

ALARM SYSTEMS FOR THE HOME

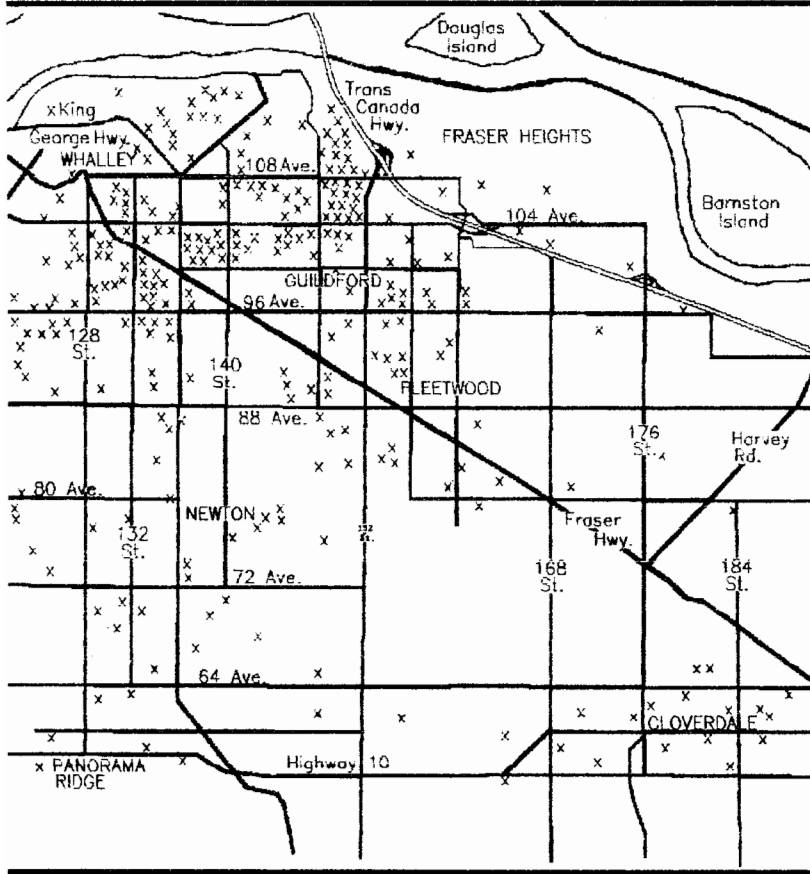
September 8, 1993

OBJECT: To be able to select alarm components and possibly install all or part of the system yourself.

MOTIVATION: A break in really makes you feel violated. Usually your spouse will not rest until you do something. An alarm is a step towards peace of mind for you and your family.



Why do you buy an alarm system?



1. To protect your possessions when you cannot personally stand guard over them.
2. To deter or catch those who may take your possessions from you.
3. Peace of mind for you and your family.

The map to the left shows where break-ins occurred in northern Surrey in May 1992. The area where a home is most at risk appears to be the Whalley/Guildford area.

Each "X" represents a break-in that occurred in May 1992 in Surrey.

STEPS TO HOME SECURITY

Get insurance. A professional thief will not be stopped by whatever you install. Insure for full replacement value for all insurable items that can be replaced. However, we all have irreplaceable personal items that insurance will not cover but thieves are not often interested in these anyway.

Recognize the three steps to protection. Deterrence, Obstruction and Capture or Flight.

1. **Deterrence** - Stop the thief from even thinking about your home as a target. Good lighting, alarm system stickers and some evidence of an alarm system. The quickest and easiest way to do this is to go to Radio Shack and buy a package of 5 Warning Decals, part number 49-507 for \$2.69.

Leaving outdoor lights on all the time is useful. However in this day of having to conserve power, you may prefer motion detector activated lights, available at building supply stores or London Drugs (often less than \$20.00) in the front and back are useful deterrents. Having lights come on while an intruder is casing the joint can do a very effective job scaring them away.

A big mean dog, properly trained, is a very good deterrent though they cost a lot to train and even more keep up but is not recommended for most people as they may be difficult to live with.

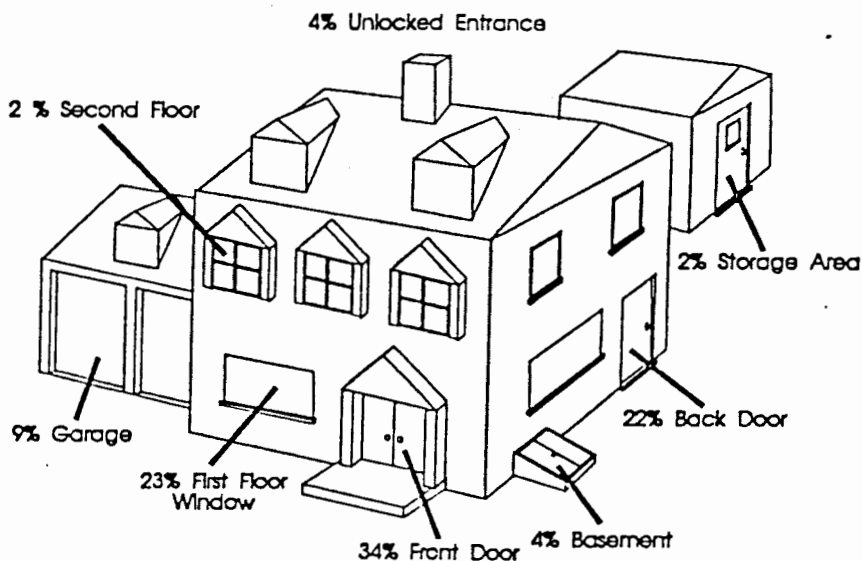
2. **Obstruction** - The diagram to the right shows you where most illegal entries are made into a home.

Make it as hard as possible for thieves to get in. Good locks, barred lower windows, etc. If it takes a thief too long to get in and out, they will not try. They only want to spend 2-3 minutes doing the entire job most of the time as the odds of detection get too high if they have to take longer. They want to do it fast.

If you only have key in the knob door locks, you may as well hang up a neon sign saying "BREAK INTO THIS HOUSE".

3. **Capture or Flight** - You can have a silent alarm to try to catch thieves or you can use a siren to scare them off. The first one may give them enough time to get out before the police arrive but they still stand a good chance of getting caught. With an audible alarm, they usually drop your stuff and run. While they have left you alone, they are still free to try again somewhere else.

Where Do Burglars Enter the House?



A Temple University study by Professor Andrew Buck revealed that in 79 percent of burglaries in three communities near Philadelphia, the burglar entered through the first floor. The front door, back door and first-floor windows were the most common means of entry.

BASIC ALARM THEORY

An alarm system has three basic sections, **input**, **control** & **output**. Input devices include: Motion detectors, magnet switches, window bugs, smoke detectors, etc. The control section is the control box which may include a keypad or key switch for arming. Output devices include: Dialer, siren, strobe light, X-10 interface, etc.

INPUT DEVICES

There are two main categories of input devices. These are **perimeter detectors** and **area detectors** (motion detectors). Perimeter detectors detect when an intruder has crossed the perimeter of the protected area. The most common types used are magnetic door or window switches and glass breakage detectors (window bugs) which have replaced the older window foil technique.

One of the first questions that you should ask yourself is what do you wish to protect with your security system? Most people have a definite idea of what is they want to protect and how they want it achieved. In analysing your needs, ask yourself whether you require perimeter protection at all.

Perimeter protection is a necessity only if you wish to arm the system at night and have the freedom to move about the house without triggering the alarm. Typically wives whose husbands travel a lot want this type of protection or if you are concerned with home invasion. Perimeter protection is also useful for keeping people inside as well, as in the case of young children or elderly people. Perimeter protection is more expensive as it requires the installation of Door/Window sensors on possible entry points and installation of wires to all these locations.

The most common perimeter device is the Magnetic Switch. Magnetic door or window switches have two parts. The first is a magnet that is mounted on the moving part of the door or window. The other is a magnetic reed switch mounted on the door or window frame. When the door or window is closed, the magnet is next to the reed switch which holds its contacts closed, completing a circuit. When the door or window is opened, the magnet is moved away from the reed switch which causes the circuit to open. This interruption of the circuit is what the alarm control panel detects.

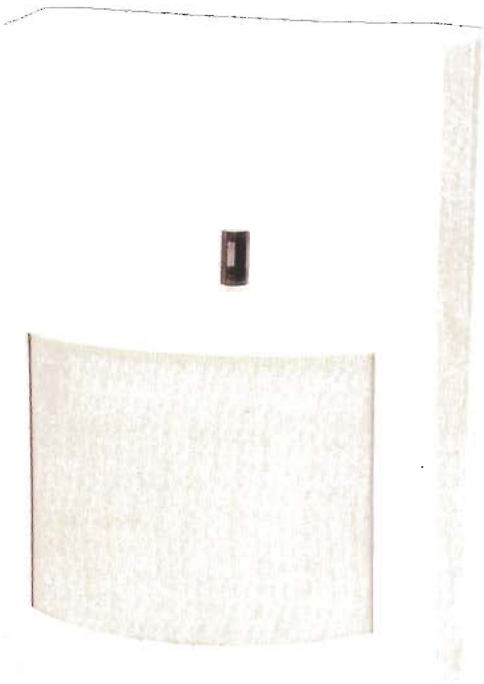
A typical door or window switch would be the Radio Shack 49-495 for \$4.69. A package deal from a company like Centra Systems would include 5. Concealed types are also available for about the same price. These look better but take longer to install. Not that all prices quoted do not include PST or GST.

For cases where the intruder is not so polite as to open the door or window, basic glass breakage detectors are used. A typical glass breakage detector (also called a window bug) is the Radio Shack 49-516 for \$11.69. This is for large patio doors or other places where an intruder may break a window for entry.

The main problem with perimeter devices is that wires have to be run to each one. This is labour intensive and may be unsightly.

The interior detector most commonly used is the Passive Infra-red (PIR) motion detector. These detect body heat and are the most

economical and most reliable detectors available. Alarm companies have both low range and extended range types from about \$50.00. Radio Shack offer these from \$59.95.



PIR Motion Detector

These are usually used to cover the rooms where the more valuable things are kept and/or areas the intruders may have to go through to get to the good stuff. Therefore, the most common places to put these is in the living room and the hall.

Interior protection is cost effective as a single detector can cover a large area whereas the Door/Window Sensor only protects a single entry point. Every security system should have at least 1 motion detector. If you do not include a motion detector in your system, the danger is that a smarter burglar could bypass the perimeter protection and then ransack the entire house without triggering an alarm.

Even if the only access is through a door, a Motion Sensor should still be installed. Burglars have been known to break into a complex through a unit without a security system and then cut through walls in order to gain access to other units.

If you have larger pets that roam the home freely, place the Motion Sensor inside the master bedroom and keep the pets out of that one room (in most cases burglars enter the master bedroom to search for money and jewelry). Cats are usually OK and seldom set off motion detectors. If necessary, specify a "pet alley" lense for the detectors. This aims the detector's pattern so that it will not pick up close to a floor, creating an "alley" where pets may roam without being detected. Also, some detectors, such as the Canadian made DSC Bravo 3 series include a lens masking kit to aim the pickup pattern if necessary.

More advanced types, often called "dual tech" combine both a microwave and passive infrared motion detector for greater sensitivity. An example would be the DSC Force 2 series. These usually cost a bit less than double what the standard passive infrared types, starting around \$89.00 each. These were developed to overcome the inability of the standard PIR detector to detect moving people when the ambient temperature is close to body temperature. This is not a really big concern in most of Canada, most of the year but could be a major problem in hotter climates.

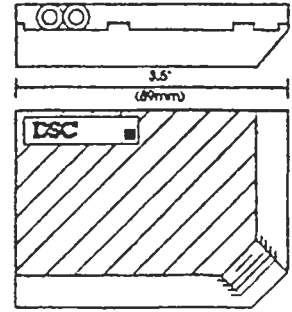
Other input devices to consider include:

SMOKE DETECTOR - There are smoke detectors that have a relay in them that is used to trip the alarm. These cost about \$45.00.

They are usually wired onto a separate zone in the panel so a distinctive fire alarm message may be sent to a monitoring service.

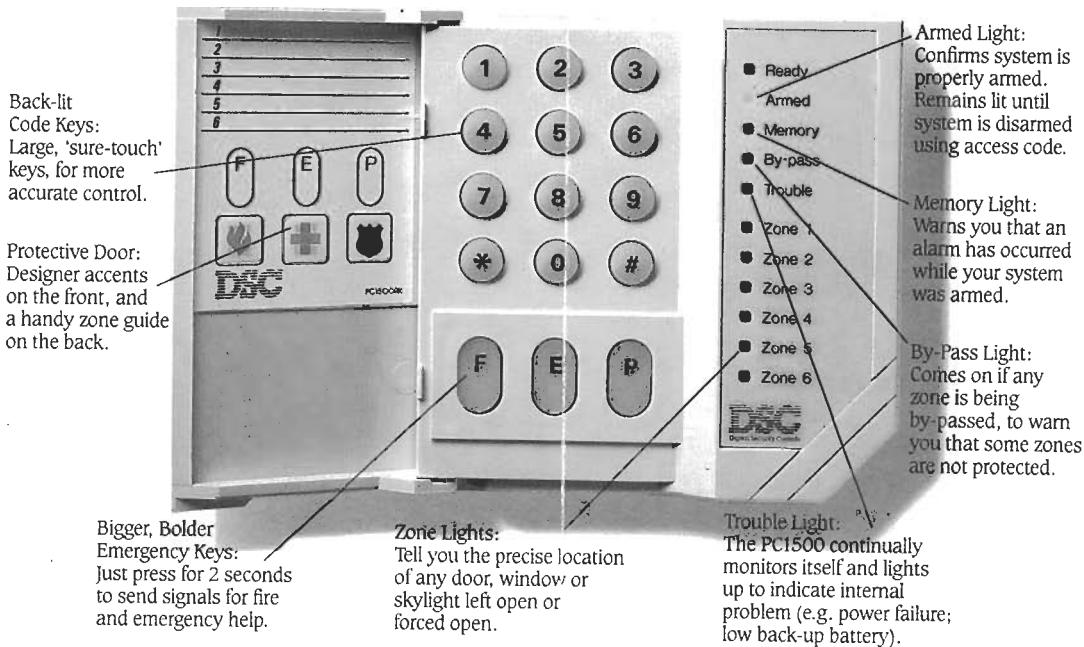
PANIC SWITCHES - If you are afraid of home invasion, you may want to wire one or more panic switches around the home to the system. This is a concern especially for women who live alone or whose husbands are away a lot. The Radio Shack 49-517 for \$1.99 is an example.

GLASS BREAK DETECTOR - An example is the DSC DG-50 for about \$48.00. It listens for the unique sound of breaking glass. One unit can cover one or possibly more rooms. This is a form of area protection as well.



DG-50 Glass Break Detector

CONTROL PANEL



DSC PC1500 Keypad

Most control panels have the same things in common. They most always have several zones or loops. These zones or loops include:

STANDARD DELAY LOOP - This loop has a time delay to allow you to exit the premises and when tripped delays the alarm to give you a chance to shut off the system when you enter. This delay is programmable and is usually set between 45 and 90 seconds.

INSTANT LOOP - This loop has the standard exit delay but sets off the alarm instantly if it is tripped. This is the most common type of loop used.

INTERIOR LOOP - This loop has the entry delay of the standard delay loop but only if the delay loop is tripped first. If this loop is tripped first, it sets off the alarm instantly.

INTERIOR HOME AWAY LOOP - This operates above except that it is bypassed if the delay loop is NOT tripped during the exit delay time. This is meant for interior motion detectors for when you are at home. They will not operate when you turn the alarm on when you are at home and turn the alarm system on. They only operate if you turn on the alarm system and exit the premises during the exit delay time. This allows your perimeter protection to function while at the same time permitting you to freely move about the house.

24 HOUR BELL LOOP - This type of loop is active at all times whether the panel is armed or not.

24 HOUR BELL/BUZZER LOOP - While active 24 hours, if you program a loop this way, it will activate the bell/siren output only if the loop is tripped while the panel is armed. Otherwise, it only sets off a buzzer in the keypad.

24 HOUR BUZZER - As a 24 hour bell loop except that only the buzzer is activated instead of the bell/siren output.

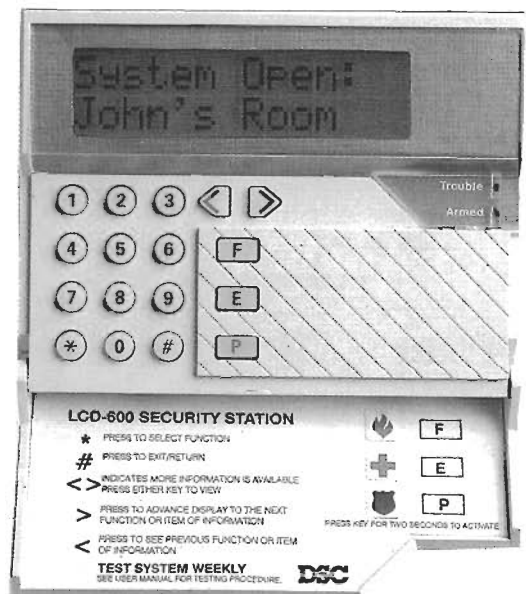
AUXILIARY DELAY LOOP - Same as a standard delay loop but the entry/exit times are different. Useful if using a second keypad.

FIRE LOOP - This type of loop is active 24 hours a day and transmits a distinctive fire code to the monitoring company if tripped. On some panels, it waits 30 seconds before transmitting to the monitoring company to give you the chance to override the alarm by pressing a special code into the keypad. This feature prevents the fire department from coming when you set off the smoke detector from bad cooking practices.

All control panels have a siren output as well as either an output to trip a dialer or may have a dialer built in. Some may also have a keypad built in or a key switch for arming and disarming. If not built in, there will be terminals for connecting an external keypad or key switch.

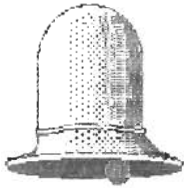
An example of a sophisticated economy panel is the Canadian DSC PC1500 Control Panel. See the picture of the keypad on page 5. It is quite adequate for most applications and costs about \$150.00. This includes 6 zones, a keypad and dialer. The only problem with this dialer is that it can only be used if you are paying for a monitoring service. The codes that it transmits can only be read by an alarm monitoring company computer.

More sophisticated models are available if your needs are greater. Some, like the DSC600 Message Keypad can even be programmed to give a readout in English where the the intrusion occurs. Others will talk, telling you the status of the system.



DSC LCD600 Message Keypad

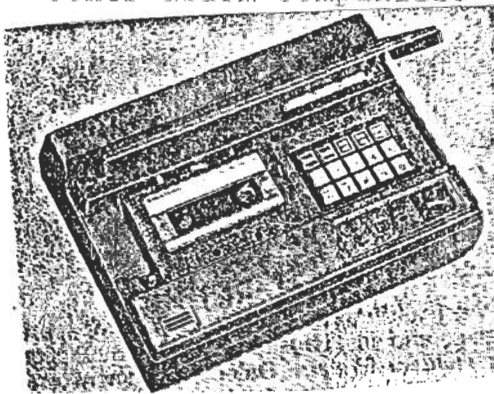
OUTPUT DEVICES



The most common output devices are the dialer and the siren. Reasonable quality, really loud electronic sirens start at about \$29.95 for weatherproof models. Others cost from \$14.69. A siren is used if your main need is to scare away intruders. It is not much help if you are in an isolated area or a very heavily populated area. In isolated areas an intruder knows no one will hear it. In heavily populated areas there many false alarms from car alarms that use sirens that sound the same.

For greater protection, a dialer is used. There are two types. The digital dialers, usually built into the panel call up a monitoring company and tell the alarm company's computer what type of alarm has occurred. These are very effective but only work when you are paying for monitoring service, about \$25.00 per month. Some control panels have a digital dialer built in. The digital dialer can be purchased separately from about \$70.00 for inclusion into already existing systems.

Alarm monitoring services are staffed 24 hours a day, 365 days a year. Most alarm companies sub-contract this work out to telephone answering companies or may pool their monitoring work with other alarm companies.



Tape type voice dialer

Another type of dialer is a voice or tape dialer. An example is mainly Radio Shack 49-433 which costs \$139.95. This unit dials three phone numbers and plays the same voice message to each one. The message is one that you have recorded. The advantage of this unit is that there are no monthly fees.

The dis-advantage is that if no one is available at all three numbers, you are out of luck. This is OK if you know three places that where at least one of them has a person available to answer the phone all times. Otherwise, it is best to supplement this unit with a siren.

Note that neither the police nor 9-1-1 will accept calls from a dialer. They require that a person calls them.

If your property is especially valuable, you can get a dedicated line system that will detect whether your phone line has been cut. However, anyone with especially valuable property should see a professional security consultant.

In addition, if using a dialer, it should be plugged into a type of phone jack called an "RJ31X". This allows the dialer to seize the phone line. Without it, a smart burglar can mess up the dialer's operation by taking the handset of any phone in the house off the hook. The RJ31X jack is installed by the telephone company.

Concerning a monitoring company, most alarm equipment suppliers do not do the alarm monitoring themselves. They contract

it to a professional monitoring company. Other alarm companies do it themselves. Today, with computers and nearly instant telecommunications, it does not matter where the monitoring company is. One in Toronto can respond just as quickly as one in Surrey. The thing to look for is that the monitoring company has some sort of UL rating and if they are out of your calling area, the dialer works on an "800" number. No matter where the monitoring company is located, they will contact your local police or fire department if they get an alarm message from your system.

Some people add a strobe light to the alarm system to aid police in finding their home. A typical unit is the Radio Shack 49-527 for \$29.19. This would normally be mounted on the roof or someplace, visible from the road.

Note that it is illegal to use as an output device anything that may actually injure the intruder. Alarm activated shotguns, poison gas cylinders, etc. are definitely out.



TYPICAL SYSTEMS

A typical, basic system would be covered with a package like that offered by Centra Systems for \$289.00. It includes:

- DSC PC1500 6 zone control panel & keypad.
- 30 Watt siren.
- CSA approved power transformer.
- 12 Volt Rechargeable Battery.
- 1 PIR Motion Sensor.
- 5 Magnetic Contacts.

Not included are wire and commissioning of the system which would probably cost an additional \$150.00. PST and GST are not included. It is possible to step up to a more deluxe system in whatever increments you wish. The other end of the spectrum for a reasonably complete home system would include for \$745.00 all of the above and add:

- Second Keypad
- Second Motion Detector
- Magnetic contacts as required.
- Installation in typical home except for pre wiring.

The labour for pre-wiring may be done by the home owner. However what a professional can do in one day, will take a home owner two days to complete. Professional labour rates range from about \$35.00 to about \$45.00 per hour.

In all cases, monitoring would be about \$25.00 a month.

RP Electronics

Another vendor of D-I-Y alarm components, RP Electronics at 4th and Arbutus in Vancouver, have the following approximate prices on alarm components:

- | | |
|----------------------------------|--------|
| 6 Zone Control Panel and Keypad. | 159.95 |
|----------------------------------|--------|

12V/6.5 AH Backup Battery	37.95
Magnetic Door/Window contacts	4.95
Concealed magnetic switches	6.95
Glass break detector (window bug)	10.95
PIR Motion Detector	59.95
15 Watt siren	19.95
Power transformer	14.95

Typical prices for other components from various vendors:

DSC PC1500 series alarm panel c/w keypad	150.00
DSC PC2500 alarm panel c/w keypad	199.00
Smoke Detectors	45.00
Heat detectors	13.00
Magnetic switches - concealed	5.00
Magnetic switches - surface	8.00
Wire - 22 Gauge/4 conductor - per foot	.06
Dialer if bought separately	85.00 to \$139.95

WIRELESS ALARMS

All of the above systems need to be wired in. Would it not be nice just to hang up the parts and not need to worry about installing messy wires? There is a wireless system made in Richmond called the SNIF and sold at Thunderbird stores. It is a good quality product and the best choice for some people.

The input devices communicate to the control box by radio using no wires. Each input device has a battery and signals the control box when the battery on any unit is getting low.

A wireless alarm system is easy to install and easy to move. A big plus if you are a renter or plan to move soon. A home owner who planned to contract out the installation would also probably save enough to cover the much higher cost of the equipment.

The SNIF starter system (suggested price \$389) consists of: 1 keypad, 1 monitor unit, 1 motion detector, instructions, warranty, door decals and monitoring agreement. Monitoring is offered at \$16.95 per month, less if you pre-pay for up to two years.

A more advanced system would add a 120db siren, a second motion detector and 2 door/window sensors. This would raise the cost to about \$655.95. If you want to expand the system further, the cost of each component is approximately:

Keypad	\$69.00
Motion Sensor	\$119.00
Door/Window Sensor	\$49.00
105dB Siren	\$39.95
120db Siren	\$49.95
Monitor only	\$219.00

In addition, delivery & setup is available direct from the manufacturer from \$50.00 in the greater Vancouver area.

Radio Shack also sell the Dicon wireless alarm system. The components available include:

Dicon 9000 console, part #49-8400	(\$578.95)
49-8404 smoke detector	(\$89.59)

49-8404 motion detector (\$125.39)
49-8403 remote control (\$117.86)
1 year monitoring service (\$265.00)
Door/window switch transmitter (\$74.85)
Freezer temperature monitor
Excess water detector
Security/Medical Pendant (\$67.72). This can be very useful for seniors. This is similar but cheaper than the one seen on the TV commercial where the lady falls down and cannot get up again.

CLOSED CIRCUIT TV

This can be useful for monitoring your front door for unexpected callers, etc. Radio shack sell a basic system for \$299.95 (\$349.95 with intercom). This consists of 1 black and white camera and 1 black and white 5" monitor.

Extra cameras (part 49-8044) are available for \$169.95 each. A switcher (part 49-8043) that will allow you to scan between three cameras automatically is available.

There are many other variations of closed circuit TV available from professional contractors. It is usually not used for normal home systems but if you have particularly valuable possessions or are concerned about strange callers, you may want to consider it.

X-10 SYSTEM

This is not strictly a security product. Radio Shack call this system the "Plug 'N Power" system. Others use the X-10 designation. This product is a line of remote control modules. It includes lamp and appliance control modules that plug into electrical outlets or lamp modules that may be used in place of wall switches. The control console is plugged into any electrical outlet in your home. The control signals are transmitted via the electrical wiring in the house.

Control consoles and modules start at \$20.00. Radio Shack also sells a programmable console that will turn your lights on and off at pre-set times to give your home a lived in look. Regular timers only turn one light on and off. This unit can control any light controlled by an X-10 module.

There is also available an alarm interface module that ties into your alarm console¹. Mine is wired to flash all the lights connected to the system in the house on and off when the alarm is tripped then leaves them on when the alarm re-sets itself.

¹The PF284 Burglar Alarm Interface connects your alarm system to lights controlled by other X-10 modules. The quoted price for 1993 is \$49.95 from Automatic Mansion. Contact David McColl at 875-6465. All X-10 modules work with Radio Shack Plug "N" Power products.

There is also an X-10 wireless alarm system available for \$99.95. Radio Shack stock it as part number #61-2611. This is a purely local alarm system and includes two door/window transmitter. Extra door/window units (61-2612) cost \$21.95 each.

INSTALLATION

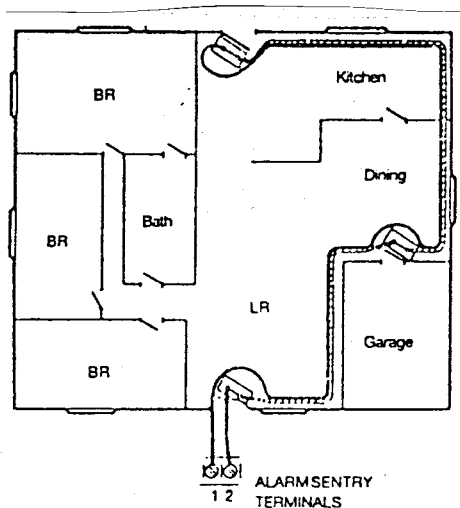
To install an alarm system, after determining what type of system to buy and deciding to do it yourself, the first step is to plan what you are going to do. Do a basic drawing of the plan of your home and make several copies. The reason for several copies is that a separate plan will be needed for each loop in your system to keep the plans legible.

When you plan, remember that wiring should be hidden not only for cosmetic reasons but to improve security. Place outside sirens and lights high and out of reach under normal circumstances. This increases the range of these devices and prevents tampering. All wiring and devices, especially the control panel should be inside the protected area for maximum security.

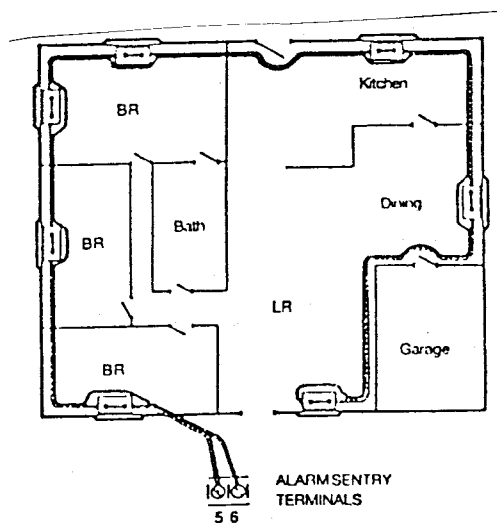
Note that the terminal numbers on the following diagrams may not match the numbers on your control panel. Also note that while the alarm devices on the diagram are shown as switches, they may also be the contacts on motion detectors, glass break detectors, smoke detectors, etc.

NORMALLY CLOSED DELAYED LOOP DIAGRAM

This loop is for the devices that while detecting an entry, their activation is delayed to allow you to get into the protected area to shut off the alarm system. These are only to be installed at points where people normally enter the home.



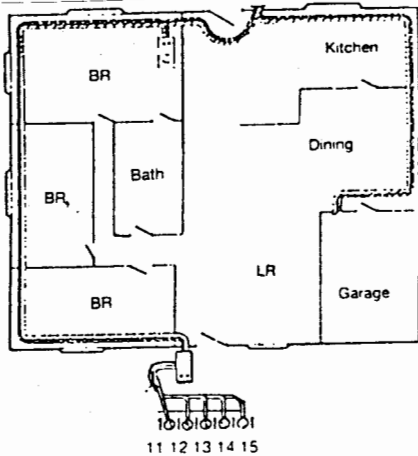
Normally Closed Delayed Loop



Normally Closed Instant Loop

NORMALLY CLOSED INSTANT LOOP DIAGRAM

This loop is for all your other areas. If you have a multiple zone alarm panel, this loop may be split up into several loops. The devices shown may include motion detectors, etc.



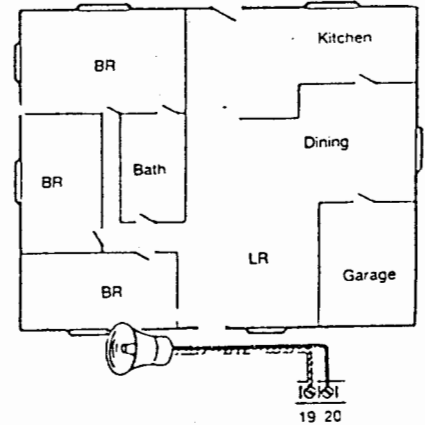
Key Pad Wiring

KEY PAD OR KEY SWITCH WIRING DIAGRAM

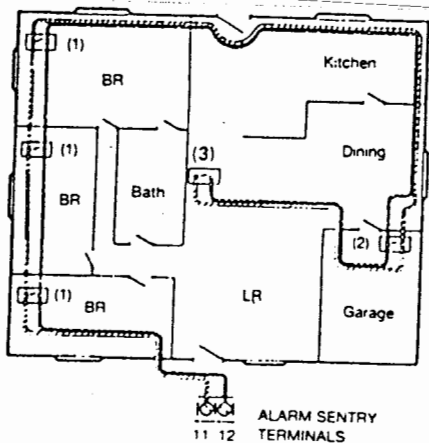
This diagram shows where you will put the key pads or key switches for turning the alarm on and off.

OUTPUT DEVICE WIRING

- This diagram includes the wiring to your siren, dialer or any other output device you may decide to use.



Output Device Wiring



Panic Switch Wiring

PANIC SWITCH WIRING DIAGRAM

- These optional switches would be connected to a "24 hour" loop. This is a loop that is never disarmed, even when you are at home. The better panels such as the DSC units may be programmed for this function.

This function is primarily used if you are worried about robbery while you are at home or for medical emergency.

GUIDELINES FOR PIR MOTION DETECTOR INSTALLATION

PIR motion detectors are not very critical for installation as long as you follow a few basic guidelines:

- Do not let the sun fall on the detector.
- Make sure that there are no large obstruction in the desired detection zone.
- Install them a bit above head height.
- Do not install them over heat registers, radiators or sources of water/oil vapours.

INSTALLATION HINTS

CONSIDERATIONS FOR PLACING MOTION SENSORS

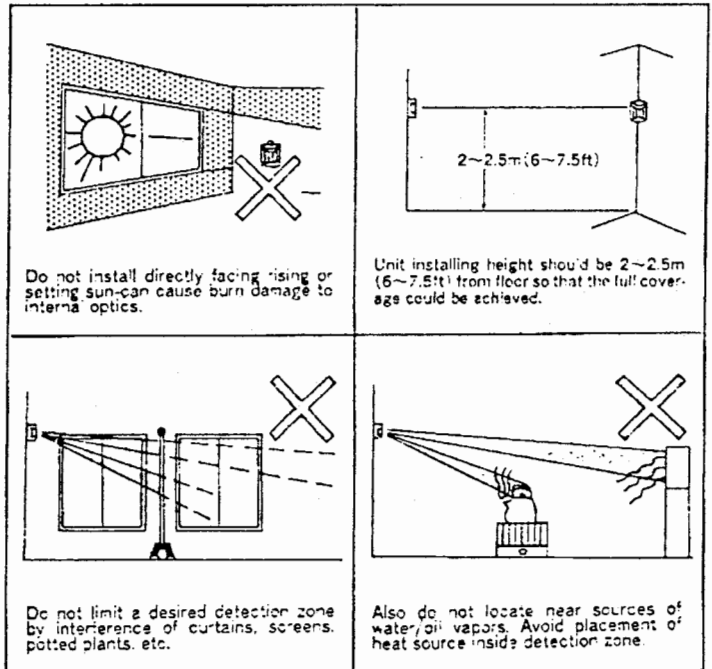
A Motion Sensor should be installed on every level of the home which is accessible from the ground, from a patio or by climbing on top of tool sheds or carports. Motion Sensors should normally be installed in a central area of each level of the home covering access to rooms containing valuables (stairwells or hallways for instance). In addition, Motion Sensors can also be installed in individual rooms containing valuable equipment such as computers, stereos or televisions where access can be gained directly from the outside of the house.

Be aware that different lenses are available for many PIR motion detectors. A common unit like the DSC Bravo 3 offers a wall to wall lense (50' x 60' coverage), long range lense (120' x 10' coverage), curtain lense (50' x 4.4') and pet alley lense (50' x 60' coverage but with a restricted vertical angle). The manufacturer also supplies a lense masking kit to allow you to custom block any areas you wish the detector to not observe. An example may be a window with bright sunlight streaming into it on occasion.

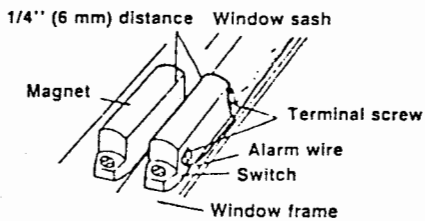
MAGNET SWITCH INSTALLATION

A Temple University study shows that burglars entered homes through the ground floor in 79% of the instances. For this reason, Door/Window sensors should be installed on every vulnerable entry point on the ground level (if the customer desires perimeter protection). By installing Door/Window sensors on the front and back doors, 56% of all break-ins will be detected (according to the Temple University study). If Door/Window sensors are also installed on all ground floor windows, then the chances of detecting the burglar increase to 79% (that is, if the burglar forces the door or window open rather than breaking the glass - another reason interior protection is valuable). If the customer has an attached garage, then you can add an additional 9% to these statistics.

Magnet Switches, the usual perimeter sensor, have two parts, the actual switch and a magnet that controls the switch. They are available in N.O. and N.C. loop models. The N.C. type are more common as the alarm



Motion Detector Installation Hints

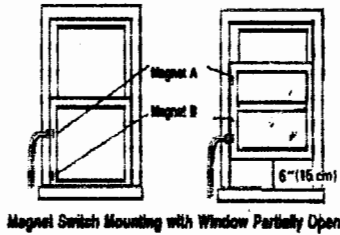


Magnet switch mounting to a window

When the two parts are separated, the switch is tripped, setting off the alarm.

Magnet switches are very reliable and are excellent for use on doors, movable windows or anywhere else you want the alarm to be activated when something is moved. You can also connect N.O. magnet switches to your panic or 24 hour loop to protect paintings or other valuable items.

In all cases, mount the switch half of the unit to the stationary surface. This may be a window frame, a door frame or wall next to a painting. The magnet would be attached to the moving part, the door, window or painting. As illustrated on the right you mount a door switch on the opening side of the door, that is, the side away from the hinges to ensure the switch is activated upon door opening without leaving enough open space for an intruder to slip through.



Magnet Switch Mounting with Window Partially Open

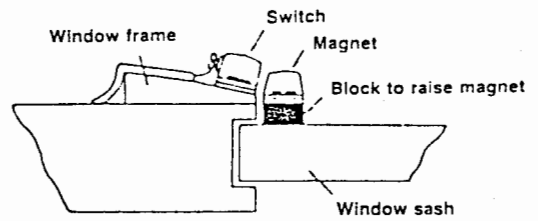
If you do not mount the switch and magnet close enough together, the switch may not activate properly. You should be able to hear the switch faintly click as the two parts are separated and brought together. If you cannot hear a click, use an ohmmeter to check for continuity as some switches click so faintly it may be inaudible.

If you cannot get the two parts close enough, you may have to mount one section or the other on a small block of wood to act as a spacer.

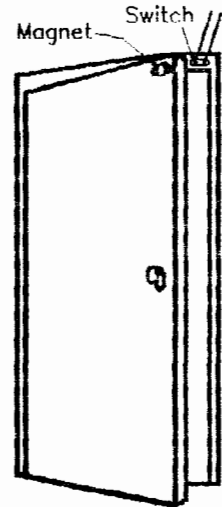
In case, you want to be able to leave a window slightly open and yet still be able to arm the alarm, mount two magnets on the window as illustrated above on the left. One magnet will be next to the switch in the window closed position while the other magnet will be next to the switch in the window open position. Regardless, you never want to leave a gap greater than 4 inches or 10 cm. using this method. Rest assured that if an intruder can get their head through an opening, some of them can get the rest of their body through as well.

panel is triggered if a smart crook tries to cut the wires.

If the two parts of the switch are close together, within 1/4" or 6mm, the switch is in the normal position.



Raising magnet level with a spacer



Magnet Switch mounting on door frame

The magnet switches in your system are usually Normally Closed devices and are wired in series like the topmost example at the right. This is so that if any switch in the series went open or if an intruder cut the wires, the alarm would be set off.

If Normally Open switches are used, they are wired in parallel like the second illustration.

At the end of the loop, the switches are wired like the bottom two illustrations with end of loop resistors in most cases.

LOCATING THE KEYPAD & CONTROL PANEL

The keypad must be mounted where it may be conveniently reached within seconds of entering the premises. This is to reduce the possibility of you running out of time on the delayed loop to deactivate it. However, the area the panel is in should be inside the protected area to avoid tampering with the keypad.

Almost all systems are wired with a "tamper" switch in the keypad, wires to the instant loop so that tampering with the keypad will set off the alarm. Some people consider mounting the keypad outside the protected area, usually outside, so there is no need for any type of alarm delay. However, weathering usually makes the keypad operation intermittent in a year or two, resulting in frustrating operation arming & disarming the system.

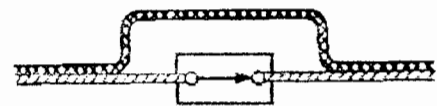
The control panel must be mounted in an out of the way location inside the protected area. Many are mounted in the furnace room or near where the telephone wiring enters the home. Regardless of what location you pick, it should not be too inaccessible for service but must not be readily obvious to an intruder so they can disable it before it completes dialling out for help.

In addition, the control panel should not be subjected to any environmental conditions that you find uncomfortable. Don't mount it over the furnace or dryer or places it may be subjected to oil or water vapours.

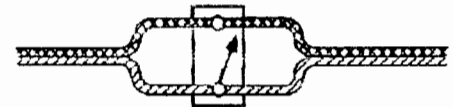
SIREN MOUNTING CONSIDERATIONS

With a professionally monitored system, a think twice before installing a siren. If the police will be called anyway, a siren may only cause unwanted intervention by a "Good Samaritan" neighbour who may end up confronting a possibly armed and dangerous criminal. However, in cases where the system is not professionally monitored or if you are unsure of police response time, many people consider a siren to be essential.

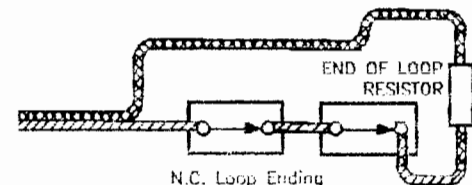
It will usually scare away the intruder and hopefully your neighbours will have the sense not to confront an intruder but to



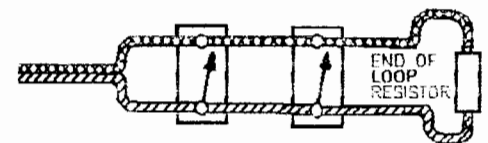
Normally Closed Switch
connected in series



Normally Open Switch
connected in parallel



N.C. Loop Ending



N.O. Loop Ending

Loop Wiring

call the police right away. However, as a courtesy, you may wish to tell neighbours you trust, especially those who are on the Block Watch program (as you should be) about the alarm system.

If your intent is to have someone call the police, the siren should be mounted outside the building, as high as possible to avoid tampering. If it cannot be mounted in a really inconvenient spot, a sturdy wire mesh cage should be built around the siren to avoid tampering.

If you want to scare away the intruder, install the siren or add a second one inside the building. The loud noise, concentrated inside a house will create a racket so loud that a criminal who is likely pumped up on adrenalin is probably going to run instantly.

WIRING TO THE CONTROL PANEL

The diagram on the next page shows the typical wiring for a basic microprocessor based alarm panel, the DSC1500. Other panels will vary somewhat but the basics will remain the same. There also may be more zones. Please note that the N.C. or N.O. contacts shown may be from any type of detector, be it a magnet switch, motion detector, smoke detector, etc.

AC TERMINALS - This is where the power transformer connects, supplying low voltage AC to the panel. This is never 120V AC power.

AUX TERMINALS - & + - These supply 12V DC power to operate keypads, motion detectors, smoke detectors, etc.

BELL TERMINALS - Connection for the siren. If there will be more than one siren, this output may have to operate a relay to control the extra units. This is because these terminals can seldom handle more than 1 Amp.

PGM TERMINAL - This is a programmable terminal. One application can be to keep a lamp on for a minute or so after you activate the system if you leave in the dark a lot.

KEYPAD TERMINALS - To connect signal wires (Yellow & Green in most cases) to the control circuitry.

ZONE/COM TERMINALS - Each zone connects between a zone terminal, Z1 for example and a common or "COM" terminal. In the example shown, zone 1 connects to a smoke detector while zone 3 connects to a loop with both normally closed and normally open contacts. Zone 4 is connected with normally closed contacts only.

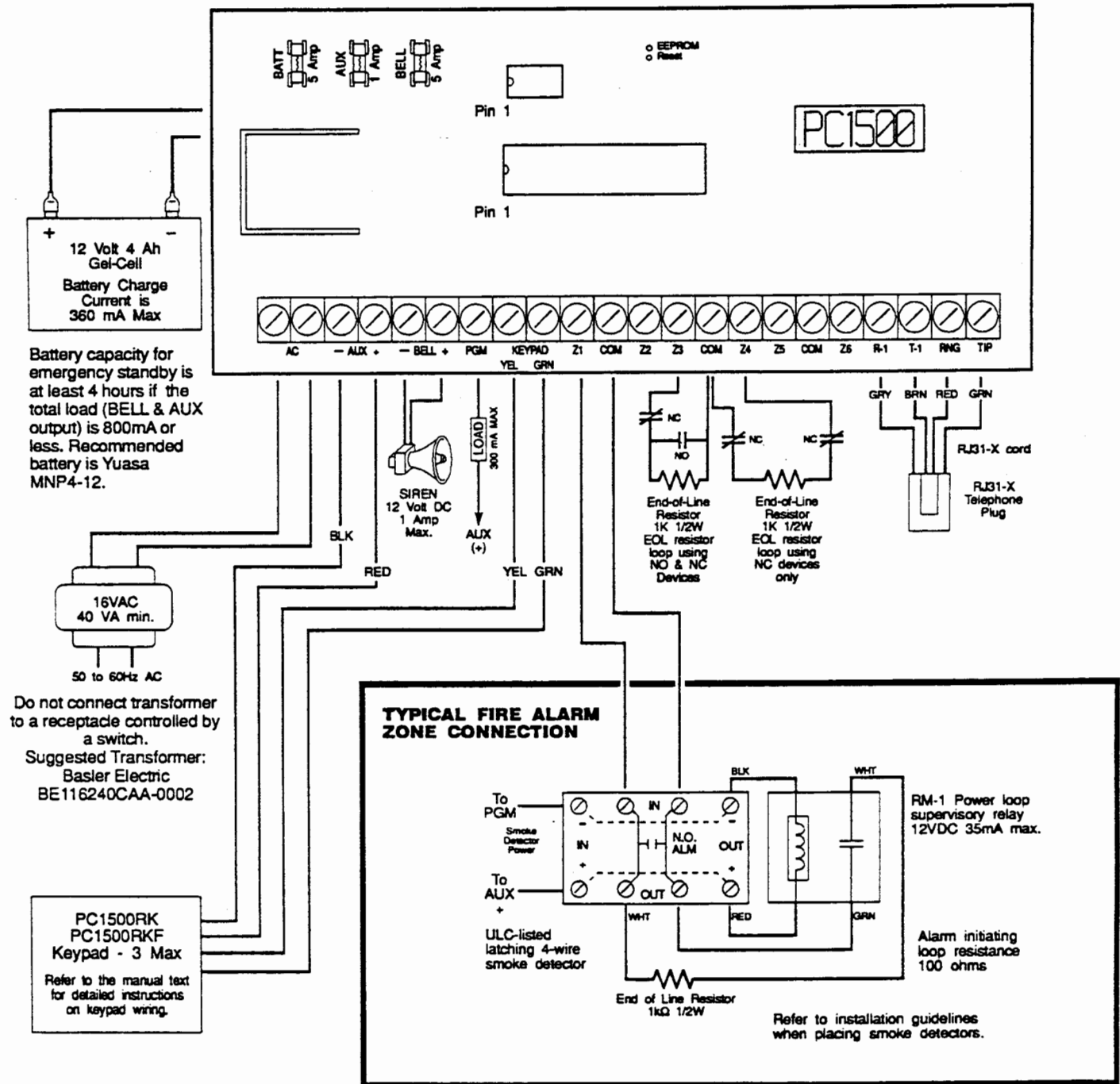
TELEPHONE TERMINALS - These are the last 4 terminals on the right. They connect the dialer to the phone system if you have the system monitored.

LIVING WITH AN ALARM

Beside the ongoing expense of paying for monitoring if you have gone this route, there is the problem of an occasional false alarm. Most false alarms are due to two reasons. The first is that the person entering the house forgot to turn the darn thing off.

Second are problems from poor installation. Usually bad locations for sensors (causing pet alarms or air movement alarms when the furnace turns on), poor connections and low quality

HOOKUP DIAGRAM



For fire alarm applications, it is suggested that at least one indoor signalling appliance with a minimum 85dB rating and current rating of 1 Amp or less be used (WHEELOK model 34T-12-R rated 85dB(A) minimum for indoor residential applications).

Temperature Range: 0°C to 47°C (32°F to 120°F)

Maximum Humidity: 85% R.H.

Do not replace fuses with higher values than noted in this drawing.

Security detection devices that require power from control panel must operate over the voltage range of 10.0 to 14.0 VDC. The DSC BRAVO series are recommended motion detectors.

workmanship. A quicky job will often backfire with extra costs involved in straightening out poor labour.

Lesser causes of false alarms include storms, power failures, equipment malfunction and potential thief setting it off over and over again until you give up and leave the darn thing turned off when you go out. Modern solid state alarm equipment is very reliable and not usually the cause of any problems.

Regardless, it is important to find out what caused any false alarm. The police do not like being called out to the same place too often. Some municipalities charge for more than a certain number of false alarm calls per year. Besides, it is a bit embarrassing to go home to find the siren going off and seeing the house surrounded by police when nothing has happened.

The point here is that you should do as good a job as you are able to do. Take your time and do good wiring. If you are not sure of how to do this, get professional or good amateur help. If you need help or are unsure of what to do, usually the vendor who sold you the equipment can be of assistance. If not, don't be afraid to phone the manufacturer or distributor for help.

DO-IT-YOURSELF ALARM EQUIPMENT SUPPLIERS

Vendors contacted or advertising in the yellow pages that say they sell do it yourself alarm system supplies include:

Centra Systems Ltd. - 13279 - 72nd Ave. - Surrey - 591-7911
The Alarm & Security Shop - Lowland Drive - Burnaby - 439-1047
Future Alarm Systems - 589-1999 (No retail location)
Golden Ears Alarm Systems - 100-22722 Dewdney Trunk Road - Maple Ridge - 463-7919
Maximum Security - 6886 King George Highway - Surrey - 590-0082
Radio Shack - Every mall - Everywhere
RP Electronics - 4th & Arbutis - Vancouver
Smart Beam Security Systems - 8977A-152nd St. - Surrey -581-9727

PARTIAL D-I-Y VENDORS

Many vendors will sell you the all the parts required for do it yourself installation but will offer to commission the system for you, making sure it operates properly. A few will only sell equipment on this basis as well as on a fully installed basis. A vendor contacted who will let you do the donkey work and but make it work for you (and guarantee it) is:

Centra Systems - 13279-72 Ave. - Surrey - 591-7911

PRE-ENTRY ALARMS

Some advertisers in the yellow pages are selling pre-entry alarms. It seems like a good idea to detect burglars before they enter your home. However, anything that detects prior to entry

would be set off by the mailman. What most of these systems actually use for "pre-entry" detection are sonic glass break detectors. They do not detect the burglar before they break a window. The pre-entry claim is based on that the thief has not yet actually set foot inside the protected area when the glass break detector has detected trouble and set off the alarm.

Any system using a sonic glass break detector such as the DSC model DG-50 is in fact a "pre-entry" alarm system. However, I would not want this to be the only input device in a system. Examples of companies selling "pre-entry" systems include:

Astro Guard - 15168 Fraser Highway - Surrey - 585-7777

Ramtron - 7981 Enterprise - Burnaby - 421-7233