

# Security Systems: A Basic Overview

*Protecting your home and family  
from thieves and other disasters.*

**By Andrew Singmin**

In today's society, with the number of unlawful entries into premises being on the increase, the security conscious home-owner is becoming more concerned about the protection of property and possessions. The statistics for a major Canadian city, reports that for every commercial premise broken into, a corresponding two residences are entered. The consequence of such incidents have led to the growth of a large number of security firms, supplying both products and services.

For the non-security specialist, a bewildering array of electronic security systems and support hardware can be had. In order to guide the concerned home-owner through the maze of available options, a very basic overview is presented on what essentially constitutes the fundamentals of any security system. Since the cost of many installed systems would leave little change from \$1000, the prudent purchaser could benefit by knowing exactly what they were getting for their investment.

## Definition

To begin; what is a security system? Very simply, a security system performs two separate and distinct functions, as shown in Fig. 1.

Depending upon the level of sophistication needed and the amount of funds available, the basic system can be configured to an infinite number of

combinations. Current technology allows functions 1 and 2, i.e. "Detection" & "Communication", to be made possible to very high levels of complexity.

A more detailed examination of functions 1 and 2 shows that a further subdivision can be made as seen in Fig. 2.

In summary, a security system should perform the following:

### 1) Detect

- Entry into premises
- and/or
- Movement within premises

### 2) Communicate

- Via internal/external siren
- and/or
- Silent alarm to local police

## Methods for Detection

### Entry detection

Electromechanical hardware forms the prime source of sensor devices, which are typically of two types: contact switches and vibration sensors.

These are generally mounted onto/within window and door frames, usually at the normal entry points. These switches can either be hidden or exposed, but perform the same unique function - when the door or window is unlawfully opened an electrical circuit is completed, via the action of the switch.

Vibration detectors this type of sensor is usually mounted onto non-open-

ing windows, detecting the act of breaking the window glass.

Both types of switches are very simple (electrically) to use; however, significant work on the door and window frames for locating the switches and associated wiring must be performed. The cost of installation would generally far exceed the cost of the switches themselves.

### Movement detection

Electronic sensors are the main source of devices and again are split into two distinct types.

a) Infra-Red, Ultrasonic or Microwave systems, send out a beam of energy into a room and detect the reflected beam off an unlawful intrusion into the protected airspace. The basic principle is always detection of a reflected beam.

b) Thermal sensors, detect the presence of heat emission from a person entering the protected zone.

Both systems contain complex electronic circuitry, but nevertheless are simply plugged directly into the standard 125v power socket. A major undesirable characteristic of these systems however, is the susceptibility to false triggering, especially via the presence of pets around the house. Hence, it is generally stipulated by the manufacturers of such systems that operation should not be carried out in such an environment.

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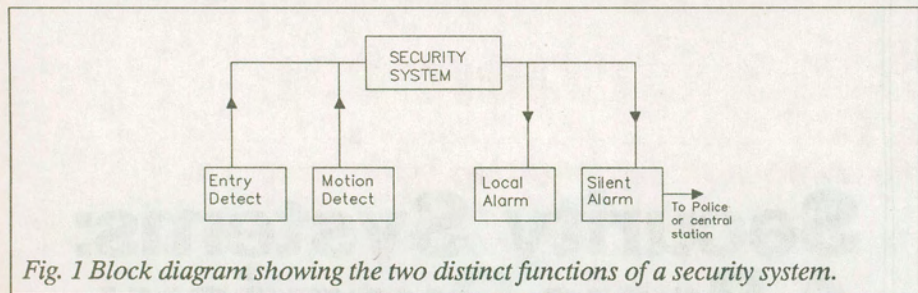


Fig. 1 Block diagram showing the two distinct functions of a security system.

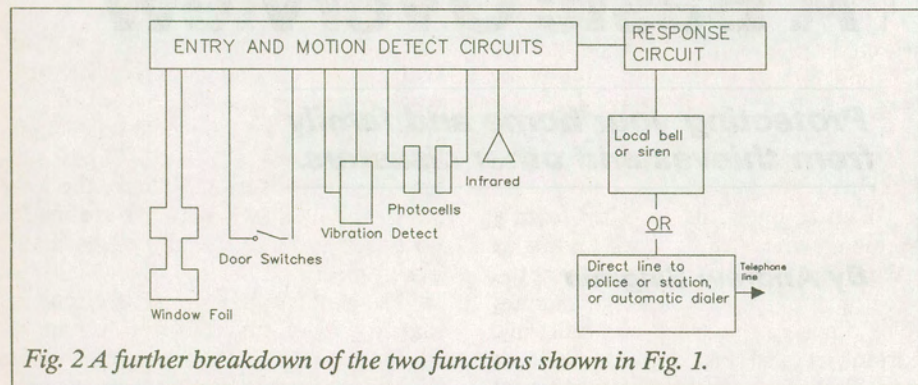


Fig. 2 A further breakdown of the two functions shown in Fig. 1.

### Methods for Communication

#### Audible siren

The very familiar siren features most often found in security systems serve as

a means of alerting the home-owner or neighbors to the fact that entry into the premises has occurred. Mounting of the siren can be either inside or outside the house. An additional purpose for

the siren is to halt the intruder's activities.

#### Silent alarm

This service is generally offered by security firms specializing in monitoring services. When a silent alarm is set off, a check is made upon the state of the house. If no verification is received that the house is secure, then a call is made to the local police.

### Conclusion

Security systems can be a significant monetary investment depending upon the level of sophistication required. It would be wise therefore, when comparing the merits of various systems offered, to separate the 'DETECTION' from the 'COMMUNICATION' functions in order that valid comparisons can be made.

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