AES•7050-*E*

RF SUBSCRIBER UNIT
VERSION 2
INSTALLATION & OPERATION MANUAL

AES·IntelliNet

c (UL) us
LISTED
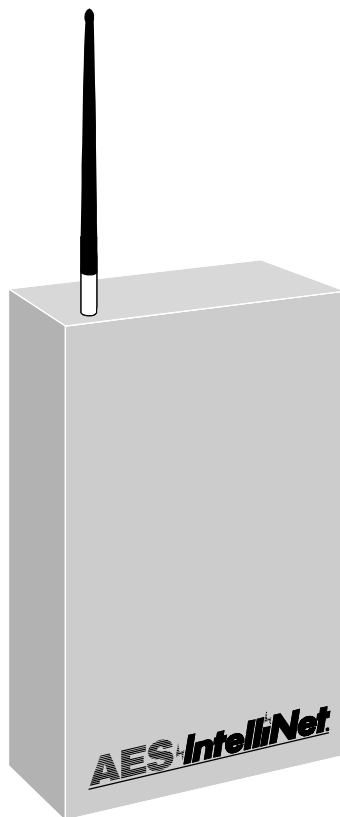
AES·IntelliNet®

AES Corporation
285 Newbury Street • Peabody, Massachusetts 01960-1315 USA
Tel 978-535-7310 • Fax 978-535-7313
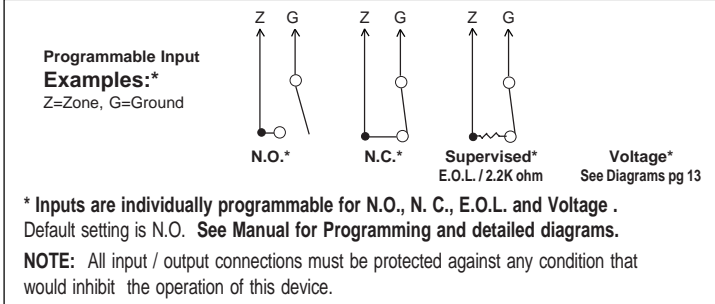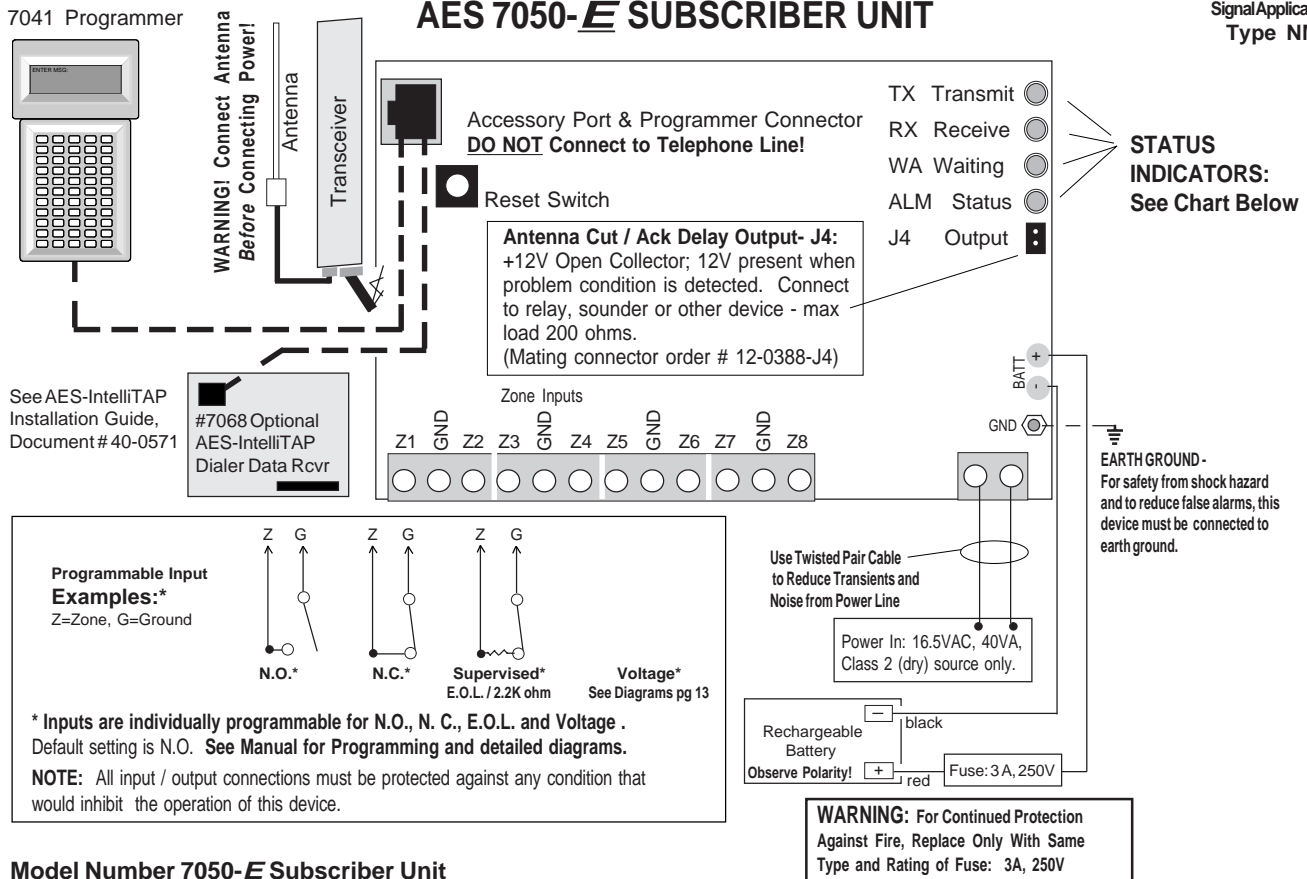Copyright 1996 - 2001 *All Rights Reserved*   *Formally 40-0550eB*

Table of Contents

Wiring and Parts Location Diagram

c(UL)us
LISTED
Signal Appliance
Type NM

AES 7050- *E* SUBSCRIBER UNIT

7041 Programmer

ENTER MSG:

Antenna

Transceiver

WARNING! Connect Antenna *Before* Connecting Power!

Accessory Port & Programmer Connector
DO NOT Connect to Telephone Line!

Reset Switch

Antenna Cut / Ack Delay Output- J4:
+12V Open Collector; 12V present when problem condition is detected. Connect to relay, sounder or other device - max load 200 ohms.
(Mating connector order # 12-0388-J4)

See AES-IntelliTAP Installation Guide, Document # 40-0571

#7068 Optional AES-IntelliTAP Dialer Data Rcvr

Zone Inputs

Z1 GND Z2   Z3 GND Z4   Z5 GND Z6   Z7 GND Z8

TX Transmit
RX Receive
WA Waiting
ALM Status
J4 Output

STATUS INDICATORS: See Chart Below

BATT +
  -
GND

EARTH GROUND -
For safety from shock hazard and to reduce false alarms, this device must be connected to earth ground.

Programmable Input Examples:*
Z=Zone, G=Ground

Z G   Z G   Z G

N.O.*   **N.C.***   **Supervised*** E.O.L. / 2.2K ohm   **Voltage*** See Diagrams pg 13

***Inputs are individually programmable for N.O., N. C., E.O.L. and Voltage .**
Default setting is N.O. **See Manual for Programming and detailed diagrams.**

NOTE: All input / output connections must be protected against any condition that would inhibit the operation of this device.

Use Twisted Pair Cable to Reduce Transients and Noise from Power Line

Power In: 16.5VAC, 40VA, Class 2 (dry) source only.

Rechargeable Battery **Observe Polarity!**
black
red
Fuse: 3 A, 250V

WARNING: For Continued Protection Against Fire, Replace Only With Same Type and Rating of Fuse: 3A, 250V

Model Number 7050-*E* Subscriber Unit
Electrical Input Rating: 16.5VAC 40VA
DC Current Draw: 175ma standby, 1.2A transmit
Onboard Fuse: Self Resetting / Not User Serviceable
In-Line Battery Fuse: 3A, 250V
Rechargeable Battery Req: 12V, 4 to 7 AH;
Low battery condition is reported to the central station.

All Zones and Outputs are Power Limited.
All power limited wiring must be kept separate from non-power limited wiring (120V, 60Hz.; Battery Wires). Maintain a minimum of 0.25 inch spacing separation at all times.

STATUS INDICATORS:
LED's on upper right edge of the board

ALM WA RX TX

TX Transmit
RX Receive
WA Waiting
ALM Status

TX - indicates radio transmit

RX - indicates radio receive (includes any radio on activity on this frequency)

WA - Steady On = Waiting for acknowledgment of last transmission;
- Steady Blinking = Not on Network;
- Off = Normal

AL - Alert / troubleshooting indicator, "blink" codes as follows:
"**•**" = short, "**—**" = long

•	•	•	steady blink - system OK;
• •	• •	• •	short-short blink - low battery;
• —	• —	• —	short-long blink - an input zone is in alarm or trouble;
• • —	• • —	• • —	short-short-long blink, low batt & zone in alarm/trouble;
• • •	• • •	• • •	short-pause-short-short, AC fault
• • • •	• • • •	• • • •	short-short-pause-short-short, AC fault & low batt
————			steady / no blink - Self test failure (excl low batt)

See page 7 for explanation of status light activity for a typical start up sequence.

Overview

AES 7050-*E* Subscriber Unit

7050-*E* Subscriber Unit

The AES "smart" subscriber unit is both a transceiver and a repeater. The *"E"* version includes several *E*nhancements
• Built In Power Supply
• 8 Programmable Zone Inputs - N.O./N.C./E.O.L./Voltage/Open Collector
• Auxiliary Inputs for future expansions - FDX and IntelliTAP technologies
• AC Fail and Low Battery Reporting
• Antenna Cut/Failure Detection and Annunciation

What's Different?
7050 VS 7050-*E*

Both the standard 7050 and the Enhanced 7050-E are "smart" transceiver / repeaters. Both types work in any AES-IntelliNet system. The 7050-E includes many "built-in" enhancements for easy installation, and can report on 8 discrete zones, plus FDX and IntelliTAP data. While the standard 7050 has fewer "built-in" features, is more expandable, with up to 72 zone inputs and 64 relay outputs. The 7050-E does not offer relay outputs or added zones.

Power Requirements:

12VDC, 175ma standby, 1.2A transmit.
16.5 VAC, 40 VA Class II transformer is required. **Input must be fused. Do Not Plug Transformer into a switched wall outlet.**

Back Up Battery:

A backup battery is required; A 12V, 4 to 7 AH lead acid gel type is required.

Inputs/Zones:

8 inputs, N.O., N.C., E.O.L. or voltage (4-30V), individually programmable. When the input senses an alarm, the zone number and unit ID are reported to the central station. The default setting is E.O.L. on all zones (see "Programming"). The zone trigger time is adjustable using the NET7000 central station software; default time is 100ms. **Lowest zones are reported first.**

Antenna Cut /
Acknowledgment Delay
Output - J4
(see illus pg 3)

Any delay caused by a communications problem or an antenna cut, is annunciated by a 12V signal output at the pins at J4. Use this voltage to activate a relay, sounder or other device to signal the problem. Maximum load is 200 ohms.

Zone Restorals:

Specific zones can be programmed to report "restorals" - when a zone in alarm is restored to a non-alarm state. The default program does not report zone restorals, but this function can be programmed for individual zones

Programming:

Use the 7041 handheld programmer, or use Net7K version 1.45 or later.
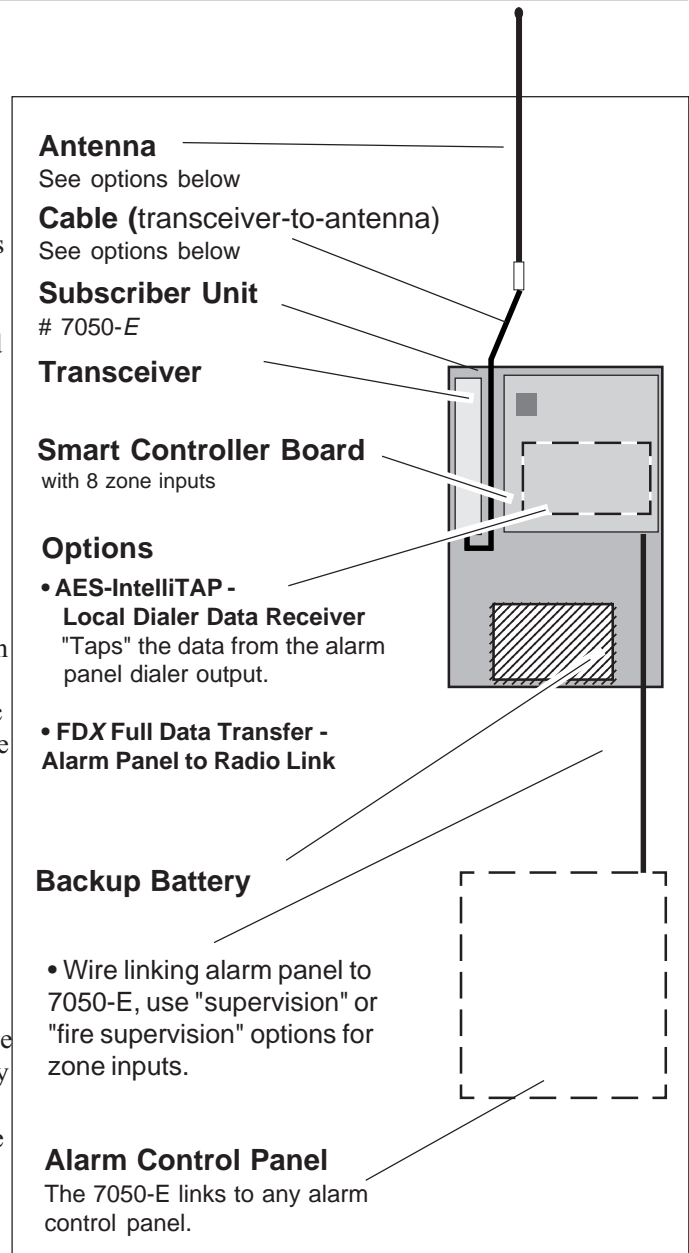
Physical Installation

SUBSCRIBER UNIT

Choose a secure, dry location for the subscriber unit. The unit must be in a climate controlled area, avoiding extremes of heat or cold. Attach to a suitable, strong surface using proper fasteners. Pre-cut "knockout" holes are provided on the back and sides of the case for wiring access - After the subscriber unit is mounted, install the radio transceiver. For burglar applications, the unit should be located away from the alarm control panel - hidden if possible - and must be within the protected area. If an intruder attacks the control panel, the transceiver will still be able to send a signal.

ANTENNA

The antenna should be mounted in a location near the transceiver to minimize signal loss due to cable length. Also, the antenna should be located as high as possible, on or in the structure, with attics and rooftops locations preferred (Subscriber Unit must not be located in the attic as extremes of temperature can affect performance.) The antenna must be grounded properly to prevent lightning damage in accordance with building codes. To protect against attack for burglary applications, the antenna and cable must be within the secured area.

Antenna Location is Important - In many cases, the 2.5db case-mounted antenna (#7210-3-UR/C, below) is adequate. Otherwise, use a separate antenna positioned as high as possible and away from metal: some structures are insulated or sided with metal foil-backed materials, or may contain a lot of metal reinforcement inside the walls. This causes significant radio signal loss. In such cases, choose a location outdoors (inaccessible to intruders for burglary uses), in the attic (assuming that the roof has no foil) or near a window. Position the antenna away from metallic surfaces of any kind. The antenna must be mounted in a vertical position for best performance.

Antenna
See options below

Cable (transceiver-to-antenna)
See options below

Subscriber Unit
7050-*E*

Transceiver

Smart Controller Board
with 8 zone inputs

Options
• **AES-IntelliTAP -**
  Local Dialer Data Receiver
  "Taps" the data from the alarm panel dialer output.

• **FD*X* Full Data Transfer -**
  Alarm Panel to Radio Link

Backup Battery

• Wire linking alarm panel to 7050-E, use "supervision" or "fire supervision" options for zone inputs.

Alarm Control Panel
The 7050-E links to any alarm control panel.

ANTENNA OPTIONS (460-470 MHz)

• **2.5 db Antenna & Cable** - mounts on Subscriber Unit case, **order p/n 7210-3-UR/C**

• **3 db Stealth Antenna & Cable** - mounts in attics, vents, walls, behind drapes **order p/n 7211**

• **5 db Antenna*** - steel mast, in/outdoor, with mount, 3 ft, **p/n 7210-5-UM**

• **6 db High Gain*** - fiberglass mast, in/outdoor, with mount, 4.5 ft, **p/n 7210-6-UC**

• **7 db High Gain*** - fiberglass mast, in/outdoor, with mount, 6 ft, **p/n 7210-7-US**

• **9 db High Gain*** - fiberglass mast, in/outdoor, with mount, 8 ft, **p/n 7210-9-UC**

*=requires cable, see below:

CABLES, BNC/N, for all AES Subscriber Units, hi performance, low loss for -UM, -UC and -US antennas. Cables and connectors are pre-assembled and tested.

• **10 Ft Cable, p/n 7220-10-N**

• **25 Ft Cable, p/n 7220-25-N**

Power Up, Initial Programming

NOTE: When a subscriber unit is powered up, it immediately enrolls itself on the network, generating signals to the central station. Central station operators must be forewarned of activity on this account to avoid the chance of false alarm.

Connect handheld programmer to the controller board (see diagram, page 3). Note that all AES subscriber units use the same programmer, but there are two types of connector/cable assemblies. The 7050-E uses the type with the 6 pin modular telephone type plug at both ends. Either type is available from AES.

Connect power to the unit: 12V, 4AH (or larger) battery to battery terminals. Then, with the transformer NOT plugged in, connect the output of a 16-18VAC, 30-40 VA class II transformer to the power input terminals. Plug in power to the power input (see page 3). Be certain that the transformer is connected to an outlet that is NOT controlled by a switch.

After power is connected, **push Reset Button.**

> The controller runs a "self test". After a few seconds, a message appears on the handheld programmer:

```
SELFTEST-PASS
SUB [rev#]  7050E
ID#: [4 digit ID number] (C)[YEAR] AES
```

> If the message reads SELFTEST - PASS, you may proceed to the "Programming the Subscriber Unit" section. Note that the current ID# for this unit is displayed, as well as the software version and date.

> If the messages reads SELFTEST - FAIL [Error Code], retry the procedure by pushing the controller RESET button (see diagram). Errors reported during the self test may be the result of transient conditions caused during a cold power up or by power interruptions during a programming procedure. Pushing the RESET button clears many of these problems.

> If the Fail message persists, see the list of error messages on following page.

> Repeat the procedure several times if necessary. If the unit consistently fails the self test, it must be serviced.

SELF TEST ERROR MESSAGES: An [Error Code] is listed when the unit fails the self test. Some may be correctable on site. Check battery and power inputs. Check that all IC's are seated properly in their sockets - chips may come loose in shipment.

Message: **01   Battery / power input is low.**
Procedure: Push RESET button, see if unit will pass self test; If the unit fails and reports the same message, replace battery and/or check main power voltage.

Message: **02   Random Access Memory (RAM) Checksum failure;** may be caused by initial power up, or by power interruption during a programming procedure.
Procedure: Push RESET button, check if unit will pass self test; If unit passes, please note that it must now be reprogrammed (see next section). If unit fails, memory may be damaged and require service.

Message: **03   Self test detects both problems 01 and 02 above.**
Procedure: Follow procedures described in 01 and 02 above.

Message: **04 or 06, EEPROM Failure**
Procedure: Push RESET button. If the unit fails and reports the same message, EEPROM chip may be bad. Push RESET button: if unit passes, please note that it must now be reprogrammed (see next section). If unit fails, memory may be damaged and require service.
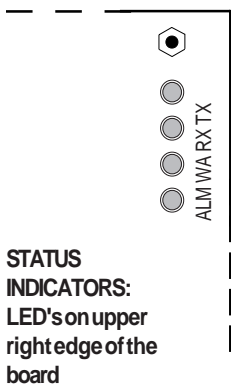
Message: **08, Analog Digital Converter / ADC Failure**
Procedure: Same as 04 / 06 failure, see above

Message: **80   Loopback Test Failure,** common on initial power up
Procedure: Push RESET button, unit will likely pass self test; If the unit fails repeatedly and consistently reports the same message, contact factory for service.

Message: **100   AC Not Present**
Procedure: Check AC power input, transformer

Other Messages: Unit requires AES authorized servicing. Report error code to AES service rep.

IMPORTANT! STATUS INDICATORS - A Key Source of Information

TX - indicates radio transmit

RX - indicates radio receive (includes any radio on activity on this frequency)

WA - Steady On = Waiting for acknowledgment of last transmission;
  - Steady Blinking = Not on Network;
    - Off = Normal

AL - Alert / troubleshooting indicator, "blink" codes as follows:
"•" = short, "—" = long

•	•	•	steady blink - system OK;
••	••	••	short-short blink - low battery;
•—	•—	•—	short-long blink - an input zone is in alarm or trouble;
• • —	• • —	• • —	short-short-long blink, low batt & zone in alarm/trouble;
• ••	• ••	• ••	short-pause-short-short, AC Fault
•• ••	•• ••	•• ••	short-short-pause-short-short, AC fault & low batt
		—————————	steady / no blink - Selftest failure (excl low batt)

STATUS INDICATORS: LED's on upper right edge of the board

ALM WA RX TX

PROGRAMMING THE SUBSCRIBER UNIT

Having passed the SELFTEST procedure, you are now ready to program the subscriber unit. Previously programmed information is stored in nonvolatile memory, so the settings are not lost during a power down or failure condition.

Overview of Programming Items:

• **THE ID NUMBER** selected for this subscriber unit must be unique, different from all other ID numbers in the system.

• **THE CIPHER** must be the same for all subscriber units and the central station on the network. The cipher serves as a password for units monitored by a specific central station. Thus if more than one AES-IntelliNet network is operating on the same radio frequency, the networks are kept separate by this code.

• **ENABLE REPEATING** function is used to enable or disable the subscriber units ability to relay messages. In general, enter Y/yes for all standard subscriber unit installations. However, mobile units must never use repeating - enter N/no for these applications.

• **CHECK-IN TIME*:** is the interval between supervisory signals to the central station. The allowable range is 1 minute to 24 hours. Use short check-in times ONLY for those installations that require it. Short check-in times create traffic that may slow the network speed.

• **THE REPORT DELAY*:** defines how often a unit can report an additional alarm. This allows the subscriber unit to accumulate multiple alarm events for each report, and assures the orderly flow of information through the network. The range is 0-330 seconds, the default is 10 seconds.

• **ZONE PROGRAMMING*:** allows flexibility to interface with any alarm panel or other input. Choose from Normally Open, Normally Closed or Supervised (using End-of-Line resistors) function for all or individual zones. For the EOL inputs, choose from Supervised, Fire Supervised or Bypass. Other options include reporting of zone input Trouble** and Restoral. Use Restorals ONLY for those installations that require it. Restorals create traffic that may slow the network speed. Also choose to report Restorals (reports return to normal state). Restorals are generally reserved for higher security users, and will create more "air traffic" on the network.

• **ESCAPE/ ABORT FEATURE:** press the ESC escape key on the programmer to abort an operation at any time. NOTE: If you started to enter data and then press Escape, you may lose the data that was stored there. In this event, repeat the programming procedure.

• **TIMEOUT/SAFEGUARD FEATURE:** During programming, you have one minute to complete a function procedure. After one minute passes, the procedure is aborted. The message appears: TIMEOUT.

   *NOTE: Functions noted by a * may be programmed using either the handheld programmer or the AES Net software supplied with the AES 7100/7700 Central Station Controller. It is much easier to use the Net software to program the subscriber units. **If the AES Net7K or Net77 software is used in the system, it is recommended that these functions be programmed using the Net software to enable it's powerful, centralized database capability.**

   **NOTE: Reporting of "Trouble" packets messages may not work with older receivers. Upgrades are available. See page 11 for details

Procedure: SETUP UNIT

The initial unit setup must be done with the handheld programmer.

> NOTE: Entering new data with this function will overwrite (erase) any previously stored information on ID# and Cipher Code. Pushing the ENTER key without entering new data saves the previously stored information. The programmer should be connected and the power should be on.

To start, push Programmer keys **(CTRL)+(F1)**

> Press programmer keys CTRL + F1 (hold down the Control key <u>and</u> then the F1 key). The following message appears:

```
    SETUP  UNIT  -OLD:    NEW          Previously stored "old" data;
    ENTER  ID#-  1234:                 Enter new data here
```

> To keep previously stored ID#, simply push ENTER. To change the ID#, enter the 4 digit identification number for this unit using any hex digit (legal digits = 1234567890ABCDEF), and then push ENTER. **The ID number must be unique, different from all other ID numbers in your system.**

> After entering the ID number, the following message appears:
>
> For security, stored cipher is not shown;

```
    CPHR  CODE--  XXXX:                Enter the correct code here
```

> Unit must be programmed with the cipher code chosen for your network. Enter the 4 digit dealer code as assigned by the system administrator, then push enter.
> **NOTE:** The code must match that of the central station - If the wrong code is used, the unit cannot log on and will not work.
> **NOTE:** DO NOT USE ZERO (0) AS A CIPHER CODE. Zero is used at the factory for test and burn in purposes and should not be used in a live installation.

> After entering the dealer code, the following message appears:

```
    OK
```

NOTE: The "SETUP UNIT" functions are the only functions that must be performed using the handheld programmer. You may complete the programming with the handheld programmer, but it is recommended that you program the remaining functions (timing, zone programming) using the AES Net software. Refer to the Net77/7K manual to complete the programming procedures.

Procedure: Set CHECK-IN TIME and REPORTING DELAY PERIOD

The Check-In Time is the interval at which the subscriber unit sends it's "Check-in" messages to the central station. The range for this feature is 1 minute to 24 hours. For most applications, a check-in interval between 12 and 24 hours is used. More frequent check-ins are used for high security users. Note that shorter intervals create more check-in and create more network traffic.

The Reporting Delay period limits the rate at which alarms are reported from this unit. The default value is 10 seconds, the range is 0 to 330 seconds. This function allows the unit accumulate alarm data between transmissions for optimum system performance.

The programmer should be connected to J1 programmer port and the power should be on.

To start, push Programmer keys (CTRL)+(F2)

Press programmer keys CTRL + F2 (hold down the Control <u>and</u> the F2 keys at the same time). The following message appears:

```
CHKIN TIME--OLD: NEW
ENTER HRS----HH: __    [0-24]
```
[0-24] (HH = Previously programmed hours)

Enter a number between 0 and 24, and push ENTER.
When data is entered in HRS field, then minutes field appears (otherwise MINS does not appear)

```
ENTER MINS---MM: __    [1-59]
```
[1-59] (MM = Previously programmed hours)

Enter the number of minutes, a number between 0 and 59, and push ENTER.

```
NTR RPT DLY-NNN: ____  [0-330]
```
[0-330] [seconds] (NNN= Previously programmed Delay)

Enter a number of seconds to allow between reporting of alarms; the range is 0 to 330; the default is 10 seconds.

If data has been entered correctly, the following message appears:

```
OK
```

NOTES ON SELECTING A CHECK IN TIME:
• **Choose a check-in time in accordance with the security requirements of the installation**
• Except for high security applications, a check in time of 24 hours is typical.
 The more frequent the check in times are set, the more traffic there is on the network.
 Excessive traffic can cause delays in communications, and thus frequent check in times should be
 used only for highest security applications.
• Do not use a check in time of greater than 24 hours, 00 minutes.

Zone Input Programming Overview

Note: When possible, zone inputs should be programmed "over the air" using Net7K or Net77 Network Manager Program at the central station. Zones *can* be programmed set up using the handheld programmer, but it is easier to use the AES software for this task. Further, the subscriber data programmed using Net software is stored in the central station database.

INPUT TYPES:
- **N.O. / Normally Open**
- **N.C. / Normally Closed**
- **E.O.L. / Supervised, using end-of-line resistors (default)**
- **Open Collector, Voltage**
- **Fire E.O.L. / Supervised (reports trouble on open)**
- **Inverted Fire E.O.L. / Supervised (reports trouble on closed)**
- **Bypassed**

The zone inputs can be programmed to match the output of the equipment being monitored by the 7050-E subscriber unit. The default setting is E.O.L.

NOTE: For voltage inputs, the subscriber unit and input device must share a common (-) ground. See diagrams in the next several pages for details.

ZONE RESTORALS: Each zone can be programmed to report "restoral" to a non-alarm status. Restoral reporting is usually reserved for higher security users, as it adds radio traffic to the system. Enable the zone restorals only when needed. The default setting is No Restorals Reported.

Zone Reporting Chart

Zone Program:	Normally **O**pen	Normally **C**losed	**S**upervised E.O.L.	**F**ire E.O.L.**	**I**nverted Fire E.O.L.**
Zone Program:	O	C	S	F	I
Input State:	*Zone Status:*				
Open	N	A	A	T	A
Resistor - 2.2K	X	X	N	N	N
Closed/Short	A	N	A	A	T

N=Normal
A=Alarm
T=Trouble**
X=Don't Use

Zone Program Entry (Use handheld programmer, CTRL+F3):

C = Normally **C**losed - Closed=Normal / Open=Alarm

O = Normally **O**pen - Open=Normal / Closed=Alarm

S = **S**upervised - EOL Resistor; 2.2K ohm = Normal / Open = Alarm / Short = Alarm

F = **F**ire - Open - EOL Resistor; 2.2K ohm = Normal / Open = Trouble** / Short = Alarm

I = **I**nverted Fire - EOL Resistor; 2.2K ohm = Normal / Open = Alarm / Short = Trouble**

**Notes on Central Receiver Compatibility with 7050-E Version 2

When zones are programmed Y/yes for "Fire" or "Inverted Fire", the unit generates a new packet type for reporting "Trouble". This type of packet may not be recognized by older receiving systems.

The 7050-*E* Subscriber Unit (Ver. 2) is fully compatible with:

• 7000 Series receivers Version 1.70 and later. If your 7000 Series receiver is pre-1.70, we recommend an upgrade to the current 2.0.

• All 7703 Receivers • All 7003 Receivers

• 7700 Receiving Systems with Net77 Version 148.3 or later.

TEST YOUR SYSTEM. Early version equipment may not recognize the "Trouble" signals.

Check with the central station manager. Older versions should be upgraded to the current version. Contact AES Corporation or details.

NOTE: All input / output connections must be protected against any condition that would inhibit the operation of this device.

Procedure: ZONE PROGRAMMING

Use Handheld Programmer:
Press programmer keys CTRL + F3. The following message appears:

```
SUPERVISE--OLD:  NEW
FIRE---------Y:   .
```

The programming sequence first asks if any "Fire" inputs are used. Answer Y/yes if you wish to have the panel report "Trouble" conditions. Otherwise answer N/no (refer to chart below). The current programming is shown under the "OLD:" If you wish to change the setting, enter Y or N. To leave unchanged, simply push ENTER. Next appears:

```
INVERT FIRE- N:   .
```

Here you can choose to reverse the logic for the fire input (refer to chart below). The current programming is displayed. To change the setting enter Y or N. To leave unchanged, push ENTER. Next appears:

```
ZONE BANK 0
SET ZONE (BOCSFI) B0
OLD 00000000  LOW>HI
NEW ........
```

Having chosen the Fire parameters, each zone can now be programmed. The valid programming options are shown in parentheses. The options that appear are determined by your input to the Fire/Inverted Fire Section above. The current programming is shown next to the word OLD, Zones 1-8 in order left to right. Your new entries will appear directly below next to the word NEW. You must enter a valid letter for each of the 8 zones. Zones Triggers 1-8 can be set for:

O - Normally Open; (alarm on short)
C - Normally Closed; (alarm on open)
S - Supervised/E.O.L. (alarm on open or short);
F - Fire Supervised E.O.L. (alarm on short, trouble on open) or
I - Inverted Fire E.O.L. (alarm on open, trouble on short).

Next appears:

```
SET RESTORAL (XR) B0
OLD XXXXXXX  LOW>HI
NEW ........
```

You can program individual zones to report restorals - i.e. send a report that the zone has returned to normal status. X= Restorals Not Reported; R=Restorals Reported. The existing or OLD programming is shown for each zone. Your new entries will appear directly below next to the word NEW. You must enter a valid letter X or R for each zone. When all is complete, the OK message appears.

```
OK
```
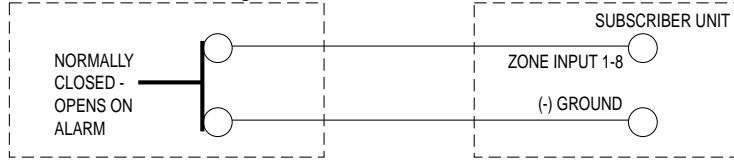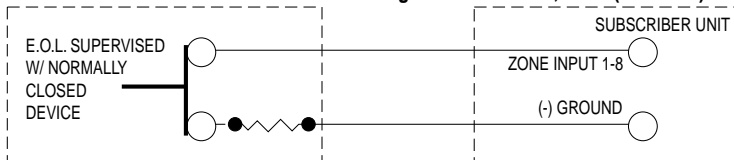
The zones are now programmed.

Zone Wiring Examples
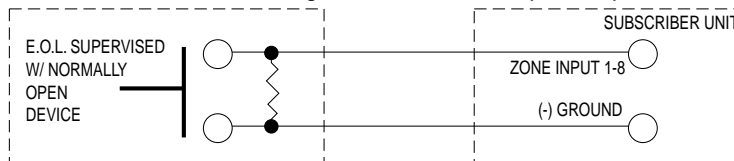
NORMALLY OPEN - Program Zone for "O"

NORMALLY OPEN - CLOSES ON ALARM

SUBSCRIBER UNIT

ZONE INPUT 1-8

(-) GROUND
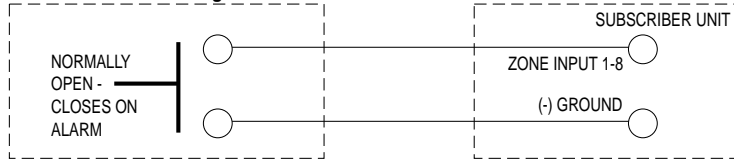
NORMALLY CLOSED - Program Zone for "C"

NORMALLY CLOSED - OPENS ON ALARM

SUBSCRIBER UNIT

ZONE INPUT 1-8

(-) GROUND

E.O.L / SUPERVISED or INVERTED FIRE - Program Zone for "S", or "I" (see chart)

E.O.L. SUPERVISED W/ NORMALLY CLOSED DEVICE

SUBSCRIBER UNIT

ZONE INPUT 1-8

(-) GROUND

E.O.L / SUPERVISED or FIRE - Program Zone for "S", or "F" (see chart)

E.O.L. SUPERVISED W/ NORMALLY OPEN DEVICE

SUBSCRIBER UNIT

ZONE INPUT 1-8

(-) GROUND

OPEN COLLECTOR TYPE DEVICE - PROGRAM FOR "S" / SUPERVISED

COLLECTOR

BASE

EMITTER

2.2K RESISTOR

SUBSCRIBER UNIT

ZONE INPUT 1-8

(-) GROUND
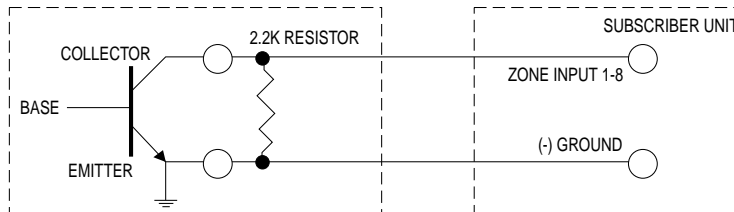
POSITIVE (+) VOLTAGE ON ALARM - PROGRAM FOR "C" / NORMALLY CLOSED

COLLECTOR EMITTER

BASE

1K RESISTOR

SUBSCRIBER UNIT

ZONE INPUT 1-8

(-) GROUND
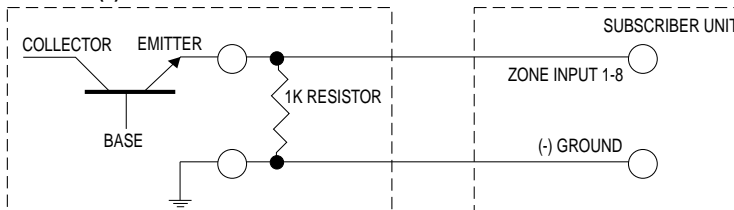
NEGATIVE (-) VOLTAGE ON ALARM - PROGRAM FOR "O" / NORMALLY OPEN

+12VDC (panel ACC out)

1K RESISTOR

COLLECTOR

BASE

EMITTER

SUBSCRIBER UNIT

ZONE INPUT 1-8

(-) GROUND
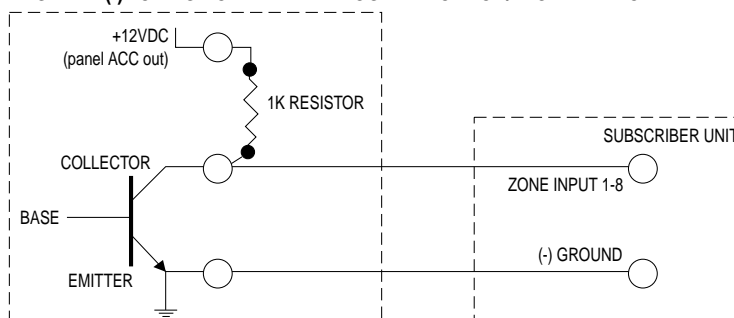
INITIALIZING THE SUBSCRIBER UNIT

Having passed the self test and programmed the unit, you are now ready to introduce it to the radio network. It is assumed that an AES•*IntelliNet* central station is actively monitoring the network and can respond to the new subscriber unit as it comes on line.

Power down the subscriber unit by disconnecting both the battery and power input. Connect the programmer to the subscriber unit (if you have not already done so).

Connect the antenna to the transceiver (if you have not already done so). Do not operate transceiver without the antenna connected!

Connect the controller-to-transceiver cable with 9 pin connector to the radio transceiver.

Connect the battery first, and then the AC primary power. The controller power indicator should be on. The Programmer should be connected as described earlier.

Push the Reset button on the controller board (see diagram page 3).

       At this point, the message on the programmer should read:

```
SELFTEST - PASS
SUB  [rev#]   7050E
ID#: [NNNN]  (C) [date] AES
```

(If a "Fail" error message is displayed, push the reset button. If an error message continues to appear, see page 7 for possible solutions.)

When the subscriber unit goes on the air, it queries the surrounding subscriber units to establish the best route(s) to link with the central station. The status lights indicate the network log on process:

• RX, TX and WA lights will all come on briefly, testing the LED's.
• RX comes on during loop back test (a self test);
• TX comes on sending a "Receiver Not in Service" message - a standard power up event;
• AL + WA will blink at different but steady rates
• TX comes on again as unit transmits a "Request for Reply" from other units
• WA stops flashing after about 30 seconds **IF** one or more other units reply to the "Request",
       (otherwise the WA continues to flash, indicating the unit is not on the network);
• TX comes on again (if WA stops flashing) to send first "Check-In";
• AL blinks at a steady rate, indicating a normal condition.

When the unit receives a valid acknowledgment, the WA light will turn off. This indicates that the new subscriber unit is now connected to the network.

IMPORTANT NOTE: A flashing WA light (blinking at a steady rate) indicates that the subscriber has NOT linked itself into the network. Check antenna and all cables; be sure that correct cipher code has been programmed in to the unit.

       The next step is to perform a status check.

Procedure: STATUS CHECK - SHIFT +F4

Performs a quick diagnostic check.

Connect the programmer to J1 programmer port. Be sure that radio and antenna are connected, and power is on.

Press programmer keys SHIFT+F4 (hold down the Shift key and then press the F4 key). The following message appears:

```
SUB [rev#]     7050E
ID#:[NNNN]   (C)YYYY AES
RT1:NNNN LEVEL: NNN
STAT:NNN NETCON: N
```

EXPLANATION OF STATUS CHECK TERMS

ID#: 4 digit ID number programmed into this unit.

LEVEL: refers to the subscriber unit "level" or "link layer", which tells you how many "hops" the message packet must make to get to the central station. In general, if the number is 1, then this unit is communicating directly with the central station. If the number is 2, the unit relays its message through one other subscriber unit to reach the central station. If the number is 3, the message goes through 2 other subscribers ... and so on. Also, the level number of any subscriber with a weak signal to the unit on the top of its routing list will be incremented by 1. A unit level = 255 indicates that unit is not on network.

RT1: refers to the "first route" or primary route in the routing table. The 4 digit number is the subscriber unit ID of the next hop to the central station. If the unit is communicating directly with the central station , the 1ST RT is 0000 - the central station ID number. If the subscriber is using intermediate units to communicate, the RT1 number is the ID number of first subscriber on the message route. If XXXX appears, the unit is not on the network.

Dynamic Routing Table: Each subscriber unit maintains a list of up to 7 alternate routes. Routes are prioritized according to signal strength and NETCON ratings. This function is dynamic, and is updated constantly.

STAT: Status - shows self-test results (see page 7 for codes).

NETCON: "NETwork CONnectivity". This is an internal rating function used by the subscriber units to align themselves in the network. The scale is 0 to 7, 0 being best. Readings of 5 or 6 are common. Units at the end of the path may show a 7.

Minimum criteria for a "good" repeater are as follows:
1. RF signal exceeds marginal threshold
2. No faults indicated in status (such as low battery)
3. Level/Link Layer of repeater is less than or equal to this unit's
4. Signal received from unit a least once every 6 hours
5. NETCON of repeater is less than 7

OTHER PROGRAMMING FUNCTIONS

DEFAULT RESET   CTRL+F5

The Default (Master) Reset function can be used to reset programmed values to their default settings. **The ID# and Cipher are not changed. Use this function only if you wish to reset all parameters.** Power must be on. Connect the programmer to J1 / programmer port.

Press programmer keys CTRL+F5 (hold down the Control key and then press F5 key). The following message appears:

```
RESET RAM?   <Your Response:>
        (Y) (Enter) for YES, or
        (N) (Enter) for NO
```

If you answer (Y) Yes, all program parameters will be restored to their default values. The subscriber then goes through its normal "reset" routine. The following message appears:

```
SELFTEST - PASS
SUB  [rev#]  7050E
ID# : [4 digit ID number] (C)[date] AES
```

The default reset restores program parameters to their default values:

CHECK IN TIME:	24 Hours 00 Minutes
ZONE INPUT PROGRAMMING:	Supervised, All Zones; NO Restorals Reported, All Zones;
REPORT INTERVAL (DELAY):	10 Seconds
UNIT ID #:	NOT Changed by Default Reset
CIPHER:	NOT Changed by Default Reset
REPEATING:	Enabled
TIME TO LIVE (TTL):	Enabled for Check-Ins only, 30 minutes (All other packets - TTL disabled)

OTHER FUNCTIONS, continued

MONITORING Using the Handheld Programmer

Installers can view network data "traffic" on the handheld programmer at a remote site. It is not a practical way to "read" data (it scrolls off the screen quickly), but it can be useful to see that data is being sent or received. Three monitor functions can be enabled:

RECEIVE MONITOR ON/OFF

PROCEDURE: Push programmer keys **(SHFT)+(F1)**

MESSAGE: `RX MONITOR ON (OFF)`

> Hold down the Shift key and then press the F1 key to enable or disable (toggle) the display of data addressed to <u>this</u> unit.

TRANSMIT MONITOR ON/OFF

PROCEDURE: Push programmer keys **(SHFT)+(F2)**

MESSAGE: `TX MONITOR ON (OFF)`

> Hold down the Shift key and then press the F2 key to enable or disable (toggle) the display of messages transmitted by <u>this</u> unit.

MONITOR ALL ON/OFF

NOTE: Requires that Receive Monitor must be on - Enter (SHFT)+(F1)

PROCEDURE: Push programmer keys **(SHFT)+(F3)**

MESSAGE: `MONITOR ALL ON (OFF)`

> Hold down the Shift key and then press the F3 key to enable or disable (toggle) the display of all network messages within range of this unit.

> The monitor functions should be disabled when installation and testing is complete.

NOTE: Text messages <u>cannot</u> be received when any of the monitoring functions are in use. Use these functions only for test purposes. Toggle the functions OFF when testing is complete, or press Reset Switch (see page 3).

KEY TRANSMITTER - SHFT+F5

This function activates the transmitter for 6 seconds. This allows the installer to use external test equipment (SWR, power meter, etc.) to test the radio power, cables connections, antenna tuning and other radio parameters. It is assumed that the programmer is connected to the subscriber, the transceiver is connected to the subscriber circuit board, power is on and the antenna is connected.

PROCEDURE: Push programmer keys **(SHFT)+(F5)**

MESSAGE: `KEYING TX..`

Activating this function causes the transmitter to go on the air for 6 seconds, and then shut off automatically. Press the ENTER key to cancel the transmit test.

SENDING ASCII TEXT MESSAGE (F5)

Text messages can be sent from the subscriber unit to the central station.

PROCEDURE: Push programmer key **(F5)**

MESSAGE: `ENTER MSG:`
            `_`   [Enter your text message, up to 200 characters. Push ENTER to send.]

   If no data is entered within approximately 60 seconds, the unit will exit the text message mode.
   Note that the unit is unable to transmit or receive while in the "send message" mode.
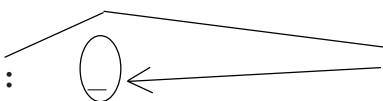
RECEIVING ASCII TEXT MESSAGES

Messages can be sent from the central station to any subscriber unit. If the handheld programmer is connected to the unit, the message will be displayed on the screen and a beep will sound. This is a handy feature for communications between installers and central stations.

NOTE: Text messages cannot be received when a monitor function is in use.

ENABLE REPEATING - CTRL+F4

To start, push Programmer keys **(CTRL)+F4** (hold down the Control key and then the F4 key. The following message appears:

   `ENABLE RPTNG-Y:`   (_) ←   Previously stored data
                                  Enter new data (Y/N) here

   For most installations, enter a "Y" for YES, and then push ENTER.

   This enables the repeating function which is critical to the proper operation of the AES network.

   To disable this unit from forwarding messages, enter "N" for NO, and then push ENTER. Mobile units such as the 7050MMP or the 7550VLS must not be used for repeater functions.

   `OK`

PACKET TIME-TO-LIVE PROGRAMMING - F2

7050-E Ver 2 subscribers include the new "Time-To-Live" or "TTL" function. The TTL function ensures a smooth, continuous flow of data through the AES-IntelliNet system.

Like the Internet, AES-Intellinet is a packet-based technology. The Time-to-Live concept in the Internet is based on the fact that all data has a useful life. This is also true in the security industry. Statistics show that 95+% of all data sent through the AES-Intellinet system are check-in/test timer packets. These messages can be burdensome to both the network and the alarm automation software attached.

The benefits of TTL are best exhibited when the central station goes off line due to a lightning hit or some other unlikely, catastrophic event. While the receiver is off line, messages traveling through the system are stored in the individual subscriber units for later delivery. Under the default TTL settings, unimportant test timer messages are deleted from the subscriber unit memory after 30 minutes of being delayed in the network. Thus, the system will not have to handle the message when the central receiver comes back on line. All other messages, such as alarms, etc. speed there way to the central station as they normally do.

NOTES:

· Even when a check-in packet is deleted due to a delay, the objective of that message has already served: the late or missing signal has been flagged at the central station.

· Under the default (factory) settings, only test timer messages are subject to the TTL function. If you want TTL for other message types, YOU must activate it when you program the subscriber unit (F4 on the handheld programmer).

· The TTL feature works best when the majority of subscribers, or the subscribers that are most heavily used, have the feature in the firmware. Call your AES representative for upgrade information.

To start, push Programmer key **F2**. The following message appears:

```
          PACKET  TIME  TO  LIVE
          CHECK   IN----OLD:NEW                    Previously stored data
          ENTER   HRS----00:..                     Enter new data here
```

Enter new data Hours 0-24, or push ENTER to accept old data. Next appears:

```
          ENTER   MINS---30:..
```

Enter new data Minutes 0-59, or push ENTER to accept old data.
Default time for Check-In Packets is 00 hours, 30 minutes. DO NOT enter a greater than 24 hrs 00 mins.
Entering a time of 00 hours and 00 minutes deactivates the time-to-live function for that packet type.
The shortest allowed TTL time is 00 hours, 10 minutes.
Next appears

```
          STATUS------OLD:NEW            The sequence repeats for
          ENTER   HRS----00:..           other packet types
```

The sequence now repeats for:

• Status Packets   • Alarm Packets   • Trouble / Trouble-Restoral Packets

• Zone Restoral Packets   • AES-*IntelliTAP* Packets   • Special Packets (Vending, etc.)

The default time for the 6 packet types above is 00, i.e. the time-to-live function is deactivated for these packets. Entering anything greater than 00 HRS and 10 MINS will enable the Time-to-Live function.

Press ENTER to accept existing "old" data.

PROGRAMMING THE 7050E UNIT FROM A PC (in place of a handheld terminal)

A cable adapter kit is available from AES to link the 7050-*E* to a computer serial port. Order Part No. 7043.

Communications Parameters: 4800 baud, NO parity, 8 data bits, 1 stop bit,
                              RTS/CTS Flow control OFF

Handheld (HH) Programmer Key equivalents to PC Keyboard:

HH	PC	HH	PC	HH	PC
F1 = CTRL-Q		SHIFT F1 = a		CTRL-F1 = f	
F2 = CTRL-R		SHIFT F2 = b		CTRL-F2 = g	
F3 = CTRL-S		SHIFT F3 = c		CTRL-F3 = h	
F4 = CTRL-T		SHIFT F4 = d		CTRL-F4 = i	
F5 = CTRL-U		SHIFT F5 = e		CTRL-F5 = j	

Remarks:

• When entering Hex numbers, use uppercase, i.e.. "9A" not "9a"

• If possible, set terminal program for "destructive backspace" so that backspace will erase the deleted character from the screen.

• If nothing is sent or received by the 7050-*E,* make sure the program is set to the correct COM port.

• If characters are received by the 7050-*E*, but nothing can be sent, make sure the CTS/RTS flow control is OFF.

ANTENNA CUT / ACKNOWLEDGMENT DELAY OUTPUT (Terminal J4)

The 7050-*E* monitors radio traffic on its frequency. If the channel is "quiet" for more than 4 minutes (as would be the case if the antenna was cut) the 7050-*E* subscriber tests the channel by sending a test message to a unit within its routing table. If that message is not acknowledged within the programmed acknowledgment delay period (default is 2 minutes*), a fault condition exists. This fault is annunciated by a voltage (12V) at the pins on J4 (see diagram, page 3). The voltage can be used to drive a relay, sounder or other device to notify someone of the condition. Maximum load is 200 ohms.

Mating Output Connectors: Order part number 7240 for a pack of 10 mating connectors for the J4 output pins.

*programmed through Net7K or Net77 Central Station Controller Software

7050-*E* SUBSCRIBER UNIT SPECIFICATIONS

SIZE:　　　　13.25"h x 8.5"w x 4.3"d
　　　　　　　34 cm x 21.5 cm x 11 cm

WEIGHT:　　6.4 pounds (2.9 kilograms) (exc battery)

RADIO:　　　Standard Frequency Ranges (others available) 150-174 Mhz. and 450-470 MHz.

　　　　　　　Standard Radio Output Power: 2 Watts (others available)
　　　　　　　All radio systems require FCC licensing;

POWER INPUT: 16.5 VAC, 40 VA, UL listed Class II transformer required

VOLTAGE: 12 VDC nomimal

CURRENT:　　175ma standby; 1.2A transmit (2W transmitter)

OPERATING TEMPERATURE RANGE: 0° to 50° C

STORAGE TEMPERATURE RANGE:　　-10° to 60° C

RELATIVE HUMIDITY RANGE: 0 to 85% RHC, Non Condensing

BACK-UP BATTERY: 12V, 4 AH (min), lead acid gel type; required for all installations

LOW BATTERY REPORTING:　　22.5 Minute Test Cycle (approx)

AC FAILURE REPORTING: Reports to central station after approximately 4 minutes without AC power; reports AC power restoral after approximately 4 minutes of restored power.

ANTENNA CUT / LOCAL REPORTING: Fault is annunciated by a ground (+12V open collector) at pins on J4 on the main circuit board; 200ma max load.

• FCC COMPLIANCE

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

　　Reorient or relocate the receiving antenna;
　　Increase the separation between the equipment and the receiver;
　　Connect the equipment into an outlet on a circuit different from that to which the receiver is connected;
　　Consult the dealer or an experienced radio/TV technician for help.

CAUTION: Changes or modifications to this equipment not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

• CANADIAN COMPLIANCE

This digital apparatus does not exceed the Class B limits for radio noise emissions from digital apparatus as set out in the interference-causing equipment standard entitled "Digital Apparatus", ICES-003 of Industry Canada.

Cet appareil numérique respects les limites de bruits radio électriques applicables aux appareils numériques de Classe B prescrites dans la norme sur le matériel brouilleur: "Appareils Numeriques", NMB-003 édictés par l'Industrie Canada.

WARNING:
• It is unlawful to operate this equipment without a valid FCC radio station license.
• If the antenna or cables connected to this equipment come in contact with electrical power lines, DEATH or SERIOUS INJURY may result.
• Never install the antenna where people may come in contact with it as SERIOUS INJURY may result.
• Test this system periodically for proper operation. AES assumes no responsibility for this equipment's failure to operate. AES's sole responsibility is to repair or replace any AES device found to be defective during the warranty period.

OWNER WARRANTY - AES CORPORATION
LIMITED PRODUCT WARRANTY AND TECHNOLOGY LICENSE

LIMITED PRODUCT WARRANTY:

AES Corporation ("AES") warrants to the original purchaser that each AES Subscriber Product will be free from defects in material and workmanship for three (3) years from date of purchase and all other products purchased from AES including central station receivers and accessories will be warranted for one (1) year from the date of purchase. At no cost to the original purchaser for parts or labor, AES will repair or replace any AES Product or any, part or parts thereof which are judged defective under the terms of this Warranty.

Defective AES Products must be returned to AES directly, provided they are properly packed, postage prepaid. Or exchange may be made through any authorized direct factory representative for any AES Products that are judged defective under the terms of this Warranty. Improper or incorrectly performed maintenance or repair voids this Warranty. This Warranty does not cover replacement parts that are not approved by AES. This Warranty does not apply to any AES Product or any part thereof that has been altered in any way to affect its stability or reliability, or that has been subjected to abuse, misuse, negligence, accident or act of God, or that has had the serial number effaced or removed.

Certain AES *Products* are designed to operate and communicate with other specified AES Products and certain other specified products, systems or networks authorized or approved by AES, as identified in the applicable AES Product instructions. This Warranty does not apply to any AES Product that is used with any unauthorized or unapproved products, systems or networks, or that has been installed, applied or used in any manner, other than in strict accordance with AES instructions.

AES makes no warranty, express or implied, other than what is expressly stated in this Warranty. If the law of your state provides that an implied warranty of merchantability, or an implied warranty of fitness for particular purpose, or any other implied warranty, applies to AES, then any such implied warranty is limited to the duration of this Warranty.

AES cannot be aware of and is not responsible for the differing values of any property to be protected by its alarm reporting systems. This Warranty does not cover and AES shall not be liable for any defect, incidental or consequential, loss or damage arising out of the failure of any AES Product to operate.

Some states do not allow the exclusion or limitation of the durations of implied warranties or the limitation on incidental or consequential damages, so the above limitations or exclusions may not apply to you.

This Warranty gives you specific legal rights and you may also have other rights that vary from state to state.

TECHNOLOGY LICENSE:

Certain AES Products include software, protocols and other proprietary and confidential technology and trade secrets of AES which are incorporated in or provided with AES Products solely for use in conjunction with and in order to operate AES Products ("Licensed Technology"). AES grants the original purchaser a non-exclusive license to use such Licensed Technology solely in connection with the use and operation of AES Products and for no other purpose or use whatsoever. No title or ownership in or to any such Licensed Technology is conveyed by the sale or delivery of any AES Products; all such rights are retained by AES.

AES SERVICE PROCEDURE: Contact AES by Phone (978) 535-7310, Fax (978) 535-7313 or Email RMA@aes-intellinet.com, to receive a Return Material Authorization Number. Have the AES part number and serial number ready. Repack equipment in original or equivalent packaging. Inside the box, please include a contact name, telephone number, address and a brief description of the reason for return.

Ship items freight-prepaid to:
    Repair Services, RMA#_____
    AES Corporation,
    285 Newbury Street
    Peabody, MA 01960 USA
(Contact AES for Return Material Authorization number)

June 2007

Quick Programming Guide for 7050-E Ver. 2 Subscriber

Use this page provides a handy reference. Complete details of these procedures are provided in the manual.

FUNCTION	PROGRAMMER SCREEN	NOTES

SETUP UNIT
(CTRL)+(F1)
	`SETUP UNIT -OLD: NEW`
	`ENTER ID#- 1234`
	`CIPHER CODE XXXX:`
		Shows existing "old" ID#, but hides Cipher (Dealer) Code
		Enter new data, or push enter to keep old data;
		Caution: Cipher must match for all subscribers and central receiver
		(Legal characters are hex numerals 0123456789ABCDEF)

CHECK IN TIME
(CTRL)+(F2)
	`CHKIN TIME--OLD: NEW`
	`ENTER HRS----HH: __   [0-24]`
	`ENTER MINS---MM: __   [1-59]`
	`NTR RPT DLY-NNN: ___  [0-330]`
		Range = 00 Hrs, 01 Min to 24 Hrs, 00Mins
		(minutes field appears if digits are entered in hours field)
		
		Enter Report Delay [seconds, default is 10]

ZONE SETUP
(CTRL)+(F3)
	`FIRE/ ----OLD:  NEW`
	`TROUBLE PKT Y:   .    [Y/N]`
	
	`ZONE BANK 0`
	`SET ZONE (BOCSFI) B0`
	`OLD SSSSSSSS LOW>HI`
	`NEW _____`
	
	`SET RESTORALS (XR) B0`
	`OLD XXXXXXXX  LOW>HI`
	`NEW _____`
		Programming Zones:
		1. Answer Y/yes if you are using Fire inputs. Enables the unit to generate "Trouble" messages*. Otherwise, answer N/no. See definition below.
		
		2. "Set Zone" sets individual zone programming. The options are displayed in brackets; these vary according to answers to part 1 above.
		
		There are 8 spaces, each representing one of the 8 zones, numbered Low>Hi, or 1 to 8, left to right.
		
		B=Bypass; O=N.O.; C=N.C.; S=Supervised EOL, F=Fire Supervised EOL; I=Inverted Fire Supervised
		
		3. Restorals - All zones can be programmed to report restorals, i.e. when the zone returns to its normal state after an alarm condition
		
		Enter "R" for Restoral, Enter "X" for no restoral

ENABLE REPEATING **(CTRL)+(F4)**	`ENABLE RPTNG-Y:  _`	Enter Y to enable repeating capability (page 18)
MASTER RESET **(CTRL)+(F5)**	`RESET RAM?     [Y/N]`	Resets all parameters to default (except Unit ID and Cipher)

DISPLAY STATUS
(SHIFT)+(F4)
	`SUB N.NN  7050E`
	`ID#:NNNN  (C)YYYY AES`
	`RT1:NNNN  LEVEL: NNN`
	`STAT:NNN  NETCON: N`
		Version Number and Subscriber Type
		ID # and Copyright
		ID of #1 in 1st Route; Link Layer Number
		Status/Error Message (if any); Netcon Rating

KEY TRANSMITTER **(SHIFT)+(F5)**	`KEYING TX..`	(6 second test)
SEND TEXT MESSAGE **(F5)**	`ENTER MSG:`	Sends text message to central receiver

MONITOR
(SHIFT)+(F1)
(SHIFT)+(F2)
(SHIFT)+(F3)
	`RECEIVE MONITOR ON/OFF`
	`TRANSMIT MONITOR ON/OFF`
	`MONITOR ALL ON/OFF`
		(toggle)
		(toggle)
		(toggle)

PACKET TIME TO LIVE
F2
	`PACKET TIME TO LIVE`
	`CHECKIN-----OLD:NEW`
	`ENTER HRS----00:..`
	`ENTER MINS---30:..`
		See page 19 for full details

*Important Note: Reporting of "Trouble" messages will not be recognized on older receivers. See page 11 for compatibility details.