

GENESYS 824 ALPHA INSTALLERS MANUAL

Contents

INSTALLER PROGRAMMING

How to Enter and Move Around Within Installers Program Mode	p. 1
Custom Zone Programming, Location 00-46	p. 1
Communications Programming, Location 48-56C	p. 3
Entry/Exit Delays, Output Cutoffs, Location 57-58C	p. 5
PGM Output Options, Location 59-59B	p. 6
Misc. Reporting Codes, Location 60-72C	p. 7
Expanders, Keypads and Partitions, Location 73-74	p. 8
Signal Routing, Location 75-75C	p. 9
System Features, Location 76-79C	p. 9

WIRING INSTRUCTIONS

Instruction & Diagram	p. 12
-----------------------	-------

ALPHA PROGRAMMING

Instruction & Chart	p. 15
---------------------	-------

PROGRAMMING SUMMARY & INSTALLATION HINTS

To install additional Keypad	p. 16
To make partitioning	p. 16
To install Hard wire expander	p. 16
To install Long range radio	p. 16
To default the 824 control panel	p. 17
Bus Test	p. 17
To Extend the Power of PGM output	p. 17

UNDERWRITERS LABORATORIES COMPLIANCE VERIFICATION	p. 18
--	-------

DECIMAL TO HEXADECIMAL CONVERSION CHART	p. 21
--	-------

HOW TO ENTER PROGRAM MODE

The Installers PIN is required to access the Installers program. The **Installers PIN is Preset from the factory as [9999]** and may be changed in Location 78. Care must be taken when changing Installers PIN.

To enter Program Mode:

Depress [**Installer PIN**] + [**↑**] + [**7**]. The LCD should now display

```
INSTALLER PRGRM
ENTER ITEM#
```

You are now in program mode.

MOVING WITHIN INSTALLERS PROGRAM MODE

Once within the Installers program mode, movement is achieved by selecting specific Memory Locations and going to those locations. Each Memory Location is identified with a two-digit number. Entering that number at the prompt will advance you to that specific location and display any memory within that field.

To access a Sub-Location (example, 56B), enter the two digit location number and press the [**↑**] button until the appropriate sub-location is displayed. To move back to a previous Sub Location within that memory location, press [STAY]. To move from one location to another press [#] then enter new location number.

Once within the field, changes can be made by either:

A) Entering the appropriate two digit number or,

Memory Location

```
ITEM#00-E
ENTER DATA=00
```

Two Digits number

B) By entering the number that corresponds to the option that you wish to enable .

Memory Location Option Number

```
#00-F    12345678
<1-8>FOR ON/OFF
```

Example: If you depress 1-2-6 , the LCD will indicate those three options have been enabled. Depressing a number that previously was displayed will remove the number from the LCD and disable the option

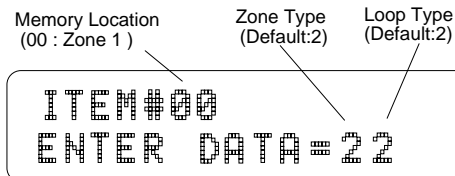
When the desired changes are made, simply depress the [**↑**] button to lock the information in the EE prom and advance to the next memory field.

To exit a specific Program Location, press the [#] button. This will exit you back to the (PRG.) prompt. When all changes have been completed, depress the [#] button twice to exit out of the Installer Program mode.

Memory Location 00 - 46 CUSTOM ZONE PROGRAMMING

All of the GENESYS 824 zones can be custom programmed to perform any number of specific functions. For each zone you will be making several decisions about the functions it will perform. The choices are as follows.

ZONE TYPE *Check Programming Sheet for Defaults. The first two-digit entry defines the **Zone Type** as well as the **Loop Type**.



Zone type is the first digit entry. The zone types and the value to enter are:

- 0 - ENTRY - EXIT 1
- 1 - ENTRY - EXIT 2
- 2 - PERIMETER INST
- 3 - INTERIOR 1
- 4 - INTERIOR 2
- 5 - INTERIOR 3
- 6 - 24 HOUR
- 7 - FIRE 24 HOUR
- 8 - DAY CIRCUIT

0 - ENTRY - EXIT 1 used for an Entry/Exit zone where a delay is required to Enter or Exit the premises.

1 - ENTRY - EXIT 2 may be used on entry exit zones requiring longer periods of time, such as garage doors, gates, outdoor detectors, etc. This zone type may also be used in a partitioned system where a separate entry or exit time is required for each partition.

2 - PERIMETER INSTANT used for devices that should create an instant alarm when the system is armed in any mode.

3-4-5 - INTERIOR 1 - 2 - 3 used for devices such as PIR, Ultrasonics, Mats, etc. that are used inside the premises.

6 - 24 HOUR is used for devices that will activate an alarm condition whether the panel is armed or disarmed.

7 - FIRE ZONES are used for devices such as smoke detectors (4 wire), heat sensor, water flow, etc. that need to be active 24 hours.

8 - DAY CIRCUIT is used for devices such as window foil, screens, etc. In a disarmed state, an activation

creates a trouble (trbl) condition and will report a trouble code if programmed. In an armed state, an activation will create an alarm condition.

ARMING MODE	ENTRY/EXIT 1 and 2	PERIMETER INSTANT	INTERIOR #1	INTERIOR #2	INTERIOR #3
AWAY	Delayed Exit Delayed Entry	Delayed Exit Instant	Delayed Exit Follower or Instant	Delayed Exit Follower or Instant	Delayed
STAY	Delayed Exit Delayed Entry	Delayed Exit Instant	Delayed Exit Follower or Instant	Bypassed	Delayed
INSTANT	Instant Always	Instant Always	Instant Always	Bypassed	Delayed

LOOP TYPE is the second digit entry. The loop type and value entered are:

- 0 - Normally Open
- 1 - Normally Closed
- * 2 - Normally Open - Normally Closed
- * 3 - N.O. - supervised w/EOL - reports trouble on break, alarm on short
- * 4 - N.C. - supervised w/EOL - reports trouble on short, alarm on open

NOTE: EOL resistor 2.2k ohm 1/2 watt (Optex Part Number: 1401-4649).

ITEM A - Loop Response - Adjusted in two digit increments in a multiplier of 50 ms. A longer loop response may be required for devices such as water flow detectors. A shorter loop response may be required for devices such as glass break detectors.
Value: 00 - 99 x 50 ms., Default: 05 (250 ms.).

ITEM B - Alarm Code - (2 Digit Entry)
The panel will transmit this code when the zone creates an alarm condition.
Value: 01 - FF, Default: 00 (Disabled).

ITEM C - Trouble Code - (2 Digit Entry)
This code that will be transmitted when a zone that is programmed for a Loop Type three or four creates a trouble condition.
Value: 01 - FF, Default: 00 (Disabled).

ITEM D - Bypass Code - (2 Digit Entry)
This code will be transmitted when the zone is bypassed and the system is armed if the zone is programmed for bypass allowed (see Item G)
Value: 01 - FF, Default: 00 (Disabled).

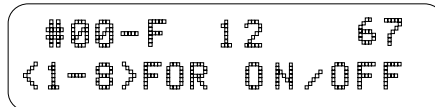
NOTE: BYPASS SHOULD NOT BE ALLOWED ON FIRE CIRCUITS.

ITEM E - Restore Code (2 Digit Entry)
This restore code is a common function that is transmitted either after an alarm condition or after a

trouble (trbl) condition if programmed as loop type three or four.

Value: 01 - FF, Default: 00 (Disabled).

ITEM F -Zone Features (MultipleEntries) Depressing the number that corresponds to the option that you wish to enable and it will also be displayed on the LCD. Depressing a number that previously was displayed will remove the number from the LCD and disable the option.



(Shows Default condition)

OPTIONS

- 1 = Telephone Output
- 2 = Audible
- 3 = Pulse Bell
- 4 = PGM 1
- 5 = PGM 2
- 6 = Walk Test
- 7 = Monitor
- 8 = Silent Day - Audible Armed

1 - TELEPHONE OUTPUT - is required to be enabled to transmit all zone reporting codes. If the codes are programmed and this function is not active, the zone report codes will not transmit.
Default: YES

2 - AUDIBLE - must be enabled to energize the steady bell voltage output. If this function is not enabled the zone will be silent. (See Item 58 for cutoff times.) **Default: YES**

Note: For Temporal Pattern Set Audible to Yes

3 - PULSE BELL - is required to be enabled to energize the pulsing bell voltage output. Audible must also be enabled to energize this function. **Default: NO**

Note: For Temporal Pattern Set Pulse Bell to Yes

4 - PGM OUTPUT 1 - is an open collector that sinks to ground for the amount of time that is programmed under

Item 58. When this output is turned on as an alarm output, it can not be used for any other function. See Item 58 for cutoff times.

Default: NO

5 - PGM OUTPUT 2 - is an open collector that sinks to ground for the amount of time that is programmed under Item 58. When this output is turned on as an alarm output, it can not be used for any other function. See Item 58 for cutoff times.

Default: NO

6 - WALK TEST - is a function that can be used by the installer or the user. With this function enabled all zones will be scrolling on the LCD. The zone number and name will be removed from the LCD and the keypad will emit an audible tone indicating the zone was violated. When all zones have been tripped the LCD will display "NO MORE FOUND".

Default: YES

NOTE: 24 Hour, Day Zone and Fire Zones are still active in this walk test mode.

7 - MONITOR - is an option that allows local annunciation of zone violation. See Item 76-B for output assignment for this feature.

Default: YES

NOTE: 24 Hour, Day Zone and Fire Zones are active in this mode and will only be displayed if they are assigned for this option.

8 - SILENT DAY - AUDIBLE NIGHT - is an option that is used with 24 hour zones that must be programmed for audible. In a disarmed state, the violated 24 hour zone(s) will enunciate on the LCD display, PGM 1 and/or PGM 2 will energize (if programmed as a zone output) and the bell voltage will not energize. If this zone(s) is violated in an armed state, PGM 1 and/or PGM 2 will energize, (if programmed as zone outputs) and the bell voltage will energize. **Default: NO.**

ITEM G This is a continuation of zone features and also requires depressing the number that corresponds to the option that you wish to enable and the number will be displayed on the LCD. Depressing a number that previously was displayed will remove the number from the LCD and disable the option.

#00-G 12345 7
<1-8>FOR ON/OFF

(Shows Default condition)

OPTIONS

- 1 = KEYPAD 1 AUDIBLE
- 2 = KEYPAD 2 AUDIBLE
- 3 = KEYPAD 3 AUDIBLE
- 4 = KEYPAD 4 AUDIBLE
- 5 = DISPLAY ARMED
- 6 = SHUNT ALLOWED
- 7 = BYPASS ALLOWED
- 8 = RADIO OUTPUT

KEYPAD 1 - 2 - 3 - 4 - is a function that enables or disables the keypad buzzer on entry. This function is only active for Entry - Exit 1 or 2 type zones. **The keypads are always silent on alarm violation.**

Default: YES.

5 - DISPLAY ARMED - the zone will be displayed on the LCD with this function on when a burglary zone is violated in an armed state, If more than one zone is violated, they will scroll on the LCD in numerical sequence.

Default: NO.

6 - SHUNT ALLOWED - Used in conjunction with audible set on for the zone.

When this option is used it prevents multiple code transmissions from a swinging alarm condition. Regardless of the number of trips, the panel will inhibit additional signals, from this zone, until the bell times out. It will then be ready to transmit subsequent events. **Default: NO.**

7 - BYPASS ALLOWED - Allows the subscriber to manually bypass the zone if this option is set on.

Default: YES.

NOTE: This option should not be used on Fire zone.

8 - RADIO OUTPUT - This option enables the zone to transmit its reporting codes via our Varitech long range radio.

Once you have completed programming memory location OO-G, the keypad will automatically advance you to memory location 02 which is Zone 2. Continue programming information in the same manner as Zone 1 (memory location 00).

To exit back or review what was programmed in Zone 1 (memory location 00) depress [#]. The LCD will display PRG. Then depress 00. To advance through each memory location depress [↑].

**Memory Location 48 - 56C
COMMUNICATIONS PROGRAMMING**

48 Receiver Telephone Number 1 (Panel will dial first)

Each memory location, from 48-48G, requires a 2 digit entry. Beginning with Memory location 48 enter in a dial pause (c) by depressing [AWAY] 2 and then the first digit of the telephone number and [↑]. Continue until the telephone number is completely entered. Fill in the remaining memory locations with (F) [AWAY] 5. The maximum number of digits is sixteen, including dial pause and dial tone detects.

For installations that require an access code to get an outside line it's recommended to put a pause before and after the access code. Example: C-9-C-3675951.

Value 0 - 9, A - D Default: FF

- A = [AWAY] 0 - *
- B = [AWAY] 1 - #
- C = [AWAY] 2 - 3 Second Pause
- D = [AWAY] 3 - Dial Tone Detect

50 Receiver Telephone Number 2

Programmed in the same manner as Receiver number 1. This receiver output can be used as back up or redundant dialing **and should always be programmed.** See memory location 75 for your options.

Value 0 - 9, A - D, Default: FF.

52 Account Number 1 and 2 (2 Digit Entry)

When a reporting function is activated this account number will identify the subscriber to the central station. In memory location 52 will be the first two digits of the account number and 52A will be the last two digits of the first account number. 52B will be the first two digits of the second account number and 52C will be the last two digits. Value 0000 - FFFF, Default: 0000.

Hex digits can be used in accounts numbers:

- [AWAY] + 0 = A
- [AWAY] + 1 = B
- [AWAY] + 2 = C
- [AWAY] + 3 = D
- [AWAY] + 4 = E
- [AWAY] + 5 = F

53 Receiver Formats for Receiver 1 and 2 (2 Digit Entry)

The first digit selects a format for Receiver number one. The second digit selects a format for Receiver number two. Many different types of central station receivers can accept a multitude of formats. Naturally the format that "dumps" the information the quickest is the most desirable. You should consult with your central station to employ the optimum format.

- 0 = SIA
- 1 = 10 PPS 4-1
- 2 = 10 PPS 4-1 extended
- 3 = 10 PPS 4-2
- 4 = 20 PPS 4-1
- 5 = 20 PPS 4-1 extended
- 6 = 20 PPS 4-2

0 - SIA

SIA is an FSK type reporting format that has all the reporting codes encoded in the control panel software. The reporting capabilities are simply enabled when any reporting code other than 00 are programmed in. (A code 00 will disable the reporting capability). The information sent is predetermined by the activation of a zone type :

EXAMPLES:

<u>ZONE TYPE</u>	<u>MESSAGE SENT</u>
All Interior / Perimeter	= Burglary + Zone Number
Fire zones	= Fire + Zone Number
24 Hour	= Burglary + Zone Number
Zone Restore (if used)	= Restore + Zone Number

10 and 20 PPS formats - The only difference between these two formats is the speed and tone at which each pulse of a digit in a message is transmitted. Both of these formats will respond to 1400Hz or 2300Hz "handshake" and "kiss off" tones. All of the 10 PPS formats are sent using 1900Hz tones with a duration of 60 ms and a gap of 40ms for each pulse of a message digit. The 20PPS formats are sent using 1800Hz tones with a duration of 30ms and a gap of 20ms for each pulse of a message digit.

1 10 PPS 4-1

This format requires a four digit account number with a single digit event code. A complete message consist of 2 identical rounds account and message digits. In the event that you have been assigned a three digit account number, the first digit in memory location 52 must be a zero.

Example: Account 123, program 0123.

The reporting codes in this format must be single digit, therefore you must enter a zero in the first memory location followed by the code number to be transmitted. Example: code 3, program 03.

2 10 PPS 4-1 Extended

The digits are sent in the same manner as 4-1 but the complete message consist of 2 rounds that will contain the account number and the high digit of the message code. This will be followed by two more rounds which will repeat the high digit of the message code, in place of the account number, and the low digit of the message code.

Example:

Message : 1234-F5
Transmitted : 2 rounds of 1234-F
2 rounds of FFFF-5

3 10 PPS 4-2

This is a format that is similar in reporting as 4-1 EXT. With the exception that the reporting is sent as two identical rounds of information.

4 - 20 PPS 4-1

5 - 20 PPS 4-1 Extended

6 - 20 PPS 4-2

All three are the same as 10PPS except at a faster transmission speed.

Value 0 - 6, Default:: 1 - 1

53 A Anti-Jam Time

This is the amount of time required for the telephone company to disconnect the phone line after the panel has hung up if it was not "kissed" off on the first dialing attempt. Check with your phone company for this value of time.

Value 00 - 99 seconds, Default: 15 seconds.

53 B Line Type / Dial Attempts (2 Digit Entry)

The first digit indicates the telephone line type for dialing the central station. A zero selects Rotary (pulse) dialing while any digit 1 - 9 will select tone dialing.

Value 0 = Rotary; 1-9 = Touch-tone, Default: 0 (Rotary).

The second digit selects the number of dialing attempts to report an event to the central station. If the communicator does not receive a handshake and/or kissoff tone from the receiver, it will disconnect and re-dial until the tone is heard or the maximum number of attempts is reached.

Value 0 - 9, Default: 5. (minimum for UL 864)

53 C Delay Before Dial (2 Digit Entry)

This function enables the capability of aborting the alarm transmission if the panel is disarmed within the period of time programmed in this memory location. This function is active on burglary zones only. All 24 Hour type zones will send their data immediately.

Value 00 - 99 seconds, Default: 00 seconds.

54 (A through G) Download Telephone Number

(Up to a 16 Digit Telephone Number)

This is a security function that when a call is initiated from a Central Station download P.C. the panel will answer, recognize the carrier tone from the modem, hang up the call, and call the P.C. back. See memory location 48 for additional telephone features. Value 0 - D, Default: FF.

56 Local Download PIN (4 Digit Entry)

This function works in conjunction with Download Telephone Number (see Memory Location 54 A-G). The telephone number must be programmed for this function to operate. When this 4 digit number + [↑] is depressed, the panel will call the phone number programmed in memory location 54 A-G. **Value 0000 - 9999, Default: BLANK**

NOTE: *[Local Downloading] will be displayed when remote down load has been activated.*

56 B Download - Number of Rings (2 Digit Entry)

When a call is initiated from the P.C. the panel will answer the call on this number of rings. **Value 00 - 99, Default: 12.**

56 C Download - Caller-ID (Telephone Company Option)

Compatibility Requires depressing the number that corresponds to the option that you wish to enable and the number will be displayed on the LCD. Depressing a number that previously was displayed will remove the number from the LCD and disable the option.

The Telephone Company transmits the caller's telephone number between the first and second ring at the premises where this feature is in service.

For the G-824 to be compatible with this service the line seizure circuitry does not become active until after the second ring.

NOTES:

- 1. When this option is enabled, if on-premises telephone is taken off hook prior to the second ring the panel will not seize the line even if carrier is present at the time.**
- 2. When this option is Disabled, the line seizure circuitry will become active after the first ring if carrier is present. In this case the panel will seize the line, if carrier is present, when an on-premises telephone is taken off hook before the second ring.**

OPTION

- 1 = Disable caller-id feature
- 2 = Not Used
- 3 = Not Used
- 4 = Not Used
- 5 = Not Used
- 6 = Not Used
- 7 = Not Used
- 8 = Not Used

**Memory Location 57 - 58C
ENTRY/EXIT DELAYS, OUTPUT CUTOFFS**

57 Entry Delay #1 (2 Digit Entry)

This memory location works in conjunction with Entry - Exit 1 (see Zone Types). The value programmed in this memory location will allow a delay on entry when the system is armed in the AWAY or STAY arming modes.

Values 00 - 99 seconds, Default: 45 seconds.

57 A Entry Delay #2 (2 Digit Entry)

This memory location works in the same fashion as Entry Delay #1 with the exception that this value is applied to Entry - Exit 2.

Value 00 - 99 seconds, Default: 45 seconds.

57 B Exit Delay #1 (2 Digit Entry)

This memory location works in conjunction with a zone type programmed as Entry Exit Zone 1 (see zone type). The value programmed in this memory location will allow a delay on exit when the system is armed in AWAY or STAY modes.

Value 00 - 99 seconds, Default: 60 seconds.

57 C Exit Delay #2 (2 Digit Entry)

This memory location works in the same fashion as Exit Delay #1 with the exception that this value is applied to Entry - Exit 2.

Value 00 - 99 seconds, Default: 60 seconds.

Note: *A separate entry exit delay period maybe selected for each partition by programming a zone(s) for Entry Exit 1 to a partition and zone(s) for Entry Exit 2 for the other Partition. A partition may have more than one entry exit zone.*

58 Pre-Alarm Delay (2 Digit Entry)

This function silences all keypad entry warning tones for the amount of time programmed. This value adds on to the entrance delay value. Example: 30 second pre alarm delay (silent) + 60 entrance delay (audible) - total entry time = 90 seconds. **Value 00 - 99 seconds, Default: 00.**

Note: *This option delay's all keypads with partition enabled.*

58 A Bell Cutoff (2 Digit Entry)

The voltage will be present at terminals 28 (+) and 27 (-) for the amount of time programmed in this memory location after an alarm circuit trips and it has been programmed for AUDIBLE. **Value 00 - 99 minutes, Default: 10 minutes.**

NOTE: *A value of 00 keeps this output energized until a valid PIN is entered.*

58 B PGM 1 Cutoff (2 Digit Entry)

This output will stay energized for the amount of time programmed in this memory location after an alarm circuit trips and it has been programmed to energize the PGM 1 output, **Value 00 - 99 minutes, Default: 0 minutes.**

58 C PGM 2 Cutoff (2 Digit Entry)

This output will stay energized for the amount of time programmed in this memory location after an alarm circuit trips and it has been programmed to energize the PGM 2 output, Value 00 - 99 minutes, Default: 0 minutes.

NOTE: A value of 00 will keep PGM 1 and PGM 2 output energized until a valid PIN is entered.

**Memory Location 59 & 59B
PGM OUTPUT OPTION**

59 PGM 1 Output Option (2 Digit Entry) PGM 1 Output can be programmed to be used as **one** of the following functions: The current available for this output is 20mA.

00 - Alarm Output - This option must be enabled when used as a Zone Alarm Output. Output time follows value in location 58 B.

01 - System Status - If this option is selected PGM 1 output will be present when all zones are secured When the system has been armed this output will not be present.

02 - Ground Start - Can be used for a phone system that requires a ground to be produced on either tip or ring to bring up a dial tone. This output will be present for 2 seconds.

NOTE: Additional hardware is required, see page 14 for wiring diagram.

03 - Fail to Communicate - Can be used when the dialing attempts have been exhausted that is programmed in memory location 53 B. After the last dial attempt, this output will be present.

04 - Follow Entry - Exit Delay - When this option is selected, this output will be present for the amount of time programmed in entry exit delay times (see memory location 57).

05 - PGM 1 Output with Utility PIN - When this option is selected, you must also program the utility PIN in the user program in memory location 2. When the utility PIN is activated this output will be present for five seconds.

06 - Long Range Radio Output - When this option is selected, the audio data signal for **Varitech** (only) long range radio transmission will be present at this output.

07 - Partition One Status - This option allows the PGM-1 output to be utilized as an armed status indicator for partition one.
Value 00-99 Default: 99 (Disabled)

NOTE: 08-99 Disables this Option

59 A PGM 2 Output Option (2 Digit Entry) PGM 2 Output can be programmed to be used as **one** of the following functions: The current available for this output is 20mA.

00 - Alarm Output - Is used in conjunction with Zone Output. Output value follows time in location 58 B.

01 - System Armed Status - When this option is selected, this output will be present when the exit time has expired and will remain until the system is disarmed.

02 - Not Used - for future use.

03 - Fail to Communicate - Can be used when the dialing attempts have been exhausted that is programmed in memory location 53 B. After the last dial attempt, this output will be present until communication is restored.

04 - Follow Entry - Exit Delay - When this option is selected, this output will be present for the amount of time programmed in entry exit delay times (see memory location 57).

05 - PGM 2 Output with Utility PIN - When this option is selected you must also program the utility PIN in the user program in memory location 2. When the utility PIN is activated this output will be present for five seconds.

06 - Radio Key Output for Long Range Radio - When this option is selected , the Varitech radio key will be produced.

07 - Ring Back - When this option is selected this output will be activated for two seconds after the open and close report has been acknowledged. (See memory location 60)

08 - Partition Two Status - This option allows PGM-2 output to be utilized as an armed status indicator for partition two.
Value 00 – 99 Default: 99 (Disabled)

NOTE: 09-99 Disables this Output

59B - PGM Output Options Requires depressing the number that corresponds to the option that you wish to enable and the number will be displayed on the LCD. Depressing a number that previously was displayed will remove the number from the LCD and disable the option.

OPTION

- 1 = PGM-1 on Two Wire Smoke Loop
- 2 = PGM-2 on Two Wire Smoke Loop
- 3 = PGM-1 on Keypad Fire
- 4 = PGM-2 on Keypad Fire
- 5 = PGM-1 on Keypad Panic
- 6 = PGM-2 on Keypad Panic
- 7 = PGM-1 on Keypad Emergency
- 8 = PGM-2 on keypad Emergency

1 - PGM-1 on Two Wire Smokes - This option allows PGM-1 to energize when the two wire smoke loop detects an activation . This output will stay active for the period of time programmed in memory 58B or when a users PIN is entered.

2 - PGM-2 on Two Wire Smokes - This option allows PGM-2 to energize when the two wire smoke loop detects an alarm activation . This output will stay active for the period of time programmed in memory location 58C or when a users PIN is entered.

3 - PGM-1 Keypad Fire - This option allows PGM -1 to energize when the keypad fire is activated .This output will stay active for the period of time programmed in memory location 58B or when a users PIN is entered.

4 - PGM-2 KEYPAD FIRE - This option allows PGM-2 to energize when the keypad fire is activated . This output will stay active for the period of time programmed in memory location 58C or when a users PIN is entered.

5 - PGM-1 KEYPAD PANIC - This option allows PGM-1 to energize when the keypad panic output is activated . This output will stay active for the period of time programmed in memory location 58B or when a users PIN is entered.

6 - PGM - 2 KEYPAD PANIC - This option allows PGM-2 to energize when the keypad panic output is activated . This output will stay active for the period of time programmed in memory location 58C or when a users PIN is entered.

7 - PGM-1 KEYPAD EMERGENCY - This option allows PGM-1 to energize when the keypad emergency output is activated . This output will stay active for the period of time programmed in memory location 58B or when a users PIN is entered.

8 - PGM - 2 KEYPAD EMERGENCY - This option allows PGM-2 to energize when the keypad emergency output is activated . This output will stay active for the period of time programmed in memory location 58C or when a users PIN is entered.

NOTE : *The options listed above for memory location 59B will function only if ALARM OUTPUT operation has been selected in memory locations 59 for PGM-1 options and 59A for PGM-2 options .*

Memory Location 60 - 72C MISCELLANEOUS REPORTING CODES

60 - 63 User Open Code (2 Digit Entry)

The system is capable of transmitting sixteen individual opening report codes. Normally the first digit entered identifies the event (in this case open code) followed by a numeric identifier. Example: 20 = Open Code, 1 = User #1. Program for User #1 = 21.

When using this reporting scheme the central station must be able to receive either a 4-1 extended or 4-2 format.

When using a 4-1 format a 2 digit entry is still required. The second digit entered is the code that will be transmitted on disarming the system. Example: 01 Code programmed. Code 1 will be transmitted, the 0 will be dropped as an inconsequential digit.

Value 01 - FF, Default: 00 (Disabled).

64 - 67 User Close Code (2 Digit Entry)

The system is capable of transmitting sixteen individual closing report codes. Normally the first digit entered identifies the event (in this case the close) followed by a numeric identifier. Example: 30 = Close Code, 1 = User #1. Program for User #1 = 31.

When using this reporting scheme the central station must be able to receive either a 4-1 extended or 4-2 format.

When using a 4-1 format a 2 digit entry is still required. The second digit entered is the code that will be transmitted on

arming the system. Example: 02 Programmed. Code 2 will be transmitted, the 0 will be dropped as an inconsequential digit. **Value 01 - FF, Default: 00 (Disabled).**

68 Auto Arm Report Code (2 Digit Entry)

When the auto arm function enabled (see users program, memory location 4) this code will be transmitted to the central station if the panel was successful in performing an auto arm. **Value 01 - FF, Default: 00 (Disabled).**

NOTE: If a zone is left violated the system will not perform an auto arm.

68 A Fail to Auto Arm Report Code - (2 Digit Entry)

When the auto arm function is enabled (see user program memory location 4) this code will be transmitted if the panel is unsuccessful in performing an auto arm.

Value 01 - FF, Default: 00 (Disabled).

68 B Duress Report Code - (2 Digit Entry).

When the duress PIN (see Memory location 78B) is enabled, this report code will be transmitted to the central station (either on arming or disarming).

Value 01 - FF, Default: 00 (Disabled).

68 C AC Fail Report Code - (2 Digit Entry).

In the event of an AC failure , this is the code that will transmitted. This code will be transmitted when the panel recognizes the battery has depleted 25% of the standby current and no greater than 50%.(See Battery Calculations - Page 16)

69 AC Restoral Report Code - (2 Digit Entry).

This code will report 3 minutes after AC is restored.

69 A Low Battery Report Code - (2 Digit Entry).

If the battery voltage drops to 10.4 Volts , this code will be transmitted.

See Battery Calculations - Page 16

69 B Battery Restore Report Code - (2 Digit Entry).

This code will be transmitted when the battery voltage returns to 10.5 volts or greater.

See Battery Calculations - Page 16

69 C Box Tamper Report Code (2 Digit Entry)

This report code will be transmitted to the central station when the cabinet tamper is violated and the box tamper function is enabled (see memory location 76A)

Value 01 - FF, Default: 00 (Disabled).

70 Box Tamper Restore Report Code (2 Digit Entry)

This code will be transmitted to the central station when the cabinet tamper is reset,

Value 01 - FF, Default: 00 (Disabled).

70 A Bell Fault Report Code (2 Digit Entry)

This code will be transmitted when a break or short occurs in the bell circuit.

NOTE: 2.2k end of line resistor must be installed at the bell.

When using the G-FM3 (Required for UL fire) this code will be transmitted when a break or short is detected in the bell circuit.

70 B Auxiliary Power Fault Report Code (2 Digit Entry)

This code will be transmitted to the central station if the auxiliary power fuse is open.

Value 01 - FF, Default: 00 (Disabled).

70 C Keypad Fire Report Code (2 Digit Entry)

This code will be sent to the central station when "STAY AND "6" are pressed simultaneously for approximately 2 seconds then the buttons are released.

(see memory location 76A)

Value 01 - FF, Default: 00 (Disabled).

71 Keypad Emergency Report Code

This code will be sent to the central station when "INSTANT" AND "9" are pressed simultaneously for approximately 2 seconds when the buttons are released.

(see memory location 76A)

Value 01 - FF, Default: 00 (Disabled).

71 A Keypad Panic Report Code

This code will be sent to the central station when "AWAY" and "3" are pressed simultaneously for approximately 2 seconds when the buttons are released.

(see memory location 76A)

Value 01 - FF, Default: 00 (Disabled).

71 B Open Restore Report Code (2 Digit Entry)

This report code will be transmitted when the system has been disarmed after an alarm condition has been occurred.

Value 01 - FF, Default: 00 (Disabled).

71 C 2 Wire Smoke Detector Report Code - (2 Digit Entry)

This report code will be transmitted to the central station when the 2 wire smoke detector circuit senses an alarm condition. (terminals 26 and 25).

Value 01 - FF, Default: 00 (Disabled).

72 Fire Trouble Report Code (2 Digit Entry)

This report code will be transmitted to the central station when a trouble is detected on the 2 wire smoke detector loop.

Value 01 -FF, Default: 00 (Disabled).

72 A Fire Restore Code - (2 Digit Entry)

This reporting function is a common restore code for both Fire Alarm and Fire Trouble on the 2 wire smoke detector circuit. This report code will be transmitted to the central station after a fire alarm or fire trouble has been reset.

Value 01 - FF, Default: 00 (Disabled).

72 B Bell Restore Code (2 Digit Entry)

This report code will be transmitted when the bell circuit has reset and the zone has been secured after an alarm condition. The code will not be transmitted until the zone is secured , even though the bell circuit has reset.

Value 01 - FF, Default: 00 (Disabled).

72 C Ground Fault Report Code (2 Digit Entry)

This report code will be transmitted to the central station when the supervised earth ground is lost on the G-FM3.

(see memory location 76)

Value 01 - FF, Default: 00 (Disabled).

73 Expander Zone Definition (2 Digit Entry)

This location determines the number of Expander Boards (G-EX) that are installed. The choices are as follows:

- 00** - No zone expansion board on bus
- 01** - G-EX number 1 installed .
- 02** - G-EX number 1 & 2 installed .
- 03** - Not Used / Future Use
- 04** - Not Used / Future Use
- 05** - Not Used / Future Use
- 06** - Not Used / Future Use
- 07** - Not Used / Future Use

Default: (00) No Expansion Board

If you have selected this option without installing the expander boards the keypad will indicate a "Bus Failure" trouble and transmit a Bus Fault report code. This G-EX(s) must also be addressed by removing the appropriate shorting links. (see wiring diagram) (see memory location 73B). Value 01 - 02, Default: 00 (Disabled).

73 A Keypad Installed/Partitions - Requires depressing the number that corresponds to the option that you wish to enable will be displayed on the LCD. Depressing a number that previously was displayed will remove the number from the LCD and disable the option.

OPTIONS

- 1 = KEYPAD 1 Always ON
- 2 = KEYPAD 2
- 3 = KEYPAD 3
- 4 = KEYPAD 4
- 5 = KEYPAD 1 for partition 1
- 6 = KEYPAD 2 for Partition 1
- 7 = KEYPAD 3 for Partition 1
- 8 = KEYPAD 4 for Partition 1

One through four are enabling the number of keypads that are going to be used.

Five through eight are assigning the keypads to a partition. If the number is displayed, that keypad will be assigned to partition number one. If the number is not displayed, that keypad will be assigned to partition number two (see memory location 76A).

73 B Buss Fault Report Code (2 Digit Entry)

This report code will be transmitted to the central station if a open or short is detected on the keypad buss.

Value 01 - FF, Default: 00 (Disabled).

73 C Charge Time - High & Low (2 Digit Entry)

Add total current draw of the system including control panel, keypad(s) and auxiliary devices. Use the following table to get digits for location 73C.

TOTAL SYSTEM CURRENT (mA)	DIGIT TO ENTER IN LOCATION 73C
00 - 100mA	91
101 - 200mA	92
201 - 300mA	93
301 - 400mA	94
401 - 500mA	95
501 - 600mA	96
601 - 700mA	97
701 - 800mA	98
801 - 900mA	99

74 Abnormal Self Test Report Code (2 Digit Entry)

This communicator test report code will be transmitted in place of the self test code programmed in memory location 77C should a fire zone or the two wire smoke detector loop be left in an alarm or trouble condition .

NOTE: This must be used to comply with UL864.

74A Telephone (TLM) Fault report code (2 Digit Entry)

This code will be sent whenever a telephone line fault is detected. (See also memory location 76-6)

Value 00 - FF.Default: 00 (Disabled)

**Memory Location 75 - 75C
SIGNAL ROUTING**

75 Receiver Reporting for Alarm & Restores - Open & Close (2 Digit Entry)

If you have been assigned to only one telephone number and account number, duplicate the receiver information and select option 2 for memory locations 75 and 75A.

The first digit tells the panel which receiver or receivers to direct the alarm and restore report codes.

Value 0 - 4, Default: 0.

Value	Function
0	Report only to receiver number 1
1	Report only to receiver number 2
2	Report first to receiver number 1, if not successful, attempt to report to receiver number 2
3-4	Report to receiver number 1 and receiver number 2

The second digit tells the panel which receiver or receivers to direct the open and close report code to.

Value 0 - 4, Default: 0.

Value	Function
0	Report only to receiver number 1
1	Report only to receiver number 2
2	Report first to receiver number 1, if not successful, attempt to report to receiver number 2
3	Report to receiver number 1 and receiver number 2
4	No reporting for receiver number 1 or number 2

75 A System Report Code (2 Digit Entry)

The first digit tells the panel which receiver or receivers to direct the housekeeping signals (power codes, failure codes, keypad triggered alarm codes, etc.).

Value 0 - 9, Default: 0.

Value	Function
0	Report only to receiver number 1

- 1 Report only to receiver number 2
- 2 Report first to receiver number 1, if not successful, attempt to report to receiver number 2
- 3 Report to receiver number 1 and receiver number 2
- 4 No Telco reporting for System messages

Value 0 - 4 Default: 0

The second digit selects reporting of codes on Long-range radio.

Value	Function
0	No radio out put for open/close, system test, or system messages
1	open/close on radio
2	system test code on radio
3	open/close + system test codes on radio
4	system messages on radio
5	system message + open/close on radio
6	system message + system test on radio
7	system message + system test + open/close on radio

Value 0 - 7 Default: 0

75 B Communication Fail Report Code (2 Digit Entry)

The Communication Fail Report Code is transmitted when the panel has exhausted its dialing attempts (see memory location 53B).

Value 01 - FF, Default: 00 (Disabled).

Note: Must use "Two phone lines" or "One phone line and Long range radio".

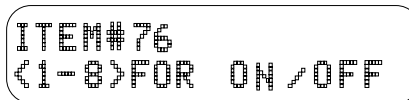
75 C Number of Radio Attempts

The number of times the event is transmitted via **Varitech** long range radio.

Value 00 - 09 units Default: 00 (Disabled)

**Memory Location 76 - 79C
SYSTEM FEATURES**

76 System Features (Multiple Entries) requires depressing the number that corresponds to the option that you wish to enable and the number will be displayed on the LCD. Depressing a number that previously was displayed will remove the number from the LCD and disable the option.



Shows Default condition : All OFF

OPTIONS

- 1 = Bell Test
- 2 = Bell Audible on Bus Fault
- 3 = Digital first & Radio second
- 4 = G-FM3 Installed
- 5 = 50 Hz
- 6 = Telephone Fault(TLM)Monitoring enable
- 7 = System test to be reported on Telco
- 8 = Partition System

1 - Bell Test With this option selected, the bell voltage will be present for three seconds when the control panel is armed. **Default: NO**

2 - Bell Audible on Bus Fault With this option selected the bell voltage will energize should the panel detect a fault

on the Buss for the amount of time programmed in memory location 58A or until a valid PIN is entered in the keypad.

Default: NO

3 - Digital first & Radio second With this option selected the digital signal will be transmitted first and if it is successful, the radio signal will not be sent.

Default: NO

4 - G-FM3 Installed With this option selected the panel will recognize the G-FM3 (Fire Module) installed and will indicate a bus fault should the G-FM3 fail or be removed from the system. **Default: NO**

5 - 50 Hz or 60 Hz This option is very important to be set correctly to insure proper operation of the time clock. The default is set for US operation (60Hz). To set the system for 50Hz, the number 5 should be showing on the LCD.

Default: 60 Hz

6 - Telco Fault Monitoring Enable With this option selected, the keypad will give a visual indication of a telephone trouble (TLM) and emit a pulsing audible tone from keypad. **Default: NO**

7 - System Test to be Reported on Telco With this option selected the panel will automatically transmit the signal to the central station on the telco line. **Default: YES**

8 - Partition System With this option selected the panel can be used as two separate systems. The first half of the zones will automatically become partition number 1 and the second half of the zones will become partition number 2. PIN's one through eight automatically become assigned to partition number one and PIN's nine through sixteen will become assigned to partition number two. Partition number one will always report its information to Receiver number one including open and close signals and partition number two will always report its information to receiver number two including open and close signals. The house keeping signals (AC fail, low batt., etc.) report to receiver one. (See memory location 48 through 53.) **Default: NO**

76 A System Features (Multiple Entries) Requires depressing the number that corresponds to the option that you wish to enable and will be displayed on the LCD. Depressing a number that previously was displayed will remove the number from the LCD and disable the option.

OPTIONS

- 1 = Keypad Panic Enabled
- 2 = Keypad Panic Audible
- 3 = Keypad Fire Enabled
- 4 = Keypad Fire Audible
- 5 = Keypad Emergency Enabled
- 6 = Keypad Emergency Audible
- 7 = Key switch or Tamper Inputs
- 8 = AC fail Audible on Keypad

1 - Keypad Panic Enabled With this option selected the keypad panic function is enabled ("AWAY" and "3"). You may have this function set for silent or audible or both.

Default: NO

2 - Keypad Panic Audible with this option enabled, the keypad panic will be audible. **Default: NO**

silent only = report code (see memory location 71A).

bell only = no report code + panic audible (see below)

report+bell = report code(see memory location 71A)+
Panic audible (see below)

3 - Keypad Fire Enabled with this option selected the keypad fire function is enabled ("STAY" and "6"). You may have this function set for silent or audible or both.

Default: NO

4 - Keypad Fire Audible with this option enabled, the keypad fire will be audible. **Default: NO**

silent only = report code (see memory location 70C).

bell only = no report code + fire audible (see below)

report+bell = report code(see memory location 70C)+
Fire audible (see below)

5 - Keypad Emergency Enable with this option selected the keypad emergency function is enabled ("INSTANT" and "9"). You may have this function set for silent or audible or both. **Default: NO**

6 - Keypad Emergency Audible with this option enabled, the keypad emergency will be audible. **Default: NO**

silent only = report code (see memory location 71).

bell only = no report code + emer. audible (see below)

report+bell = report code(see memory location 71)+
emergency audible (see below)

7 - Key switch or Tamper Inputs When the key switch option is selected terminals 7 and 10 will support any momentary or latching arming station. The number 7 should be displayed on the LCD to select the key switch input. The number 7 should not be displayed if you need to use as a tamper switch. A report code must be programmed in memory location 69C when selected for tamper switch input, This tamper input is silent only.

Default: Tamper Switch

8 - AC Fail Audible on Keypad Should there be a loss of AC power, this option will enable an audible tone to emit from all keypads, together with AC trouble display on the LCD. Only AC trouble will display on the LCD if this option is not selected.

Default: NO

76 B Monitor Mode Features (Multiple Entries)

Requires depressing the number that corresponds to the option that you wish to enable and the number will be displayed on the LCD. Depressing a number that previously was displayed will remove the number from the LCD and disable the option.

(See next page).

OPTION

- 1 = Acknowledge required for monitor mode
- 2 = Bell output for monitor mode
- 3 = PGM 1 output for monitor mode
- 4 = PGM 2 output for monitor mode
- 5 = Bell output for walk test mode
- 6 = Bell output for TLM fault in armed condition
- 7 = 2 wire smoke alarm verification
- 8 = Steady bell on 2-wire smoke and keypad fire

1 - Acknowledge Required When a zone is violated in the monitor mode with this option selected, the zone number will stay in the display until the zone is secured and the keypad and/or audibles will emit a continuous tone until the [↑] key is depressed or a valid PIN is entered. If this option is not selected the keypad will emit a 2 second tone and the zone will continue to display until the zone is secured. **Default: NO ACK**

2 - Bell Output for Monitor Mode With this option is enabled, the bell voltage will energize when the panel is put into the monitor mode and a zone that is assigned to the monitor mode, is violated. **Default: NO**

3 - PGM 1 Output for Monitor Mode With this option is enabled, the PGM-1 will energize when the panel is put into the monitor mode and a zone that is assigned to the monitor mode, is violated. **Default: NO**

4 - PGM 2 Output for Monitor Mode With this option is enabled, the PGM-2 will energize when the panel is put into the monitor mode and a zone that is assigned to the monitor mode, is violated. **Default: NO**

5 - Bell Output for Walk Test Mode With this option selected Bell activates for one second when a zone is activated in the walk test.

6 - Bell Output for TLM Fault in Armed Condition With this option selected the panel will activate the bell output and emit a pulsing audible tone from keypad along with indication of [TLM fault]. If the system is configured for Radio, it generate common fail signal.

7 - 2 Wire Smoke Alarm Verification When this feature is enabled the panel will automatically reset the power to the two wire smoke detectors upon receipt of an alarm signal. The reset time is a predetermined period in accordance with UL requirements. If the detector returns to an alarm condition, when power is re applied, the panel will initiate the appropriate reporting as programmed.

8 - Steady Bell Output for 2-wire smoke & keypad fire If selected, bell output will be steady for programmed time on 2-wire smoke alarm & keypad.

76C - System Features (Multiple Entries) Requires depressing the number that corresponds to the option that you wish to enable and the number will be displayed on the LCD. Depressing a number that previously was displayed will remove the number from the LCD and disable the option.

OPTION

- 1 = Hide Clock

- 2 = Auto. Monitor on Disarm
- 3 = Key switch Operation
- 4 = Force Arming
- 5 = Common PIN
- 6 = not used
- 7 = not used
- 8 = not used

1 - Hide Display Clock If selected clock will not be displayed, but current system status mode will be displayed.

Default: NO

2 - Automatic Monitor on Disarm This option allows the control panel to automatically enter into in the monitor mode when the system is disarmed if there have been no alarm activation. Should an alarm been activated, the panel must present the memory to the subscriber and then be manually put into the monitor mode. See memory location 76B for additional monitor mode options.

Note: This option is not available with partitioned systems.

Default: NO

3 - Key Switch Operation This option allows the control panel to accept a latching or momentary closure across the key switch input (terminals 7 & 10) to arm the system. For latching operation the number must be present. See memory location 76A for additional key switch programming option .

Default: Momentary

4 - Force Arming This option allows the key switch input to force arm the control panel. The key switch input must be programmed for a latch mode operation. (see above option) See memory location 76A for additional key switch programming option .

Default: No

5 - Common Pin This option allows user number one PINs to disarm both partition one and partition two. See memory location 76 for partition system .

Default: no

77 Self Test Time Interval (Hours)

A memory location where the hours of a day the self test code will be transmitted to the central station. The value entered in this location must be 2 digits. The hours must be entered in military time. Example: 3:00 PM - Program 15.

Value 00 - 23, Default: 99 (disable).

77 A Self Test Time Interval (Minutes)

A memory location where the minutes of the hour the self test code will be transmitted. Example: test at 3:30 PM = 15:00 hours, 30 minutes. **Value 00 - 59 minutes, Default: 99.**

77 B Self Test Time Interval (Days)

This memory location indicates the interval between days the panel will transmit the self test code to the central station.

Value 01 - 99, Default: 00 (Disabled)

77 C Self Test Report Code (2 Digit Entry)

When the self test time occurs this report code will be transmitted to the central station.

Value 01 - FF, Default: 00 (Disabled).

78 Installers PIN (4 Digit Entry)

This memory location is **very important**. Record this PIN in a secure location. Call the factory should this PIN be lost.

Value 0000 - 9999, Default: 9999

78 A Duress PIN (4 Digit Entry)

This PIN will arm or disarm the system and will transmit the duress report code (see memory location 68B) to the central station. **Value 0000 - 9999, Default: BLANK.**

NOTE: *PIN's (installer, duress, user) cannot be duplicated. If a duplicate PIN is attempted to be programmed an audible from the keypad will indicate the PIN has been rejected.*

79 - 79 A Battery Charging Calculations

BATTERY CALCULATIONS

To comply with UL requirements the primary power failure trouble signal for the communicator shall not be transmitted until the standby power capacity is at least 25 percent depleted, but not more than 50 percent. Therefore, it is necessary to program these two memory locations with the total current available (subtract total current draw of panel, keypad(s), expansion modules and other auxiliary devices powered from auxiliary power from total current capacity) and amp-hour rating of battery to be used.

$$79) \quad \frac{1000 \text{ mA} - \text{Total current in mA}}{10} = \text{XX}$$

Convert XX in Hex Chart 1 and enter in 79.

$$79 \text{ A}) \quad \text{AH Batt} \times 10 = \text{YY}$$

Convert YY in Hex Chart 1 and enter in 79 A.

NOTE 1:

LOW BATTERY CODE is transmitted when:

- 1) *there is no battery connected;*
- 2) *the battery fuse is open;*
- 3) *the battery voltage goes below approximately 11.5 VDC.*

NOTE 2:

GOOD BATTERY is transmitted when the battery voltage reaches approximately 12 VDC.

79B First 2 digits of Panel Access ID for RPU

(Remote Programming Utility)

79C Last 2 digits of Panel Access ID for RPU

Memory Location

80 - 95 NOT USED / FUTURE USE

ALPHA PROGRAMMING INSTRUCTION

The alpha programming of the control panel is accessed by entering the **installers PIN** (↑) 7 & (AWAY). The LCD will change to: **ENTER ZONE #.**

The zone number you wish to program should be entered as two digits (01-24). Pressing the (↑) will lock in your selection and the LCD will change to read:

**ENTER ZONE #
ZONE ONE**

(ZONE ONE was used only as an example)

At this point you may now begin entering the alpha text you wish by selecting the number that corresponds to the letter or character from the chart on page. You must press (↑) after each of your selections to lock in the letter and this will automatically advance the cursor to the next character. Once editing of the zone name have been completed, you **must** press (INST) to lock your selection into memory. If (INST) is not pressed, the name will revert to the factory default: settings.

After (INST) is pressed, the LCD will now request another zone number be entered. Repeat the above procedure until all zones have been named.

Once all zones have been named, press (#) once to return to the main installers program mode. Pressing the (#) a second time will return the User's operating mode.

PROGRAMMING HINTS:

1) To enter a space, simply press the (↑). The cursor will delete the previous character (if anything) and advance to the next character.

2) To move about the location without deleting the characters, press (AWAY) to move right or press (STAY) to move left.

WIRING INSTRUCTIONS

TERMINALS

1 & 2 16 VAC Class II plug-in transformer (20 VA maximum). Use 18 GA twisted or zip pair and keep wire run as short as possible. Test the electrical outlet being used to ensure it is not controlled by a light switch. (24 hour source)

3-4-5-6 Data bus inputs - These terminals are used for wiring in keypads (maximum 4), expansion modules (maximum 2), and G-FM3. The keypads and expansion modules can be wired in either a daisy chain or homerun configuration. Each keypad must be addressed by setting the two dip switches located on the back of each keypad. Maximum cable length 1,000 feet.

KEYPAD	SWITCH	
	<u>1</u>	<u>2</u>
1	on	on
2	on	off
3	off	on
4	off	off

7-11-12 **PGM-1 and PGM-2 outputs are open collector outputs** - Terminal 7 is the positive voltage output and Terminal 11 is the negative output of PGM-1. Terminal 7 is the positive voltage output and Terminal 12 is the negative output of PGM-2. The maximum current available for these two outputs is 20 mA each. When PGM-1 and or PGM-2 are triggered, these outputs go low.

7 - 9 **Auxiliary power outputs** - Terminal 7 is positive voltage output and Terminal 9 is negative voltage output. These terminals provide a continuous 12 volt output. These terminals should be used for any device that doesn't require an interruption of power to reset an activation.

8 - 9 **Switched power output** Terminals 8 is a positive, Terminal 9 is negative.

If any zones are configured as fire zones, the power is derived from these terminals. If a fire zone is activated, the user enters his PIN and terminal 8 will go low for ten seconds.

7 - 10 **Tamper N.C. or Key switch inputs** - This input is a programmable option. See installation and programming manual - memory location 76A. When programmed as a tamper switch input the input will always be silent. When programmed as a key switch input, a momentary close is required. The panel will always arm in an away mode, when a key switch is used.

13 thru 24 **Protection loops** - Zones 1 through 8 are connected to these terminals as indicated in Fig. 1.

All loops are two wire and may be wired as the following "Loop Types":

0 NORMALLY OPEN: This loop requires the use of detection devices or switches that close (short) on alarm.

1 NORMALLY CLOSED: This loop requires the use of detection devices or switches that open on alarm.

2 NORMALLY OPEN and NORMALLY CLOSED: This loop requires an end-of-line resistor (2.2 K ohms) and will accept both types of switch operation (open or closed).

3 NORMALLY OPEN with TROUBLE REPORT ON BREAK: This loop requires an end of-line resistor (2.2 K ohms) and detection devices or switches that "close" (short) on alarm. An open condition (loss of 2.2 K ohms resistor) will produce:

a) If programmed as a 24 Hour zone and for trouble report - the audible in the keypad will sound and the communicator will transmit the trouble code to the central station.

b) If programmed as a controlled zone (Day/Night) and for Trouble report - the audible in the keypad will sound if the system is disarmed.

If the system is armed the audible in the keypad will sound and the communicator will transmit the trouble code to the central station.

4 NORMALLY CLOSED with TROUBLE REPORT on SHORT: This loop requires an end of-line resistor (2.2 K ohms) and detection devices or switches that "open" on alarm. A short will produce:

a) If programmed as a 24 Hour zone and for trouble report - the audible in the keypad will sound and the communicator will transmit the trouble code to the central station.

b) If programmed as a controlled zone (Day/Night) and for Trouble report - the audible in the keypad will sound if the system is disarmed.

If the system is armed the audible in the keypad will sound and the communicator will transmit the trouble code to the central station.

25(-) 26(+) **Two wire smoke detector loop.** These 2 terminals are used in conjunction with ESL Model 425 series. If there is an activation on this loop entering a valid [PIN] + [↑] + [2] will reset this loop. Maximum number of approved smoke detectors that can be used on this loop is ten (10). Refer to wiring diagram for list of approved smoke detectors.

The keypad will display [FIRE] when this input trips.

Note: Heat detectors, Do not use Water flow switch or Any other device on this circuit. Only the two wire smoke detector loop may used to comply with UL864.

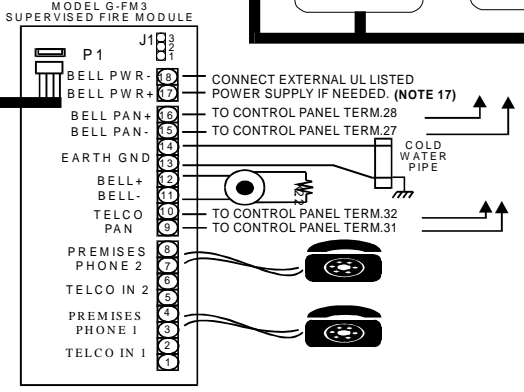
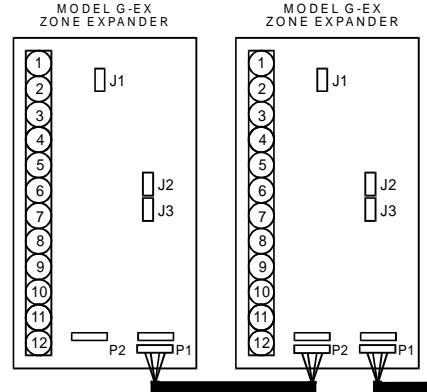
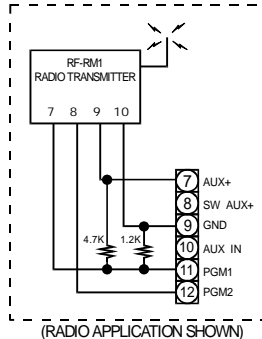
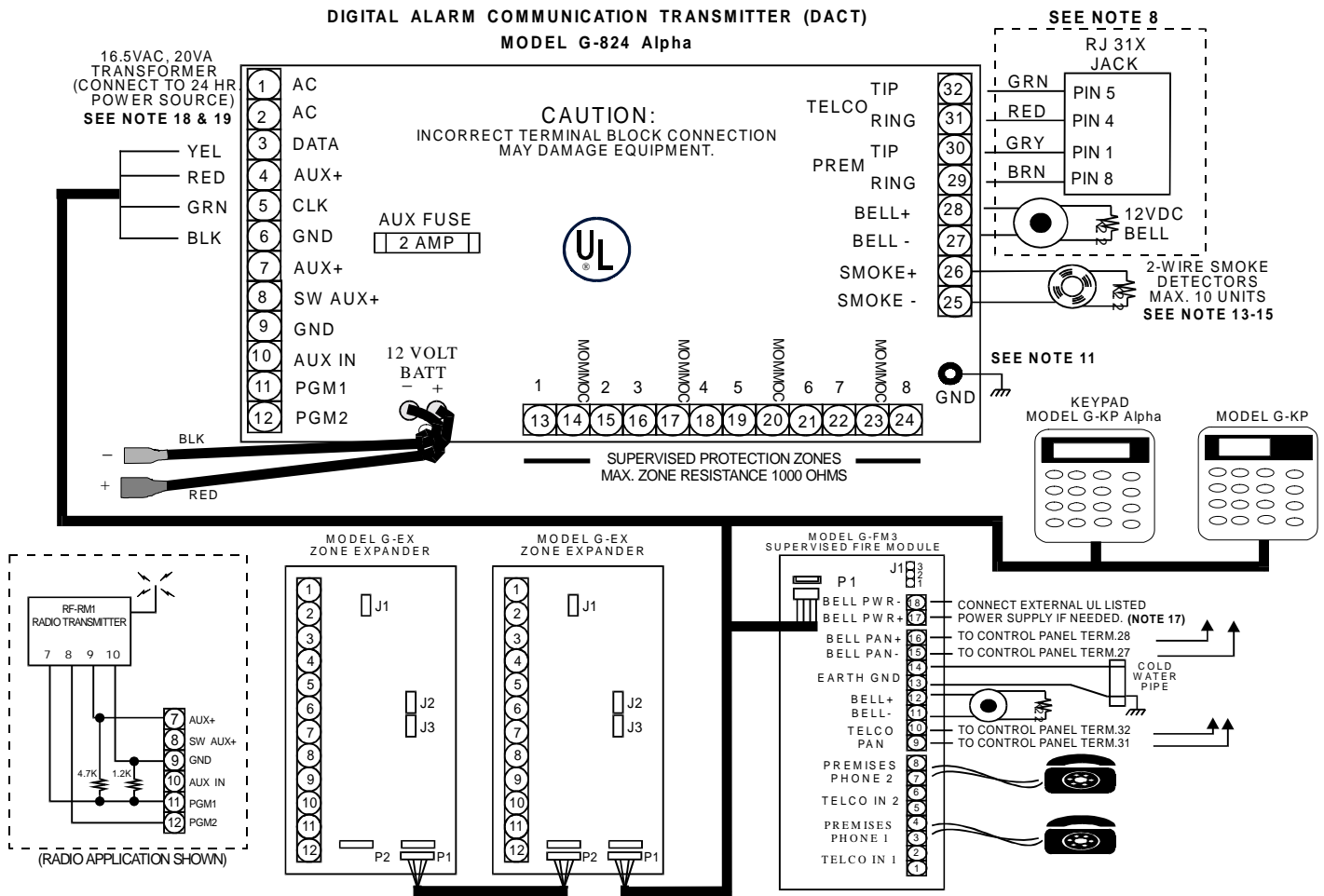
27(-) 28(+) **Bell voltage output** - 12 VDC is provided on these terminals. The maximum amount of current available is 2 amps. For supervision of the bell circuit, a Fire Module (G-FM3) must be used.

29 through 32 **Telephone line connection** - The Genesys 824 provides for single phone line hookup with full line seizure. To expand to two line use the Fire Module (G-FM3) must be used.

		<u>RJ JACK</u>	<u>PIN</u>
TERM 29	PREMISE RING	GRAY	1
TERM 30	PREMISE TIP	BROWN	8
TERM 31	TELCO RING	RED	4
TERM 32	TELCO TIP	GREEN	5



**DIGITAL ALARM COMMUNICATION TRANSMITTER (DACT)
MODEL G-824 Alpha**



- NOTE:**
- MAXIMUM COMBINED POWER AVAILABLE ON 824 CONTROL PANEL INCLUDING TERMINALS 4, 6, 7, 8, 26, 27, AND 28 IS 750 mA AT 12 VDC. ALL CIRCUITS ARE POWER LIMITED.
 - USE 2.2 KOHM 1/2 WATT RESISTORS FOR ZONES THAT REQUIRE EOL (ZONE TYPE 2, 3 AND 4).
 - BELL AND 2-WIRE SMOKE ZONES REQUIRE 2.2K OHM FIRE EOL RESISTORS. OPTEX PART NUMBER 5090-0255.**
 - THE OPERATING VOLTAGE RANGE FOR SMOKE DETECTOR TERMINALS IS 9.3 TO 14.8 VOLT.
 - ZONE EXPANDER G-EX BOARD IS CONFIGURED AS ZONE TO ZONE 16 WHEN JUMPER J1, J2, AND J3 ARE LEFT OPEN. THE BOARD IS CONFIGURED AS ZONE 17 TO ZONE 24 WHEN J1, J2 ARE LEFT OPEN AND J3 IS SHORTED.
 - COMMUNICATION BETWEEN CONTROL PANEL G-EX AND G-FM3 IS MADE THROUGH 4-WIRE CONNECTIONS AS SHOWN. CABLE ASSEMBLY IS PROVIDED.
 - PGM1 AND PGM2 ARE OPEN COLLECTOR OUTPUTS THAT GO LOW TO APPROXIMATELY 2V WHEN ACTIVATED. MAXIMUM CURRENT: 20 mA.
 - BOXED AREA SHOWS PHONE AND BELL CONNECTIONS WHEN G-FM3 IS NOT USED. DISREGARD IF USING G-FM3.
 - REFER TO BATTERY CALCULATION CHART IN INSTALLERS MANUAL (3440-0241) FOR CORRECT AMP-HOUR BATTERY. FOR UL FIRE APPLICATIONS USE DUAL BATTERY CABLE (60118)
 - TERMINALS 7 AND 10 MUST BE USED FOR CABINET TAMPER FOR UL LISTED INSTALLATIONS.
 - CONNECT EARTH GROUND TO RIGHT SIDE MOUNTING SCREW. FOR UL FIRE APPLICATION DO NOT USE THIS MOUNTING SCREW FOR EARTH GROUND! INSTEAD CONNECT TERMINALS 13 & 14 OF G-FM3 TO COLD WATER PIPE AND USE THE ENCLOSED MOUNTING KIT IN G-FM3 (SEE G-FM3 MANUAL FOR INSTRUCTIONS).
 - THE UNIT SHOULD BE TESTED WEEKLY.
 - THIS CONTROL UNIT SHOULD BE CHECKED BY A QUALIFIED TECHNICIAN AT LEAST EVERY 3 YEARS.
 - DETECTION SYSTEMS DS250/DS250TH - DETECTOR IDENTIFIER=A SYSTEM SENSOR 2400/2400TH - DETECTOR IDENTIFIER=A SENTROL 429C/429CT - DETECTOR IDENTIFIER=510A SYSTEM SENSOR 2300T-DETECTOR IDENTIFIER=A
 - 2-WIRE SMOKE DETECTOR OF DIFFERENT MODELS CANNOT BE MIXED AND MATCHED.
 - CONTROL PANEL CANNOT DETECT MORE THAN ONE SMOKE DETECTOR IN ALARM CONDITIONS.
 - CONTROL PANEL COMPATIBILITY IDENTIFIER NUMBER IS 50150.
 - IF USING EXTERNAL POWER SUPPLY TO DRIVE BELL, CONNECT 12V OR 24V DC, 5AMP MAX UL LISTED POWER SUPPLY.
 - UL LISTED METAL CLAD BOXED TRANSFORMER SHOULD BE USED FOR NFPA-72 APPLICATIONS.
 - DO NOT CONNECT TO A RECEPTACLE CONTROLLED BY A SWITCH.
 - FOR INSTALLATION INSTRUCTIONS SEE INSTALLERS MANUAL, OPTEX PART NUMBER: 3440-0241 REV G.

**UL FILE NO. S1152
APPLICABLE U.L. STANDARDS.**

SIGNAL SYSTEMS CONTROL UNIT (UL 864), REF NFPA-72 (1993) ALSO SUITABLE AS A CENTRAL STATION BURGLARY ALARM CONTROL UNIT (UL 1610), POLICE CONNECT (UL 365), AND LOCAL BURGLAR ALARM SYSTEM CONTROL UNIT (UL 609), HOUSEHOLD FIRE (UL 985) AND BURGLAR WARNING SYSTEM CONTROL UNIT (UL 1023), DIGITAL DIALER COMMUNICATOR (UL 1635). THE G-EX MODULES MUST BE MOUNTED IN THE G-824 CCS CONTROL CABINET IN ALL INSTALLATIONS MEETING COMMERCIAL CENTRAL STATION BURGLARY ALARM SYSTEM UL611, UL1610, UL365, AND UL609.

THIS PRODUCT HAS NOT BEEN INVESTIGATED FOR MEDICAL EMERGENCY, PANIC AND/OR HELP SIGNAL APPLICATIONS.

FIGURE 1

3400-0132 REV. G

ALPHA PROGRAMMING INSTRUCTION

The alpha programming of the control panel is accessed by entering the **installers PIN** (↑) **7** & (**AWAY**). The LCD will change to: **ENTER ZONE #**.

The zone number you wish to program should be entered as two digits (01-24). Pressing the (↑) will lock in your selection and the LCD will change to read:

**ENTER ZONE #
ZONE ONE**

(ZONE ONE was used only as an example)

At this point you may now begin entering the alpha text you wish by selecting the number that corresponds to the letter or character from the chart A. You must press(↑) after each of your selections to lock in the letter and this will automatically advance the cursor to the next character. Once editing of the

zone name have been completed, you **must** press (**INST**) to lock your selection into memory. If (**INST**) is not pressed, the name will revert to the factory default settings.

After (**INST**) is pressed, the LCD will now request another zone number be entered. Repeat the above procedure until all zones have been named.

Once all zones have been named, press (**#**) once to return to the main installers program mode. Pressing the (**#**) a second time will return the User's operating mode.

PROGRAMMING HINTS:

1) To enter a space, simply press the (↑). The cursor will delete the previous character (if anything) and advance to the next character.

2) To move about the location without deleting the characters, press (**AWAY**) to move right or press (**STAY**) to move left.

CHART A

1 = A	27 = a	53 = :	70 = !
2 = B	28 = b	54 = ;	71 = "
3 = C	29 = c	55 = <	72 = #
4 = D	30 = d	56 = >	73 = Not used
5 = E	31 = e	57 = =	74 = \$
6 = F	32 = f	58 = ?	75 = %
7 = G	33 = g	59 = @	76 = &
8 = H	34 = h		77 = '
9 = I	35 = i		78 = (
10 = J	36 = j		79 =)
11 = K	37 = k	60 = 0	80 = *
12 = L	38 = l	61 = 1	81 = +
13 = M	39 = m	62 = 2	82 = ,
14 = N	40 = n	63 = 3	83 = -
15 = O	41 = o	64 = 4	84 = .
16 = P	42 = p	65 = 5	85 = /
17 = Q	43 = q	66 = 6	86 = [
18 = R	44 = r	67 = 7	87 =]
19 = S	45 = s	68 = 8	88 = ^
20 = T	46 = t	69 = 9	89 = _
21 = U	47 = u		90 =
22 = V	48 = v		91 = →
23 = W	49 = w		92 = ←
24 = X	50 = x		93 = ¥
25 = Y	51 = y		94 = {
26 = Z	52 = z		95 = }

PROGRAMMING SUMMARY AND INSTALLATION HINTS

TO INSTALL ADDITIONAL KEYPAD

1. Set dip switch on the keypad

KEYPAD	SWITCH	
	1	2
1	ON	ON
2	ON	OFF
3	OFF	ON
4	OFF	OFF

2. Program memory location **73A** in accordance with the number of keypad you installed.

TO MAKE PARTITIONING

1. Program **73A**
Select which keypad to be assigned to partitioning 1 and 2.

2. Program **76**
Enable partitioning function.

Now the first half of the zones are assigned to partition 1, and the second half of the zones are partition 2.
Also, The user [PIN] number 1 to 08 are assigned to partition 1, 09 to 16 are partition 2 automatically.

3. Program user [PIN] number 09 (or 09 to 16 as necessary) from user programming mode ([PIN] + [↑] + [8]) memory location 1. (see owners manual for the details)

Note: Zones will be divided as follows when expander board(s) is installed.

Number of expander	Zone assignment	
	partition 1.	partition 2
0	01 to 04	05 to 08
1	01 to 08	09 to 16
2	01 to 12	13 to 24

TO INSTALL HARD WIRE EXPANDER(S) (G-EX)

1. Wiring

G-EX Expander	824 Terminal
Yellow	3 (DATA)
Red	4 (AUX. +)
Green	5 (CLOCK)
Black	6 (GROUND)

2. Set jumper position on the G-EX Expander Board

Jumper		
1	2	3

1st board
2nd board

open open open
open open closed

3. Program memory location 73
4. Program memory location 16 to 46
(custom zone programming for zones 09 to 24)

TO INSTALL LONG RANGE RADIO

1. Enable Radio output for each zone as necessary in Memory location **00G** to **46G**.
2. Memory location **59** (PGM1 output option)
Select output option 06 (Radio modulator output)
3. **59A** (PGM2 output option)
Select 06 (Radio key output)
4. **75** (Receiver reporting for ALARM/OPEN, CLOSE)
Program as required. (see page 8 for details)
5. **75A** (System report code)
Program as required. (see page 8 for details)
6. Program **75C** (Number of Radio attempt)
7. Program **76** (System features)
8. Connections

RM-1 MODULE

GENESYS 824

TERM 7 (TRANS MODULATOR)	TERM 11 (PGM-1)
TERM 8 (RADIO KEY)	TERM 12 (PGM 2)
TERM 9 (SYSTEM +)	TERM 7 (AUX.)
TERM 10 (SYSTEM-)	TERM 9 (GROUND)

Also resistor of 1.2 K should be connected between TERM-11 & TERM-9 on GENESYS 824.

Also resistor of 4.7 K should be connected between TERM-11 & TERM-7 on GENESYS 824.

TO DEFAULT THE 824 CONTROL PANEL

1. Press [installer pin] + [↑] + [7]
2. The display will read [PRG]
3. Press [99], The display will read [TST#]
4. Press [0], Display will read [DEF]
5. Press [↑], Display will read [CODE]
6. Press [9999] then press [↑]. Wait 15 seconds.
7. The display will flash [TIME]. The panel is now defaulted.

BUS TEST

This Procedure is to determine whether keypads and or add on modules are functional. It is very helpful for trouble shooting the system for failures of hardware.

[Installer PIN] + [↑] + [7]

Keypad will display [INSTALLER PROGRM ENTER ITEM#]

Press [9] [9]

Keypad will display [TST#]

Press [1]

Keypad will display [WAIT]

Wait approximately 50 seconds.

Keypad will beep and display [BUS ERROR]

Note: Do not touch keypad while beeping.

After keypad stops beeping press [↑] to view result of test.

If there is anything less than 45 should display, there is a potential problem that might occur, such as keypad or module failure indications.

Each depression of the [↑] will advance the display to the next programmed device.

the symbols for each device are;

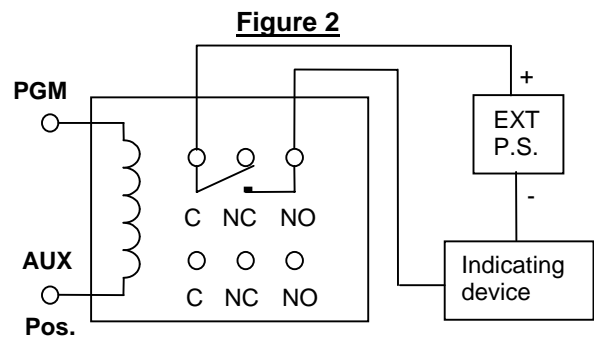
- [B1:--] = Keypad Number 1
- [B2:--] = Keypad Number 2
- [B3:--] = Keypad Number 3
- [B4:--] = Keypad Number 4
- [B9:--] = Expander Board 1
- [BA:--] = Expander Board 2
- [BB:--] = Fire Module (G-FM3)

TO EXTEND THE POWER OF PGM OUTPUT

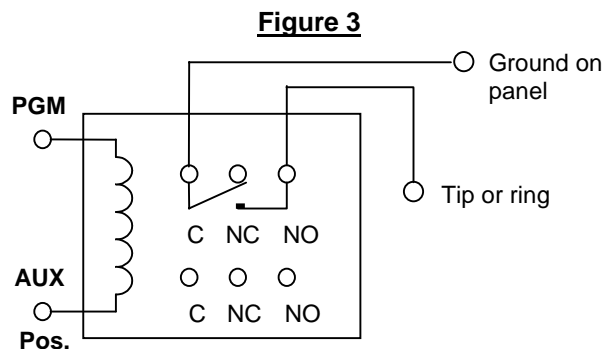
The PGM output has a maximum current rating of 20mA.

If you are going to use the **PGM** outputs for triggering some other control or indicating devices that draw more than 20mA you must use a **RELAY MODULE**. Your local distributors carry modules such as the **ALTRONIX RBSN RELAY MODULES** and the **ALARM CONTROL CORP. MODEL 8007 RELAY MODULE WITH THE 8012 RELAY** which are low current draw relays. Maximum current on relay contacts depends on which module is used.

NOTE: After you have completed testing the systems cut one side of the resistor on the 8007 relay module board, this will allow the relay to operate at a lower voltage should the AC POWER fail and the battery voltage gets low. After cutting the resistor please test unit again. Please note Fig.2



When using a **PGM** for **Ground Start**, use the wiring hook up shown in Fig.3



Note: The panel must be attached to either earth or cold water pipe ground for proper ground start operation.

Note: When using a RBSN-TTL relay module. Tie the TRG terminal on the RBSN-TTL module to the positive voltage terminal 7 of the panel and use it just like a RBSN module.

False alarm reduction features

1. Delay before dial

This function enables the subscriber to abort the alarm transmission of burglary zones. If the control panel is disarmed within this prescribed time value.

Memory location: 53B

Value: 00 - 99 seconds

Default: 00 seconds

2. Open restore code

This report code will be transmitted when system is disarmed after an alarm(s) has occurred during the armed period.

This function can be utilized as a cancel code with the central station. The end user must be trained as to how this function operates.

Memory location: 71B

Value: 00-FF

Default: 00 Disabled

3. Last 15 second pulsed beep of exit delay

This function informs the end user that the Exit time will expire in 15 seconds, when arming in away mode.

4. Bell test

By enabling this feature, the bell will ring for 3 seconds when system is armed. This function will alert anyone left on premises that the system is armed.

Memory location: 76

Default: Disable

5. Zones set-up time on power up

On power up, G-824 ALPHA will ignore all zones for 3 seconds.

6. PGM output for armed status

PGM's can be programmed to show armed status for partitioned or non-partitioned status.

7. Zone shunt feature

This option allows you to auto bypass swinger zone in armed condition.

8. Alarm verification on 2-wire smoke

This option will require two consecutive trip in a 60 second period with smoke power reset in between to report 2-wire smoke alarm.

9. Duress code

Separate duress code for all users (option).

10. 2-digit keypad zones

2 keys to be pressed simultaneously to detect keypad zones such as panic, emergency & fire.

11. Call waiting disable

Phone number can be programmed to eliminate call waiting.

UNDERWRITERS LABORATORIES **COMPLIANCE VERIFICATION**

When programming the Genesys 824, the following programs must be maintained to meet minimum UL requirements for Household Burglar Systems, and/or commercial burglar alarm systems, and police connect.

Approved Bells

Amseco & Wheelock 12 volt motor bells.

Approved Smoke Detectors

Detection Systems DS250/DS250TH-Detector identifier=A

System sensor 2400/2400TH-Detector identifier=A

Sentrol 429C/429CT-Detector identifier=510A

System sensor-2300T-Detector identifier=A

Exit Time not to exceed 60 seconds.

Entrance Time not to exceed 45 seconds including pre-alarm delay.

Loop Response not to exceed 1 second.

Bell and/or Siren - 4 minutes minimum (to meet UL residential Burg and Fire)

Bell and/or Siren - 15 minutes minimum (to meet UL commercial Burglar Alarm and Police Connect)

For Bell to Ring in Temporal Pattern the following settings must be entered:

- **Zone Type** programmed to **Fire 24 Hour**
- **Audible** programmed to **Yes**
- **Pulse Bell** programmed to **Yes**

Burglar Alarm Loops must alarm in an Open or Shorted condition.

Low Battery must be programmed to report.

Two (2) separate telephone numbers must be programmed (Receiver 1 and Receiver 2)

Close Ringback - Program "YES".

Abnormal self test code must be programmed.

SMOKE DETECTORS

To reset Smoke Detector, enter four digit PIN.

SMOKE DETECTOR PLACEMENT

(Reprinted from NFPA-72 1993)

B-2 Smoke Detection.

B-2.1 Where to Locate the Required Smoke Detectors.

B-2.1.1 The major threat from fire in a family living unit is at night when everyone is asleep. The principal threat to persons in sleeping areas comes from fires in the remainder of the unit; therefore, smoke detector(s) are best located between the bedroom areas and the rest of the unit. In units with only one bedroom area on one floor, the smoke detector should be located as shown in Figure B-2.1.1.

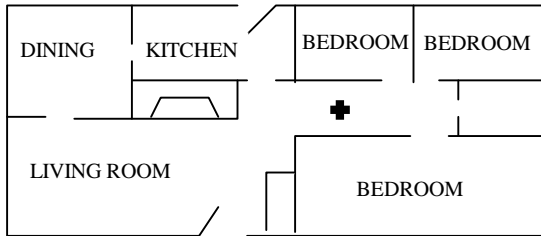


Figure B-2.1.1 A smoke detector (indicated by cross) should be located between the sleeping area and the rest of the family living unit.

B-2.1.2 In family living units with more than one bedroom area or with bedrooms on more than one floor, more than one smoke detector will be needed, as shown in Figure B-2.1.2

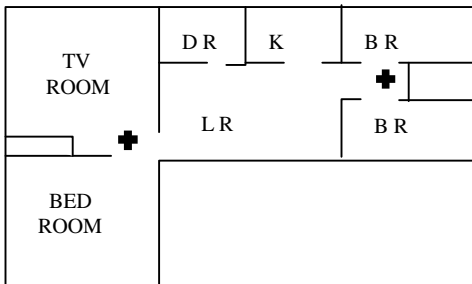


Figure B-2.1.2 In family living units with more than one sleeping area, a smoke detector (indicated by cross) should be provided to protect each.

B-2.1.3 In addition to smoke detectors outside of the sleeping areas, this standard requires the installation of a smoke detector on each additional story of the family living unit, including the basement. These installations are shown in Figure B-2.1.3. The living area smoke detector should be installed in the living room and/or near the stairway to the upper level. The basement smoke detector should be installed in close proximity to the stairway leading to the floor above. If installed on an open-joisted ceiling, the detector should be placed on the bottom of the joists. The detector should be positioned relative to the stairway so as to intercept smoke coming from a fire in the basement before the smoke enters the stairway.

B-2.2 Are More Smoke Detectors Desirable? The location of the required smoke detectors does not provide adequate protection for the occupants from a fire starting

within their bedrooms, nor do the required smoke detectors provide reliable early warning protection for those areas separated by a door from the areas protected by the required smoke detectors. For these reasons, it is recommended that the householder consider the use of additional smoke detectors for those areas for increased protection. The additional areas include: basement, bedrooms, dining room, furnace room, utility room, and hallways not protected by required smoke detectors. The installation of smoke detectors in kitchens, attics (finished or unfinished), or in garages is not normally recommended as these locations occasionally experience conditions which may result in improper operation.

B-2.3 Smoke Detector Mounting - "Dead" Air Space.

B-2.3.1 The smoke from a fire generally rises to the ceiling, spreads out across the ceiling surface and begin to bank down from the ceiling. The corner where the ceiling and wall meet is an air space into which the smoke may have difficulty penetrating. In most fires, this "dead" air space measures about 4 in. (0.1m) along the ceiling from the corner and about 4 in. (0.1m) down the wall as shown in Figure B-3.2.1. Detectors should not be placed in this "dead" air space.

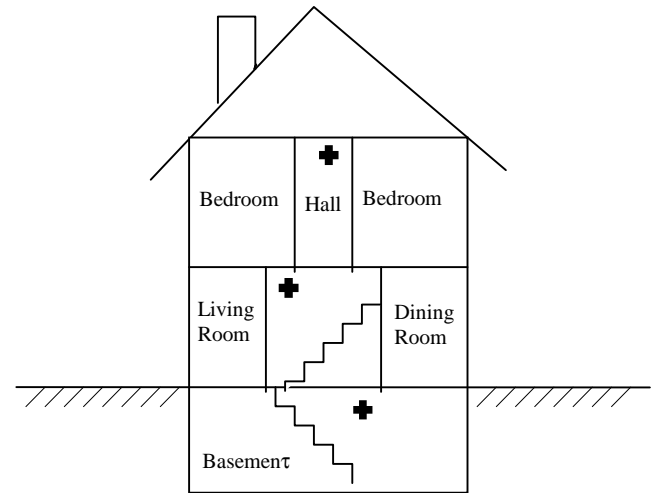


Figure B-2.1.3 A smoke detector (indicated by cross) should be located on each story.

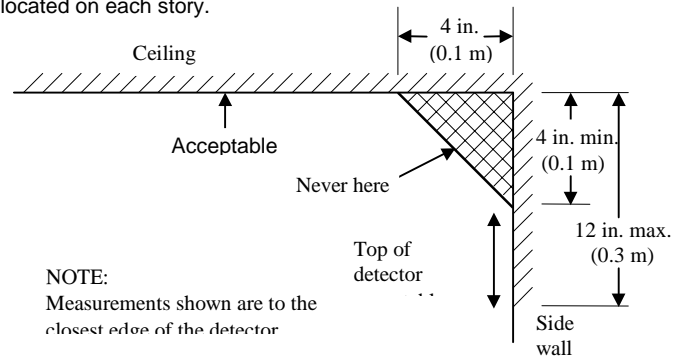


Figure B-3.2.1 Example of proper mounting for detectors.

The minimum requirements to form a Listed Grade A Local system includes:

Low Battery alarm annunciation (unless dialer is used to transmit a low battery message).

CURRENT RATING CHART

CONTROL (G-824)	= 100 mA
KEYPAD (G-KP)	= 24 mA
FIRE MODULE (G-FM3)	= 50 mA
EXPANSION BOARD (G-EX)	= 29 mA
KEYPAD (G-KP ALPHA)	= 40 mA

BATTERY CALCULATIONS

EXAMPLE:

4 HOUR STANDBY PLUS 15 MINUTE BELL RINGING:

$$\text{G-824 Control (with keypad)} = 124 \text{ mA} \times 4 \text{ hours} = .496 \text{ AH}$$

$$\text{Bell} = \frac{125 \text{ mA} \times 15 \text{ minutes}}{60} = .031 \text{ AH}$$

$$\text{G-824 Control (with keypad)} = \frac{124 \text{ mA} \times 15 \text{ minutes}}{60} = .031 \text{ AH}$$

$$\text{TOTAL} = .558 \text{ AH}$$

WORKSHEET:

Control (G-824)	100 mA	x _____ Hours	= _____ AH
Keypad (G-KP)	24 mA	x _____ Hrs x # of Keypads	= _____ AH
Bell	_____ mA	x 15 minutes	= _____ AH
G-FM3	50 mA	x _____ Hours	= _____ AH
Control (while bell ringing)	100 mA	x 15 minutes	= _____ .025 AH
Keypad (G-KP ALPHA)	40 mA	x _____ Hrs x # of Keypads	= _____ AH
Switched Aux. Power	_____ mA	x _____ Hours	= _____ AH
Continuous Aux. Power	_____ mA	x _____ Hours	= _____ AH
		TOTAL	= _____ AH

BATTERY SPECIFICATIONS

Yuasa - Model NP7-12 (12VDC 7.0AH)

Powersonic - Model PS-1270 (12VDC 7.0AH)

DECIMAL TO HEXADECIMAL CONVERSION CHART

DEC	HEX	DEC	HEX	DEC	HEX	DEC	HEX	DEC	HEX	DEC	HEX		
000	00	040	28	080	50	120	78	160	A0	200	C8	240	F0
001	01	041	29	081	51	121	79	161	A1	201	C9	241	F1
002	02	041	2A	082	52	122	7A	162	A2	202	CA	242	F2
003	03	043	2B	083	53	123	7B	163	A3	203	CB	243	F3
004	04	044	2C	084	54	124	7C	164	A4	204	CC	244	F4
005	05	045	2D	085	55	125	7D	165	A5	205	CD	245	F5
006	06	046	2E	086	56	126	7E	166	A6	206	CE	246	F6
007	07	047	2F	087	57	127	7F	167	A7	207	CF	247	F7
008	08	048	30	088	58	128	80	168	A8	208	D0	248	F8
009	09	049	31	089	59	129	81	169	A9	209	D1	249	F9
101	0A	050	32	090	5A	130	82	170	AA	210	D2	250	FA
011	0B	051	33	091	5B	131	83	171	AB	211	D3	251	FB
012	0C	052	34	092	5C	132	84	172	AC	212	D4	252	FC
013	0D	053	35	093	5D	133	85	173	AD	213	D5	253	FD
014	0E	054	36	094	5E	134	86	174	AE	214	D6	254	FE
015	0F	055	37	095	5F	135	87	175	AF	215	D7	255	FF
016	10	056	38	096	60	136	88	176	B0	216	D8		
017	11	057	39	097	61	137	89	177	B1	217	D9		
018	12	058	3A	098	62	138	8A	178	B2	218	DA		
019	13	059	3B	099	63	139	8B	179	B3	219	DB		
020	14	060	3C	100	64	140	8C	180	B4	220	DC		
021	15	061	3D	101	65	141	8D	181	B5	221	DD		
022	16	062	3E	102	66	142	8E	182	B6	222	DE		
023	17	063	3F	103	67	143	8F	183	B7	223	DF		
024	18	064	40	104	68	144	90	184	B8	224	E0		
025	19	065	41	105	69	145	91	185	B9	225	E1		
026	1A	066	42	106	6A	146	92	186	BA	226	E2		
027	1B	067	43	107	6B	147	93	187	BB	227	E3		
028	1C	068	44	108	6C	148	94	188	BC	228	E4		
029	1D	069	45	109	6D	149	95	189	BD	229	E5		
030	1E	070	46	110	6E	150	96	190	BE	230	E6		
031	1F	071	47	111	6F	151	97	191	BF	231	E7		
032	20	072	48	112	70	152	98	192	C0	232	E8		
033	21	073	49	113	71	153	99	193	C1	233	E9		
034	22	074	4A	114	72	154	9A	194	C2	234	EA		
035	23	075	4B	115	73	155	9B	195	C3	235	EB		
036	24	076	4C	116	74	156	9C	196	C4	236	EC		
037	25	077	4D	117	75	157	9D	197	C5	237	ED		
038	26	078	4E	118	76	158	9E	198	C6	238	EE		
039	27	079	4F	119	77	159	9F	199	C7	239	EF		

THIS CHART CONVERTS DECIMAL VALUES FROM 000 TO 255
INTO 2 DIGIT HEXADECIMAL EQUIVALENTS.