GENERAL INFORMATION:

The 678 is an 8 channel digital communicator that transmits coded messages over the telephone system to a digital receiver located at a central monitoring station. Special leased lines are not required. (There is a 9th channel dedicated to user test and optional low battery reporting.)

To accommodate various receivers, the 678 can transmit in three formats: 1) Ademco (and Silent Knight), 2) Ademco High Speed or 3) Sescoa/Franklin/DCI.

The 678 consists of a printed circuit board chassis and cover that may be installed in any suitable enclosure, such as the Nos. 204 or 205 Cabinets, or the lower section of a No. 1023 or 1024 Alarm Processing Center's cabinet. (Note: The upper section of a No. 1023 or 1024's cabinet may be used as well, if the 678 is mounted behind or in lieu of the APC's normal control chassis.)

The 678 may be powered from a 6 or 12V. DC, filtered rechargeable, source [such as (for 6V): Ademco Nos. 492, 493]. Caution: The Nos. 89 and 89-12 Energy Packs may not be used, nor may sources containing Ni-Cad batteries such as the Nos. 96, 97, 497. A common power supply from a control panel can be used, even with bells connected to the control (No. 1026 or 1028 series Alarm Processing Centers may not be used, as they contain Ni-Cad standby batteries).

The 678 may be triggered by: 1) Application (or removal) of 6-12V. DC supplied from any alarm control (or other DC source), 2) Dry contact closure. 3) Dry contact opening.

The 678 is easily programmed by the insertion of a PROM (Programmable Read Only Memory) Chip, such as the No. 691. PROM Chips can be programmed by Ademco or (with the No. 690 Programmer) by the installer.

The 678 has built-in line seizure and telephone line surge arrestors. Line seizure automatically disconnects all telephones in the premises on the same line with the communicator whenever the 678 is activated, to insure transmission without interruption. Surge arrestors help protect the 678 from voltage surges on the telephone line.

The 678 is compatible with the Ademco family of ancillary communicator accessories, including the following:

Cat. No.	Description
620	Direct Connect Cord
659	Line Fault Monitor
664	Digital Communicator Tester
674	Select-A-Line (two line select module)
675	Ground Start Module
676/677	Listen-in System
684	Remote Command Tone Responder
688	Opening/Closing Switching Module
689	AC Power/Telephone Line Fault Monitor
8261	Remote Buzzer

OPERATION:

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

1. After the normal 150 millisecond response time (or 16 seconds delay, if so programmed) the 678 executes line seizure and forces a 1.6 second hang-up to insure a disconnect if an outgoing call was being made. Note: The 678 has a built-in ACTIVATION LED which lights whenever the unit is activated.

2. Next, the 678 checks for dial tone. To shorten the time required for contacting the central monitoring station, the 678 can sense internal dial tone as well as external (telephone company) dial tone.

3. If dial tone is detected, the 678 immediately and automatically dials the preprogrammed telephone number, which can consist of up to 4 access digits and up to 12 digits in the main (telephone company) number. Two telephone numbers can be programmed and dialed as explained in PROGRAMMING OPTIONS. Furthermore, the 678 can be programmed to dial "touch tone" in lieu of the slower "pulse dial" method.

   The probability of immediate dial tone detection is high, but if a dial tone is not detected within 11 seconds, (30 seconds, if so programmed), the 678 will dial anyway, on the assumption that the connection may be good even though the dial tone is not clear.

4. When connection is made with the central monitoring receiver, a "handshake" tone (acknowledgment) is sent over the telephone lines by the receiver to the 678. This "handshake" confirms, to the 678, that connection has been completed to the receiver.

   If "handshake" is not received within 30 seconds (60 seconds if so programmed), the communicator will disconnect itself from the telephone line. After waiting long enough (approximately 30 seconds) to disconnect any outgoing or incoming calls which might interfere with dialing ("anti-jam" which only works in "called party" control exchanges), the 678 will reconnect to the telephone line, and again seize the line, check for dial tone and dial as described in Steps 1, 2 and 3.

   If necessary the 678 will make up to a total of 8 attempts* (or "Unlimited Attempts", if so programmed) to reach the central monitoring station via primary and/or secondary programmed telephone numbers. See PROGRAMMING OPTIONS.

5. Upon receipt of the "handshake" (acknowledgment) tone, the 678 will start transmitting its message(s), each consisting of a subscriber identification number and a 1 digit alarm code corresponding to the number of the channel that triggered.

   Since faulty phone lines can distort the numbers, the 678 sends each message up to 4 times while the receiver compares each message with the one before it. As soon as the Receiver detects 2 successive identical messages, it considers the transmission "valid" and sends a "kiss-off" code to the Communicator.

   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.

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Example: If Channels 3 and 6 of Subscriber 1890 go into alarm, the 678
will respond as follows in conjunction with an Ademco 660
(or Silent Knight, SESCOA, Franklin or DCI) Receiver:

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

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 an Ademco No. 685 High Speed Receiver (available
soon).

If the 678 does not receive the "kiss-off" code(s) by the time it has sent
its message(s) four times, it hangs up and dials again. Up to a total of
8 attempts*or "Unlimited Attempts", if so programmed will be made to
reach the central monitoring station via primary and/or secondary programmed
telephone numbers. See PROGRAMMING OPTIONS.

6. In the event that "handshake" or "kiss-off" is not received, the 678 hangs
up and tries again. If necessary, the 678 will make up to a total of 8
attempts*(or "Unlimited Attempts" if so programmed) to reach the central
monitoring station, via primary and/or secondary telephone numbers. If,
after these attempts, the 678 has not made contact and received "kiss-off"
it will shut down and stop dialing (unless programmed for "Unlimited Attempts").

The 678 has a built-in KISS-OFF LED which lights upon receipt of "kiss-off"
and goes out 8 seconds after completion of all transmission to that telephone
number.

*If the "Dual Report" option is selected, the 678 will make up to 8 attempts
to reach each telephone number.

PROGRAMMING OPTIONS:

The No. 678 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 678
during installation.

See Diagram 3 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. Low Battery Trigger and Report: Initiates a call to the central monitoring
station and sends Code 8 when the rechargeable power source drops below
5 volts (10V for a 12V rechargeable source). This report will not be
repeated during later alarm transmissions.

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2. <u>Dual Report</u>: 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. 678 will then make 8 more attempts to report to the secondary number.

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

3. <u>Alternate by Pairs</u>: 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. <u>Extended Acknowledge Wait</u>: Doubles the acknowledgment wait period from 30 seconds to 60 seconds. Helpful on phone networks with long switching time.

5. <u>Extended Dial Tone Wait</u>: Triples the dial tone waiting period from 11 seconds to 30 seconds. Useful in slow dial tone areas.

6. <u>Touch Tone Dial</u>: Instructs the communicator to dial touch tone instead of the slower pulse dial method.

7. <u>Unlimited Attempts</u>: Causes the 678 to continue making attempts to reach the receiver until "kiss-off" is received, rather than ceasing after 8 attempts. <u>Note</u>: Unlimited Attempts should <u>not</u> be programmed when Dual Report (System Option 2) is used.

8. <u>SESCOA</u>: Causes the No. 678 to look for the SESCOA/Franklin/DCI acknowledge and acknowledge hold signals and to report in SESCOA format. If this option is not selected, the No. 678 will respond in the Ademco standard format. For Ademco hi-speed format see instructions accompanying the No. 685 Receiver.

Channel Programming Options:

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

1. <u>Long Delay Channels</u>: Any number of channels may be programmed for a 16 second delay. Thus, the normal 150 millisec response time can be extended to 16 seconds to minimize false triggering due to transients.

2. <u>Open/Close Channels</u>: Channels selected as Open/Close Channels will report when the triggering voltage appears as well as when the input voltage is removed.

   In order to transmit opening and closing rounds, the 678 must receive signals when the control panel is armed and disarmed. These signals are available directly from the No. 1023 Alarm Processing Center or Nos. 1022, 1024, 1026 and 1028 Alarm Processing Centers when used with the No. 688 Opening/Closing Switching Module. The signal may be applied to the 678 when the control is armed and removed when the control is disarmed, or vice versa.

   With the standard Ademco or SESCOA format, an Open/Close Channel will report the subscriber identification (the 3 last digits of the 4 digit identification code contained in the PROM) followed by the number of the channel when an input is applied to the channel.

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When the input is removed, 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. 678 will report:

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

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 (alarm) 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 678 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 678 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 fire, holdup, burglary, etc. This channel option takes precedence over the system options of "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 (restored). 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

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further that a <u>code 4</u> is wanted for closing (input going low) and code 5 for opening (input going high). Simply tie the inputs of channels 4 and 5 together and then to 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. <u>Note:</u> 16 sec delay, if selected, will apply when signal is removed from the inverted channel.

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

<u>The "Kiss-off" (Ring-Back) Feature</u> 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.

INSTALLATION PROCEDURE:

Mounting:

The 678 may be mounted in a No. 205 Cabinet or any other enclosure that will accommodate it. See GENERAL INFORMATION.

<u>If a No. 205 Cabinet is to be used,</u> mount the cabinet in its desired location and install the communicator chassis in it. Use the upper set of grooves provided at the side edges of the cabinet and secure the chassis with a sheet metal screw through the upper hole in the cabinet's right edge.

SHEET METAL SCREW

ALARM PROCESSING CENTER PC BOARD AND COVER.

COMMUNICATOR CHASSIS MAY BE INSTALLED HERE (INSTALL PROM FIRST) OR HERE

SHEET METAL SCREW

*MOUNTING GROOVES PROVIDED IN CABINET

*EARLY PRODUCTION CABINETS DO NOT HAVE MOUNTING GROOVES OR SCREW HOLES. USE DOUBLE SIDED TAPE TO SECURE CHASSIS.
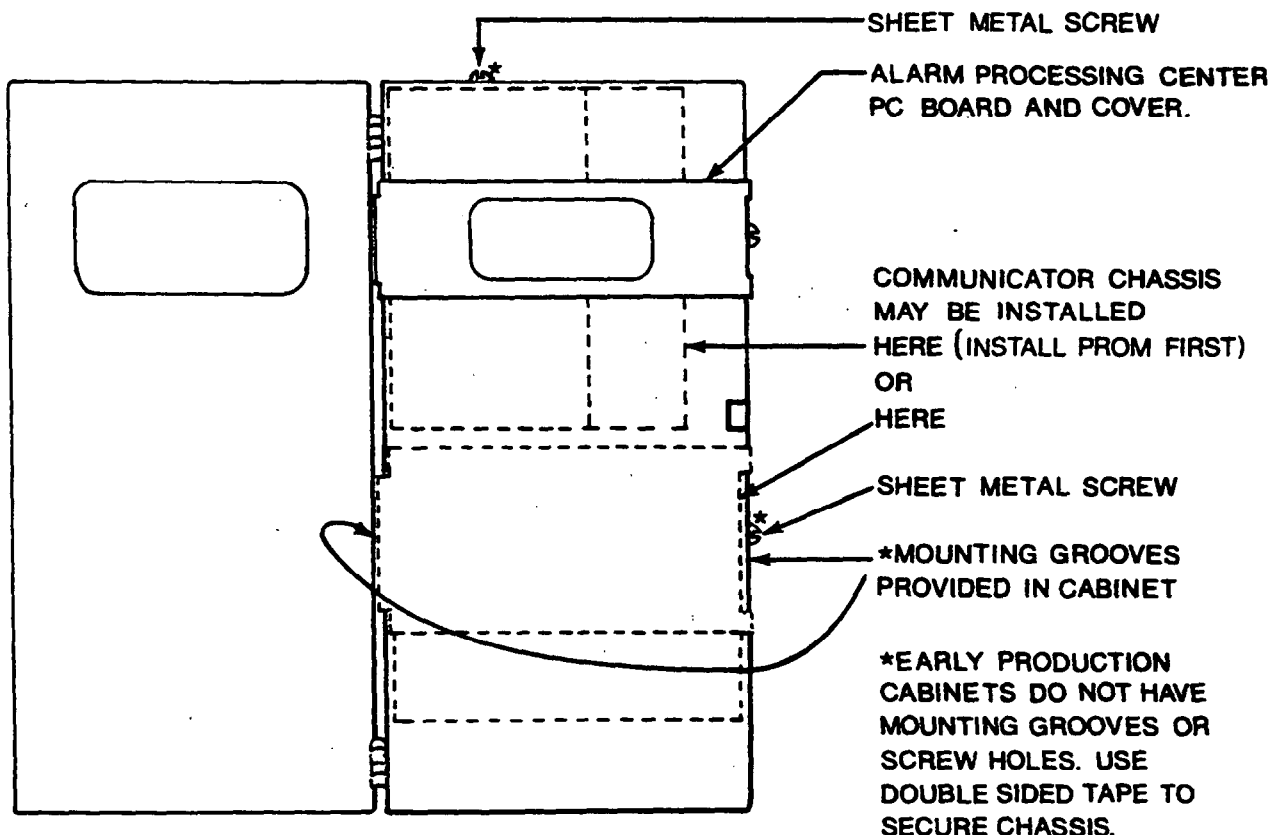
Diagram1 : INSTALLATION OF COMMUNICATOR CHASSIS IN ALARM PROCESSING CENTER. (eg: No. 1023,1024)

*REMAINING CONNECTIONS FOR ACCESSORIES ARE AS SHOWN IN INSTRUCTIONS THAT ACCOMPANY THEM

POSTS FOR ACCESSORIES

POST	DESIGNATION	TYPICAL USE
A	GROUND START	No. 675: BLUE LEAD
B	ALTERNATE TEL. LINE	No. 674: WHITE LEAD
C(−) D(+)	REMOTE KISSOFF INDICATORS	SEE DIAGRAM
E	SWITCHED(+)POWER	No. 674: GRAY LEAD No. 675: VIOLET LEAD No. 676: VIOLET LEAD
G	SIGNAL	No. 675: BROWN LEAD

TELEPHONE LINE CONNECTION
PLUG INTO JACK (USOC No. RJ31X OR RJ38X) FURNISHED AND INSTALLED BY TELEPHONE CO.

No. 620 DIRECT CONNECT CORD

PLUG

No. 678

HANDSETS

INCOMING LINE

FUSE, 1A (No. 90-14)

WHITE JUMPER (CUT IF USING 12V POWER SOURCE)

YELLOW BLACK BLUE ORANGE

NOT USED

BROWN GRAY RED GREEN

① ② ③ ④

RED

RED

FOR OPTIONAL TAMPERED CONNECTION (SEE No. 620's INSTRUCTIONS)

SURGE ARRESTORS (MAKE SURE RED LEADS ARE CONNECTED AS SHOWN)

COLD WATER PIPE GROUND

GREEN

SEE TABLE ABOVE

G

A B

KISSOFF LED

ACTIVATION LED

PROM CHIP, PRE-PROGRAMMED. (SHADED CORNER MUST BE ORIENTED AS SHOWN)

No. 691 PROM

C D

(−)V TRIGGERING INPUTS FOR ANY OR ALL CHANNELS (IF NEEDED)

E

(+)V TRIGGERING INPUTS FOR CHANNELS INDICATED

+V OUTPUTS ┌─TESTING─┐ (−) 1 2 3 4 5 6 7 8 (−)

⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪ ⑫ ⑬ ⑭ ⑮ ⑯ ⑰ ⑱ ⑲

BLACK RED

BLACK WHITE RED

OPTIONAL No. 664 DIGITAL COMMUNICATOR TESTER (WITH LED)

or OPTIONAL N.O. MOMENTARY TEST SWITCH

ORANGE

TO POST "C" (−)

TO POST "D" (+)

WHITE

WHITE RED

OPTIONAL No. 8261 REMOTE KISSOFF BUZZER

OPTIONAL REMOTE KISSOFF LED

TO +V INPUT TERMINAL FOR DESIRED CHANNEL

(−) VOLTAGE
(+) TRIGGERING

6-12V. DC FROM BELL TERM. OF CONTROL or OPEN/CLOSING SIGNAL (VIA No. 688) FROM A P C

DRY CONTACT TRIGGERING

N.O. FOR TRIGGERING UPON CONTACT CLOSURE

N.C. FOR TRIGGERING UPON CONTACT OPENING (NOTE: Channel must be programmed for inverted operation)

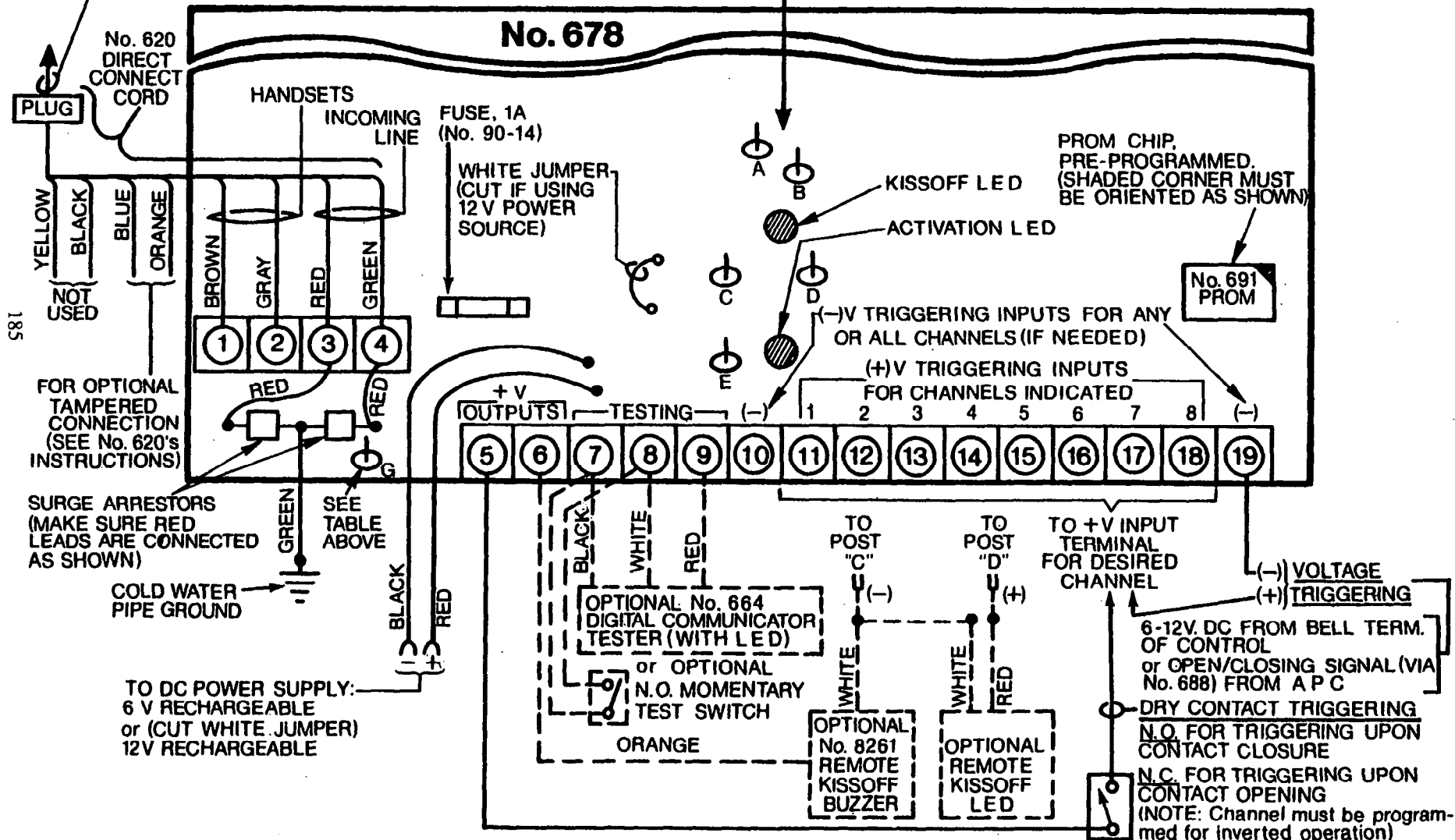TO DC POWER SUPPLY: 6 V RECHARGEABLE or (CUT WHITE JUMPER) 12V RECHARGEABLE

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Diagram 2: FIELD CONNECTIONS for No. 678

Current models of the Nos. 1023 and 1024 are provided with extra mounting grooves and hole at the sides of their cabinet to accommodate the communicator chassis. In addition, a small hole is provided in the top of these cabinets to enable the communicator chassis to be mounted vertically <u>behind</u> the alarm processing center's chassis <u>after connecting</u>. (See Diagram 1) Note: In cabinets without mounting grooves, the communicator chassis may be secured in place with double sided tape.

Connections: (See Diagram 2)

1. <u>With the 678 unpowered, plug previously programmed PROM (No. 691 programmed by means of a No. 690 programmer or No. 691P pre-programmed by Ademco) into the socket provided.</u> See Diagram 2. Care should be taken to orient it properly and avoid bending any pins. For best results, use Ademco No. 692 I.C. Insertion Tool. To remove a PROM, insert small screwdriver and carefully pry up.

2. <u>Connect the BLACK flying lead to the negative power supply terminal.</u>

3. <u>(Optional:) Connect a remote "kiss-off" LED and/or a remote "kiss-off" buzzer, No. 8261 as shown in Diagram 1.</u> Use wires with quick-connect female terminals supplied.

4. <u>(Optional:) Connect a No. 664 test switch or a momentary N.O. test switch.</u> See terminals 7, 8 and 9 in Diagram 2. Note: The test channel should not be used if any alarm channel is selected as Open/Close, since both the test and closing will be reported as a code 9 (standard Ademco or SESCOA).

5. <u>Connect the alarm inputs to the appropriate terminals.</u>
   <u>Notes:</u>　a.　Channel 1 gives alarm code 1, channel 2 gives code 2, etc.
   　　　　b.　If the Low Battery Trigger and Report option has been programmed do not use Channel 8, since "low battery" code is "8".
   　　　　c.　For voltage triggering, two ground (-) positions are provided on the terminal block if needed.
   　　　　d.　If one or more channels are to be triggered by dry contacts, terminals 5 and 6 each provide +V dry contact excitation. Each is isolated from power supply positive (+) through a 47 ohm protective resistor. If the remote "kiss-off" buzzer No. 8261 is connected to one of the terminals, it is recommended that dry contact excitation (if required) be obtained from the other one. For triggering by contact <u>closure</u>, use a N.O. contact. For triggering by contact <u>opening</u> use a N.C. contact (the channel must be programmed for inverted operation).

6. <u>Connect the telephone line</u> (and handsets) via a No. 620 Direct Connect Cord as shown in Diagram 2.

7. <u>Apply power to the CONTROL UNIT</u> if it is not already powered.

8. <u>If a 12V. DC power source is to be used</u> with the 678, cut the 678's WHITE jumper as indicated in Diagram 2.

9. <u>Connect the red flying lead of the 678 to the (+) terminal of the 6 or 12 V rechargeable power source.</u> The 678's line seizure and dialing relays will be activated, and the two LED's on the 678 will light. After 8 seconds, both LED's will be out and the dialing and the line seizure relay will have dropped out. The dialer will now have initialized to the alarm status present at the input barrier strip. Any changes in the alarm conditions will be monitored by the 678 and those which require that a call be made will activate the 678.

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10. Test the 678, using the No. 664 test button or N.O. switch (if installed
    ...see Step 4) to transmit a code 9 or by triggering one of the alarm
    channels.

GENERAL SPECIFICATIONS:

Physical: Width: 8"   (20.3 cm)
                 Height: 5 1/2" (14.0 cm)
                 Depth: 1 3/8" (3.5 cm)

                 Note: May be mounted in No. 205 (or other) Cabinet (See GENERAL
                        INFORMATION).

Electrical:

    Power: Rechargeable filtered power source: 6V. DC or (by cutting WHITE
            jumper) 12V. DC. (For additional information, see GENERAL INFORMATION.)
            Note: Power sources with nickel cadmium batteries may not be used.

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

Current Drain: In standby (non-activated):   135 ma

                During call (activated):   260 ma

Transmission Format: Accommodates Ademco (and Silent Knight) receivers as well
            as those of: SESCOA, Franklin or DCI.

Fuse: 1A (Ademco No. 90-14)
        (Protects against incorrect power supply polarity as well as
        excessive current.)

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

ACCESS
┌─(INTERNAL)─┐
NUMBER
(If any,
such as a
"9" for PBX
systems)

MAIN
┌──────(TELEPHONE CO.)──────┐
NUMBER
Fill in: Prefix (usually a "1"
in areas requiring it), Area
Code, Exchange and Line,
as required.

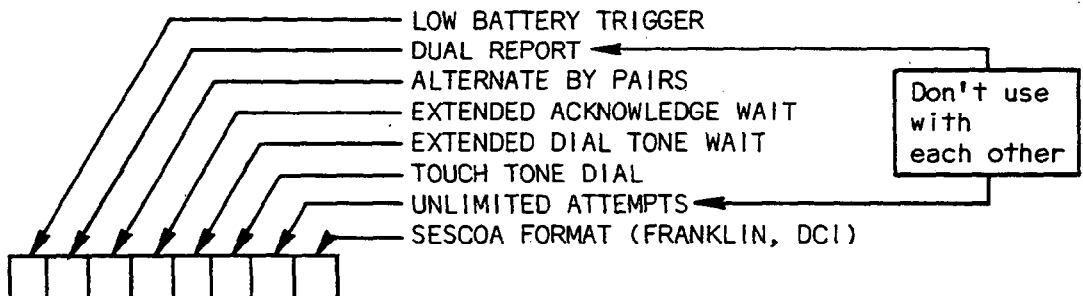1. PRIMARY TELEPHONE NO.:   ┌first   ┌first

2. SECONDARY TELEPHONE NO.:   ┌first   ┌first

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. 660 Receiver (or Silent Knight,
SESCOA, Franklin or DCI), only last 3 digits will be sent. Any digit may be
entered in first space, but select one that will be significant when a
receiver accommodating 4 digits is in use.

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

LOW BATTERY TRIGGER
DUAL REPORT ◄───────────
ALTERNATE BY PAIRS
EXTENDED ACKNOWLEDGE WAIT
EXTENDED DIAL TONE WAIT
TOUCH TONE DIAL
UNLIMITED ATTEMPTS ◄───────
SESCOA FORMAT (FRANKLIN, DCI)

Don't use
with
each other

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

CHANNEL OPTION 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.

Restrict "Open/Close" to single channel.
Do not select both for same channel.

Diagram 3: PROGRAMMING FORM for No. 691 PROM

(used with No. 678 Digital Communicator)

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ADDENDUM TO: INSTALLATION INSTRUCTIONS
                for
                No. 678 DIGITAL COMMUNICATOR

RE: A)   REPORTING FORMATS (LOW SPEED, HIGH SPEED),
      B)   KISS-OFF RING-BACK CAUTION
      C)   PROGRAMMING FORM FOR No. 691 PROM

A) REPORTING FORMATS:

Substitute the following for Step 5 in the "OPERATION" section that begins on
Page 2 of the 8/80 issue of the 678's installation instructions:

5. Upon receipt of the "handshake" (acknowledgment) tone from the receiver, the
   678 will start transmitting its message(s) in LOW SPEED or HIGH SPEED format,
   depending upon the type of acknowledgment tone received (assuming the 678's
   SESCOA option has not been selected) as described below.

   Since faulty phone lines can distort the numbers, the 678 sends each message
   up to 4 times while the receiver compares each message with the one before
   it. As soon as the Receiver detects 2 successive identical messages, it
   considers the transmission "valid" and sends a "kiss-off" code to the
   Communicator.

   If the 678 does not receive the "kiss-off" code(s) by the time it has sent
   its message(s) four times, it hangs up and dials again. Up to a total of
   8 attempts or "Unlimited Attempts", if so programmed, will be made to
   reach the central monitoring station via primary and/or secondary programmed
   telephone numbers. See PROGRAMMING OPTIONS (if the "Dual Report" option is
   selected, the 678 will make up to 8 attempts to reach each telephone number).

ADEMCO LOW SPEED REPORTING FORMAT

Receipt by the 678 of the standard (LOW SPEED) acknowledgment tone from a No. 660
Receiver (or LOW SPEED acknowledgment tone from a No. 685 Digital Alarm Receiver)
will result in LOW SPEED FORMAT transmissions, each consisting of the last 3 digits
of the subscriber identification number and a 1 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 678 will
           respond as follows:

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

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.

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Receipt by the 678 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 I digit defining the status of the ninth (test, low battery) channel.

Note: If the 678 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. 678'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:

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

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

7	NORMAL (no event)
8	NEW LOW 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 LOW BATTERY or TEST will trigger the 678, 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.

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

```
              Subscriber                    Channel Number
              Identification            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.

```
              Subscriber                    Channel Number
              Identification            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:

```
              Subscriber                    Channel Number
              Identification            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, a new alarm on channel 5 and a restore on channel 6:

```
              Subscriber                    Channel Number
              Identification            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.

```
              Subscriber                    Channel Number
              Identification            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, low 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 low 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].

CAUTION: A No. 685 Digital Alarm Receiver, when equipped with a No. 685-2 Line Card for Ademco High/Low Speed Format, has the capability of sending either high or low speed acknowledge signals when called; therefore, it is possible (with certain telephone line problems) for a No. 678 to reply to a receiver in either HIGH or LOW SPEED format. It is recommended that when the number of subscribers on one telco rotary exceeds 999, the high/low speed line cards be converted to high speed only by cutting the appropriate jumper on the No. 685-2's circuit board (see the No. 685's installation instructions).

SESCOA REPORTING FORMAT

When this option is selected (see PROGRAMMING OPTIONS section) the 678 will respond to SESCOA/Franklin/DCI acknowledge and acknowledge-hold signals in SESCOA format. Ademco HIGH SPEED format response is not possible when the SESCOA format has been selected.

B) KISS-OFF RING-BACK CAUTION:

Add the following to the paragraph on Page 6 of the instructions that describes the Kiss-off Ring-back Feature:

> 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.

C) PROGRAMMING FORM FOR No. 691 PROM:

Make the following changes to the programming form shown in Diagram 3 on Page 10 of the instructions:

Step 3:   At the end of this step's instructions, add: (such as a No. 685).

Step 5:   Change the note pointing to channel 8 to read: Do not use channel 8 if "Low Battery Trigger" System Option is selected unless HIGH SPEED reporting format is to be used.

Change the first note pointing to the OPEN/CLOSE option to read: Restrict "Open/Close" to single channel unless HIGH SPEED reporting format is used.

ADDENDUM TO: <u>INSTALLATION INSTRUCTIONS</u>
for
<u>No. 678 DIGITAL COMMUNICATOR</u>

RE: <u>IMPROVEMENTS IN LATE PRODUCTION</u>

The following improvements have been incorporated in current production
of the No. 678 Digital Communicator:

    1. <u>Reduced current drain:</u>

        Standby: 70 ma
        Activated: 200 ma

    2. <u>Can be powered from UNFILTERED, full wave rectified 6V. DC source,</u>
        providing that there is no power transfer relay in source (trans-
        fer must be accomplished without interruption). <u>Note:</u> 12V. DC
        power if used, must still be from rechargeable and filtered
        source.

        Triggering may be accomplished by application or removal of
        6 to 12V. DC (battery or <u>filtered</u> full wave rectified) or via
        dry contact opening or closure.

Accordingly, the following changes should be made in the accompanying copy
of the No. 678's installation instructions:

A. <u>Under GENERAL INFORMATION, substitute the following for the fourth and
fifth paragraphs:</u>

    The No. 678 may be <u>powered</u> from an <u>unfiltered</u> full wave rectified 6V. DC
    (as described in GENERAL SPECIFICATIONS) or filtered 12V. DC rechargeable
    source. <u>Caution:</u> The Nos. 89 and 89-12 Energy Packs may <u>not</u> be
    used, nor may sources containing Ni-Cad batteries (such as the Nos. 96,
    97 or 497) that cannot supply at least 70 ma continuously. A common
    power supply from a control panel can be used, even with bells connected
    to the control (No. 1026 or 1028 Series Alarm Processing Centers may
    <u>not</u> be used as they contain Ni-Cad batteries such as those precluded
    above).

    The No. 678 may be triggered by 1) Application (or removal) of 6-12V.
    DC (battery or filtered full wave rectified) from an alarm control or
    other source, 2) Dry contact closure, 3) Dry contact opening. The 678
    may not be triggered from an <u>unfiltered</u> rectified source.

B. <u>Under GENERAL SPECIFICATIONS, change the Power, Activating Inputs (Trig-
gering) and Current Drain paragraphs to read as follows:</u>

    <u>Power:</u> 6V. DC, full wave rectified source. May be <u>unfiltered</u>, providing
             that there is no power transfer relay in the source (transfer
             must be accomplished by the source without interruption).

             or

             12V. DC rechargeable <u>filtered</u> power source (WHITE jumper
             must be cut).

             Power sources with nickel cadmium batteries may not be used,
             unless they can provide at least 70 ma continuously. For
             additional information see GENERAL INFORMATION.

<u>Activating Inputs (Triggering):</u> Application (or removal) of 6 to 12V. DC
(battery or <u>filtered</u> full wave rectified) or via dry contacts (N.O. or N.C.).

<u>Current Drain:</u> Standby (non-activated): 70 ma
               During call (activated): 200 ma

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