

I. GENERAL INFORMATION:

The ADEMCO No. 678UL DIGITAL COMMUNICATOR is an eight channel communication device which receives alarm, trouble, and status signals from the alarm control panel and converts them into a digital transmission format. Activated by a 6-12VDC input, a dry closure application or removal, the communicator will seize a phone line, establish communication with the central station and report the message using either the ADEMCO STANDARD, ADEMCO HIGH SPEED or SESCOA reporting formats. The device also provides complete monitoring of its operation with six LED indicators.

The communicator is comprised of two printed circuit boards, one mounted on top of the other. The lower board contains the circuitry for those functions found on the standard ADEMCO 678 DIGITAL COMMUNICATOR and the upper board contains the circuitry required for UL listing. It has a 6VDC power supply complete with a no maintenance, rechargeable, sealed lead acid battery to provide standby power. The entire device is enclosed inside a locking metal cabinet which has an LED viewing window on the cover and contains both door and wall pry-off tamper switches.

The ADEMCO No. 678UL incorporates all of the features required for UL listing and is available in two different versions. Each version fulfills a different application requirement and is, therefore, uniquely equipped.

The ADEMCO No. 678UL-B COMPLIES WITH AND IS LISTED UNDER UL Standard 1635 requirements for digital communicators for Grade B central station burglary alarm service, when used in conjunction with a UL listed burglary control such as the ADEMCO Nos. 4080XL, 4080-12, and AML. For a grade B listing, a UL approved local bell must be used. For a grade C listing, the bell is not necessary.

The 678UL-B comes equipped with the following components:

QTY.	Part No.	Description
1	678UL	Digital Communicator in cabinet
1	496	2.5 AH Battery
1	1322	Plug in Transformer

The ADEMCO No. 678UL-F complies with Underwriters Laboratories requirements for Central Station Fire alarm signaling service under UL Standard 864 and under Chapter 5 of NFPA 71 when used in conjunction with an Ademco 880 Fire control panel or other appropriately Listed Fire control panel.

The 678UL-F comes equipped with the following components:

QTY.	Part No.	Description
1	678UL	Digital Communicator in Cabinet
1	498	5 AH Battery
1	1421	Wired in Transformer
1	674	Select-a-line Module
2	659	Line Fault Monitor
2	664	Digital Dialer Tester

II. FEATURES:

The ADEMCO No. 678UL contains the following additional features which distinguish it from the standard No.678 and which qualify it for a UL listing.

AUTOMATIC TEST TIMER

The communicator automatically signals the central every 24 hours if no other communication (such as opening, closing or alarm) has been sent. These status signals can be monitored by exception by Ademco's central station computer.

AUTOMATIC BATTERY TEST

The battery is tested under load automatically every 12 hours when the communicator automatically disconnects the A.C. power source; which allows the communicator to be powered directly from the battery for an accurate assessment of battery fitness.

Additionally, the battery voltage is constantly being monitored. If the battery fails either the constant voltage test or the automatic test or the automatic reset, the central station is notified and the user is alerted by the BATTERY FAIL LED.

If a bad battery has been detected, the battery test under load will not be repeated until the battery recovers or is replaced.

AC POWER FAILURE ALERT

In any A.C. power failure of more than 1-1/2 hours duration, the central station is notified the user alerted by the POWER FAIL LED. This 1-1/2 hour duration restriction eliminates unnecessary transmissions due to short term power failures.

BUILT-IN POWER SUPPLY AND RECHARGEABLE BATTERY

The 678UL has its own internal power supply, powered from the low voltage AC available from the secondary of a transformer. This power supply provides power to the communicator, its listed accessories, and recharges its standby battery.

This feature is available two ways:

678UL-B: This version is equipped with an ADEMCO No. 496 RECHARGEABLE BATTERY and an ADEMCO No. 1322 PLUG-IN-TRANSFORMER. This provides up to 16hours of battery back-up power in case of an A.C. power failure.

678UL-F: This version is equipped with the ADEMCO No. 498 RECHARGEABLE BATTERY and ADEMCO No. 1421 WIRED-IN TRANSFORMER. This provides more than 24 hours of battery back-up power in case of an A.C. power failure.

LED INDICATORS

The system contains six LEDs which display different aspects of the communicator's operation. The latched LEDs (BATTERY FAIL, POWER FAIL, and KISSOFF FAIL) remain latched until the system is armed by the control panel. They will remain latched until the conditions that latched the LEDs are resolved and a) the system is next armed (Burglary System 678 UL-B) or b) the LED's are manually reset (Fire System 678UL-F).

DIALER ACTIVE LED

This LED indicates the transmission procedure is in progress. It will remain lit during the communication sequence.

KISSOFF RCVD LED

When the communicator receives a "kissoff" signal from the central station receiver, this LED lights for 8 seconds to signify a successful communication. This is especially useful when sending closing messages as the subscriber is immediately assured that the central station has been reached.

KISSOFF FAILED

When the communicator is activated but does not receive the "KISSOFF" signal, the lit KISSOFF FAIL LED signifies that the communicator has not successfully communicated to the central station. The LED will latch ON as described in the first paragraph above.

BATTERY FAILED

If the battery fails either the constant voltage test or the 12 hour test the user is alerted by the BATTERY FAILED LED. It will latch on as described in the first paragraph above.

POWER FAILED

Any A.C. power failure which exceeds 1-1/2 hours duration will cause the communicator to notify the central station and alert the user with a lit POWER FAIL LED. The LED will remain latched as described in the first of this section, (on the previous page).

A.C.

This lit LED signifies that the system is operating from A.C. power.

LOCKING METAL CABINET

The 678UL is encased in a locking metal cabinet with door and wall pry-off tamper switches. The cabinet door has a window which permits the viewing of six LED indicators.

LINE SEIZURE

Built-in line seizure disconnects all extension phones so that the communicator cannot be blocked by outgoing calls or by a phone left off hook.

ANTI-JAM

The unit automatically executes anti-jam after the first call and the each successive call to prevent any incoming calls from blocking transmission.

LIGHTNING ARRESTORS

Telephone line surge arrestors built into the system protect against voltage surges entering via phone lines. The LIGHTNING ARRESTORS ARE NOT EFFECTIVE UNLESS A PROPER GROUND CONNECTION HAS BEEN MADE.

III. OPERATION:

OVERVIEW

The ADEMCO 678UL DIGITAL COMMUNICATOR is an alarm reporting device that links the alarm control panel with the telephone network. When channels 1-8 are activated by a 6-12VDC input, by dry contact closure operation, or UL ADAPTER board output, the communicator translates the incoming data from the alarm control with its on board micropocessor and PROM into a digital communication message. It then seizes a phone line, establishes a communication link and then reports the message to the central station. A bank of six LEDs displays the communication process and also displays system fitness. The ninth channel may be used to automatically send to the central station a low battery condition and a user or 24 hour timer initiated test signal if desired.

678UL-B OPERATION

The 678UL-B burglary configuration includes a communicator in a cabinet, a 2.5AH battery and a plug-in transformer.

When a channel is activated, transmission to the central station occurs as follows:

1. After the normal 150 millisecond response time (or programmed 16 second delay), the communicator executes a **line seizure** and forces a 1.6 second **HANGUP** to insure a disconnect in case an outgoing call was being made. This sequence causes the **DIALER ACTIVE LED** to light.
2. The communicator then checks for a dial tone. To reduce response time, the No. 678UL senses both local and external (telephone company) dial tones.
3. If a dial tone is detected, then the communicator dials (using Touch tone or rotary dial format) up to two separate 16 digit telephone numbers. It may be programmed to do this in three ways: (1) Call the second number upon failing to receive Kissoff after two attempts to the first number, then alternate every two calls between the first and second number. (2) Always call the second number even after Kissoff or eight attempts to the first number (3) Have only selected channels call the second number.

If a dial tone is not detected within eleven seconds, the No. 678UL will dial anyway as it assumes that a good connection has been made and that the dial tone is not clear.

4. Successful connections are verified when the communicator receives an acknowledgement tone from the central station receiver. If this tone is not received within 30 seconds, the communicator will disconnect from the line and wait 30 seconds before trying again. This will be repeated up to eight times (or, if programmed for **UNLIMITED ATTEMPTS**, will repeat the procedure indefinitely). If a connection is not made after eight attempts, then the communicator gives up and the red **KISSOFF FAIL LED** will light.
5. Transmission will begin when the acknowledgment tone is received. The No. 678UL communicator will transmit in **LOW** or **HIGH SPEED** format depending upon which acknowledgment tone has been received from the central station. (Provided that the **SESCOA** option hasn't been programmed. The No. 678UL will respond to a **SESCOA** acknowledge and acknowledge-hold signals from a **SESCOA** compatible listed receiver.

To ensure proper transmission, the No. 678UL sends each message up to four times. As soon as the central station receiver detects two successive identical messages, it considers the transmission "valid" and sends a "**Kissoff**" message to the communicator. This causes the yellow **KISSOFF RCVD LED** to light.

If the communicator does NOT receive the **Kissoff** code, it will disconnect and will dial again. It will make eight attempts (or unlimited attempts if programmed) to reach the central station via the primary and secondary phone numbers. If the **DUAL REPORT** option is programmed, the communicator will make eight attempts to contact each number.

6. A **LOW BATTERY** level will be reported to the central station and the user is notified by a lit LED. The communicator will shut down if the A.C. power fails and the battery terminal voltage falls below a safe operating level. All LEDs will shut down (However, any latched fail condition will be maintained until the battery level falls below 4.5 volts). If the A.C. power is restored before the battery level falls below 4.5 volts, the LED's will again be powered and indicate any stored FAIL conditions.

No.678UL-F OPERATION

The No. 678UL-F DIGITAL COMMUNICATOR responds to the control panel and reports to the central station in a fashion identical to the No.678UL-B. It differs only in the response backup equipment and in the extra capacity battery backup which are required when using the communicator in a fire alarm application.

The No. 678UL-F is connected to a No. 674 SELECT-A-LINE which enables the communicator to utilize two phone lines. Additionally, each phone line is monitored by a No. 659 LINE FAULT MONITOR and by a No. 664 TESTER. If a line becomes disabled, the LINE FAULT MONITOR will cause the communicator to access the able phone line and relay a line fault message to the central station. The No. 664 will notify the user of the line fault with a lit LED. After the line is repaired, depressing the button on the No. 664 will reset the No. 659 LINE FAULT MONITOR.

In the event of an A.C. power failure, the No. 678UL-F has an extra capacity battery backup system which will enable the system to report for up to 24 hours.

ADEMCO LOW SPEED REPORTING FORMAT

Receipt by the No. 678UL of the standard (LOW SPEED) acknowledgment tone from a UL listed (burglary) No. 673 or like Receiver (or LOW SPEED acknowledgment tone from a UL listed (burglary and fire) No. 685 or like Digital Alarm Receiver) will result in LOW SPEED FORMAT transmissions, each consisting of the last 3 digits of the subscriber identification number and a single digit alarm code corresponding to the number of the channel that triggered.

If more than one channel has triggered, the triggered channels will report in order of priority (i.e.: low alarm numbers first) unless subsequent channels trigger while one or more channels have commenced transmission. Each channel message must receive "kiss-off" before the next is sent.

Example If Channels 3 and 6 of Subscriber 1890 go into alarm, the No. 678UL will respond as follows:

```

890           3
890           3
"Kiss-off"
890           6
890           5
Final "kiss-off" (No. 678UL hangs up)

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Note: Only the last 3 digits of the subscriber identification number will in this case be sent. The full 4 digits will be used in conjunction with the HIGH SPEED FORMAT described next.

ADEMCO HIGH SPEED REPORTING FORMAT

Receipt by the No. 678UL of a high speed acknowledgment tone from a No. 685-2 Line Card in a No. 685 Digital Alarm Receiver will result in HIGH SPEED FORMAT transmissions, each containing 13 digits as follows: 4 digit subscriber identification number, 8 digits defining the status of each of the eight alarm reporting channels, and 1 digit defining the status of the ninth auxiliary (test, low battery) channel.

Note If the No. 678UL is programmed for Ademco format (that is, the SESCOA system programming option described under PROGRAMMING OPTIONS has not been selected), it will automatically respond at HIGH SPEED to a high speed acknowledgment tone and at LOW SPEED to a low speed (or standard) acknowledgment tone. No special re-programming of the PROM chip or communicator is required for HIGH SPEED. Only the last 3 digits of the 4 digit subscriber identification code will be sent at LOW SPEED; therefore, to ensure the same identification at HIGH SPEED as at LOW SPEED, program the first digit as a "0".

As the number of subscribers calling into the central monitoring station increases beyond 1000 (subscriber identification number 999) the No.685-2 Line Cards can easily be modified to send only the high speed acknowledgment tone. Subsequently connected additional No. 678UL's may then be programmed with subscriber numbers 1000 through 9999.

For the eight alarm reporting channels
(digits 5 through 12), the channel status codes are as follows:

<u>Code</u>	<u>Meaning</u>
1	NEW ALARM (previously unreported)
2	NEW OPENING (previously unreported)
3	NEW RESTORE (previously unreported)
4	NEW CLOSING (previously unreported)
5	NORMAL (no event since previously reported RESTORE or CLOSING)
6	PREVIOUSLY REPORTED ALARM (OR OPENING) STILL IN EFFECT

For the ninth (test, bad battery) channel (digit 13), the following channel status codes are used:

7	NORMAL (no event)
8	NEW BAD BATTERY (will not re-report on subsequent calls and will not send restore)
9	TEST

Note: Only NEW events: ALARM (or OPENING), or RESTORE (or CLOSING) on any channel or NEW BAD BATTERY or TEST will trigger the 678UL, at which time all 9 channels will report.

An ALARM (or OPENING, if so programmed) is triggered by application of an input. A RESTORE (or CLOSING, if so programmed) is triggered by removal of an input. If the "Inverted Channel" option is programmed (see Channel Programming Options) the words "application" and "removal" in the previous sentence should be reversed.

Examples (HIGH SPEED format):

- A. At subscriber #2890, channels 1 through 8 are normal and a bad battery (channel 9) initiates a call. The following message will be sent:

<u>Subscriber Identification</u>	<u>Channel Number</u>
	1 2 3 4 5 6 7 8 9
Message: 2 8 9 0	5 5 5 5 5 5 5 5 8
Channel 9:	NEW LOW BATTERY

- B. At subscriber #5890, channels 2 and 5 go into alarm (and initiate a call) and channel 8, which has previously reported an alarm is still triggered.

<u>Subscriber Identification</u>	<u>Channel Number</u>
	1 2 3 4 5 6 7 8 9
Message: 5 8 9 0	5 1 5 5 1 5 5 6 7
Channel 2:	NEW ALARM
Channel 5:	NEW ALARM
Channel 8:	PREVIOUSLY REPORTED ALARM (still in effect)

- C. Still at subscriber #5890, following the events of example B above, channel 2 restores (initiating the call) and channels 5 and 8 remain in alarm:

<u>Subscriber Identification</u>	<u>Channel Number</u>
	1 2 3 4 5 6 7 8 9
Message: 5 8 9 0	5 3 5 5 6 5 5 6 7
Channel 2:	NEW RESTORE
Channels 5, 8:	PREVIOUSLY REPORTED ALARMS (still in effect)

- D. Subscriber #0135 sends an opening on channel 3, new alarm on channel 5 and restore on channel 6:

<u>Subscriber Identification</u>	<u>Channel Number</u>
	1 2 3 4 5 6 7 8 9
Message: 0 1 3 5	5 5 2 5 1 3 5 5 7
Channel 3:	NEW OPENING
Channel 5:	NEW ALARM
Channel 6:	NEW RESTORE

- E. After transmission of Example D, subscriber #0135 sends a closing on Channel 3.

<u>Subscriber Identification</u>	<u>Channel Number</u>
	1 2 3 4 5 6 7 8 9
Message: 0 1 3 5	5 5 4 5 6 5 5 5 7

Channel 3: NEW CLOSING
Channel 5: PREVIOUSLY REPORTED ALARM
(still in effect)

The sending of individual channel status in all HIGH SPEED messages eliminates the ambiguities present in the LOW SPEED format between channel 8 (code 8 in LOW SPEED) and low battery (also CODE 8 in LOW SPEED). In HIGH SPEED, bad battery is reported as a channel 9 status, thus freeing use of channel 8 for alarm reporting (its use in LOW SPEED having been precluded when bad battery reporting was selected).

Similarly, OPEN/CLOSE programming is restricted to a single channel when standard LOW SPEED Ademco (or SESCOA) format is used (to avoid confusing code 9 "close" with code 9 "test"). When HIGH SPEED format is used, however, this restriction does not apply since each channel's status is sent individually.

The time from detection, by the No. 685, of a call from the communicator, through transmission of two successive 13 digit messages to kiss-off, is less than 5 seconds (corresponding time for LOW SPEED format would be 15 seconds or more, depending upon the number of channels or type of messages (closing report, for example) to be sent.

SESCOA REPORTING FORMAT

When this option is selected (see PROGRAMMING OPTIONS section) the No. 678UL will respond to SESCOA/Franklin/DCI acknowledge and acknowledge-hold signals from a No. 685-3 Line Card in SESCOA format or from any other UL listed SESCOA format receiver. Ademco HIGH SPEED format response is not possible when the SESCOA format has been selected.

IV. INSTALLATION PROCEDURES:

Installing the No.678UL involves the following procedures:

1. Mounting the CABINET
2. Programming the PROM
3. Making all connections

MOUNTING

Mount the No. 678UL at a location where it will be accessible and undisturbed. For ease of maintenance, the location should be climate controlled. The A.C. power should be from a 24 hour source, undisturbed and not on a switch.

No. 678UL-B: When used as part of a burglar alarm system, the communicator should be located near a 110V, 60Hz power outlet to accommodate the No. 1322 plug-in transformer. The outlet must not be connected to a switch.

No. 678UL-F: When used as a fire alarm, all wires supplying power to the communicator must be enclosed in conduit. The No. 1421 TRANSFORMER must be wired directly. The power source must not be connected to a switch.

To protect the system from external voltage surges, the communicator must be grounded to a metallic cold water pipe ground.

PROGRAMMING OPTIONS

The No. 678UL may be programmed with a number of options which affect its method of sensing alarms and reporting to the central monitoring station. Programming is contained in a PROM Chip (No. 691) which can be programmed by Ademco or (with the No. 690 Programmer) by the installer. The PROM Chip is inserted in the No. 678UL during installation.

See Diagram #6 for a reproduction of the form used in programming the PROM chip. It may be used to record the PROM programming used for the actual installation as well as a guide for requesting a differently programmed PROM.

Some of these options affect the unit as a whole, while others affect only the desired channel. The options which affect the units as a whole are:

SYSTEM PROGRAMMING OPTIONS:

1. Bad Battery Trigger and Report: Initiates a call to the central monitoring station and sends Code 8 when the rechargeable power source drops below 5.6 volts; when the power source rises above 8V (indicating an open battery); or when the AC power fails longer than 1 1/2 hours. This occurs when channel 9 is connected to terminal 25 as shown in diagram 2 ALTERNATE METHOD. This report will not be repeated during later alarm transmissions.
2. Dual Report: Reports all information to the second telephone number after receiving kissoff from the receiver at the primary number. In the event that 8 attempts are made, but no "kiss-off" is received from the primary number, the No. 678UL will then make 8 more attempts to report to the secondary number.

Note: When Dual Report is used, Unlimited Attempts (System Option 7) should not be programmed.

3. Alternate by Pairs: The dialer will attempt to call the primary number twice, then, if "kiss-off" has not been received, it will make two attempts to reach the receiver at the secondary number. It will alternate by pairs of calls until a total of 8 attempts have been completed, or "kiss-off" is received.
4. Extended Acknowledge Wait: Doubles the acknowledgment wait period from 30 seconds to 60 seconds. Helpful on phone networks with long switching time.

5. Extended Dial Tone Wait: Triples the dial tone waiting period from 11 seconds to 30 seconds. Useful in slow dial tone areas.
6. Touch Tone Dial: Instructs the communicator to dial Touch Tone instead of the slower pulse dial method. Use only if Touch Tone service is provided at premises by the telephone company.
7. Unlimited Attempts: Causes the No. 678UL to continue making attempts to reach the receiver until "kiss-off" is received, rather than ceasing after 8 attempts. **Note**: Unlimited Attempts **should not** be programmed when Dual Report (System Option 1) is used.
8. SESCOA: Causes the No. 678UL to look for the SESCOA/Franklin/DCI acknowledge and acknowledge hold signals from an Ademco No. 685-3 Line Card or a UL listed SESCOA format compatible receiver and to report in SESCOA format. If this option is not selected, the No. 678UL will respond in the Ademco standard high speed formats as a function of the acknowledgment tone received.

CHANNEL PROGRAMMING OPTIONS:

In addition to the system options, there are a number of options which can be selected that affect only those channels which the user desires. These are:

1. Long Delay Channel: Any number of channels may be programmed for a 16 second delay. Thus, the normal 150 millisecond response time can be extended to 16 seconds to minimize false triggering due to transients. UL only permits 16 second delay if triggering is accomplished by removal of voltage or removal of closure.
2. Open/Close Channels: Channels selected as Open/Close Channels will report when the voltage appears as well as when the input voltage is removed (for burglary usage only).

In order to transmit opening and closing rounds, the No. 678UL must receive signals when the control panel is armed and disarmed.

With the standard Ademco or SESCOA format, an Open/Close Channel will report the subscriber identification (3 last digits) followed by an alarm code 9. For example, for subscriber No. 1890 the No. 678UL will report:

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890          9
890          9
"Kiss-off"----- hang-up

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If a channel is selected as both an Open/Close Channel and a Delay Channel, the delay applies to the input being applied and the input being removed. Since Code 9 can also mean test, use caution. Also, since the channel is not identified upon removal of input, restrict this method to one channel.

3. Restore Channels: Channels so designated will **not only** report when the input voltage goes high, but will report again when the input voltage goes low (restore). When the input goes high (alarm) the affected channel will report subscriber identification and channel number, to be followed by "kiss-off".

However, when the input goes low, the channel (if it is selected as a Restore Channel) will report the subscriber identification followed by the channel number; then, after "kiss-off", the No. 678UL will report

the subscriber identification followed by code 9. For example, should channel 4 restore, the message sequence will be:

890	4
890	4
"kiss-off"	
890	9
890	9
"kiss-off"-----	hang up

If, in addition to being selected as a Restore Channel, a channel is selected as a Long (16 sec) Delay Channel, the delay applies **only** to the input going high (alarm). If the input goes low (restores), 150 msec delay applies. This feature permits the No. 678UL to report a restore on the same call as it reports an alarm, thus reducing the frequency with which emergency services will be notified in the event of false alarms.

4. Secondary Number only Channels: Any channel or channels may be selected to call and report only to the secondary number. This feature can be used to force openings and closings to call the secondary number, leaving the primary number open for emergency calls, such as holdup, burglary, etc. This channel option takes precedence over the **system options** "Alternate by Pairs" and "Dual Report".
5. Inverted Channels: Any number of channels may be programmed for inverted operation. This means that the microprocessor will interpret the presence of a voltage on that channel's input terminal as normal (restore). The **absence** of a voltage will then be treated as abnormal (alarm).

All alarm reporting and timing features described in channel options 1 to 3 (above) still apply, but with the reversed definition of normal and alarm. Inverted operation can be used to obtain triggering upon dry contact **opening** by hooking up the channel input as for dry closure, but substituting a NC switch for the NO switch.

The ability to invert a channel also provides features not otherwise easily available. For example, suppose it is desired to send opening and closing information, but **code 9** (see Channel Option 2) is found unacceptable. Suppose further that a **code 4** is wanted for closing (input going low) and **code 5** for opening (input going high). Simply tie the inputs to channels 4 and 5 together, and there or at the control unit. Program channel 4 (input going low) for inverted operation. In this case, **DO NOT** program either channel 4 or 5 for Open/Close or for Restore. **Note:** 16 sec delay, if selected, will apply when signal is removed from the inverted channel. UL only permits 16 second delay if triggering is accomplished by removal of voltage or removal of closure.

Channels 4 and/or 5 or any other combination used this way may be programmed for Long Delay or Second Number only (as desired).

The **"Kiss-off" (Ring-Back) Feature** is an important tool when transmitting test or opening/closing signals. Once "kiss-off" is received, the built-in LED will light and stay on for 8 seconds. By remoting an LED or buzzer (Ademco No. 8261) at a convenient location, the customer is advised of a successful transmission to the receiver.

Caution: Discretion is advised if a remote buzzer (or other audible device) is used in conjunction with a communicator that has a **silent** emergency alarm connected to one of its channels, as the buzzer will **sound** after such an alarm is sent.

WIRING AND CONNECTIONS

1. **MAKE ALL CONNECTIONS** between the upper board and the lower board using one of the methods depicted in diagram 2 and described below.

PREFERRED METHOD:

Power Fail and Battery Fail inputs are connected to communicator Channels 7 and 8 (respectively). Both channels 7 and 8 must be programmed to report a RESTORE message.

Advantage: The central station receives unique fail and restore reports for both the battery and power, thereby reducing the number of service calls (for HIGH SPEED and LOW SPEED reporting formats only).

Disadvantage: Only 6 of the 8 channels are available for premises monitoring.

ALTERNATE METHOD:

POWER FAIL and BATTERY FAIL status reports are both reported on channel 9 (Test) when the **Bad Battery** option is selected. Using the LOW SPEED reporting format, both messages are reported as a code 8. Channel 8 also reports as a code 8. To avoid confusion, channel 8 should not be used with the LOW SPEED format. Using the HIGH SPEED format, all 8 channels may be used.

Advantage: Maximum number of available channels for premises monitoring.

Disadvantage: POWER FAIL and BATTERY FAIL messages are not unique and are not distinguishable.

Restore messages will not be reported to the central station.

2. **INSTALL THE PROM** into the socket after making certain that there is no power going to the system. Take care to align the PROM orientation marks. Install the PROM using the ADEMCO No. 692 INSERTION TOOL.
3. **CONNECT ANY REMOTE LEDS** to the upper circuit board (see diagram 1).
4. **(OPTIONAL) CONNECT A NO. 664 TEST SWITCH** to terminals 7, 8 and 9 (see diagram 1).

NOTE: While using SESCOA or ADEMCO STANDARD reporting formats, any channels programmed for OPEN/CLOSE reporting will report "TEST" and "CLOSE" as a code 9.

5. **CONNECT THE ALARM INPUTS** to the appropriate channels (see diagram 1).

Notes:

1. Channel 1 gives alarm code 1 etc.
2. For voltage triggering, two ground (-) positions are available.

3. Terminals 5 and 6 each supply +V dry contact excitation. [Be certain that each external connection is isolated from the power supply positive (+) with a 47 ohm protective resistor.] If the optional remove kiss-off buzzer is connected to either 5 or 6, then any dry contact excitation should be obtained from the terminal not connected to the buzzer.

For triggering by contact closure, use an N.O. contact. For triggering by contact opening, use an N.C. contact connected to a channel which has been programmed for inverted operation.

6. FOR NO. 678UL-B

Connect the telephone line and handsets via a No. 620 Direct CONNECT CORD. (see diagrams 1, 3, 4 and 5).

FOR NO. 678UL-F (See diagrams 3,4 and 5)

Connect the No. 678UL to two phones using a No. 674 SELECT-A-LINE module and two direct connect cords (No. 620). A No. 659 LINE FAULT monitor must be connected to each phone line. A No. 664 Digital Communicator Tester must be connected to each LINE FAULT monitor. See their installation instructions for details concerning the No. 659, 664 and the 674.

7. Underwriters Laboratories requires that all wiring between the control panel and the communicator be in conduit.

FOR NO. 678UL-B

Connect the ARMED/DISARMED control signal wires from the control panel to the No. 678UL upper board. Apply power to the control panel.

FOR NO. 678UL-F

Latching LEDs may be reset by attaching a SPDT switch. (see diagram 1).

8. **CONNECT THE TAMPER SWITCH** lead to the control panel's 24 hour day circuit or directly to one of the No. 678UL channels (for triggering on contact opening) as desired.
9. **CONNECT THE BATTERY** to the Molex connector at the end of red and black leads from the upper board. Attach the transformer (plug-in for the No. 678UL-B and hard wired for the No. 678UL-F) to a 24 hour 110VAC power source. The communicator's line seizure and dialing relays will be activated which will cause the DIALER ACTIVE and the KISSOFF RECVD LEDs to light. After 8 seconds both LEDs will go out and the line seizure relay will de-energize. The communicator will have initialized to the alarm status present at the input barrier strip. Any changes in the alarm conditions will be monitored by the communicator and those which require reporting will activate the communicator.

V. SPECIFICATIONS:

The following specifications refer to the ADEMCO NO. 678UL as an operating system. For detailed information concerning the individual components, please refer to the respective installation instructions.

Dimensions: **Width:** 8" (20.3 cm)
 Height: 15" (38.1 cm)
 Depth: 3" (7.6 cm)

Current Drain: **Standby:** 135 ma Provided by unit's
 Operating:260 ma own power supply

Auxiliary Output: (Terminals #5 and #6):
 6V.DC Aux output
 XMA (max. continuous load)

Power: No. 678UL-B Transformer No. 1322 - 12VAC/20VA
 No. 678UL-F Transformer No. 1421 - 12VAC/20VA

Backup: No. 678UL-B Battery No. 496-6V, 2.5AH Sealed Lead Acid
 No. 678UL-F Battery No. 498-6V, 5AH Sealed Lead Acid

Fuse: 1A (ADEMCO No. 90-14)
 (Protects against shorting of power supply outputs as well as excessive current drain)

Activating Inputs (Triggering): Application (or removal) of 6 to 12 VDC (regulated or full wave rectified DC) or via dry contacts (N.O. or N.C.)

Transmission Format: Accommodate ADEMCO (SILENT KNIGHT) format as well as: SESCOA, FRANKLIN or DCI. Use UL Listed ADEMCO No. 673T or No. 685 receivers for burglary application and UL Listed No. 685 or other so listed receiver for a fire application.

FCC Registration No.: AC 398U -68192-AL-E
 Ringer Equivalence 0.0.B.

TO THE INSTALLER

Regular maintenance and inspection (at least annually) by the installer and frequent testing by the user is vital to continuous satisfactory operation of any alarm system.

The installer should assume the responsibility of developing and offering a regular maintenance program to the user as well as acquainting the user with the proper operation and limitations of the alarm system and its component parts. Recommendations must be included for a specific program of frequent testing (at least weekly) to insure the system's proper operation at all times.

FEDERAL COMMUNICATIONS COMMISSION (FCC) STATEMENT

This equipment has been tested to FCC requirements and has been found acceptable for use. The FCC requires the following statement for your information:

This equipment generates and uses radio frequency energy and if not installed and used properly, that is, in strict accordance with the manufacturer's instructions, may cause interference to radio and television reception. It has been type tested and found to comply with the limits for a Class B computing device in accordance with the specifications in Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference in a residential installation. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on, the user is en-

couraged to try to correct the interference by one or more of the following measures:

- Reorient the receiving antenna
- Relocate the computer with respect to the receiver
- Move the computer away from the receiver
- Plug the computer into a different outlet so that computer and receiver are on different branch circuits

If necessary, the user should consult the dealer or an experienced radio/television technician for additional suggestions. The user may find the following booklet prepared by the Federal Communications helpful:

"How to Identify and Resolve Radio-TV Interference Problems".

This booklet is available from the U.S. Government Printing Office, Washington, DC 20402. Stock No. 004-000-00345-4.

203
209

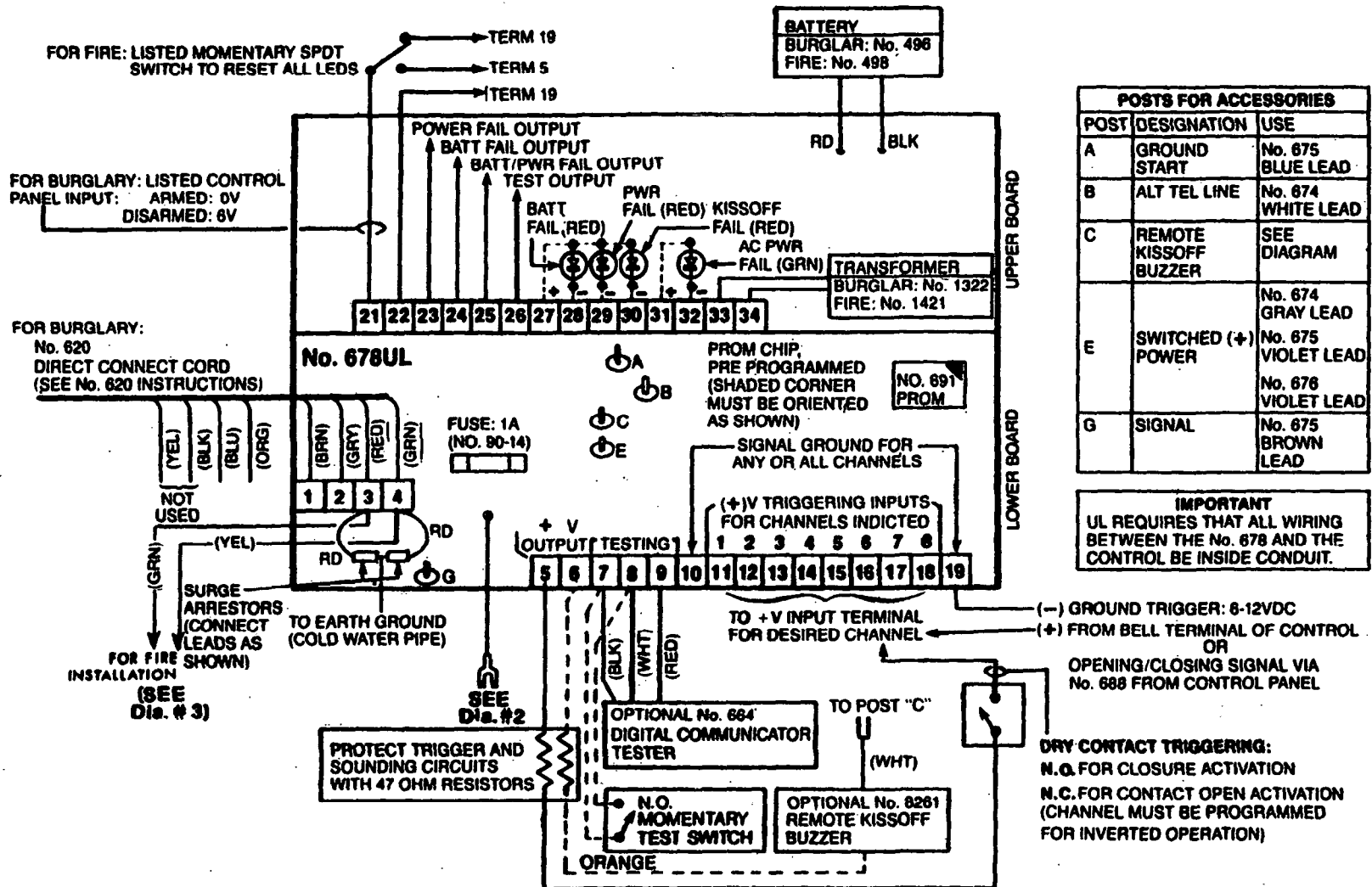
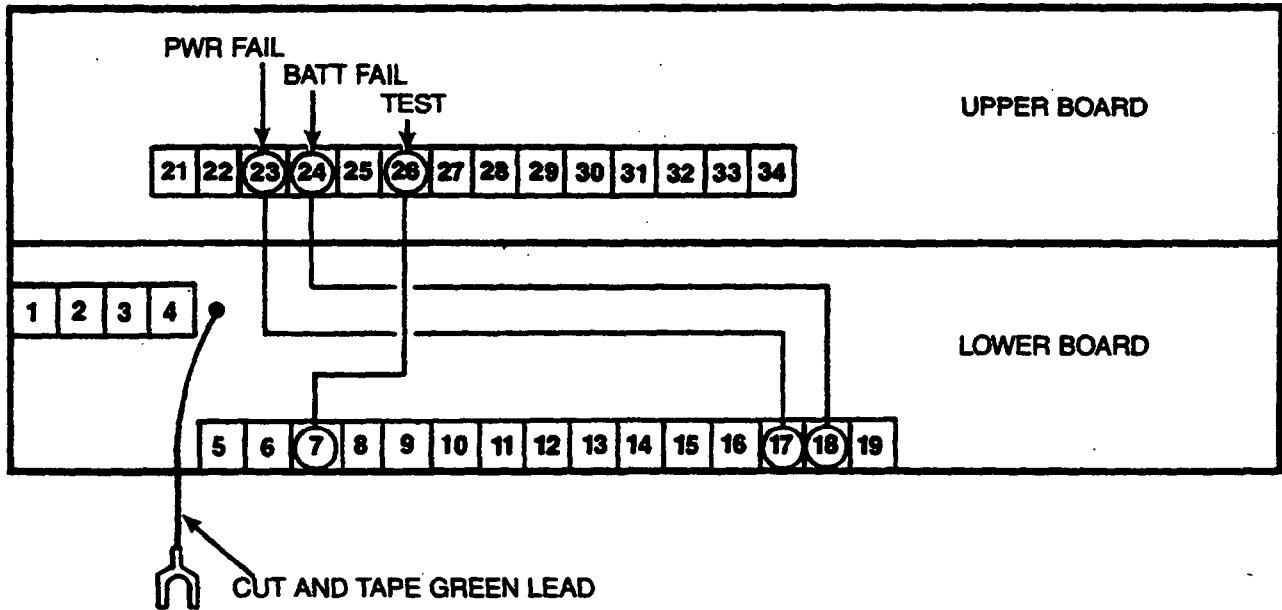


Diagram 1: SUMMARY OF CONNECTIONS

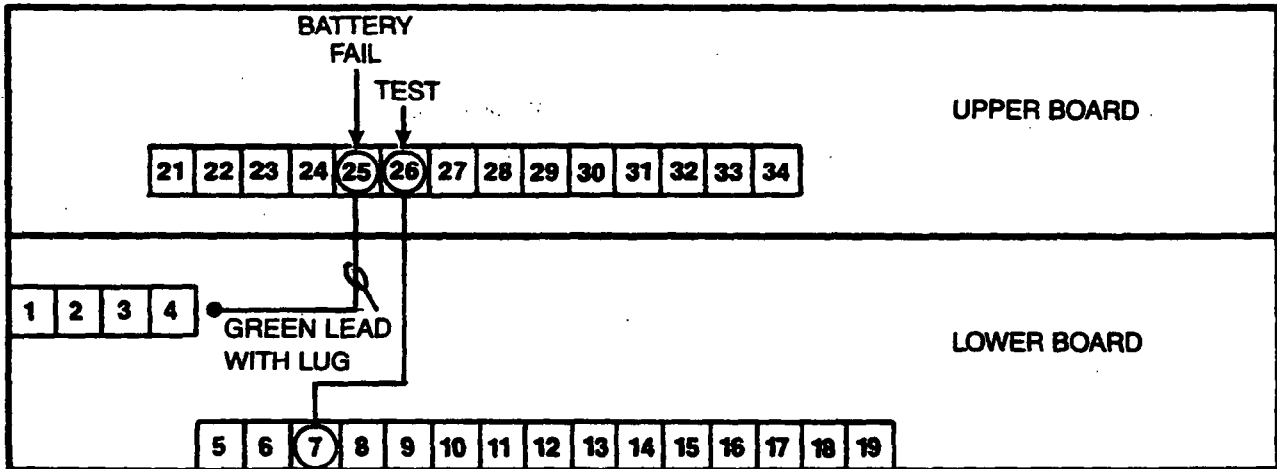
PREFERRED METHOD: UNIQUE REPORT OF BATTERY AND POWER FAIL AND RESTORE



ADVANTAGE: This configuration provides individual messages for POWER FAIL and BATTERY FAIL conditions. Corrected incidents are signified with a RESTORE message.

DISADVANTAGE: This configuration allows for only 6 monitored channels.

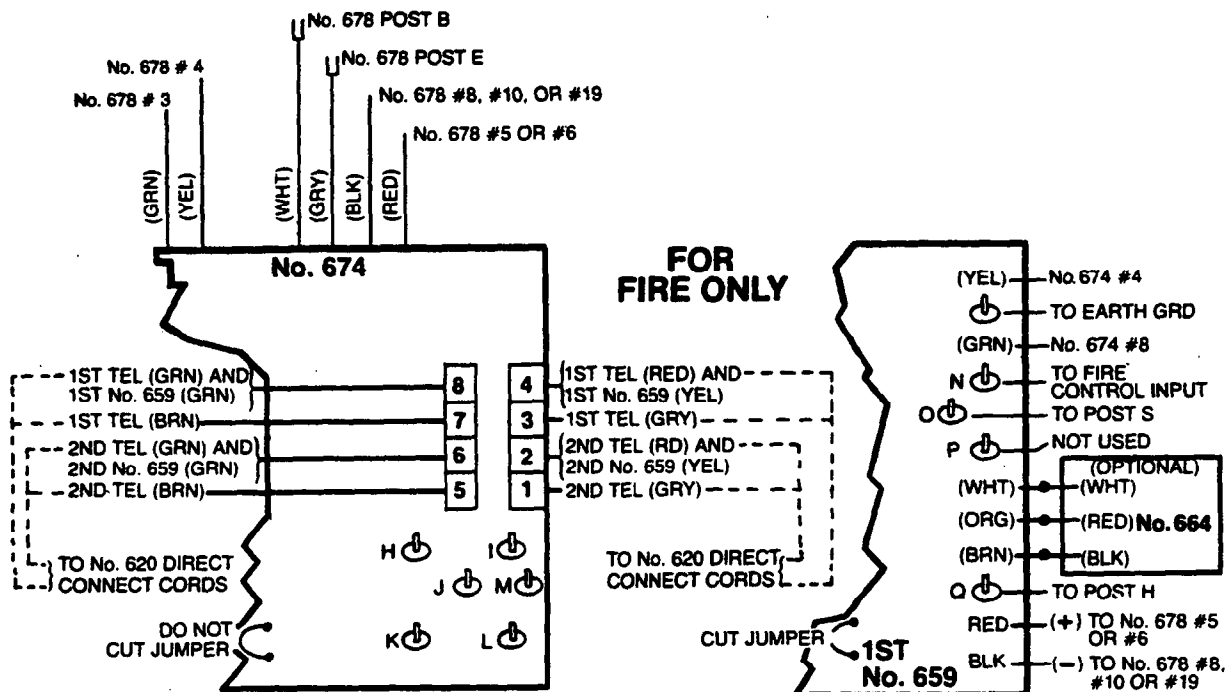
ALTERNATE METHOD: COMMON REPORT OF BATTERY/PWR FAIL W/NO RESTORE MESSAGE
NOTE: LOW BATTERY OPTION MUST BE ENABLED.



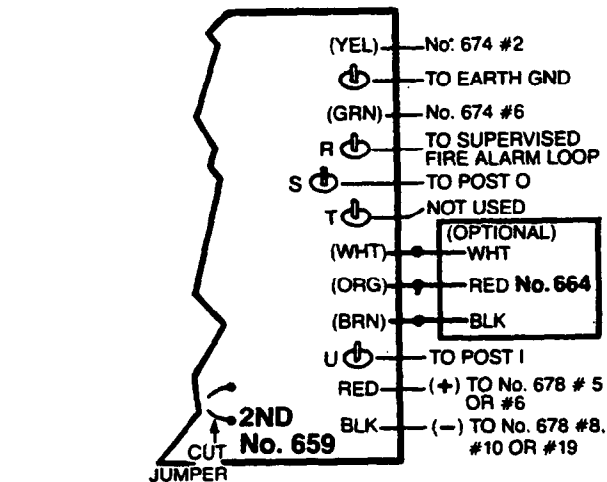
ADVANTAGE: All eight channels are available for premises monitoring.

DISADVANTAGE: BATTERY and POWER FAIL messages are not unique and cannot be distinguished by the central station.

Diagram 2: FIELD CONNECTIONS OF THE UPPER AND LOWER BOARDS



No. 674 TERM-POST-WIRE ASSIGNMENTS		
ITEM	DESIGNATION	USE
1	HANDSET INPUT	TO TEL
2	RING AND 2ND No. 659	TO TELCO/No. 659
3	HANDSET RING INPUT (GRY)	TO TEL
4	RING AND 1ST No. 659	TO TELCO/No. 659
5	HANDSET TIP INPUT (BRN)	TO TEL
6	TEL TIP AND 2ND No. 659	TO TELCO/No. 659
7	HANDSET TIP INPUT (BRN)	TO TEL
8	TEL TIP AND 1ST No. 659	TO TELCO/No. 659
H	LOGIC LEVEL FROM 1ST No. 659	TO POST Q
I	LOGIC LEVEL FROM 2ND No. 659	TO POST U
J	SWITCHED POWER OUT (+)	SEE POST E USES
K	LISTEN-IN POWER (+)	No. 676 OUTPUT IF USED
L	SWITCHED POWER (-)	NOT USED
M	EARTH GROUND	METAL GROUND
RED (+)	No. 678 POWER	No. 678 #5 or #6
BLK (-)	No. 678 POWER	No. 678 #8, #10 or #19
GRY	SWITCHED POSITIVE PWR	No. 678 POST E
WHT	LINE SELECTION CONTROL	No. 678 POST B
YEL	SW TEL LINE	No. 678 #4
GRN	SW TEL LINE	No. 678 #3



No. 659 POST-WIRE ASSIGNMENTS		
ITEM	DESIGNATION	TO:
YEL	LINE MONITOR	SEE DIA
GRN	LINE MONITOR	SEE DIA
WHT	GROUND	No. 664 (WHT)
ORG	LED	No. 664 (RED)
BRN	RESET	No. 664 (BLK)
RED	(+) POWER	No. 678 #5 or #6
BLK	GROUND	No. 678 #8, #10 or #19
N	INITIATING CIRCUIT INPUT	CONTROL PANEL
O	RELAY COMMON	POST S
P	RELAY N.O. CONTACT	NOT USED
Q	LOGIC	POST H
R	FIRE ALARM LOOP	SENSOR LEAD
S	RELAY COMMON	POST O
T	RELAY N.O. CONTACT	NOT USED
U	LOGIC	POST I

Diagram 3: CONNECTIONS FOR THE No. 678UL-FIRE

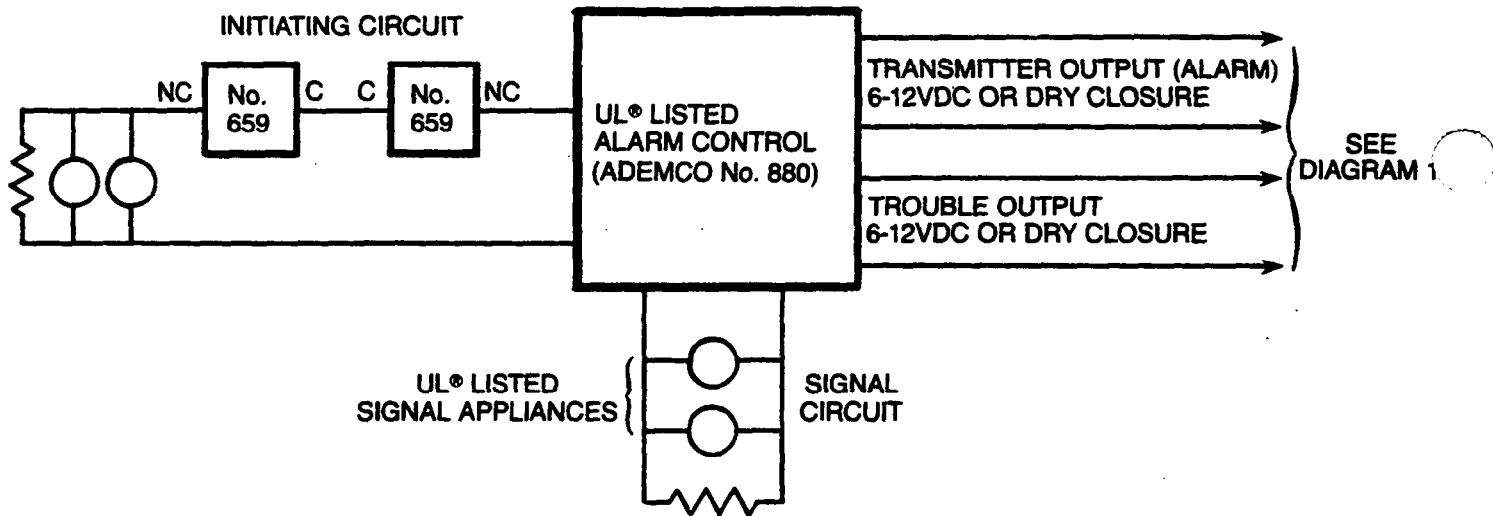


Diagram 4: OVERVIEW DEMONSTRATING No. 659 LOGIC INSTALLATION FOR UL® FIRE INSTALLATION

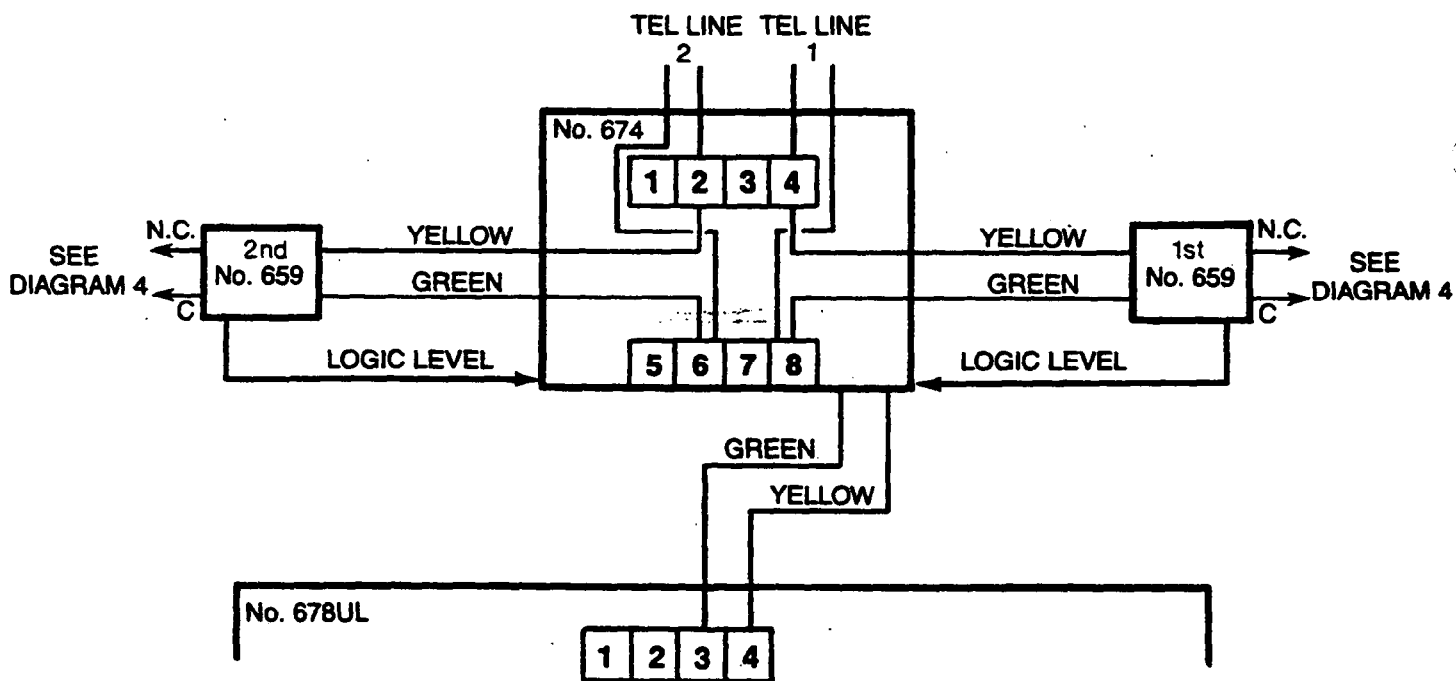
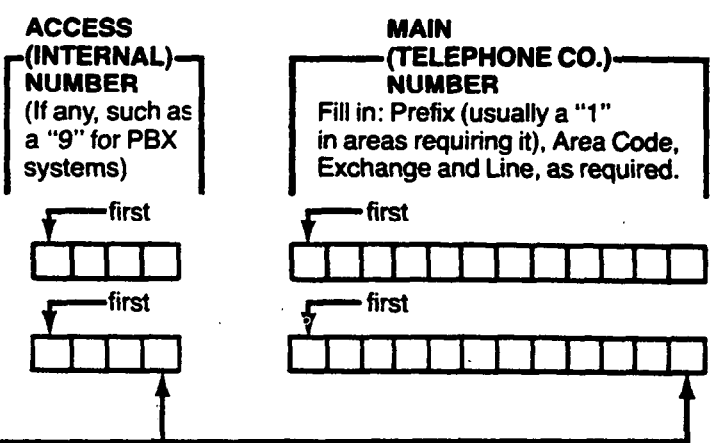


Diagram 5: OVERVIEW DEMONSTRATING 678UL-F COMPONENT CONNECTIONS

This form may be used to record PROM Programming used at actual installation. Follow this format when requesting new programming.

Subscriber's Name: _____
 Address: _____
 Telephone No.: _____

PROM: Serial No.: _____ Type: _____ New, _____ Copy, _____ Master



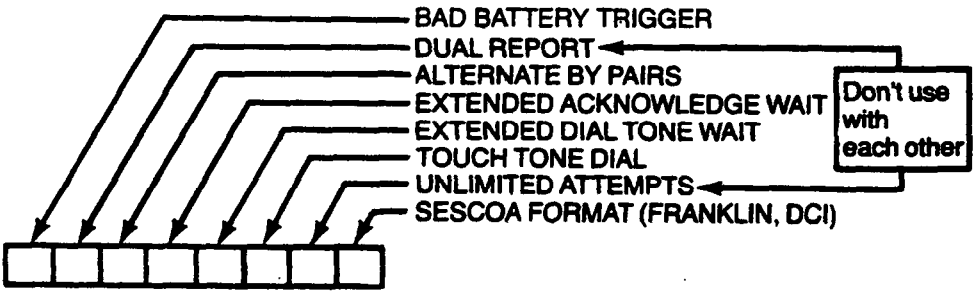
1. PRIMARY TELEPHONE NO.:
 2. SECONDARY TELEPHONE NO.:

Blank space(s) can be left at end of each section.
 Do not leave spaces between digits.

3. SUBSCRIBER IDENTIFICATION NO.: [] [] [] []

Fill in all 4 spaces. If using with Ademco No. 673T Receiver, only last 3 digits will be sent. Any digit may be entered in first space, but select one that will be significant when a No. 685 receiver accommodating 4 digits is in use.

4. SYSTEM OPTIONS: Check appropriate space(s).



5. CHANNEL OPTIONS: Check appropriate space(s) for each Channel.

OPTION \ CHANNEL NO.	1	2	3	4	5	6	7	8
INVERTED								
LONG (16 SEC) DELAY								
SECONDARY NO. ONLY								
OPEN/CLOSE								
RESTORE								

Do not use Channel 8 if "Low Battery Trigger" System Option is selected with Low Speed reporting format.

Restrict "Open/Close" to single channel, unless HIGH SPEED reporting format is used. Do not select both for same channel.

Diagram 6: PROGRAMMING FORM for No. 691 PROM (used with No. 678UL Digital Communicator)



ALARM DEVICE MANUFACTURING CO.
 A DIVISION OF PITTMAY CORPORATION
 165 Eileen Way, Syosset, New York 11791

ADDENDUM TO: **INSTALLATION INSTRUCTIONS for
ADEMCO No. 678UL DIGITAL COMMUNICATOR**

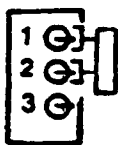
RE: **TEST TIME SELECTION FEATURE**

The following information should replace the comparable paragraph on page 2 of the accompanying installation instructions:

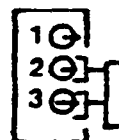
AUTOMATIC TEST TIMER The communicator automatically signals the central station every 12 or 24 hours (jumper selectable) if no other communication (such as opening, closing or alarm) has been sent. These test status signals are monitored by the central station.

The following information should replace step number 2 under **WIRING and CONNECTIONS** and the present steps 2 through 9 should increase by one number.

2. **The Test Timer Feature** enables the communicator to automatically report to the central station every 12 hours or 24 hours (selectable). The reporting interval is determined by positioning a shorting jumper located on the upper left-hand corner of the lower circuit board. (The communicator is sent from the factory with the 24 hour report selected.)



Move the jumper to the upper two pins for 12 hour reporting.



Leave the jumper across the lower two pins for 24 hour reporting.

ADEMCO

ALARM DEVICE MANUFACTURING CO.

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165 Eileen Way, Syosset, New York 11791

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