

# *Home Automation: Maintaining people in their own homes*

PILOT PROJECT FOR  
ADAPTED HOUSING  
INTEGRATING  
HOME AUTOMATION



Canada

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Québec

**A pilot project carried out jointly by:**



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*La domotique, pour le maintien à domicile. Projet pilote de logement adapté intégrant la domotique.*

# PILOT PROJECT FOR ADAPTED HOUSING INTEGRATING HOME AUTOMATION

## What is home automation?

Increasingly, electronic and computerized applications are used for domestic functions. Take for example the programming of heating systems, and the remote control of various devices and appliances like garage doors. The systematic utilization of such devices in a "smart" home, while not yet widespread, will soon be part of our everyday lives.

Home automation uses new technologies — electronics, computer science and telecommunications — to make the building "smart." Home automation is like a control centre that integrates the functions of safety and security, comfort, energy management, communications, entertainment, education, etc., that may be found in a home. To fulfil this mission of information and interconnection, home automation requires a bidirectional communications system linked with the outside.

Thus, home automation is an integrating concept that links various existing systems. These systems can be programmed to respond to the specific needs of the occupant, and then be either preprogrammed or function by remote control. They also may be controlled from outside the home, by telephone for example. Such systems offer a flexibility of utilization that can make life much easier.

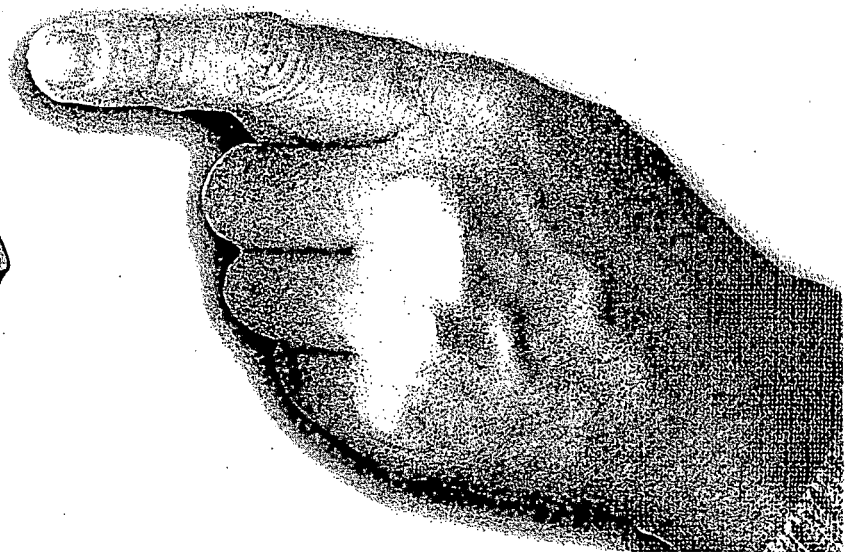
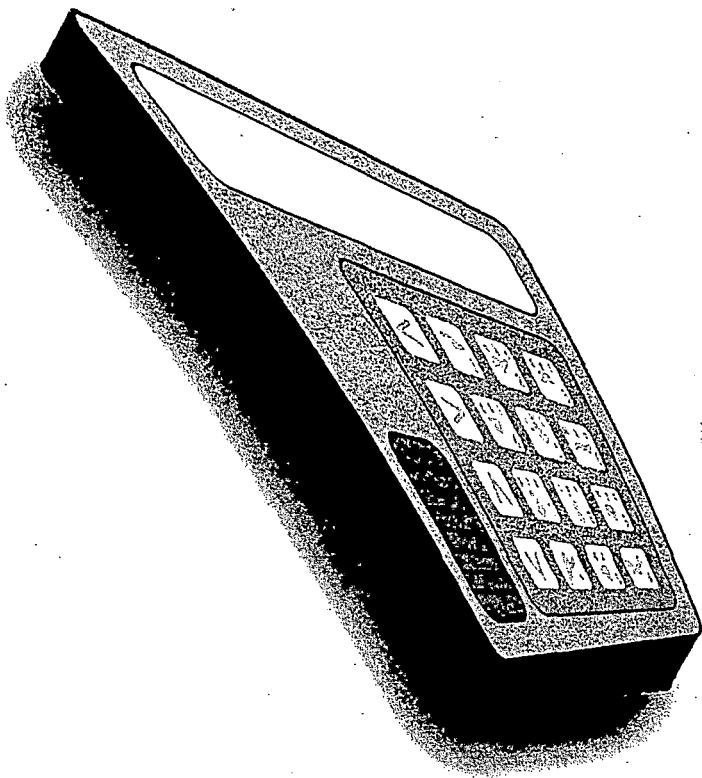
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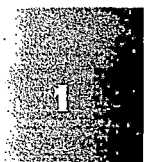
# **PILOT PROJECT FOR ADAPTED HOUSING INTEGRATING HOME AUTOMATION**

## **What is home automation?**

Increasingly, electronic and computerized applications are used for domestic functions. Take for example the programming of heating systems, and the remote control of various devices and appliances like garage doors. The systematic utilization of such devices in a "smart" home, while not yet widespread, will soon be part of our everyday lives.

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## **Why a pilot project?**

For the first time in Québec, home automation is being tested in an apartment adapted for a person with limited mobility. Home automation is indeed a viable solution to increase the autonomy of seniors or the physically challenged, allowing them to live on their own.

This project also provides an opportunity to verify whether this technology involves economic benefits compared to other housing approaches.

Québec possesses state-of-the-art technology and manufacturers in Québec offer high quality home automation products. The current project innovates by adapting this technology to specific needs, and aims at creating a synergy among the private and public partners.

A thorough evaluation of this pilot project will examine the viability of this technology and its capacity to evolve and adapt to specific needs.

## **Where is this pilot project?**

The pilot project's specially-adapted demonstration apartment, which integrates home automation, is in the Badeau-Sauvé building, a 48-unit low-rental housing project for seniors located on boulevard Sainte-Croix in Saint-Laurent. It will be occupied by a person who is quadriplegic. Three similar apartments in the same housing project have been adapted to needs of paraplegic individuals. While these other apartments have been equipped with electronic devices, they are not fully automated.

## **How is home automation useful for a person with limited mobility?**

The utilization of home automation specially adapted to the needs of physically challenged people is neither a luxury nor a simple improvement to their quality of life. It's a means of increasing their degree of autonomy. While it does not replace appropriate home care, home automation makes it possible to alleviate certain limitations caused by reduced physical capacity.

For example, for some people opening a door can be a major challenge. But always having to rely on someone else to do it can be just as inconvenient. The motorized opening of a door or window by a remote control, or with a control panel on the wall, is a solution that can increase independence and contribute to the well-being of a person in a wheelchair or whose mobility is otherwise limited.

In addition, the various functions of home automation, from telecommunications to alarms and emergency calls, augment the security of the occupant. The automation of certain functions inside the apartment, such as the automatic turning on of lights with a movement detector, also ensures greater independence and increased comfort. In sum, automated home systems offer services adapted to the requirements of individuals that can evolve according to their changing needs.



# DESCRIPTION OF THE DESIGN AND MODIFICATIONS

## GENERAL MODIFICATIONS IN THE APARTMENT

The accessibility measures and architectural modifications endeavoured to incorporate the latest advances in this field.

### Home automation modifications

All the home automation and electromechanical modifications present are regulated by a universal remote control, but other control devices, such as voice recognition, are also possible.

Emergency call stations activated by pull cords are located in the bedroom, bathroom, kitchen and living room. They release the electric latch at the entrance door and activate an emergency horn and light located in the hallway of the building. **A**

The home automation functions of the telephone alarm system can direct a digitized voice message to four outside numbers and are utilized in case of an accident, fire, break-in or flood. An alarm signal is also set off in the apartment. **B**

The alarm system for break-ins is equipped with a presence simulator which registers the occupant's usual habits and is activated automatically when the occupant is absent.

If the occupant falls or is otherwise in need of assistance and the pull cords are out of reach, a device hung around the neck can sound the alarm for outside help, through the central computer.

Movement detectors placed in each room are utilized both to turn on lights automatically and to signal a break-in when the security system is on. A timer in the home automation system turns off the lighting fixtures as soon as the occupant leaves the room. **C**

Commands from the remote control are relayed from one room to another through an infra-red transmission device installed in the living room and bedroom. **D**

The heating system is programmed to maintain a comfortable room temperature in the daytime, and automatically lowers the temperature at night or when the occupant leaves the apartment. The temperature of individual rooms can still be adjusted by remote control or by one of the two central wall commands. **E**

All home automation functions mentioned can be controlled from remote locations by telephone.

### Architectural modifications

In the summer, a platform made of treated lumber makes the balcony accessible to someone in a wheelchair. **F**

A false floor raises floorings off the cement floor to avoid uneven door thresholds. **G**

Electrical outlets and switches are placed at heights convenient for a person in a wheelchair. **H**

The encircled letters refer to the illustrations on pages 6, 8 and 10. **X**

## **BUILDING MODIFICATIONS**

The apartment is located in a building to which certain modifications have been made, making it easier for the occupant to take part in community life.

### **Home automation modifications**

The electromechanical door operator can open the main entrance either by a portable remote control or by pressing the button on the wall control. A similar device allows access to the common room, laundry, garbage room on the main floor and to the public washrooms.

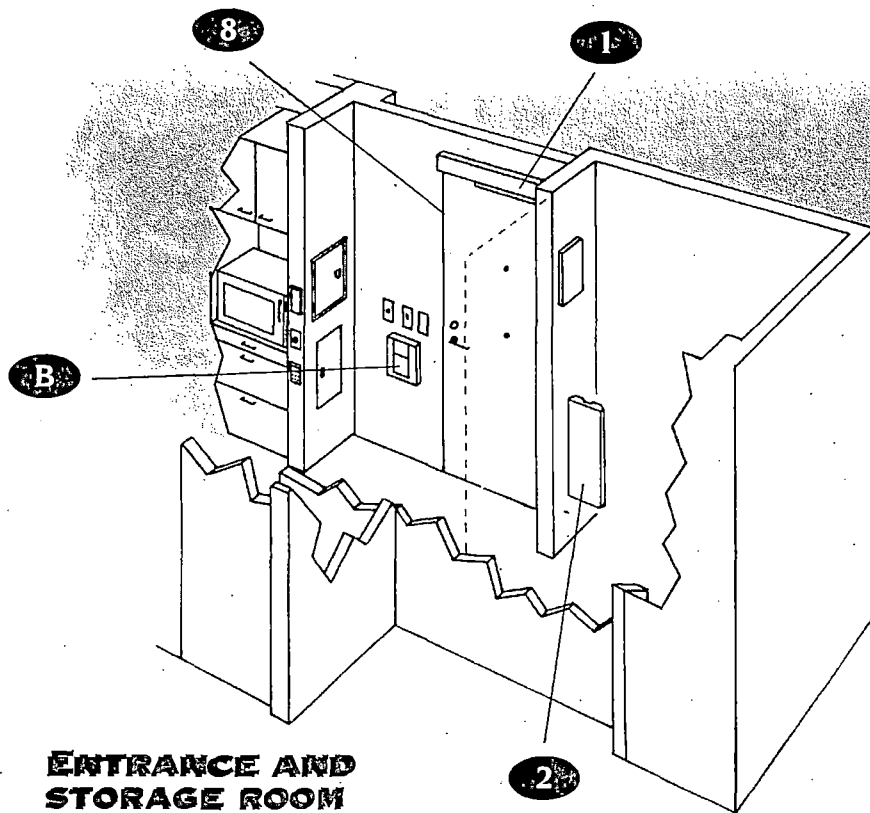
A remote camera located in the lobby transmits images to the tenant's television so visitors can be identified.

With the intercom system, the administration office can contact tenants to notify them of any group activities, emergency situations and special events.

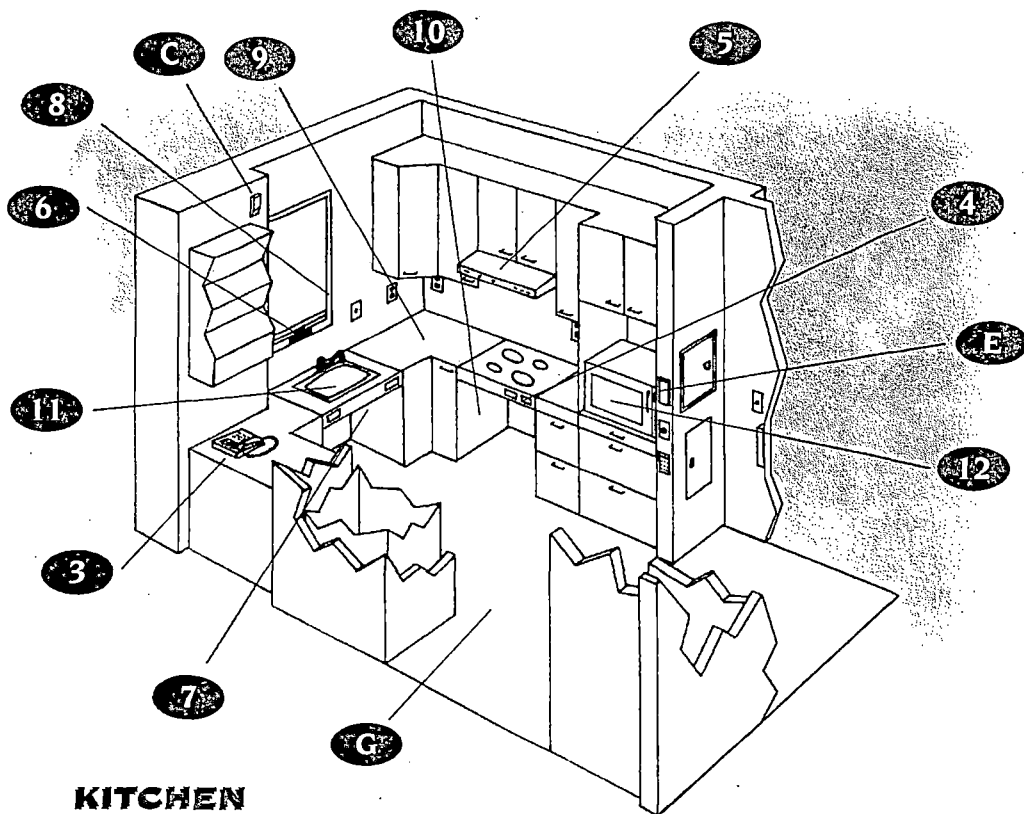
### **Architectural modifications**

The building is equipped with access ramps in the front and the back.

Ramps in the hallways make it easier for people with limited mobility.



**ENTRANCE AND  
STORAGE ROOM**



**KITCHEN**

## **Modifications to the entrance and the kitchen**

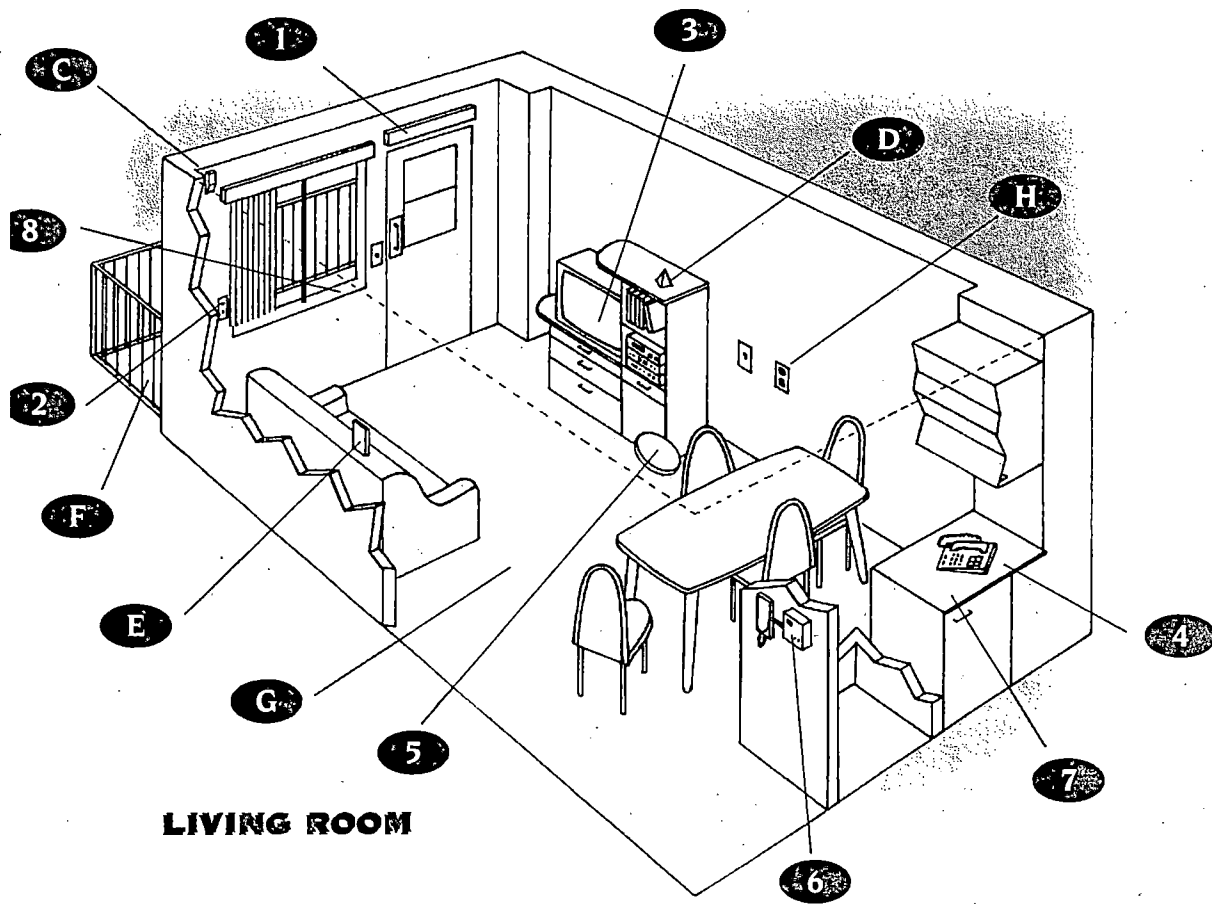
### **Home automation modifications**

- 1 The electromechanical door operator can open the apartment entrance either by a portable remote control or by the wall control. The door then closes automatically after a programmed length of time.
- 2 The central controller – a type of computer – is located in the storage area adjacent to the apartment entrance.
- 3 An intercom and a hands-free telephone are located between the kitchen and living room. Calls may be answered by the same universal remote control used for other functions.
- 4 The burner controls are located on the front of the range top, and a safety timer automatically turns off the burners after a programmed length of time.
- 5 The ventilation hood is equipped with an automatic fire extinguisher. Hood and lighting switches are placed on the front on the counter.
- 6 The window is power-assisted and can be opened and closed using the portable remote control or the wall control panel. When it rains, a humidity detector commands the closing of the window automatically. The opening and the closing of the window also can be programmed with the home automation system.
- 7 A humidity detector under the kitchen sink will alert the absent occupant or the building manager when there is a leak, setting off the appropriate alarm.
- 8 The break-in detectors on the doors and windows, combined with the movement detectors, can cause the controller to sound an identifiable alarm and send an alarm signal to the services concerned.

### **Architectural modifications**

- 9 The height of the counters has been adapted to the needs of a person in a wheelchair.
- 10 Maneuvering room under the counters provides greater access for a wheelchair.
- 11 A shallow sink is equipped with a single lever faucet handle, and maneuvering room under the sink for a wheelchair makes the tap easier to reach.
- 12 The microwave and convection oven is mounted on sliders, and a retractable shelf has been installed underneath.

- X The encircled letters refer to the description on page 4.



**LIVING ROOM**

## **MODIFICATIONS TO THE LIVING ROOM**

### **Home automation modifications**

1

Like the apartment entrance, an electromechanical door operator can open the balcony door with a portable remote control or by the wall control.

2

The opening, closing and angle of the vertical blinds are activated by a programmable wall control unit or by remote control.

3

The occupant's sound system and television are both controlled by the universal remote control.

4

The telephone, which can be answered by remote control, has large-sized buttons which are easier to handle for a person with limited dexterity.

5

The heat and smoke detectors, placed on the ceiling at the junction of the entrance, kitchen and living room, are linked to the central controller.

6

An intercom and a hands-free telephone are located between the kitchen and living room. Calls may be answered by the same universal remote control used for other functions.

### **Architectural modifications**

7

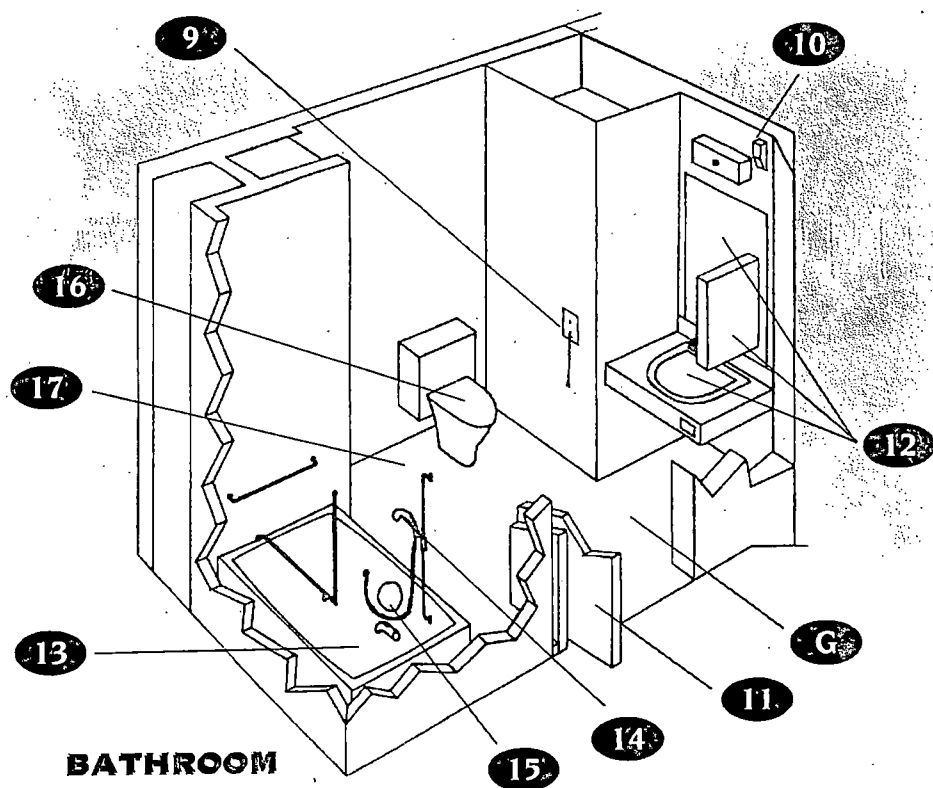
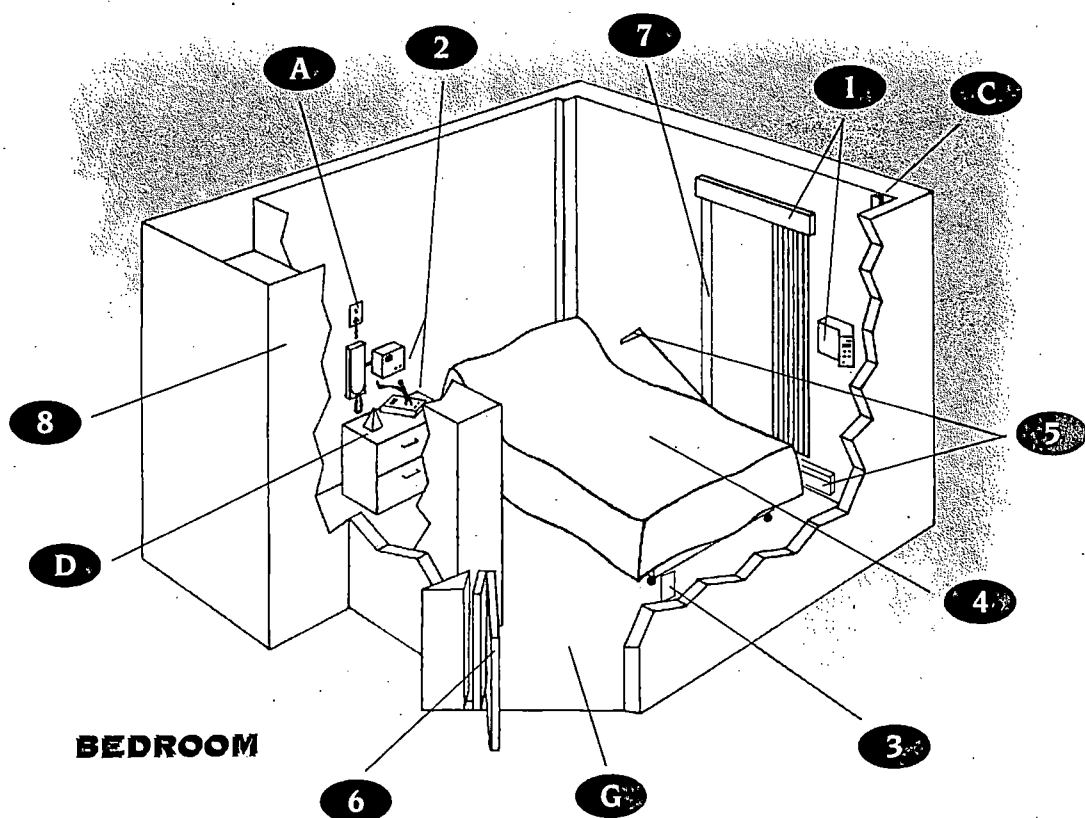
A pass-through between the kitchen and living room makes using the dining area easier for a physically challenged person.

8

The glass panels of the sliding window are mounted on rollers instead of nylon gliders, making them easier to handle.

X

The encircled letters refer to the description on page 4.



## **Modifications to the bedroom and bathroom**

### **MODIFICATIONS TO THE BEDROOM**

#### **Home automation modifications**

1

The vertical blinds function like those in the living room, by remote control or wall control.

2

An intercom, emergency pull cord and a telephone that is activated simply by blowing are located close to the bed.

3

Night-lights are activated automatically, adjusted to the user's taste and to the desired intensity.

4

The electrically adjustable bed is activated by the universal remote control or the wall control.

5

In the bedroom, the heating and lighting are also regulated by the universal remote control attached to the bed with a special support. Heating and lighting are fully programmable.

#### **Architectural modifications**

6

The bedroom doorway has a folding door that requires less range to operate.

7

The window panels of the sliding window are mounted on rollers instead of nylon gliders making them easier to handle.

8

Like the entrance closet, the height of the rod in the bedroom closet is adjustable.

### **MODIFICATIONS TO THE BATHROOM**

#### **Home automation modifications**

9

An emergency pull cord is easily accessible.

10

A movement detector automatically turns on the lights, and can signal a break-in when the security system is on.

#### **Architectural modifications**

11

Like the bedroom, the bathroom has a folding door that requires less range to operate.

12

The sink has a single lever faucet handle and maneuvering room under the vanity facilitates access for a person in a wheelchair. The mirror is big enough to be used by people of various sizes. The medicine cabinet is placed on the side wall to make it more accessible.

13

The straight-back bathtub has a no-slip bottom and grab bars.

14

The shower head is attached to a vertical bar so its height can be adjusted.

15

A thermostatic faucet system regulates water temperature and pressure.

16

The height of the toilet seat is adapted to the needs of a person in a wheelchair.

17

Sufficient space has been provided around the toilet to maneuver a wheelchair.

X

The encircled letters refer to the description on page 4.



**A pilot project carried out jointly by:**

Canada Mortgage and Housing Corporation

Ministère de l'Industrie, du Commerce et de la Technologie

Société d'habitation du Québec

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Domotique Sécant inc.

