

7450-XL RF Subscriber Unit - Installation Manual

► 7450-XL Technical Specifications

- ◆ SIZE: 13.25"H x 8.5"W x 4.3"D / (34cm H x 21.5cm W x 11cm D)
- ◆ WEIGHT: 7 pounds. (3.2 kilograms) (Approx, excl battery)
- ◆ RADIO:
 - Standard Frequency Range (450-470MHz) (others available)
- ◆ STANDARD OUTPUT POWER: 2 Watts (others available)
- ◆ VOLTAGE: 12VDC nominal
- ◆ POWER INPUT: 16-18VAC, 30-40VA / 18-20VDC, 2A
- ◆ CURRENT: 150mA standby; 1.1A transmit (2W),
1.5A transmit (5W)
- ◆ OPERATING TEMPERATURE: 0° to 50° C (32° to 122°F)
- ◆ STORAGE TEMPERATURE: -10° to 60° C (14° to 140°F)
- ◆ RELATIVE HUMIDITY: 0 to 85% RHC, Non Condensing
- ◆ ALARM SIGNAL INPUTS: 4 individually programmable Zones:
NO/NC/Supervised EOL/Fire EOL/ Trouble and Restore
- ◆ BACK-UP BATTERY: 12V, 1.2AH– 4.5AH max lead acid gel type
- ◆ LOW BATTERY REPORTING: Below 11V.
22.5 Minute Test Cycle (approx)
- ◆ AC STATUS REPORTING: Detects AC Fail/Restore after approx
4 min without/with AC; Report to central station after detection -
delayed 0-60 minutes randomly or programmable.
Suppression of AC Status Reporting also available.
- ◆ ANTENNA CUT / LOCAL REPORTING: 12V open collector
output at J4, ground on activation; 200ma max load.
- ◆ PHONE LINE CUT MONITOR: Reports line cut to Receiver as Zn
5 Trouble.
- ◆ RESET BUTTON: Located on main circuit board.

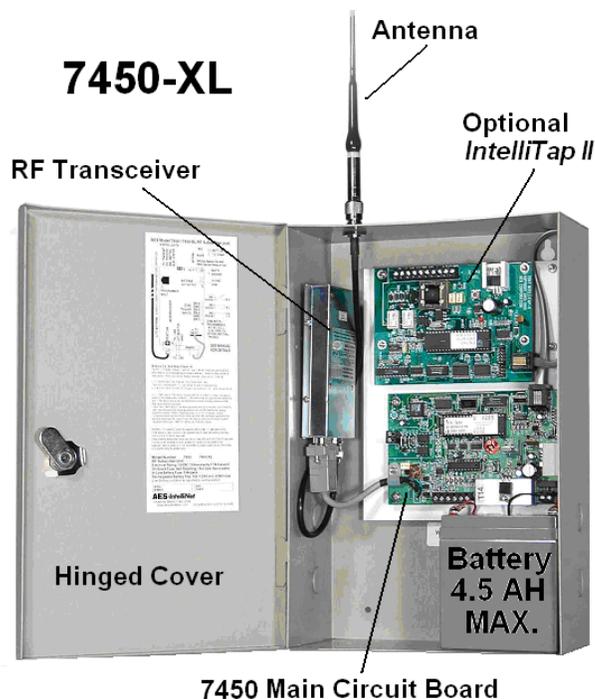
► WARNING:

- ◆ It is unlawful to operate this equipment in the USA 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.
- ◆ 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.
- ◆ Exposure to extreme cold below 0°C or extreme hot above 50°C could damage any Gel battery used in the installation of this product and cause unexpected operation of electronics.
- ◆ Exposure of the 7450 to excessive water or moisture (such as a shower, bath, pool, sauna, etc) could cause damage and unexpected operation of the electronics.
- ◆ Avoid dropping or other physical impact to the 7450, which could damage the enclosure or internal components of the unit.
- ◆ Be certain to properly ground the antenna and surge suppressor to help dissipate surges away from equipment and personnel. The grounding of the antenna and surge suppressor is for your safety and the safety of your equipment and should not be neglected.

There are no serviceable parts of the 7450 unit.

► Optional Accessories

- 7041 – Subscriber Hand-Held Programmer
- 7067 – IntelliTap II



7450-XL with enclosure cover open

► UHF Antenna Options 450-480 MHz; contact AES for other frequencies

Antenna db	Construction, Usage and Length	Part No.
2.5 db Flex ⁽¹⁾	Vinyl Clad, Indoor, 11 inch	7214
3 db Stealth ⁽²⁾	Vinyl Clad, Indoor, 1.5 ft	7211
5 db High Gain ^(3 & 4)	Steel Mast, Indoor/out, 3 ft	7210-5-UM
6 db High Gain ⁽³⁾	Fiberglass Mast, In/Outdoor, 4.5 ft	7210-6-UC
7 db High Gain ⁽³⁾	Fiberglass Mast, In/Outdoor, 6 ft	7210-7-US
9 db High Gain ⁽³⁾	Fiberglass Mast, In/Outdoor, 8 ft	7210-9-UC

Notes:

1. Included standard Tamper Resistant antenna, mounts on unit's enclosure. Includes cable.
 2. Mounts in attics, vents, walls, behind drapes, etc. Includes integrated 10-foot cable.
 3. Requires cable, see below, and possibly user supplied mounting hardware.
 4. Antenna is approved for outdoor use, supplied mount is intended for indoor use as coax connection is exposed. To use outdoors, connection should be sealed with a suitable product such as self-fusing tape, to protect against moisture.
- CABLES w/CONNECTORS, BNC<->N, for all AES Subscriber Units, high performance, low loss cables for all -UM, -UC and -US antennas above.

- 10 Ft Cable, p/n 7220-10-N
- 25 Ft Cable, p/n 7220-25-N
(Avoid using 25 ft. length if a 10 ft. will be sufficient.)

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► **Installation**

Installation Guidelines. Refer to Diagram on previous and next pages for typical component installation locations.

- ◆ The 7450 Subscriber Unit should be mounted inside the secured area of the protected premises.
- ◆ Avoid extremes of heat, cold, humidity, dust.
- ◆ The supplied tamper resistant Flexible 2.5db antenna can be mounted on the Subscriber's XL enclosure as shown in the diagram in this document. A remote external antenna can also be purchased separately and installed.
- ◆ Avoid installing the antenna in very close proximity to other metal surfaces, as they may severely impact the performance of the radio communications.
- ◆ Secure enclosure to wall or other appropriate surface, using suitable screws/anchors.
- ◆ When needed, use higher gain antenna with rated cable and connectors. Mount antenna as high as possible - attics can be ideal. (See "UHF ANTENNA OPTIONS" listed on page 1)
- ◆ Avoid tightly coiled or bunched coax as this could affect RF performance. Use Coax length that best fits the installation.

NOTE: During installation, the subscriber unit attempts to enroll itself into an available AES-IntelliNet network and if successful, generates signals at the central station. Central station operators must be forewarned to avoid a false alarm.

► **User Connections (see diagram on pg. 3)**

- **J1 – Programmer / External Module connector.** Plug programmer's cable into this jack to perform programming functions. The internal supply voltage of the 7450 will power programmer. The AES IntelliTap or other supported accessories are connected and powered by this jack. Any attached module must be disconnected to connect the programmer and the programmer must be disconnected to use an accessory.
- **J2 - Zone Connection Block.** Connect zone wiring to this terminal block. Zone wiring examples follow.
- **J3 – Power Input.** Connect 16.5-18VAC 30-40VA / 18-20 VDC, 2 Amp
- **J4 (Trbl) – Antenna Cut / Trouble output Local.** This is for local reporting or annunciating of antenna cut or communication troubles. It is a 12V open collector output. The pin closest to heatsink grounds on activation; 200ma max. The pin closest to the Red LED is +12V. Use AES part number 7210 (12-0388-J4 internal p/n) for mating connector.
- **J6 – Telephone line cut.** The 7450 can monitor an attached phone line for line cut. Connect the phone line to be monitored to terminals at J6. The 7450 senses the voltage on the line. If the line voltage drops below 3V for at least 2 minutes, the 7450 transmits a "Trouble" on "Zone 5" to the central receiver.

NOTE: ~ Line Cut Reporting requires a Receiver manufactured or updated after July 1997. To enable full trouble reporting, you must answer Y/yes to zone programming for Fire and/or Inverted Fire (Ctrl+F3).

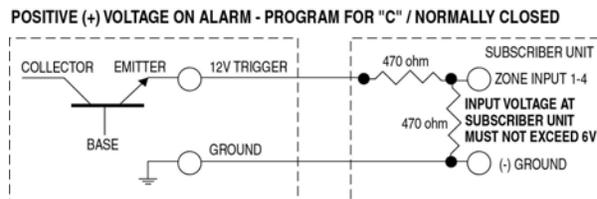
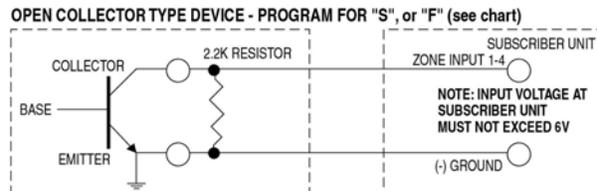
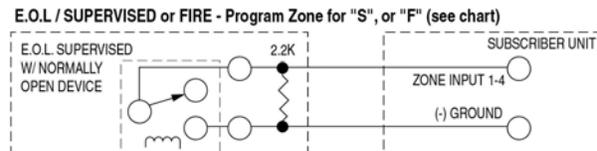
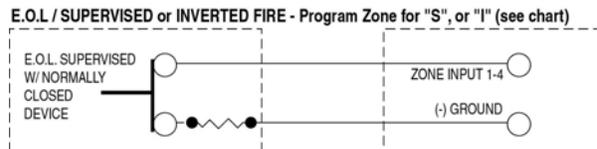
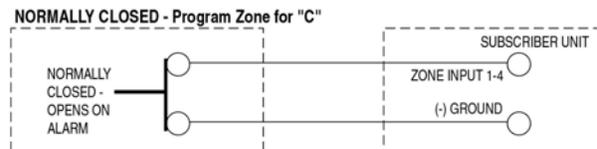
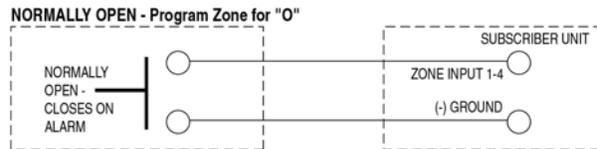
- **Battery Leads** – Attach external 12 VDC battery (4.5A max) to the Red (+12) and Black (-) wires carefully observing polarity.

► **Wiring - Zone Inputs**

- Refer to illustration on page 2 for Zone Terminals.
- Zone inputs may be programmed for use with various types of outputs used in alarm panels. Options are:
B = Bypassed - Zone status is ignored
C = Normally Closed - Closed=Normal / Open=Alarm
O = Normally Open - Open=Normal / Closed=Alarm
S = Supervised - EOL Resistor; 2.2K ohm = Normal / Open = Alarm / Short = Alarm
F = Fire - EOL Resistor; 2.2K ohm = Normal / Open = Trouble** / Short = Alarm
I = Inverted Fire - EOL Resistor; 2.2K ohm = Normal / Open = Alarm / Short = Trouble**

**** NOTES:** ~Reporting of "Trouble" messages requires a Receiver manufactured or updated after July 1997.

If any Inputs are unused, it is best to NOT install a resistor and program unused Zones as "B" for Bypass.



► **IMPORTANT:**

FOR ALARM PANELS WITH VOLTAGE OUTPUTS:

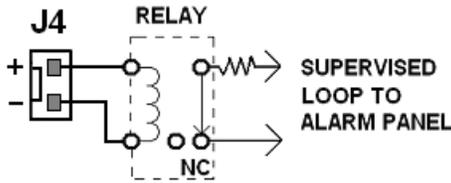
Resistors must be added so that the voltage at the subscriber unit input terminals DOES NOT EXCEED 6V. Excess voltage on any zone may cause false alarms in all zones. As an alternative, use a relay as an interface.

For more details, see the Dealer Support website at www.aes-intellinet.com

► **Wiring – Antenna Cut / Acknowledge Delay Output (J4)**

If the radio channel is "quiet" for more than 4 minutes (as would be the case if the antenna was cut) the 7450 subscriber attempts to send a test message to another subscriber. If that message is not acknowledged within the programmed acknowledgment delay period (default is 2 minutes), a fault condition exists. This fault condition is annunciated at J4, which is a 12V open collector output. The pin closest to the heat sink grounds on activation. The pin closest to the LEDs is connected to +12V. (See diagrams below). The voltage can be used to drive a relay, sounder or other device to notify someone of the condition. Maximum load is 200 mA. An "Acknowledge Delay" message is also added to the transmit queue to be sent when the unit re-connects to the network. (Seen as an R356 E903 or T903 in automation)

The (+) pin of J4 is internally connected directly to the 12 Volt supply.
The (-) pin is switched to ground by an internal transistor. Maximum load is 200mA.



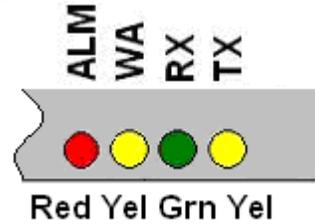
Connecting a Relay to J4

► **Parts List**

The standard 7450-XL RF Subscriber includes the following items.

- Transceiver, Part number varies (7080 is most common)
- 7214 UHF Tamper Resistant Antenna Assembly
- 40-7450-S Instruction manual

► **Status (LED) Indicators**



LED Indicators on Circuit Board

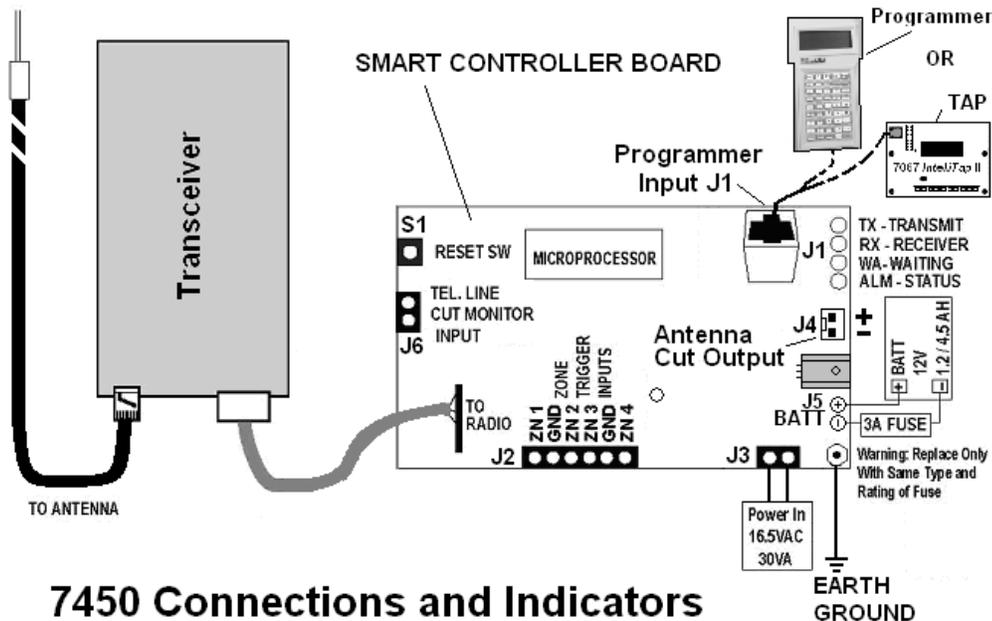
There are 4 LED's on the main circuit board of the 7450. The function of each is described below.

- ALM** – (Red) Status / troubleshooting indicator, See "...Blink Patterns" below
- WA** – (Yellow) Steady On = Waiting for acknowledgment of last transmission;
– Steady Blinking = Not on Network; Off = Normal
- RX** – (Green) Indicates radio receive (includes any radio activity on this frequency strong enough to break squelch)
- TX** – (Yellow) indicates radio transmit

► **Red ALM LED, Blink Patterns**

Blink Codes: "•" = short "—" = long. Period between patterns is about 1 second with diagram showing 3 repeats. |1 second|

- • • Steady blink – System OK;
- ••• Short-Short blink – low battery;
- •— •— Short-long blink – an input is in alarm or trouble
- ••— ••— Short-short-long blink – low batt & zone in alarm or trouble
- ••• ••• short-pause-short-short, AC Fault
- ••••• short-short-pause-short-short, AC Fault and low battery
- Steady / no blink – Self test fail (Excluding low battery)



7450 Connections and Indicators

► **Power Up**

Note: Once powered up, the unit attempts to enroll in an available the network. If successful, it will generate signals to the central station. Central station operators must be forewarned to avoid false alarm reporting.

If using a programmer, connect it to J1. Confirm wiring of the 16-18 VAC, 30-40 VA transformer to the power input terminals at J3 and be sure power source is or will be connected to an outlet or circuit that is NOT controlled by a switch. Connect the battery leads to the battery terminals while observing polarity. Energize the transformer. After power is connected, push RESET button on the 7450 for a fresh reset. The controller runs a "self test". After a few seconds, a message will appear on the handheld programmer:

```
SELFTEST-PASS (or FAIL ###)
SUB [rev#] 7350
ID#: [4 digit ID number] (C)YYYY AES
```

If the message reads SELFTEST - PASS, you may proceed with programming the unit. Note that the current ID# for this unit is displayed, as well as the firmware version and date. If the message reads SELFTEST - FAIL [Error Code], retry the procedure by pushing the RESET button. If the Fail message persists, refer Status Error Codes listed below for explanation and resolution.

Note: 001 = low battery. 100 = AC fail. 101 = AC fail with low battery. If the message reads SELFTEST - FAIL 001, 100 or 101 you may proceed with programming the unit if the reported condition is expected and you know or feel that the battery has sufficient capacity to complete programming.

► **Self-Test/ Status Error Codes:**

An [Error Code] is listed when the unit fails the self-test. Push the reset switch to see if the problem clears. If not, check these procedures.

- Message: **001 Battery power is low**
Procedure: Check battery; Push RESET button,
- Message: **002 RAM Checksum failure**
Procedure: Push RESET button. If unit passes, it must now be reprogrammed (see next section). If unit fails service is required.
- Message: **003 Problems 001 and 002 above.**
- Message: **004, 006 EEPROM Failure**
Procedure: Push RESET button. If unit passes, it must now be reprogrammed (see next section). If unit fails service is required.
- Message: **008 Analog Digital Converter / ADC Failure**
Procedure: Same as 004 / 006 failure, see above
- Message: **080 Loopback Test Failure**
Procedure: Push RESET button, unit will likely pass self test. If the unit consistently reports the same message service is required.
- Message: **100 AC Input Fail**
- Message: **101 AC Input Fail with Low Battery**

Other Messages: Multiple errors are added. For example a Fail message of 084 indicates Loopback Failure and EEPROM fail (080+004).

Except for the low battery fault and AC Fail, most other persistent fault messages may indicate that the unit requires AES authorized servicing. Report the error code to AES service rep.

► **Programming the Unit**

Programming is accomplished by attaching a compatible programmer to the J1 connector on the 7450 Smart Controller board. Following are programming instructions using the AES 7041 Hand Held Programmer. Software at the AES central receiver can also be used to program some of the functions listed in this section. Refer to AES software documentation.

A conversion chart for using a PC terminal program as a programmer can be found elsewhere in this manual.

The order of programming in this manual is structured so that the first programming functions can be performed to program the Subscriber as configured to minimize sending alarm conditions on an active network. The last programming function is where the unit ID and cipher code is programmed. After performing this last function and resetting the unit, alarm conditions may be minimized, as the zones should be programmed to the normal condition as they were connected.

Another method to prevent transmission of undesired messages until the unit is completely programmed, is to disconnect the transceiver until programming is complete.

► **Reset RAM**

Use the Reset RAM function to return the 7450 to the factory default settings. All parameters except the Unit ID (also referred to as the account number or code) and Cipher code (also known as the system ID) are returned to default values.

This is a great first step to ensure that you are always starting from the same configuration. This should not be used as a starting point if you are simply modifying a few settings and most of the units programming is already configured.

It is good practice to perform this function on a new factory unit to ensure that you are always starting from the same configuration. Also perform this function if you are unsure of the configuration or if you are having other unexplained problems with the unit.

Press <CTRL> + <F5> then Y then <ENTER> to complete this operation.

► **Handheld Programmer Commands; Quick Guide**

- CTRL+F1 SETUP UNIT - ID#; Cipher
- CTRL+F2 SET TIMERS - Check-In Interval
AC report delay; Report delay
- CTRL+F3 SET ZONES - NO/NC/Supervised/Fire
- CTRL+F4 SET MODES - Repeating; Line Cut;
AC fail suppression
- CTRL+F5 RESET RAM - Y/N, resets factory
defaults, except ID# and Cipher.
- SHFT+F1 RX MONITOR ON / OFF (toggle)*
- SHFT+F2 TX MONITOR ON / OFF (toggle)*
- SHFT+F3 MONITOR ALL ON / OFF (toggle)*
- SHFT+F4 TEST STATUS
- SHFT+F5 KEY TRANSMITTER (5 seconds)
- F2 SET TIME-TO-LIVE
- F5 SEND TEXT MESSAGE

* Turn off monitor functions when not in use

► Set Check-In Time and Reporting Delays

The factory default is set to 24 Hour Check-In. If this is appropriate you can skip to the next section. All other timing parameters typically should remain at factory defaults.

The Check-In Time is the interval at which the subscriber unit sends its "Check-In" messages to the central station. The default is 24 hours (recommended). The range for this feature is 5 minutes to 24 hours.

Important Note: Short check-in times (less than 6 hours) can impede system performance by creating heavy radio traffic in larger AES IntelliNet network systems. The standard setting is between 12 and 24 hours.

Use shorter check-in times for highest security applications only. 00 hours, 00 minutes is an illegal entry and will not be accepted.

AC Report Delay sets the delay in minutes, after detection that a subscriber waits before transmitting AC failure and restore messages. The default value is RM, which selects a random delay between 0 and 60 minutes. This randomly disperses AC failure messages that occur to a region, over an hour rather than all at once. The range is 0 (no delay) to 60 minutes or RM.

The Reporting Delay sets the rate at which a subscriber's own signals are transmitted. The default value is 10 seconds; transmissions are sent at least 10 seconds apart (this helps to meter traffic on the system). The range is 0 (no delay, not recommended) to 330 seconds. During this delay, Zone activations will be accumulated and included in one packet, reducing the amount of radio traffic.

To start, press programmer keys (**CTRL + F2**) (hold down the Control and then press the F2 key). The following message appears:

```
CHKIN TIME--OLD:NEW
ENTER HRS----HH:.. [0-24] (HH = existing data)
```

Enter a number of hours between 0 and 24 (default = 24) and push <ENTER>.

```
ENTER MINS---MM:.. [0-59] (MM = existing data)
```

Enter the number of minutes between 0 and 59, then push <ENTER>.

```
AC RPT TIME-OLD:NEW
ENTER MINS---MM:.. [RM or 0-60]
(AC Report Delay, MM = existing programmed data)
```

Enter a number of minutes to delay transmissions of AC fail/restore messages or RM for random. The range is 0 to 60 or RM; the default is RM. If data has been entered correctly, the following message appears:

```
NTR RPT DLY-NNN:.. [0-330] [seconds]
(Report Delay, NNN = existing programmed data)
```

Enter a number of seconds to allow between transmissions; the range is 0 to 330; the default is 10 seconds. If data has been entered correctly, the following message appears:

OK

Timing parameter programming complete

► Zone Programming

Factory default zone programming is set to EOL Supervision (**S**) without restore (**X**). If this is satisfactory skip to the next section.

To start, press programmer keys (**CTRL + F3**) (hold down the Control and then press the F3 key). The following message appears:

```
SUPERVISE-OLD:NEW
FIRE-----Y: . [Y/N] (Y = existing data)
```

The sequence first asks if any "Fire" programming is used. Answer Y/yes if you wish to have the subscriber report "Trouble" conditions. Also, **enter Y/yes if you are using the line cut monitor****. Otherwise answer N/no (refer to chart below). The existing 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: . [Y/N] (N = existing data)
```

Here you can choose to reverse the logic for the fire input (refer to chart below). The existing setting is displayed. To change the setting enter Y or N. To leave unchanged, push <ENTER> alone.

The most versatile option is to select Y for Fire and N for Inverted Fire. This provides the best choice of zone programming options available (BOCSF).

After pressing <ENTER>, the following appears:

```
ZONE BANK 0 .
SET ZONE (BOCSFI)B0 (available options)
OLD SSSS LOW>HI (S = existing data)
NEW .... (Must enter exactly 4 values)
```

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 1-4 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 4 zones. Zones Triggers 1-4 can be set for:

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

After successfully entering data, the following appears:

```
SET RESTORAL (XR)B0 (available options)
OLD RRRR LOW>HI (R = existing data)
NEW .... (Must enter exactly 4 values)
```

You can program individual zones to report restorals - i.e. send a report that the zone has returned to normal status.

X = No Restorals 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 restore data entry is complete, Press <ENTER>. If data has been entered correctly, the following message appears:

OK

Zones programming complete

Programming (Continued)

► **Set Packet “Time-To-Live” Function**

In most cases the default settings will be appropriate. If so skip to the next section.

The Time to Live Function aborts old messages to ensure the efficient flow of data through the network. The old messages have typically been buffered, due to a network problem, but not yet sent.

The default setting is recommended. In the default setting, test timer packets are assigned a 30-minute time to live. Any TTL aware subscriber, in possession of the packet that includes time to live data will be decrementing the timer. Any timer that reaches 0 will cause that packet to be removed from the transmit queue effectively aborting it. (Note: any 30-minute-old test timer message has already served its purpose. The central station should have recognized a missed Check-In by then and identified the event as a “failure to test”). For more information, contact AES technical support.

Note: Adding STATUS can also help because there could be a large number of Acknowledge Delay messages created if a significant network communication issue exists. This way the packets can be aborted after the programmed period freeing up the airwaves for other more critical packet communication.

To start, press programmer key (F2). The following appears:

```
PACKET TIME TO LIVE
CHECK IN----OLD:NEW
ENTER HRS----HH:.. [0-24] (HH = existing data)
Enter new data and or press <ENTER> Next appears:
ENTER MINS----MM:..
```

Pressing Enter at each screen will move through all available packet types programming hours then minutes.

The remaining packet types are:

```
STATUS          ALARM          TROUBLE/RST
RESTORAL        INTELLITAP    SPECIAL
```

If data has been entered correctly for all packet types, the following message appears:

OK

Time-to-Live programming complete

► **Set Modes – Line Cut Monitor, Enable Repeating and Disable AC reporting**

There are several programmable functions, in the Set Modes programming area. Repeating can be disabled, Telephone Line Cut can be enabled and AC reporting can be disabled.

To start, press programmer keys (CTRL + F4). The following message appears:

```
SET MODES--OLD: NEW
ENABLE RPTNG-Y: .
```

Enter Y/yes to enable the 7450 repeating capability. Default is Y.

Press <ENTER>, the following appears:

```
TEST LINECUT-N: .
```

To monitor the phone line connected to terminals at J6, you must enable LINECUT. Refer to diagram on page 3 for connection detail. Polarity is not important on this connection.

Enter Y/yes to enable the phone line cut monitor, enter N/no to disable the feature.

Default is N.

(Set Modes, continued at top of next column)

SPRSS ACFAIL-N: .

Enter a Y to suppress the reporting of AC Fail and Restore messages. Enter N to allow AC fail reporting. Default is N, which will result in the reporting of AC Fail and Restore Messages to the central station.

Press <ENTER>, if data has been entered correctly, the following message appears:

OK

Set Mode programming complete

► **Zone Reporting Chart**

	Zone Program	Normally Open	Normally Closed	Supervised E.I	Fire E.O.L.**	Inverted Fire E	Bypassed
	O	C	S	F	I	B	
Input State/Condition:	<i>Zone Status:</i>						
Open	N	A	A	T	A	B	
EOL Resistor - 2.2K	X	X	N	N	N	B	
Closed/Short	A	N	A	A	T	B	

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

** See Notes on Central Receiver Compatibility - on Pg. 7 and Wiring – Zone Inputs – on Pg. 2

► **Program ID# and System Cipher Code**

The unit ID# and the system cipher can only be entered with a programmer, directly attached to J1.

NOTE: Entering new data overwrites (erases) any previously stored ID# and the 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, press programmer keys (CTRL+F1). The following message appears:

```
SETUP UNIT-OLD: NEW (Existing stored "old" data.)
ENTER ID#-1234:..... ← (New data shown here.)
```

To keep previously stored ID#, simply push <ENTER>. To change the ID#, enter the 4 digit identification number for this unit using any of the 16 hex numerals (0-9, A-F), and then push <ENTER>. **The ID number must be unique, different from all other ID numbers in your system.** After successfully entering the ID number, the following message appears:

```
CPHR CODE-XXXX:..... (Old data is not shown)
```

Enter the 4-digit cipher as assigned by the system administrator, and then press <ENTER>. The code must match that of the central station receiver or IP-Link(s) it communicates through - If the wrong code is used, the unit cannot log on and will not communicate. After entering the cipher code, or pressing <Enter> alone the following message appears:

OK

ID and Cipher programming is complete

► **Reconnect Cables after Programming**

After programming is complete, reconnect any cable (such as the cable to the AES IntelliTap), disconnected from J1.

► **Initializing the Subscriber Unit**

Having programmed the unit, you are now ready for a final check. Plug in the handheld programmer if available. Push the Reset button on the controller board (See Diagram on Page 1). At this point, the message on the programmer should read:

```
SELFTEST - PASS
SUB [rev#] 7450
ID#:NNNN (C) [date] AES
```

If a "Fail" error message other than 001, 100 or 101 is displayed, push the reset button. If the error persists, refer to page 4, which contains a list of "Status Error Codes".

The status lights indicate the progression as the subscriber unit goes on the air and attempts to enroll into the network.

Network log on process after a reset:

- STATUS INDICATOR LED's RX, TX and WA lights 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 - AL + WA blink at different but steady rates.
- TX comes on as unit transmits a "Request for Reply".
- WA stops flashing after 15-30 seconds if one or more subscriber units reply to the "Request", (otherwise the WA continues to flash, indicating the unit is not on the network).
- TX comes on (if WA stops flashing) to send first message.
- AL blinks at a steady rate, indicating a normal condition.
- When the unit receives a valid acknowledgment, the WA light turns off. This indicates that the reset subscriber unit is now on the network.

IMPORTANT NOTE: A flashing WA light (blinking at a steady rate) indicates that the subscriber has NOT linked itself into the network.

If enrollment fails, check antenna, all cables and connectors; be sure that correct system cipher was programmed in to the unit. Once enrolled you can continue with Local Status Check and then Additional Testing.

► **Local Status Check**

This function performs a quick diagnostic check, whenever it is initiated. Use the handheld programmer: press SHIFT+F4. The following message appears:

```
SUB [rev#] 7450
ID#:[NNNN] (C)YYYY AES
RT1:NNNN LEVEL: NNN
STAT: NN NETCON: N
```

EXPLANATION OF STATUS CHECK TERMS

Top Line: Indicates Subscriber model and firmware revision information.

ID#: 4 digit ID number programmed into this unit.1

YYYY: Indicates Copyright year.

RT1: Route #1, the ID of the next subscriber in the "best" route to the central station. If RT1 is 0000, the unit is communicating directly with the central station. If XXXX appears, the unit is not on the network. Any other 4 digit ID indicates the unit at the top of the routing table.

LEVEL: Subscriber unit "level" or "link layer", which indicates how many expected "hops" to the central station. A unit level = 255 indicates that unit is not on network.

NETCON: Internal rating used in the automatic positioning of this unit in the network. The normal range is from 0-7, 0 being best. Note that while a low number is better, any NetCon from 0 to 6 is OK. 7 may indicate a problem with this unit or a unit in its path to the central receiver.

A NetCon of 5 guarantees at least 2 unique paths to the central.

► **Programming the Subscriber Unit from a PC**

In place of a handheld terminal, a cable adapter kit #7043 may be ordered from AES to link the 7450 to your computer's serial port. Use a terminal program like Hyper-Terminal or Telix to send keystrokes to and display output from the programming port of the 7450.

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

Key output on a PC differs from that of a 7041 Hand-Held Programmer. See chart below:

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

- 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 subscriber, make sure the program is set to the correct COM port.
- If the subscriber receives characters, but nothing can be sent, make sure the CTS/RTS flow control is OFF, and that the cable is OK.

► **Additional Testing**

Before leaving the installation site, you want to test that the expected signals are properly getting to the monitoring system. Perform at least the tests below and confirm that the monitoring system and their personnel properly received the correct messages and understand what they mean.

Installation Site Checks

Some of the tests to be performed at the installation site require a response from a Central Station person.

- Have a knowledgeable person Request Status and other test functions available in the AES Net7000 or IPCtrl program to confirm that they are satisfied the 7450 is communicating properly.
- Trigger alarm conditions and confirm that the proper message is received at the Central Station.
- Cause fault conditions and confirm that the proper message is received at the Central Station.

Central Receiver Status Checks

Perform testing from the central station using the AES Net7000 or IPCtrl software to determine adequate signal strength, quick reception of messages and acceptable routing. Refer to separate Net7000 or MultiNet software manuals for use of testing functions.

► **Notes on Central Receiver Compatibility**

The 7450 Subscriber Unit is fully compatible with AES Version 1.70 Central Receiver and up. **A receiver manufactured or updated after July 1997 usually complies with this requirement.** Contact AES if your receiver is pre-1.70 for upgrade options. When "Fire" or "Inverted Fire" is enabled, the unit generates a specific packet type for reporting "Trouble". "Trouble" data within this packet can only be received on version 1.70 and newer receivers. Line cuts are reported as a Trouble on Zone 5. You must answer Y to Fire or Inverted Fire under Zone Programming for "Trouble" messages to be properly processed.

**► 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.

Warranty Rev date June 2007

FCC Identification: AES Model 7450 Subscriber Unit

This unit complies with FCC part 68 as of date of manufacture.
FCC# 5IWUSA-47000-MO-N Ringer Equivalence 0.0B Jack: Barrier Block

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

► Maintenance

Once installed and normal operation is confirmed, there is typically little maintenance required. Monitoring the automatic test messages will confirm proper RF operation. Batteries should be periodically tested to be certain they have sufficient capacity to operate the system as needed.

► Troubleshooting

The most common causes of an RF failure or trouble are due to issues with the transmission line including but not limited to the antenna type, antenna location, coax, connectors, and transceiver. Antennas in close proximity to metal or with conductive material blocking or reflecting the transmitted signal would be at the top of the list. Observe the RX light on the 7450. If it is on steady or most of the time you may be receiving some RF or electrical interference. Try different locations for the antenna or use a remote long range RF antenna. Try replacing transmission line components such as a new transceiver, the coaxial connectors, coax and antenna. Problems on the circuit boards usually require returning the defective unit to AES for service.

► AES SERVICE PROCEDURE

Contact AES by Phone (978) 535-7310, Fax (978) 535-7313 or Email service@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)

