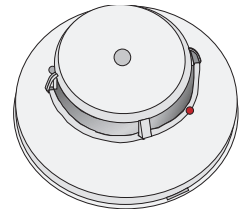# System Sensor™ Smoke Sensor Model 2100ARFT

Document Number: 466-1747 Rev. C
September 2000

Installation Instructions

Product Summary

The System Sensor Smoke Sensor Model 2100ARFT (smoke alarm) is a Learn Mode, wireless, photoelectric smoke sensor with a self-contained alarm siren, a low-battery annunciator, and a status light. The smoke alarm is part of a security/fire alarm system and communicates with the system control panel.

Each smoke alarm uses two 3-volt lithium batteries. The batteries are shipped in the unit with a pull tab inserted at the positive terminal. Remove the pull tab and reinstall the batteries as needed, observing correct polarity.

The detector provides the following features:

❑ **Fixed/rate of rise 135° F temperature heat detector** trips an alarm when the temperature reaches 135° F or higher, or when the temperature rises rapidly.

❑ **Freeze detector** sends a trouble signal when the ambient temperature around the detector drops below 40° F. This could indicate a heating problem on the premises. System sirens sound trouble beeps, and if the condition continues for one hour, the panel reports to central monitoring station.

> **Note**
> Freeze detector only compatible with Concord™, Concord Express™, Ultragard®, and Advent® systems. Simon® systems will only respond on site with trouble beeps and will not report the trouble condition to the central monitoring station.

Installation Guidelines

❑ This equipment should be installed in accordance with the National Fire Protection Association's Standard 72 and/or Standard 74 (National Fire Protection Association, Batterymarch Park, Quincy, MA 02269).

❑ Avoid installing the unit until all construction is completed. The mounting ring may be pre-installed.

❑ Leave the orange dust cover on the unit until sheet rocking and sanding are completed; otherwise, dust can get into the unit and cause false alarms.

> **Note**
> The orange dust cover must be removed for the unit to detect smoke.

☼ **CAUTION**
Not compatible with CareTaker® *Plus* and custom versions with software versions 3.0 or earlier.
Not compatible with Commander® 2000 and custom versions with software versions 4.0 or earlier.

Equipment Needed

❑ Phillips screwdriver.
❑ Pocket-sized slotted screwdriver.

Programming

This section describes the basic steps for adding the sensor to panel memory. For more detailed programming information, refer to the specific panel installation instructions.
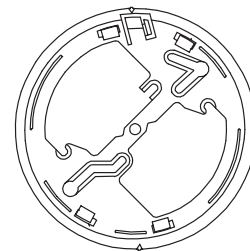

Figure 1. Mounting Bracket

To add the smoke alarm to panel memory:

1. Put the panel in Program Mode/Learn Sensors.
2. Select a sensor group and sensor number.
3. Remove mounting bracket to trip tamper.
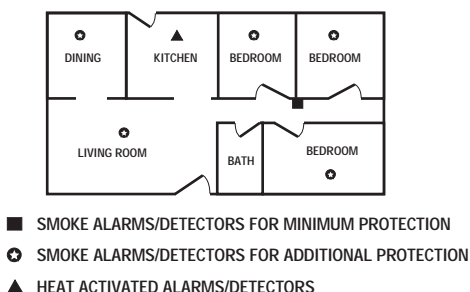4. The panel will indicate that the sensor has been learned.
5. Exit from program mode.

> **Note**
> Reinstall smoke unit on mounting bracket. This restores the tamper to normal—it may take the microprocessor in the smoke unit up to 12 seconds to restore the tamper.

Mounting Guidelines

Selecting a suitable location is critical to the operation of smoke alarms/detectors. This equipment should be installed
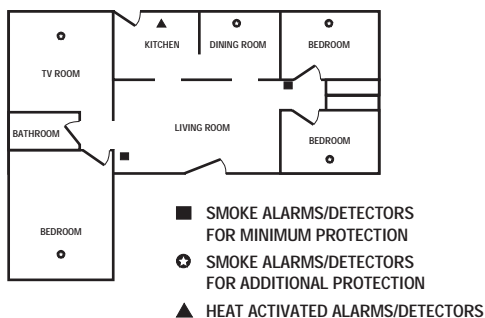
in accordance with the National Fire Protection Association's (NFPA) Standard 72, Chapter 8.

❑ NFPA 72, A-8-1.2.1.a *Where to Locate the Required Smoke Alarms/Detectors in Existing Construction.* The major threat from fire in a family living unit occurs at night when everyone is asleep. The principal threat to persons in sleeping areas comes from fires in the remainder of the unit. Therefore, a smoke alarm(s)/detector(s) is best located between the bedroom areas and the rest of the unit. In units with only one bedroom area on one floor, the smoke alarm(s)/detector(s) should be located as shown in Figure 2.
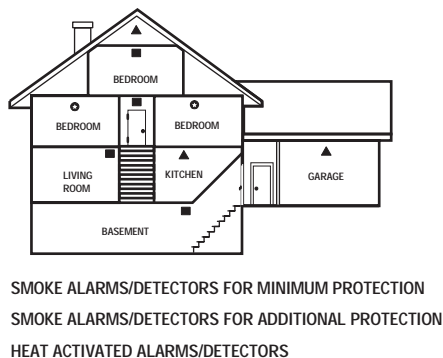
■ SMOKE ALARMS/DETECTORS FOR MINIMUM PROTECTION

✪ SMOKE ALARMS/DETECTORS FOR ADDITIONAL PROTECTION

▲ HEAT ACTIVATED ALARMS/DETECTORS

Figure 2.Family units with one bedroom area.

In family units with more than one bedroom area or with bedrooms on more than one floor, more than one smoke alarm/detector is required, as shown in Figure 3.

■ SMOKE ALARMS/DETECTORS FOR MINIMUM PROTECTION

✪ SMOKE ALARMS/DETECTORS FOR ADDITIONAL PROTECTION

▲ HEAT ACTIVATED ALARMS/DETECTORS

Figure 3.Family units with more than one bedroom area.

In addition to smoke alarms/detectors outside of the sleeping areas, Chapter 8 requires the installation of a smoke alarm/detector on each additional story of the family living unit, including the basement. These installations are shown in Figure 4. The living area smoke alarm/detector should be installed in the living room or near the stairway to the upper level, or in both locations. The basement smoke alarm/detector should be installed in close proximity to the stairway leading to the floor above. Where installed on an open-joisted ceiling, the alarm/detector should be positioned relative to the stairway so as to intercept smoke coming from a fire in the basement before smoke enters the stairway.
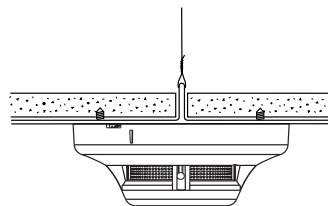
■ SMOKE ALARMS/DETECTORS FOR MINIMUM PROTECTION

✪ SMOKE ALARMS/DETECTORS FOR ADDITIONAL PROTECTION

▲ HEAT ACTIVATED ALARMS/DETECTORS

Figure 4.Multilevel residence.

NFPA 72, A-8-1.2.1.b *Where to Locate the Required Smoke Alarms/Detectors in New Construction.* All of the smoke alarms/detectors specified in A-8-1.2.1.a for existing construction are required, and, in addition, a smoke detector is required in each bedroom.

NFPA 72, A-8-1.2.1.c Are More Smoke Alarms/Detectors Desirable? The required number of smoke alarms/detectors might not provide reliable early warning protection for those areas separated by a door from the areas protected by the required smoke alarms/detectors. For this reason, it is recommended that the householder consider the use of additional smoke alarms/detectors for those areas for increased protection. The additional areas include the basement, bedrooms, dining room, furnace room, utility room, and hallways not protected by the required smoke alarms/detectors. The installation of smoke alarms/detectors in kitchens, attics (finished or unfinished), or garages is not normally recommended, as these locations occasionally experience conditions that can result in improper operation.

Important !
Regulations pertaining to smoke alarm/detector installations vary from state to state. For more information, contact your local fire department or local authority having jurisdiction.

❑ DO NOT mount a smoke alarm to a drop ceiling tile; mount it to a metal runner (see figure 5).

Figure 5.Smoke alarm mounted to drop ceiling.

❑ Mount all smoke alarms within 100 feet of the panel or receiver.

❑ Install a minimum of two smoke alarms in any household, no matter how small it is.

❑ Put a smoke alarm in the hallway outside of every bedroom area. A minimum of two smoke alarms are required in homes with two bedroom areas.

❑ Put a smoke alarm on every level of a multi-level residence.

❑ Install basement alarms on the ceiling at the bottom of the basement stairwell.

❑ Install smoke alarms on the ceiling as close to the center of the room as possible. If this is not practical, install it on the ceiling no closer than 4 inches (10 cm) from any wall or corner (see figure 6).

❑ If ceiling mounting is not practical, install on an inside wall between 4 and 6 inches (10 and 15 cm) from the ceiling (see figure 6).

❑ Put smoke alarms at both ends of a bedroom hallway if the hallway is more than 30 feet (9 meters) long. Large rooms over 900 square feet require more than a single sensor.
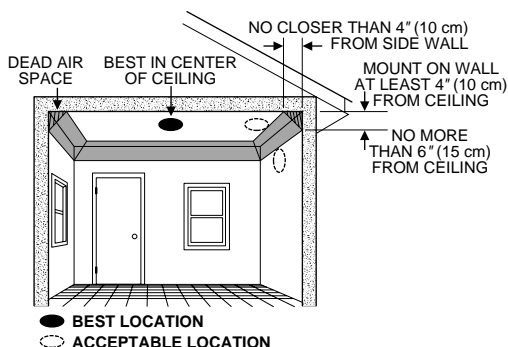

Figure 6. Smoke alarm mounting locations

❑ Areas with rough ceilings or short, transom-type walls coming down from the ceiling require additional smoke alarms.

❑ Install second-floor smoke alarms on the ceiling at the top of the first-to-second floor stairwell. Be sure no door or other obstruction blocks the path of smoke to the unit.

❑ In rooms with sloped, peaked, or gabled ceilings, install smoke alarms 3 feet (0.9 meter) measured down on the slant from the highest point of the ceiling (see figure 7).
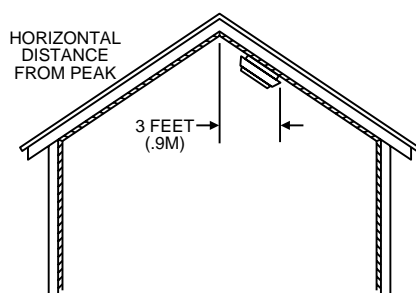

Figure 7. Sloped, peaked, or gabled ceilings

Limitations

All alarms are subject to possible compromise or failure-to-warn for a variety of reasons, for example:

❑ Smoke alarms cannot detect smoke in chimneys, walls,

roofs, or smoke blocked by a closed door.

❑ Alarms may not detect smoke on other levels of the building.

❑ Alarms may not warn in time when fires are caused by smoking in bed, explosions, improper storage of flammables, overloaded electrical circuits, or other hazardous conditions.

Do Not Install Smoke Alarms in the Following Locations:

❑ In or near areas where combustion particles are normally present such as kitchens; in garages where there are particles of combustion in vehicle exhausts; near furnaces, hot water heaters, or gas space heaters.

❑ On the ceiling in rooms next to kitchens where there is no transom between the kitchen and these rooms.

❑ In damp or very humid areas, or next to bathrooms with showers. Install sensors at least 5 feet (1.5 meters) away from bathrooms.

❑ In very cold or very hot areas.

❑ In dusty, dirty, or insect-infested areas.

❑ Near fresh air inlets or returns or excessively drafty areas. Air conditioners, heaters, fans, and fresh air intakes and returns can drive smoke away from smoke alarms.

❑ In dead air spaces at the top of a peaked ceiling or wall/ceiling intersect. Dead air may prevent smoke from reaching a smoke alarm.

❑ Near fluorescent light fixtures. Install smoke alarms at least 10 feet (3 meters) away from fluorescent light fixtures.

Mounting

The mounting bracket must be separated from the unit before you begin.

To mount the smoke alarm:

1. Secure the mounting bracket directly onto wood surfaces using No. 8, 1½ inch wood screws. If mounting onto plaster or dry wall, use appropriate anchors.

2. Align the arrows on the mounting bracket with the raised marks on the smoke alarm. Turn the smoke alarm clockwise until it locks in place.

Testing

Test each smoke alarm every week to verify that its siren and signal integrity are adequate. Refer to the specific panel installation instructions for system response and sensor testing.

To test the smoke alarm:

1. Put the panel in sensor test mode. <u>Although not necessary for this model</u>, it is a good practice to maintain. Refer to the specific panel installation instructions for details.
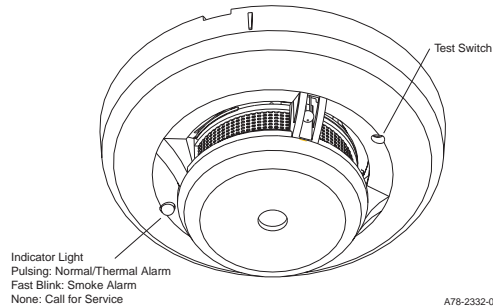
Note
Simon and Advent panels respond to test button activations only when in sensor test mode.

⚠ **WARNING**
Commander and CareTaker panels will go into alarm if not in sensor test when the test button is pressed.

2. Press and hold the test button on the smoke alarm for 3 to 4 seconds.

Test Switch

Indicator Light
Pulsing: Normal/Thermal Alarm
Fast Blink: Smoke Alarm
None: Call for Service

A78-2332-03

Figure 8.Smoke Alarm Test Switch and Indicator Light.

The sensor should immediately transmit a test alarm signal, causing the siren inside the smoke alarm to sound and the status light to flash rapidly while the test button is pressed. Refer to the specific panels installation instructions for system response details.

Note
After verifying that the siren and signal integrity are adequate, you may want to cover the center opening with your thumb. This will help reduce the siren noise until the test is completed.

Maintenance

Replacing Batteries

When the batteries need to be replaced, the unit transmits a signal to the panel. If the batteries are not replaced within 7 days, the unit will chirp every 44 seconds until the unit shuts down in 7-8 days.

Note
If you test the smoke alarm or it goes into alarm during this initial 7-day period, chirp delay is canceled.The unit will then begin chirping continuously at 44 second intervals until the unit shuts down in 7-8 days.
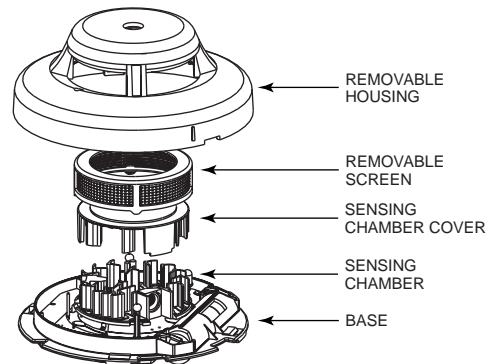
Constant exposure to high or low temperatures or high humidity may reduce battery life. Replace *both* batteries when the smoke alarm or panel notifies you that the batteries are low.

Note
For UL installations, use the following battery brands: Sanyo CR123A, Panasonic CR123A, or Duracell DL123A. These can be obtained through Interactive Technologies, Inc. Do not mix brands.

Cleaning

Clean the smoke alarm chamber at least once each year.

REMOVABLE HOUSING

REMOVABLE SCREEN

SENSING CHAMBER COVER

SENSING CHAMBER

BASE

Figure 9.Smoke Alarm diagram

To clean the smoke alarm chamber:

1. Place the panel in sensor test mode.
2. Remove smoke alarm from mounting ring.
3. Remove the batteries.
4. Separate housing from base.
5. Remove screen and chamber housing.
6. Vacuum screen, chamber housing, and chamber.
7. Reassemble smoke alarm.
8. Re-install the batteries.
9. Attach smoke alarm to mounting ring.
10. Test operation as describe in the "Testing" section.

Servicing

In the event that the smoke alarm needs servicing, send it to: Interactive Technologies, Inc., 2266 Second St. North, North St. Paul, MN 55109.

Emergencies

Develop plans for a variety of emergency situations. Periodically discuss and rehearse emergency plans that include the following:

❑ Know the normal state of doors and windows; open, closed, or locked.
❑ Use a different escape route if closed doors feel hot to the touch.
❑ Emphasize that everyone should escape as quickly as possible. Do not stop to gather any belongings.
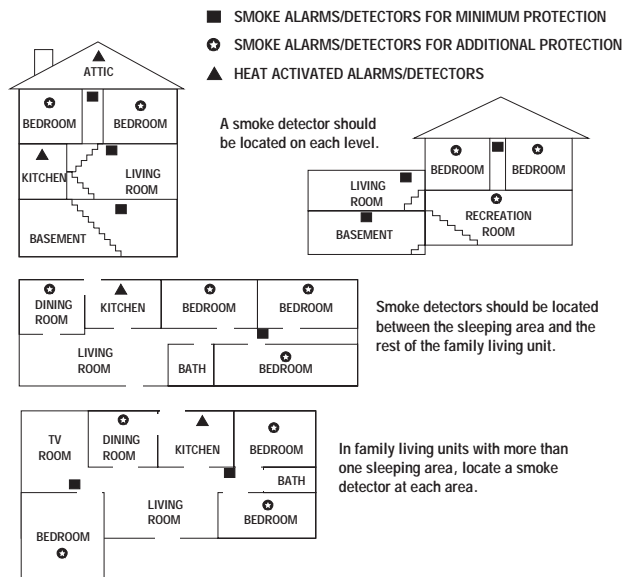❑ Crawl and hold your breath as much as possible to help reduce smoke inhalation during your escape.

☐ Meet at a designated outdoor location.
☐ Emphasize that no one should return to the premises if there is a fire.
☐ Notify fire department from a neighbor's phone.

⚠ WARNING
If you arrive at the premises and hear sirens, do not attempt to enter the building. Call for emergency assistance from a neighbor's phone.

Floor Plan Example

Figure 10 is an example of a multilevel floor plan. Use it as a guide and draw your floor plan on the next page.
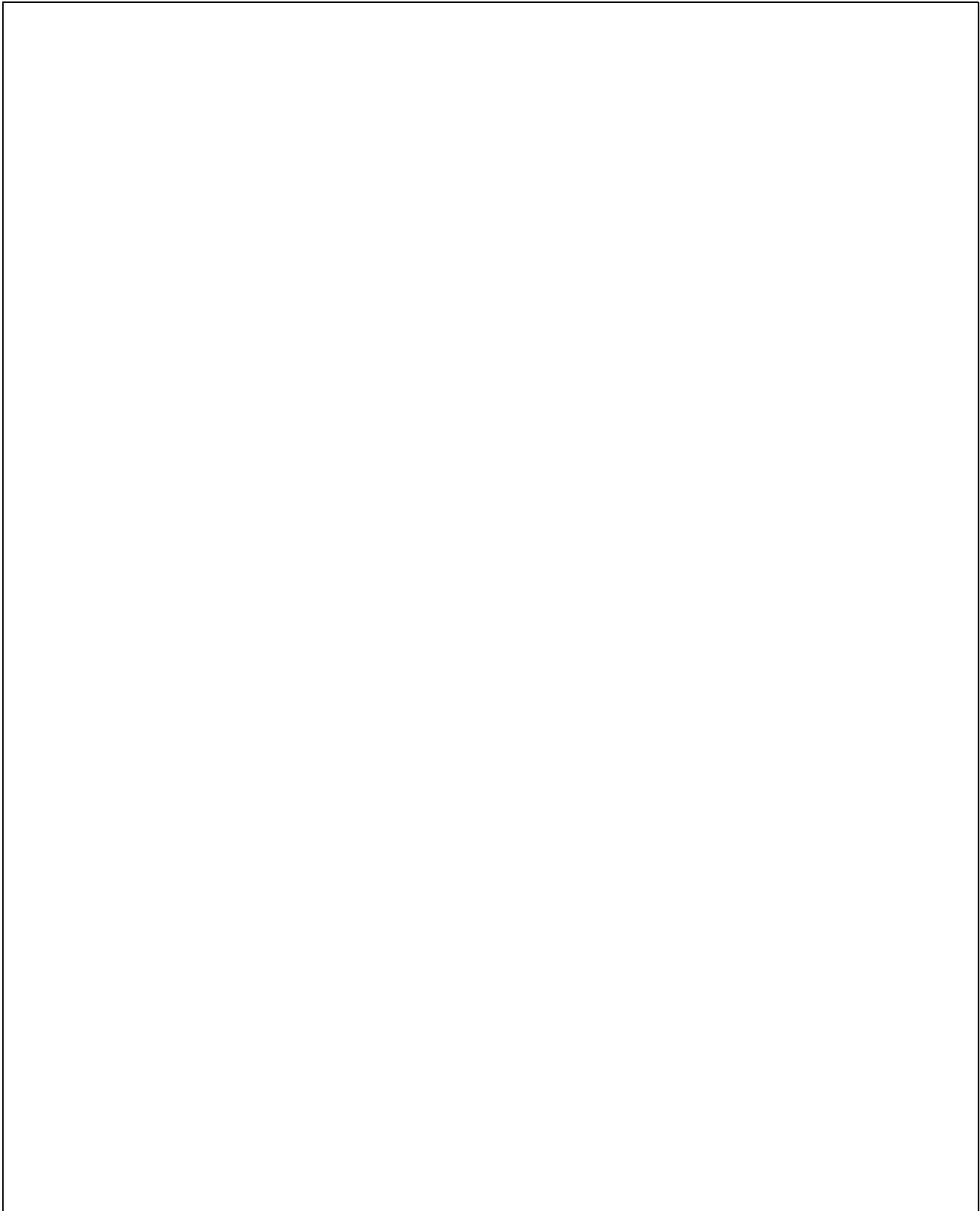

Figure 10. Examples of a floor plans.

Your Floor Plan

When establishing your escape routes, consider the following guidelines:

☐ Show all building levels.
☐ Show all exits, (two exits per room are recommended).
☐ Show the location of all components of the fire system.
☐ Show the locations of any fire extinguishers, hoses, ladders, etc.

Draw you floor plan in this space.

Troubleshooting

The panel fails to indicate that the sensor has been learned.

❑ Check panel programming. If necessary, reprogram the sensor following the steps outlined in the Programming section.

❑ Check sensor batteries.

The sensor fails to transmit an alarm signal when in test mode.

❑ Check sensor batteries.

❑ Check panel programming. If necessary, reprogram the sensor following the steps outlined in the Programming section.

Specifications

Compatibility:

60-838-95	Advent, Commander 2000 and Custom Versions with software versions 4.1 and later, UltraGard and Custom Versions, CareTaker *Plus* and Custom Versions with software versions 4.0 and later, Concord, Concord Express, Simon, Quik Bridge Loop Receivers, and Quik Bridge® Repeater.
60-838-95R	Concord, Concord Express, Simon, and Quik Bridge Loop Receivers.

Current: 12.5µA typical
28µA peak
54.8mA in alarm (average)

Sensitivity Test: Use canned smoke SM-200 or equivalent

Dimensions: $2.0 \times 5.0''$ (without mounting bracket)
$2.0 \times 5.5''$ (with mounting bracket)

Temperature Range:
Operating	32° to 100°F (0° to 38°C)
Storage	-4° to 140°F (-20° to 60°C)

Humidity: 90% non-condensing

Power Source: Two 3-volt lithium batteries of the same type. UL-approved types: Sanyo CR123A, Panasonic CR123A, Duracell DL123A.

Sensitivity Levels:

Nominal:	1.00%/ft - 3.54%/ft obscuration
Nominal Supervisory:	2.25%/ft obscuration
Nominal Close to Alarm:	LED stops blinking at 44 sec. intervals.
Nominal at Alarm:	LED blinks once per second.

Notices

Agency Listings

UL 217—Residential Installations
UL 268—Commercial Installations
CUL—S531 - M87 Standard for Smoke Alarms

FCC Part 15 Information to the User

Changes or modifications not expressly approved by Interactive Technologies, Inc. can void the user's authority to operate the equipment.

This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions:

❑ This device may not cause harmful interference.

❑ This device must accept any interference received, including interference that may cause undesired operation.

Changes or modifications not expressly approved by Interactive Technologies, Inc. can void the user's authority to operate the equipment.

FCC ID: B4Z-764A-SMOKE   CANADIAN IC: 867-102-1644

Patent No.: 4,855,713 and 5,686,885 and 5,686,896 and 5,761,206

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WIRELESS

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Automation
Fire Protection
Access Control

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