeded (condition A) **OR** another 4150 signal indicated that the high humidity trip point had been exceeded (condition B), or if both signals had been received.

EXAMPLE 2: The system could be programmed to activate a relay on the Model 4180 Status Display Module that would turn on an LED if area 1 and area 2 were **both armed** or **both disarmed** (A = B).

8.5.2 I/O PROGRAMMING PROCEDURE--5540 SOFTWARE

To program the I/O statements using the 5540, go to the **Programmable I/O** menu (selection **L** of the Edit Accounts menu). The inputs and outputs are programmed through a series of control statements that you enter into this menu. These statements take the form: **1 OUTPUT = STATUS**

The **OUTPUT** label refers to the device on which an output is generated. Output labels are assigned using the names shown in tables 8.5.2A and B. The **STATUS** label refers to the internal condition or combination of conditions that cause the output to be generated. STATUS labels are assigned using the names shown in table 8.5.2C.

Some labels include a number in brackets [], which specifies one of several similar outputs or sets of outputs; or one of several components of the installation (e.g., zones), or sets of components, on which an internal condition can exist (e.g., armed or disarmed).

Some labels can be used to access 8 data bits at a time. Labels of this type are identified in the **DATA TYPE** column of tables 8.5.2A and C by the word **BITS**. To access only one of the 8 bits, key in a **□** after the label, followed by a digit from **0** to **7**.

Labels of data type **NUMBER** take the form (LABEL = NUMBER).

EXAMPLE 1: **1 RLY[1] = ALMAREA**

The output label **RLY[1]** refers to the first group of 8 outputs on the first 4180 module. The status label **ALMAREA** indicates that all 8 areas in alarm status bits are to be accessed.

EXAMPLE 2: 1 RLY[4].7 = AZONES[18].5

The output label RLY[4].7 refers to the eighth output (.7) on the second group of outputs on the second 4180 module ([4]). The status label AZONES[18].5 refers to the armed status of the sixth zone (.5) of the zone group to which [18] has been assigned (zones 137 - 144)—in other words, zone 142. Table 8.5.2D shows which zones are assigned to each bracketed number.

EXAMPLE 3: 1 TER16 = (THR = 1) OR (THR = 2)

The output label TER16 refers to terminal 16 of the 4720. (THR = 1) refers to the hour that begins at 1:00 AM and ends at 1:59 AM. (THR = 2) refers to the hour that begins at 2:00 AM and ends at 2:59 AM. If the current time falls within either of these two intervals, the LED connected to terminal 16 will light. Because these two time periods happen to be consecutive, the LED will remain on continuously from 1:00 AM to 2:59 AM; it will not go off between the two time intervals.

TABLE 8.5.2A: PROGRAMMABLE I/O OUTPUT LABELS (READ/WRITE)*1

LABEL*2	DATA TYPE	FUNCTION
TER16	BIT	Output on terminal 16
TER15	BIT	Output on terminal 15
TER18	BIT	Output on terminal 18
RLY[4]	BITS	4180 status relays
X10[4]	BITS	X-10 output bits
SCR[8]	NUMBER, BITS	User scratch area
*1NOTE: An output can be generated (written—left side of statement) as a result of an internal condition, or its own status can be read (right side of statement) to generate an output on some other device.		
*2NOTE: In this column, the number in brackets [] indicates how many devices or components of this type are available.		

TABLE 8.5.2B: OUTPUT DESIGNATIONS

LABEL	OUTPUT
RLY[1] RLY[2] RLY[3] RLY[4]	Outputs on 4180 module 1, connector P2 Outputs on 4180 module 1, connector P3 Outputs on 4180 module 2, connector P2 Outputs on 4180 module 2, connector P3
RLY[1].0 RLY[1].1 ... RLY[1].7	Output on 4180 module 1, connector P2, pin 8 Output on 4180 module 1, connector P2, pin 7 Output on 4180 module 1, connector P2, pin 1
RLY[2].0 RLY[2].1 ... RLY[2].7	Outputs on 4180 module 1, connector P3, pin 8 Outputs on 4180 module 1, connector P3, pin 7 Outputs on 4180 module 1, connector P3, pin 1
X10[1] X10[1].0 X10[1].1 ... X10[2] X10[3] X10[4]	Outputs to X-10 modules 1-8 of house code 1 Output to X-10 module 1 of house code 1 Output to X-10 module 2 of house code 1 Outputs to X-10 modules 9-16 of house code 1 Outputs to X-10 modules 1-8 of house code 2 Outputs to X-10 modules 9-16 of house code 2
TER15 TER16 TER18	Active low output sink on terminal 15 of the 4720 panel (50 mA) Active low output sink on terminal 16 of the 4720 panel (50 mA) High output source on terminal 18 of the 4720 panel (20 mA)— Supplies 12 V _{DC} when turned on

NOTE: On connectors P2 and P3 of the 4180, the designation .0 refers to pin 8 and the designation .7 refers to pin 1.

TABLE 8.5.2C: PROGRAMMABLE I/O STATUS LABELS (READ ONLY)*1

LABEL*2	DATA TYPE	FUNCTION
ALMTYP ALMAREA AUDAREA CENT DOOR80 ARMED[8] AREADY[8] AINST[8] ACHIME[8] ACODE2[8]	NUMBER BITS BITS NUMBER BITS BIT BIT BIT BIT BIT	Current alarm type Areas in alarm Areas using audio Century Toggle 1-8 door Area[n] armed Area[n] ready Area[n] instant mode Area[n] chime mode Area[n] code2 mode
BYPASS[8] ATROUBL[8] MDAY MONTH ORGKID AEXIT[8] AENTRY[8] AUXRLY T31MS T31MS.2	BIT BIT NUMBER NUMBER NUMBER BIT BIT BITS BITS, NUMBER BIT	Area[n] bypassed zones Area[n] zone trouble Day of month Month number Keystation using phone/intercom Area[n] in exit delay Area[n] in entry delay Aux control relay status 31 millisecond counter Pulse at 4 per second
T31MS.3 T31MS.4 TEE[8] THR TMIN TSEC TSHUT TSMOKE TWKDAY	BIT BIT NUMBER NUMBER NUMBER NUMBER NUMBER NUMBER NUMBER	Pulse at 2 per second Pulse at 1 per second Area[n] entry/exit/arm timer Hour of day Minute of day Second of day Time left until shutdown (seconds) Time until smoke on (seconds) Day of week
WINSTAT[4] YEAR AZONES[18] HZNC[18] IZONES[18] LOWBAT[18] LZNC[18] ZALM[18] ZMEM[18] ZBYPASS[18]	BITS NUMBER BITS BITS BITS BITS BITS BITS BITS BITS	Time window status bits Year Zones that are armed Zone inputs above high limit Zones that are interior bypassed Zones that have low battery Zone inputs below low limit Zones in alarm or entry Alarm memory zones Zones that are bypassed
ZTR[18] KEYSUPR[16] DOORSUPR[16] DOOROPEN[16] TOPEN[16] AUDALM AUXALM INTBELL EXTBELL CLGRP	BITS BIT BIT BIT NUMBER BIT BIT BIT BIT BIT	Zones in trouble Keystation supervise trouble Keystation door trouble Keystation door is open Keystation door timer (seconds) Any alarm not silent Auxiliary type alarm Internal bell output on External bell output on Close window group active

(Table 8.5.2C continued on next page)

(TABLE 8.5.2C CONTINUED)

DACT	BIT	Dialer active
DURESS	BIT	Duress alarm
EMER	BIT	Emergency alarm
FIRE	BIT	Fire alarm
HLDAY	BIT	Holiday
ICOM	BIT	Intercom active
INTRU	BIT	Intrusion alarm
IRDY	BIT	Zones all ready
ITR	BIT	Zone in trouble
LISTEN	BIT	Listen in active
OPGRP	BIT	Open window group active
PAPOUT	BIT	Printer paper out
PHONE	BIT	Phone mode active
READY	BIT	Zones ready
REPORT	BIT	Dialer reporting
BYPASSES	BIT	Zones bypassed
SILENC	BIT	Trouble silenced
SMKPWR	BIT	Smoke power on
SPECL	BIT	Special alarm
SYSTR	BIT	System trouble
TEST	BIT	Bell test
TREE	BIT	EEPROM trouble
TROUBL	BIT	Any trouble
WARM	BIT	Watchdog reset occurred
WALKTEST	BIT	Walk test mode
*1NOTE: A status condition can only be read (right side of statement), so that the information can be used to determine whether or not an output will be generated. Status conditions can not be altered by programmable I/O statements.		
*2NOTE: In this column, the number in brackets [] indicates how many devices or components of this type are available.		

TABLE 8.5.2D: ZONE GROUPS

BRACKETED NUMBER [N]	ZONES
[1]	1 - 8
[2]	9 - 16
[3]	17 - 24
[4]	25 - 32
[5]	33 - 40
[6]	41 - 48
[7]	49 - 56
[8]	57 - 64
[9]	65 - 72

BRACKETED NUMBER [N]	ZONES
[10]	73 - 80
[11]	81 - 88
[12]	89 - 96
[13]	97 - 104
[14]	105 - 112
[15]	113 - 120
[16]	121 - 128
[17]	129 - 136
[18]	137 - 144

Shown below are three examples of programmable I/O statements that can be used on the 4724 to obtain customized status outputs.

EXAMPLE 1: The following statement will cause terminal 15 on the 4720 to produce an active low output whenever there is a fire alarm in any area.

TER15 = FIRE

EXAMPLE 2: The following statement will cause terminal 16 on the 4720 to produce an active low output whenever there is an intrusion alarm in any area.

TER16 = INTRU

EXAMPLE 3: The following statement will cause the X-10 module address 1 from the first house code to be activated whenever area 1 (or a non-area system) is in entry or exit delay. The module could then be used to activate entry lighting. The unit will be deactivated when the entry/exit delay ends, or the area is disarmed.

X10[1].0 = (AEXIT[1] OR AENTRY[1])

9 WALK TEST OPERATION

The 4724 walk test mode allows the system to be tested without causing alarm reports. Follow the procedure below to perform a walk test.

1. Press **2** **TEST** followed by code 0 or code 1.
2. The display will show **WALK TEST** or your customized walk test message (see section 7.9).
3. Arm individual areas or the entire installation. Then violate the sensors by walking through the armed areas. The system will operate as normal, except that it will not report alarms to the central station, and alarm tones will not be sent to the external bell. The alarm conditions will be displayed on the keystation LCD and annunciated on the internal speakers.

NOTE: The system will remain in the same armed/disarmed state after you exit the walk test mode, so be sure to arm or disarm it as desired.

Interior zones may be armed or disarmed during the test to verify operation of the interior control key and options.

Test the exit and entry zones to verify the delay times you have programmed.

View the alarm memory to see that the desired areas have been activated.

4. To exit the walk test mode, press **MUTE** **MUTE** on any keystation.