

3 MAY 1998

# Yale®

## CORDLESS ALARM SYSTEM

MODEL NO MSA 2000

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### Section 1- Overview of System

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The Yale High Security Alarm System is based on cordless FM radio technology to give exceptional levels of protection and reliability. It has the ability to control up to 24 zones and can use both cordless and wired detectors.

**IMPORTANT - Please read through Sections 1-4 before commencing installation. You will find installation easier if you follow the steps in the sequence shown.**

#### 1.1 Kit Contents

The system comprises :

##### Control Unit

This is the heart of your system. It receives signals from detectors, accepts inputs from a user and activates warning devices such as sirens and strobe lights. The Control Unit must be wired to a mains supply and to the external siren unit.

There are two types of Yale Control Units - one is mounted onto the wall vertically, the other is mounted horizontally. This manual is applicable for both types as the alarm functions, operations and internal layout are the same.

##### Cordless Movement Detector/ Passive Infra Red (PIR)

The PIR senses the body heat of a moving person. One unit can cover an entire room.

##### Cordless Door/Window Contact

Uses a magnetically operated switch to sense the opening of a door or window.

##### Rechargeable Battery

Fits inside the Control Unit and maintains all system functions for up to 8 hours in the event of mains power failure.

##### External Siren/Strobe Unit

Gives audible and visual indication of an alarm condition.

##### Your alarm kit also contains :

20m of 6-core cable for connection of the Control Unit to the siren. N.B. This cable **MUST NOT** be used for mains connections.

Screw/wall plug pack (also contains magnet for use with door/window contact and cable clips).

##### To complete your installation, you will also require:

- 2 "AA" (R6) Alkaline batteries (for PIR)
- 2 "AAA" (R3) Alkaline batteries (for door/window contact)
- 1mm<sup>2</sup> Mains Cable (twin and earth), fused connection unit (fused spur) plus suitable cable clips and trunking.
- 1mm<sup>2</sup> flexible mains cable (3 core).

**These items are not included in your kit, and need to be purchased separately.**

## 1.2 Tools Required

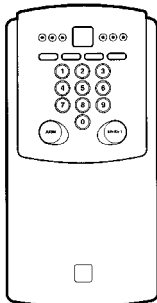
Large & small flat bladed screwdrivers • Large & small crosspoint screwdrivers • Hammer • Power drill • 5mm & 6mm masonry drill bits • Sharp knife • Pencil & Bradawl • Wire cutters & wire stripper • Ladder or other safe working platform • Eye protection (recommended when using a power drill or hammer).

## 1.3 System Features

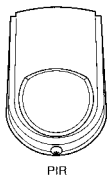
- Detector Learning System - every Yale cordless detector contains a unique identification code; during installation, the Control Unit will learn which detectors belong within your system by receiving coded radio transmissions from each detector.
- The system can control up to 24 detectors, 16 of which can be cordless. The remaining 8 detectors (PIR or Door/Window contact) can be wired directly into the Control Unit for a lower cost solution. If the system is triggered the Control Unit will indicate exactly where the alarm occurred.
- To allow you to leave and enter the protected area without setting off the alarm, Zone 1 is set aside as an Entry/Exit zone. When activated, Zone 1 gives the user 30 seconds (adjustable) to unset (disarm) the system without causing a full alarm. In most cases the Zone 1 detector will be either a door/window contact on your main entrance door.
- Every system component contains a tamper detection device. If any attempt is made to interfere with any part of the system, an alarm will sound immediately even if the system is not armed.
- Each cordless detector transmits a supervisory signal to the Control Unit at approximately 30 minute intervals. This enables the Control Unit to warn the user of any problems within the detector, such as a low battery condition.
- The system incorporates sophisticated anti-jamming protection. Once the system is armed, any attempt to "jam" signals from the wireless detectors will cause a full alarm. The transmissions also incorporate advanced code encryption techniques to protect against code grabbing.
- Optional wired detectors give alternative protection - they do not rely on radio signals and hence cannot be jammed.
- The Zone Omit (Part Set) facility allows you to have certain zones disabled when the system is armed, for example, at night the system can be set with any upstairs detectors omitted, but the downstairs detectors will still activate the alarm in the event of a break-in.

## 1.4 Explanation of Terms

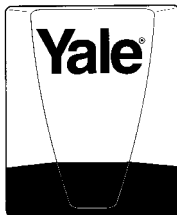
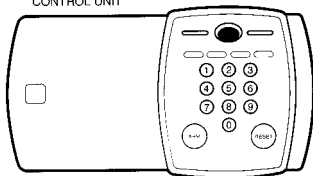
- Zone -** An area which is protected by a single detector.
- Standby -** The normal state of the system when the house is occupied. The Control Unit will respond only to Tamper signals by sounding the internal siren.
- Armed (Set) -** In the Armed condition, the Control Unit will sound full alarm (external and internal sirens) when it receives an Alarm or Tamper signal.
- Part Setting -** Arming the system such that certain zones are omitted (i.e. will not trigger an alarm).
- Exit Zone(s) -** The zone(s) through which you pass between arming the system and leaving the house.
- Entry Zone(s) -** The zone(s) through which you pass between entering the house and disarming the system. (Entry Zones are usually the same as Exit Zones).
- OK Beep -** Rapid triple tone, indicates correct operation.
- Error Beep -** Long single tone, indicates incorrect operation.



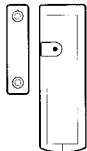
CONTROL UNIT



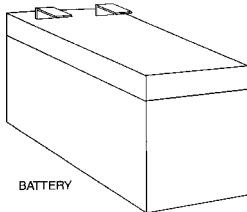
PIR



SIREN/STROBE



DOOR/WINDOW CONTACT



BATTERY

## Section 2 - Planning your Installation

### 2.1 Location of components

#### Control Unit - Location

This unit is a comprehensive alarm Control Unit containing a very sophisticated radio receiver.

In choosing a suitable location you should bear in mind :

- The need to reach the Control Unit easily, within the allocated time, when entering and leaving the premises, ideally passing only one detector.
- The Control Unit should not be visible from the exterior of the protected premises.
- The external siren **must** be wired to the Control Unit
- Reception of radio signals can be affected by the presence of metal objects within a few feet of the Control Unit, for example mirrors, central heating radiators, garage doors and cars parked in garages on the opposite side of a wall. Avoid any location which is near (within 60cm) to these or any other large metal objects.
- The Control Unit needs to be connected to the 220-240V AC mains directly via a 3 amp fused connection unit (fused spur). **WARNING: Connections to the mains should be made in accordance with all national and local wiring regulations, including correct isolation and fusing; if in doubt, consult a suitably skilled and competent person.**

*Having chosen the location, do not mount at this stage.*

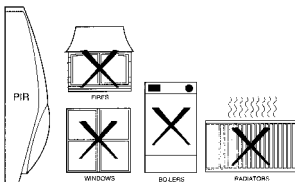
#### Door/Window Contact Detector - Location

- This product contains an FM radio transmitter and should not be sited on or near to large metal objects.
- There are two parts to the detector. The larger (the actual detector) contains the batteries and the electronics and the smaller part is simply a magnet.
- It is designed to detect a door or window opening so the detector is usually mounted onto the frame and the magnet is mounted next to it on the door or window. For optimum radio range the detector should be mounted as high on the door as possible.
- In most applications this detector is fitted to the front door and assigned to ZONE 1 which is the Entry, Exit Zone. This zone allows a 30 second (adjustable) delay to enter and leave your house and should be the only zone activated before reaching the Control Unit on entering the premises.

*Having chosen the location do not mount at this stage.*

#### Movement/Passive Infra Red Detector (PIR) - Location

- The detector should not be mounted near to large metal objects or on metal surfaces. It needs to be mounted on a wall or in a corner at a height of approximately 2-2.5 metres for the best general coverage in an average room. The detector has been designed to avoid false alarms, nevertheless, it is best to avoid siting the unit where it is looking directly at sources of heat such as fires and boilers, and always try to avoid looking directly at a window. A PIR can look at a radiator but should not be sited above one.
- Do not site a PIR where its field of view may be obstructed (e.g. by curtains). Also, note that PIRs work best when sensing movement across rather than along their detection



beams. For wired detectors (available as accessories), the need to wire these units back to the Control Unit should be considered.

- Do not locate a PIR in the Exit Zone i.e. between the Control Unit and the final exit door. In this situation, the PIR will activate the alarm, once set, when you attempt to leave the property.

*Having chosen the location do not mount at this stage.*

#### Siren - Location

- Choose a location for the siren box, preferably in a prominent position high up on an external wall, taking into account that the 6 core cable supplied must be run from the siren to the Control Unit. The cable should ideally run directly from behind the siren box through the wall to the inside. This is to avoid any cable running along the exterior wall which could be reached by an intruder.
- The siren unit contains a tamper switch operated by a lever which acts against the wall. If mounting on an uneven surface ensure that the lever is pressed in firmly; in some cases it may be necessary to place packing behind the lever for reliable operation.

*Having chosen the location do not mount at this stage.*

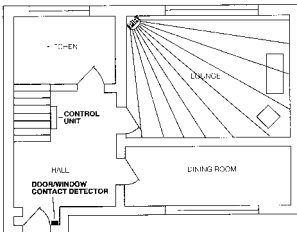
### 2.2 Planning the location for the system components

#### Example of a domestic layout

The layout below is intended as a guide only but demonstrates one example of how a house can be protected with the system.

The PIR has been placed downstairs to protect valuables in a chosen room - in this case to protect the TV, video and hi-fi in the lounge. The Door/Window Contact Detector has been positioned to protect the front door.

The example follows the guidelines as stated for each individual component, but there are situations where additional accessories may be required to meet your exact needs.



## 2.3 Allowing for Pets

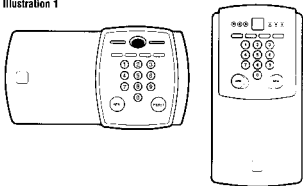
The PIR senses moving body heat. In some cases the movement of pets may also be detected. To overcome this it is recommended that the pets are kept in one specific room out of site of a PIR when the system is armed. If required, additional Door/Window Contact Detectors (available as accessories) can then be used to protect the doors and windows of the room (see Section 8 - Extending the System).

## Section 3 - Installing your System

Note: To assist you in selecting the correct screw and wall plug for each component, each type is assigned a code letter as shown on the leaflet in the screw pack.

### 3.1 Control Unit

Illustration 1



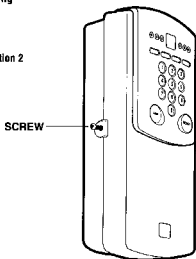
#### a) Connecting to mains power supply

**WARNING:** Isolate the supply before starting work. All connections to the mains should be made in accordance with all relevant wiring regulations, including correct fusing and isolation. If you are in any doubt, consult a qualified electrician. This apparatus must be earthed to comply with wiring regulations.

Use an approved 1mm<sup>2</sup> 3 core flexible mains cable wired direct to a fused connection unit (often called a fused spur), which must be fitted with a 3 amp fuse. All wiring should be supported by clips and enclosed in suitable trunking.

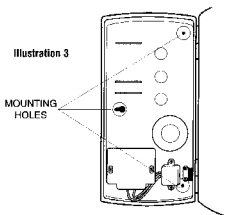
#### b) Fitting

Illustration 2

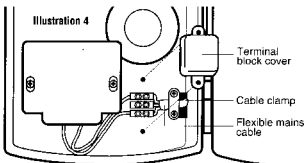


- i. Remove and retain screw from side panel of Control Unit (Illustration 2). Swing open front cover.

Illustration 3



- ii. Position the Control Unit against the wall, (either vertically or horizontally, depending on your model). Mark & drill three 6mm mounting holes as shown (Illustration 3) and use the three 28mm domehead (Type A) screws and wall plugs (Type E) to mount the unit in your chosen location.



- iii. Unscrew cover over mains terminal block and slacken the two cable clamp screws (Illustration 4). Feed the flexible mains cable through the hole in the rear of the Control Unit and through the cable clamp.
- iv. Make connections to the mains terminal block following the colour code:

TERMINAL MARKING	FLEXIBLE CABLE
L	BROWN
N	GREEN/YELLOW
⊖	BLUE

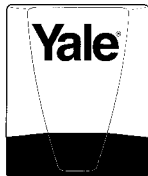
Tighten the cable clamp screws so that the clamp holds the outer mains cable sheath, and check that the cable is secure.

- v. Replace the mains terminal block cover, ensuring that no wires are trapped or pinched.
- vi. Connect the other end of the mains cable to the fused connection unit.

**WARNING:** The Control Unit must never be operated from the mains with the front cover open.

### 3.2 Siren/Strobe Unit

Illustration 5



**N.B.** An optional Cable Protector is available to protect against unauthorised tampering with the cable connected to the Siren/Strobe Unit. If you are fitting the optional Cable Protector, follow the instructions supplied in conjunction with these.

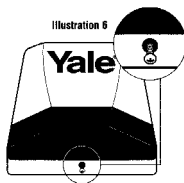


Illustration 6

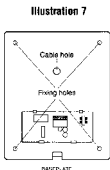


Illustration 7

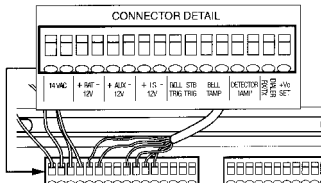


Illustration 9

- a. Remove the cover fixing screw from the base of the yellow siren cover (Illustration 6). Remove the cover from the siren baseplate.
- b. Use the siren baseplate as a template to mark and drill four 6mm fixing holes (Illustration 7). Drill a further 6mm hole through the wall directly behind the siren for the 6-core cable. If this hole cannot be drilled directly through the wall, run the cable vertically upwards into the eaves of the building to leave as little cable as possible visible from the outside.

**Caution** When drilling holes through walls, ensure that the path taken by the drill is not through electrical/water/gas installations. If in doubt, consult a qualified installer.

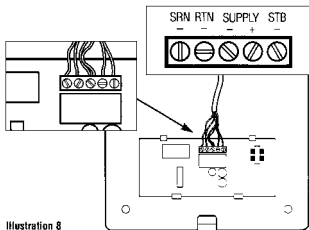


Illustration 8

- c. Connect the 6-core cable to the siren control board (Illustration 8), making a careful note of the colour used for each terminal in the table below. Note that for security purposes it is left to you to decide which colour wire to use for which connection.

Siren Terminal Markings	Enter your choice of colours from 6-core cable
SRN -	YELLOW
STB -	BLACK
SUPPLY +	BLUE
SUPPLY -	GREEN
(choose 2 colours!)	RED
RTN -	WHITE

N.B. You must connect TWO coloured wires to the SUPPLY - terminal.

- d. Thread the cable through the wall to the inside of the property and fix the siren baseplate in position using the four 28mm domehead (Type A) screws and Type E wall plugs provided.
- e. Run the free end of the 6-core cable inside the building to the Control Unit, using the supplied clips to secure the cable at regular intervals. Feed the cable into the Control Unit through one of the cable holes in the rear of the unit.

- f. Connect the 6-core cable to the Control Unit (Illustration 9), taking care to match the connections in the siren to those in the Control Unit as shown in the following table:

SIREN TERMINAL	CONTROL UNIT TERMINAL
SRN -	BELL TRIG
STB -	STB TRIG
SUPPLY +	+12V AUX
SUPPLY - (1)	-12V AUX
SUPPLY - (2)	BELL TAMP (RIGHT)
RTN -	BELL TAMP (LEFT)

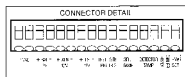


Illustration 10

Please ensure that you remove the wire link, which is factory-fitted, in the Control Unit BELL TAMP terminals (Illustration 10).

- g. Close the front cover on the Control Unit and replace the fixing screw.

### 3.3 Testing the Siren/Strobe

You can now test the operation of the Siren/Strobe Unit. Proceed as follows:

- a. Turn on mains power to the Control Unit; the unit will beep twice only, the display will show "00", and the "Mains" LED will be on. You may notice that the display flickers slightly. This is not a fault but indicates that the Control Unit is functioning correctly.
- b. To test the siren, press keys as follows:
- |                |  |
|----------------|--|
| 1 - 2 - 3 - 4  | display changes to "00" flashing                               |
| <b>Program</b> | display changes to "P"   |
| 3              | display changes to "P3" and sirens sound (internal & external) |
| <b>Reset</b>   | sirens stop sounding   |
- c. To test the strobe, press keys as follows:
- |                |  |
|----------------|--|
| 1 - 2 - 3 - 4  | display changes to "00" flashing           |
| <b>Program</b> | display changes to "P"                     |
| 4              | display changes to "P4" and strobe flashes |
| <b>Reset</b>   | strobe stops flashing                      |

### 3.4 Installing Batteries in the Cordless Detectors

**Note:** Do not install batteries in the detectors until you reach Step 3.5 in the "Programming Cordless Detectors into your System" section below. Do not use rechargeable, zinc carbon or zinc chloride batteries in the detectors.

#### a. Cordless Door/Window Contact Detector

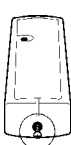


Illustration 11

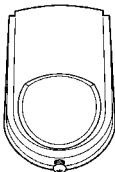


Illustration 12

- Slacken screw on base of detector and lift off cover (Illustration 11).
- Remove screw from battery cover and remove cover.
- Insert two "AAA" size alkaline batteries as shown, taking care to observe correct polarity (Illustration 12).
- Replace battery compartment cover and screw.

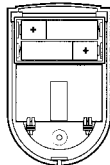
#### b. Cordless Movement Detector/PIR

Illustration 13



- Slacken screw on base of detector and lift cover away from PIR baseplate (Illustration 13).
- Slide cover from battery compartment.

Illustration 14



- Insert two "AA" size alkaline batteries as shown, taking care to observe correct polarity (Illustration 14).

- Replace battery compartment cover.

### 3.5 Programming Cordless Detectors into your System

- Decide to which zones you want to assign the detectors - remember that Zone 1 must be the first detector triggered when you enter the building. Only one detector can be assigned to each zone.

- Press keys as follows:

**1 - 2 - 3 - 4** display changes to "00" flashing.

**Program, 1** display changes to "P1" to indicate that Control Unit is now in detector programming mode.

#### Display

press until the required zone (01-16) is displayed. If you press "Display" more than 16 times, other zones will be indicated. These are set aside for other devices such as smoke alarms - press "Display" again until the display returns to "01", "02", etc.

#### Store

Activate the detector you wish to assign to the chosen zone by installing batteries as shown above, then waiting for a few seconds until the detector LED glows continuously. If the LED flashes, try using different batteries. Replace cover on detector and refit retaining screw.

If the signal is correctly received, the zone display on the Control Unit changes to a number which indicates the percentage of good radio transmissions received. This number should be greater than 60 for reliable operation; note that "AD" indicates 100%.

#### Reset

Check that the display shows "00" and that the "Mains" LED is on.

Note that you can leave detector programming mode at any time by pressing the "Reset" key.

To programme the next cordless detector, repeat the procedures as above using a different zone number for each detector.

### 3.6 Checking the Locations of the Cordless Detectors

The Yale alarm system uses advanced radio technology which under most circumstances will give more than sufficient transmission range. Before fitting the detectors, however, it is recommended that each wireless detector be tested in its final location to ensure that the Control Unit receives the radio signals transmitted by the detector. To do this, follow the procedure below:

- Hold the detector as close as possible to its final location.

- Remove the detector cover thus activating the detector tamper switch. Replace the cover on the detector.

- The internal beeper on the Control Unit will sound as it has received a Tamper signal, you must then reset the Control Unit. Press keys as follows:

**1 - 2 - 3 - 4** display changes to show the activated zone and the "Tamper" LED will be on.

#### Reset

display clears to "00", "Tamper" LED goes off.

Repeat this procedure for each detector in turn.

If the Control Unit fails to receive a signal from a detector, relocate the detector until the test is completed successfully.

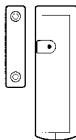
Once done, TURN OFF mains power to the Control Unit.

### 3.7 Installing your Detectors

N.B. Zones d1 - d8 can be used with wired detectors only. Zones 01 - 16 are cordless only zones. Only one detector can be used on each zone.

#### a. Cordless Door/Window Contact Detector

Illustration 15



There are two parts to the detector. The larger section is the actual detector and contains the batteries and the electronics. The smaller section is simply a magnet.

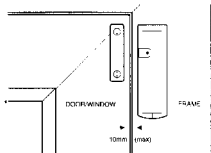
If fitting to a door which opens from the right (looking from inside) then the detector can be fitted to the frame on the right and the magnet alongside it on the door.

If the door opens from the left (looking from the inside) then the detector should be fitted to the top of the frame, again with the magnet alongside fitted to the door.

If it is difficult to fit the detector to the frame then simply fit it to the door instead, this time fixing the magnet to the frame. (Please note : do not mount the detector on the hinged edge of the door).

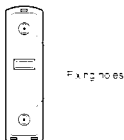
- i. Choose whereabouts on the door or window you wish to locate the unit. The transmitter unit is usually mounted on the frame and should be positioned such that the red LED is closest to the door or window edge.

Illustration 16



- ii. The magnet should be fitted as shown (Illustration 16) with one narrow edge level with the flat top of the detector housing. The gap between magnet and detector should be no more than 10mm.
- iii. If there is insufficient room to mount the detector on the frame then it can be fitted to the door or window instead, with the magnet fixed to the frame alongside it. For reliable operation, the front face of the magnet should be no more than 10mm below the front face of the detector - in some cases it may be necessary to place packing behind the magnet or detector to achieve this.

Illustration 17

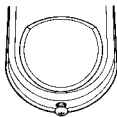


- iv. Remove and retain the screw from the bottom of the detector (Illustration 11). Using a small drill or screwdriver make two fixing holes in the backplate (Illustration 17). Using the backplate as a template, mark and drill two fixing holes. Fix the backplate in position using the screws provided.
- v. Locate the detector on the backplate and replace the retaining screw at the base of the unit.
- vi. Align the magnet as described above and fix in position with the two screws provided.

Note: If you are fitting the unit to a uPVC door or window, you may wish to use STRONG double-sided tape to fix both the detector and magnet in position.

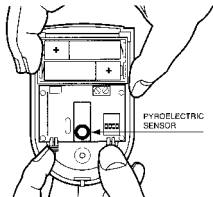
## b. Cordless Movement Detector/PIR

Illustration 18



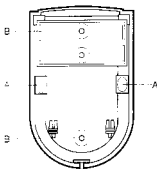
- i. Remove and retain the screw from the bottom of the PIR and lift off the cover (Illustration 18).

Illustration 19



- ii. Remove batteries from PIR. Carefully remove the electronic module from its retaining clips, ensuring that the connecting wires to the battery holder are not put under strain and that you handle the circuit board **by the edges only; in particular do not touch the pyroelectric sensor** (Illustration 19).

Illustration 20

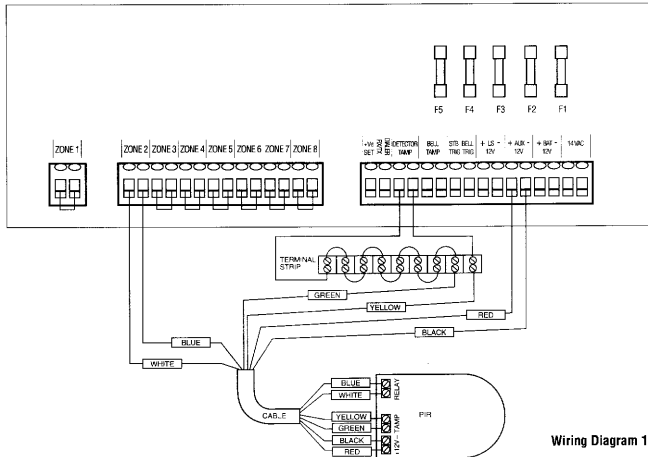


- iii. If you are fitting the PIR in a corner, use mounting points "A", if you are fitting the detector on to a flat surface use mounting points "B" - the mounting points are shown by indentations in the plastic moulding. Use a small drill to create two fixing holes at the mounting points (Illustration 20).

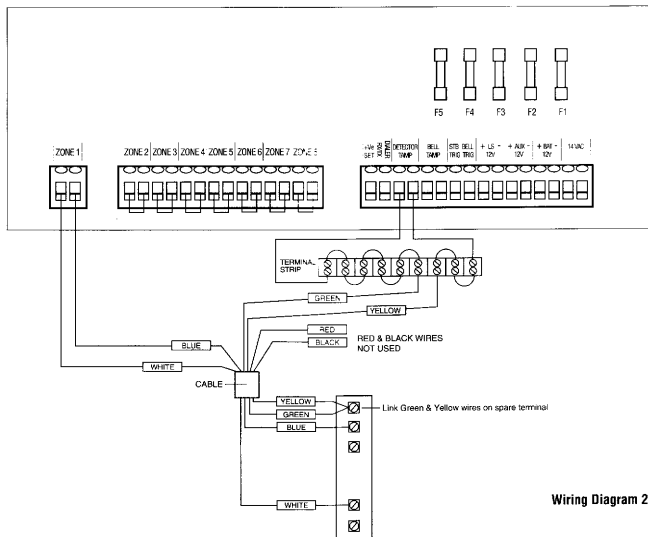
- iv. Hold the base of the PIR in the chosen position, ensuring that the front of the PIR will face towards the centre of the protected area, and mark and drill two 5mm fixing holes in the wall. **DO NOT** drill holes with the PIR in position - the resulting dust may damage the unit. Secure the PIR to the wall using two Type B screws (16mm countersink) and Type F wall plugs provided.
- v. Replace the electronic module into the retaining clips, ensuring that it is correctly positioned and firmly seated. Replace PIR cover and refit retaining screw.

## c. Wired Movement Detector/PIR (available separately as an accessory)

- i. Remove and retain the screw from the bottom of the PIR and lift off the cover.
- ii. Carefully remove the electronic module from its retaining clips, ensuring that you handle the circuit board **by the edges**



Wiring Diagram 1



Wiring Diagram 2



only; in particular do not touch the pyroelectric sensor (Illustration 21).

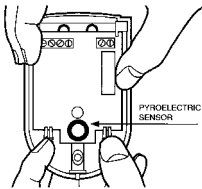


Illustration 21

- iii. If you are fitting the detector in a corner, use mounting points "A", if you are fitting the detector on a flat surface use mounting points "B" - the mounting points are shown by indentations in the plastic moulding. Use a small drill to create two fixing holes at the mounting points (Illustration 22).

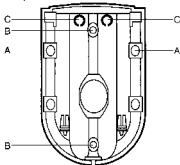


Illustration 22

- iv. Hold the base of the PIR in the chosen position, ensuring that the front of the PIR will face towards the centre of the protected area, and mark and drill two 5mm fixing holes in the wall.
- v. Choose one of the cable entry holes "C" and make a third hole in the detector base. Thread one end of the 6-core cable through this hole, laying the cable into the recess on the rear of the base, running towards the top or bottom of the detector as required. Secure the PIR to the wall using two Type B screws (16mm countersink) and Type F wall-plugs provided.
- vi. Replace the electronic module into the retaining clips ensuring that it is correctly positioned and firmly seated.

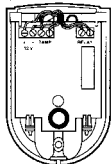


Illustration 23

- vii. Connect the 6-core cable to the terminal block of the PIR (Illustration 23). Use the following wiring sequence:

CONNECTED TO	WIRE COLOUR USED
12V +	RED
12V -	BLACK
TAMP	GREEN
TAMP	YELLOW
RELAY	WHITE
RELAY	BLUE

- viii. Run the cable back to the Control Unit, fixing the cable at intervals of about 50cm using the clips provided, and enter the wire into the back of the Control Unit through any convenient cable hole.

- ix. Select to which zone the PIR is to be connected and remove the jumper wire from the required zone terminals. (Note: wired zone 1 (d1) is an entry/exit zone). Make connections to the Control Unit terminals as follows (Wiring Diagram 1).

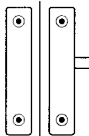
CONTROL UNIT	PIR	COLOUR
AUX 12V +	12V +	RED
AUX 12V -	12V -	BLACK
RELAY	Zone Terminal	WHITE
RELAY	Zone Terminal	BLUE

- N.B. Observe polarity on 12V terminals. The PIR RELAY and Control Unit Zone terminals are not polarised.

In order to insert the PIR into the Tamper circuit, the two wires which have been connected to the Tamper terminals in the PIR, yellow and green, must be wired to the Terminal Strip (Illustration 24). Remove one of the wire links in the Terminal Strip and connect the yellow and green wires in its place.

- xi. Replace cover on PIR and refit the retaining screw.

Illustration 24



**d. Wired Door/Window Contact Detector (available separately as an accessory)**

- i. Choose the location for each magnetic contact (remembering the need to wire them back to the Control Unit). Each contact consists of a magnetically-operated switch (with five screw terminals on the back) and a magnet in an identical housing. The magnet and switch should be mounted on the opening side of the door or window directly opposite one another and must be no more than 2mm apart when the door or window is closed (Illustration 25). Mark two mounting holes for the magnet on the door or window and two mounting holes for the switch on the frame.

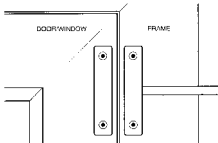
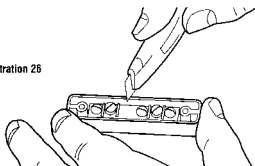


Illustration 25

- ii. Choose a convenient entry point for the cable on the switch housing and carefully remove part of the plastic using a sharp knife to create a hole (Illustration 26). Connect two of the wires from the 6-core cable to the two switch terminals (silver coloured screws), and join two other wires together using one of the spare terminals (brass coloured screws).

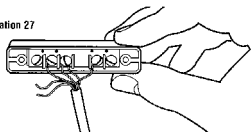
Illustration 26



Use the following wiring sequence (Illustration 27).

CONNECTED TO	WIRE COLOUR USED
Switch Terminal	Blue
Switch Terminal	White
Spare Terminal	Yellow & Green

Illustration 27



Cut off the two unused wires (red and black). Fix the contact and magnet in position using the four Type D screws (20mm countersunk) provided, ensuring the outer cable is held in place by the detector casing.

- iii. Run the cable back to the Control Panel, fixing the cable at intervals of about 50cm using the clips provided, the wire entering the back of the Control Unit through any convenient cable hole.
- iv. Select to which zone the contact is to be connected and remove the small 'U' shaped jumper wire from the required zone terminals. Make connections to the Control Unit terminals as follows, polarity is not important (Wiring Diagram 2).

MAGNETIC CONTACT	CONTROL UNIT
Switch Terminal	Zone Terminal (White)
Switch Terminal	Zone Terminal (Blue)

The green and yellow wires that were connected to the spare terminal form part of the tamper protection circuit. Remove one of the wire links from the Terminal Strip and connect the yellow and green wires in its place.

- v. Use two spare pieces of wire, attach one end of each to the Terminal Strip. Remove the jumper wire from the Detector Tamp terminal and inset the other ends of the two wires (Wiring Diagram 2). This completes the tamper protection circuit.

### 3.8 Testing your Detectors

- a. Make sure that there is no movement in the rooms where the PIRs are located and close all doors to which the door/window contact detectors are fitted. Check that the covers of all detectors are fitted and securely fastened.
- b. Turn on mains power to Control Unit.
- c. Enter **1 - 2 - 3 - 4**, the Control Unit gives OK beep and display changes to **"00"** flashing - the Control Unit is now in test mode.
- d. Open the door or window to which the door/window contact detector is fitted, the LED on the door/window contact detector should light for two seconds. The Control Unit will give a two-tone beep and the display will change to indicate the door/window contact detector zone number. Close the door.
- e. If a wired detector is fitted the display will change to indicate **"d"** plus the zone number, the **"d"** indicating a wired detector. Close the door.
- f. Walk in front of each of the PIR detectors. The LED inside the PIR will light (visible through the lens at the base of the

detector) to indicate that movement has been detected. The Control Unit will give a beep and the display will change to indicate the PIR zone number. Please read the notes below about **"Sleep"** condition.

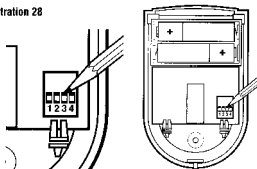
- g. Press **Reset** on the Control Unit to cancel the test mode. Note that the Control Unit will automatically revert to **"Standby"** mode (display = **"00"**) one minute after the last detector was triggered. Should this happen before you have completed testing, simply go back to Step 'c'.
- h. When you are satisfied that all detectors are working satisfactorily, turn off mains power to the Control Unit.
- i. Remove the wireless PIR covers, and set the mode switches to give the functions you require (see Section 3.9).

### 3.9 Movement Detector/PIR - Final Setup

**IMPORTANT!** To extend battery life, cordless PIR detectors are designed to detect only once before entering a **"Sleep"** condition for five minutes during which the unit will not trigger. Any movement seen by the PIR during this period causes the **"Sleep"** condition to be extended by a further five minutes. Therefore, a cordless PIR which is constantly sensing movement, such as a person walking around a room, may appear to be non-functional; you will find that the PIR will detect normally again following a five minute period with no movement present. THIS "SLEEP" TIME DOES NOT APPLY TO WIRED PIR DETECTORS.

The cordless PIR detectors contain four small switches which can be operated with a small screwdriver or pencil (Illustration 28). Their functions are as follows:

Illustration 28



- |              |   |
|--------------|---|
| Switch 1 & 2 | Set <b>Walk Test Mode / Pulse Count</b> . Pulse Count describes the number of detections which must be made in a five second period before the detector triggers.<br><br>When a cordless PIR is set to <b>"Walk Test"</b> mode, the five minute <b>"Sleep"</b> period is reduced to 10 seconds to speed up testing.<br><br>Switch 1 OFF, Switch 2 OFF Walk Test<br>Switch 1 ON, Switch 2 OFF One Pulse<br>Switch 1 OFF, Switch 2 ON Two Pulses<br>Switch 1 ON, Switch 2 ON Three Pulses |
| Switch 3     | Sets <b>Detector Sensitivity</b> - ON for high sensitivity, OFF for low sensitivity.  |
| Switch 4     | ON - LED activates for 2 sec when detector is triggered<br>OFF - LED does not operate   |

Yale recommend that in most situations you should select the Two Pulse Count option and low sensitivity. You may leave the LED on if required, but bear in mind that this will reduce the battery life.

If you install optional wired PIR detectors, these are factory set to operate satisfactorily in nearly all operating environments and should not require any adjustment when sited as recommended.

When you have selected the required settings, replace the PIR covers and fixing screws.

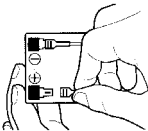
### 3.10 Installing the Rechargeable Battery

Illustration 29



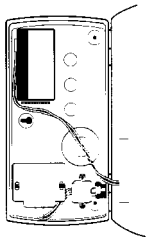
- Turn off mains power to the Control Unit and open the front cover.
- Locate the red and black flying leads with spade connectors attached.

Illustration 30



- Push the spade connectors firmly over the terminals on the battery, fitting the black (negative) connector first (Illustration 30). **WARNING - OBSERVE POLARITY!** When both terminals are connected, the internal Control Unit tamper alarm will sound - ignore this for now. Place the battery into the Control Unit (Illustration 31) close the front cover and replace the fixing screw.

Illustration 31



- To silence the tamper alarm, enter **1-2-3-4**, and the internal sounder will stop, with the "Tamper" LED on and the display showing "cu" (to indicate Control Unit tamper). Press **Reset**, the display reverts to "00" with the system in "Standby" mode.
- Turn on mains power to the Control Unit. Note that if the Control Unit is operating from the rechargeable battery only for more than a few seconds, the "Mains" light will flash and the display goes blank to conserve battery power.

This completes the basic installation of your system. If required, you may wish to set up some of the system parameters (e.g. siren time) as shown in Section 5.

## Section 4 - Using the System

Note: You may notice that the display on the Control Unit sometimes flickers. This is not a fault but indicates that the system is receiving transmissions from detectors.

### 4.1 Changing the User Code

The User Code is factory set to 1234 and is the same for every Yale alarm system. It is recommended that the user code be

changed immediately after completing the basic installation.

Press the following buttons:

- 1-2-3-4** OK beep, display changes to "00" flashing.
- Program, 2** Display changes to "P2" for 2 sec, then to a four-bar pattern, to show that four digits need to be entered.

#### Enter your new 4 digit User Code

For each digit you press, one of the lighted bars on the four-bar pattern will go out.

After pressing the fourth digit, unit gives OK beep and display changes to "P2" flashing. If four digits are not pressed within 10 sec, the Control Unit reverts to "Standby" (display = "00") and the user code remains unchanged.

#### Store

Control Unit stores the new user code

or

#### Reset

This cancels the above procedure and returns the Control Unit to "Standby".

Note that both the old and new user codes will work until the new code has been used to arm the system, thereafter the old user code is deleted.

### 4.2 Arming the System

Before attempting to arm the system, check that all doors and windows (particularly those fitted with a door/window contact detector) are securely closed and that all PIR detectors have an unobstructed view of the areas they cover.

Press the following buttons:

- User Code** OK beep, and display shows "00" flashing

#### Arm

Exit countdown commences and the Control Unit beeps slowly - this is factory set at 30 seconds. To reduce the exit time to 10 seconds, press Arm twice more.

During the last 10 seconds of the exit countdown, the beeping gets faster as a final warning to leave the premises. Once armed, the display on the Control Unit will go blank. N.B. You are only allowed to pass the Entry/Exit detector (zone 1) during the Exit Time.

Immediately after arming, the external strobe will activate for 5 seconds, this is to confirm that the system has set after you have left the building.

### 4.3 Programming the Zone Omit memory

The Zone Omit feature is used where you wish to arm the system but leave certain detectors inactive (for example, for night time setting). An omitted detector will still detect and trigger as normal, but it is not able to generate an alarm condition.

The first step is to program the Control Unit with the zones which you wish to omit as follows. Enter:

- User Code** OK beep, display shows "00" flashing.

**Program, Omit** Display changes to "PP".

#### Display

Keep pressing until the zone you wish to omit (1-16 then d1-d8) is shown on the display. If the zone is already omitted, the display will flash.

#### Omit

Press once to omit the zone (zone display

flashing), and a second time to make the zone active again (zone display steady).

To omit further zones, or to un-omit previously omitted zones, press '**Display**' and '**Omit**' as above

**Store** To retain omitted zones in memory

or

**Reset** To return to '**Standby**' ("**00**") and cancel all changes.

N.B. You cannot omit zones F1, F2 or PA, nor any zone which does not have a detector assigned to it.

#### 4.4 Arming the system with zones omitted (Part Setting)

Proceed as follows. Enter:

**User Code** OK beep, display shows "**00**" flashing.

**Omit** Display changes to show "**01**".

If required you may press '**Display**' to check which zones are omitted - omitted zones will flash when displayed. Press '**Display**' again to see the status of the next zone. At this point, you can also make a temporary change to the pattern of the omitted zones by pressing '**Omit**' to switch between zone omitted (display flashing) and zone enabled (display steady).

N.B. any changes made at this time are only effective for one armed period - the zone omit pattern stored in memory is unchanged. When you are satisfied with the pattern of omitted zones, press:

**Arm** The exit timer countdown begins indicated by slow beeps, speeding up in the final 10 seconds.

If you always use the same pattern of omitted zones, then once those zones have been programmed, the procedure for part setting the system becomes simple - enter: '**User Code, Omit, Arm**'.

#### 4.5 Disarming the System

There are three possible scenarios for disarming the alarm system.

##### a. Normal disarming

This is the procedure to follow when disarming the system under normal circumstances (i.e. there has been no alarm condition while the system was armed).

- Enter the building passing zone 1 only. The Control Unit will begin to beep slowly indicating that you must disarm the alarm system within 30 seconds (default entry/exit time). As with the exit timer, these beeps get faster in the last 10 seconds of the entry time.
- Proceed to the Control Unit and enter your **User Code**. The Control Unit gives OK beep and the display shows "**00**" to show that no alarm condition exists - the system is now in "**Standby**".

##### b. Disarming after an alarm event

If an alarm has occurred, the siren will stop sounding after 10 minutes (factory setting). If you return to the system after this period, you will notice that the entry timer does not operate as normal. Instead, the Control Unit will be beeping once every

few seconds and the internal siren will sound when zone 1 is triggered. In this event you should proceed as follows. Enter:

**User Code** OK beep, display shows first alarm condition (see table below). If the display flashes, then more than one alarm event has occurred and you must press '**Display**' to show the next alarm event. In the unlikely event that several alarm events have taken place since the system was armed, press '**Display**' again to view further events. The last alarm event will not flash when displayed, pressing '**Display**' again returns to the first alarm event.

LEDs illuminated	Display shows	What happened?
Intruder	Zone no. 1 - 16	Movement was detected in this zone
Tamper	Zone no. 1 - 16	The tamper switch on this detector was activated
Tamper	cu	The tamper switch on the control unit was activated
Tamper	sb	The tamper switch on the external siren box was activated
Interference	In	Jamming of radio transmissions was detected
Tamper	dt	A tamper signal was received from one of the hardwired detectors
The Intruder LED is always illuminated if any alarm condition exists.		

When you have viewed and noted all alarm events, press :

**Reset** Display now shows "**00**" and system is in "**Standby**".

Note that if you have purchased some of the accessories available for your system you may obtain other indications as shown below :

LEDs illuminated	Display shows	What happened?
None	PA	A Personal Attack (Panic) button was pressed
None	F1, F2	A dedicated fire detection zone was activated (smoke detector)

##### c. Silencing the system when the alarm is sounding

If you accidentally trigger a detector when the system is armed then the external and internal sirens will sound and the external strobe will flash. If an attempt was made to tamper with any part of the system with the Control Unit in "**Standby**", then only the internal siren will sound.

To silence the system in such a case, follow the procedure in section 'b' above.

#### 4.6 Changing the Cordless Detector Batteries

Every Yale cordless detector will detect when its batteries are in need of replacement. When this occurs, a "low battery"

transmission is sent to the Control Unit.

With the system in "Standby", this will cause the Control Unit to beep 10 times and thereafter to beep once every 5 minutes. The Control Unit display shows the zone number from which the low battery signal originated and the "Low Battery" LED will be on. Press **Reset** to clear the indication.

If the low battery signal is received when the system is armed, then no alarm signal is generated but the low battery condition will be indicated in the same way as above when you disarm the system.

A detector will continue to transmit low battery warnings regularly until the batteries are changed. To change the batteries:

- Delete the detector from the system (Section 5.4)
- Open the detector case and remove old batteries (Section 3.4)
- Re-learn the detector in to the same zone as before (Section 3.5) when fitting new batteries.

If the Low Battery LED is on, but no zone number is displayed, then the rechargeable battery inside the Control Unit is run down - this may happen if the mains power has failed and the Control Unit has been operating from battery power for more than a few minutes. Press **Reset** to clear the low battery indication. *The rechargeable battery may need replacing if it has been installed for more than four years.*

#### 4.7 Cordless Detector Transmissions (important!)

To comply with BS6799 Class 5, the cordless detectors in your Yale alarm system must transmit several kinds of signal. In addition to the normal Alarm and Tamper transmissions, the detectors also send:

Restore signals - for a door/window contact detector these are generated when the door or window protected by the detector is closed after being open. For a PIR, the restore signal is sent when no movement is detected for 5 seconds.

Supervisory signals - these are sent automatically every 30 minutes, allowing the Control Unit to monitor the status of a detector.

If, on attempting to arm the system, any detector has failed to transmit a restore signal, it will be indicated on the Control Unit by the display showing the relevant zone and the system will not arm e.g. if a door or window fitted with a contact detector is left open, the system will not arm.

You must check that all doors and windows fitted with door/window contact detectors are closed and that all areas covered by PIRs are clear.

If the indication remains, you should trigger the detector which shows the fault in order to initiate the transmission of a restore signal.

Any detector which misses five consecutive Supervisory transmissions will cause the "Fault" LED to be displayed together with the relevant zone number. If the system is armed this will cause an alarm condition.

## Section 5 - Programming the System

Your Yale alarm system incorporates many programmable functions which can be used to make your installation more flexible.

### 5.1 Chime Zones

Any zone which is set to chime mode will cause the Control Unit to generate a two-tone sound when the zone is activated with the system in "Standby" - this could be used on a shop

front door, for example. To set a zone to chime mode enter:

<b>User Code</b>	OK beep, display changes to "00" flashing.
<b>Program, 0</b>	Display shows "P0".
<b>Display</b>	Press until the required zone is displayed.
<b>1</b>	To set chime ON, display changes to zone number flashing.
<b>0</b>	To set chime OFF, display changes back to zone number steady. Press <b>Display</b> again and proceed as above until all required chime zones are programmed.
<b>Store</b>	To retain chime settings
<b>or</b>	
<b>Reset</b>	To return to "Standby" mode.

### 5.2 Changing Entry/Exit Time

To change Entry/Exit time, enter:

<b>User Code</b>	OK beep, display changes to "00" flashing.
<b>Program, 6</b>	Display shows "P6" for 2 seconds then changes to "—"
<b>Enter new entry/exit time</b>	This must be in seconds - only times between 10 and 60 are allowed. The time entered will be shown on the display. If an invalid time is entered, the Control Unit gives an error beep and the display reverts to "—" for you to enter another time.
<b>Store</b>	To confirm the new entry/exit time
<b>or</b>	
<b>Reset</b>	To return to "Standby" mode.

### 5.3 Changing Siren Duration

To change Siren Duration, enter:

<b>User Code</b>	OK beep, display changes to "00" flashing.
<b>Program, 7</b>	Display shows "P7" for 2 seconds then shows "—"
<b>Enter new siren duration</b>	This must be in minutes - only values between 01 and 20 are allowed. The time entered will be shown on the display. (N.B. you must always enter two digits). If an invalid time is entered, the Control Unit gives an error beep and the display reverts to "—" for you to enter another time.
<b>Store</b>	To confirm the new siren duration
<b>or</b>	
<b>Reset</b>	To return to "Standby" mode.

### 5.4 Deleting Cordless Detectors

To delete Cordless Detectors, enter:

<b>User Code</b>	OK beep, display changes to "00" flashing.
<b>Program, 8</b>	Display shows "P8".
<b>Display</b>	Press until the required zone is displayed.
<b>Store</b>	This confirms the deletion - unit gives OK beep to confirm, or an error beep if there is no detector assigned to the zone
<b>or</b>	

**Reset** To cancel the operation.

To reprogramme cordless detectors back into your alarm system, follow the procedure in section 3.5.

## 5.5 Deleting Wired Detectors

Wired detectors cannot be deleted by using the buttons on the Control Unit. To de-activate them, the wires must be disconnected from the Control Unit itself.

To reactivate wired detectors, reconnect the wires in the Control Unit.

## 5.6 Recalling Alarm Events

The Control Unit stores information on the last 10 alarm events. This may be recalled at any time.

To recall Alarm Events, enter:

**User Code** OK beep, display changes to "00" flashing.

**Program, 5** Display shows "P5" for 2 seconds then the cause of the most recent alarm - for an explanation of the display codes see Section 4.5.

**Display** This causes the indication to change to the next most recent alarm event. When the last entry is displayed, pressing **Display** again results in an error beep.

or

**Reset** To return to "Standby" mode.

## 5.7 Resetting the System

On very rare occasions you may wish to completely clear the Control Unit memory to return the unit to its "as new" condition. To do this, proceed as follows:

- Turn off mains power to the Control Unit, remove the cover retaining screw and open the front cover - this will cause the internal Tamper alarm to sound as normal.
- Disconnect the rechargeable battery to stop the alarm.
- Locate the "RESET" link on the main printed circuit board. (Illustration 32) and move the push-on jumper from position "A" to position "B".

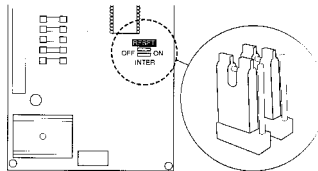


Illustration 32

- Reconnect the rechargeable battery. Wait for about 20 seconds, until the display changes from "Pu" to "00", ignoring the internal Tamper alarm.
- Move the "RESET" link back to its previous position, and close the Control Unit cover. To silence the internal alarm, enter your **User Code**, then **Reset**.
- Turn on mains power to the Control Unit. You may now reprogram the system from the beginning.

## Section 6 - Maintenance

**Once every three months:**

Test all detectors.

Test siren & strobe.

**Additionally, once a year:**

Replace all batteries in cordless detectors.

**Additionally, once every four years:**

Replace the rechargeable battery in the Control Unit.

## Section 7 - Extending the System

A number of accessories are available to expand your system to suit your exact requirements.

**Cordless Movement Detector/PIR** - easy to install, one unit protects a large area.

**Wired Movement Detector/PIR** - covers a large area, does not require batteries.

**Cordless Door/Window Contact Detector** - easy to fit, detects opening of a door or window, can be extended by the addition of wired magnetic contacts.

**Wired Door/Window Contact Detector** - small, robust and reliable.

**Remote Control** - can be used to arm, part set or disarm; doubles as a personal attack button; up to 3 remote controls can be used on one system

**Cable Protector** - sounds alarm if the siren cable is cut, ensures that system meets equipment requirements of BS6799 Class 5.

**Smoke Detector** (approved to BS5446 Pt. 1) - sounds external alarm in the event of fire.

**Security Lighting Controller** - illuminates security lighting, up to a maximum of 1000W, when alarm is activated (can only be used with lights WITHOUT a built-in PIR sensor).

## Section 8 - Radio Interference

The unit is equipped with the latest type of radio receiver using FM Radio technology and will not normally suffer from problems caused by interference.

However if interference is present nearby, an indicator light on the control unit will illuminate. It will do this even when the alarm is not set.

If the alarm is set any criminal attempt to prevent (or jam) the detector transmissions will be picked up as interference and will trigger an alarm.

If the alarm is frequently triggered by interference it is likely there are high levels of unusual radio signals in your area.

Some electronic equipment (e.g. cordless doorbells, garage door openers, PCs and fax machines) can generate interference. If you have such equipment and experience problems with interference, try moving the equipment as far away from the Control Unit as possible.

If the problem remains, it is recommended that you:

- Turn off mains power to the Control Unit and disconnect the rechargeable battery.
- Prevent the control unit from triggering the alarm through interference by opening the front cover (after disconnecting the mains) and moving the push on link marked "INTERFERENCE" on the circuit board from on to off (Illustration 33).

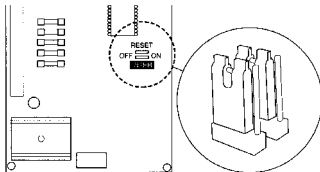


Illustration 33

3. Use wired detectors in this area/zone.

If you require further assistance, contact the Yale Helpline (see next page).

## Section 9 - Specifications

### Control Unit

Type	Microprocessor based cordless/wired hybrid control unit
Housing	Polycarbonate
Zones	24 Alarm Zones (16 cordless, 8 wired plus 2 Fire and Personal Attack)
Entry/Exit Delay	10-60 seconds, programmable
Siren Duration	1-20 minutes, programmable
Classification	System conforms to equipment requirements of BS6799 Class 5 (when fitted with Cable Protector accessory)
Radio System	418MHz FM. Transmitter: approved to MPT1340. Receiver: narrow band, double-conversion superheterodyne type. Jamming detection and anti-grabbing encryption implemented.
Siren/Strobe Outputs	12V dc, switching (negative fused)
Power Supply	230V ac, 50Hz mains
Power Consumption	0.6W (Standby), 4.2W (alarm)

### Cordless Movement Detector/PIR

Type	Dual Pyroelectric element with hemispherical lens
Housing	ABS
Adjustments	Pulse Count (Test, 1, 2 or 3) and Sensitivity (high/low)
Test LED	Selectable (on/off)
Mounting height	2-2.5m
Detection Range	Up to 20m
Power Supply	3V dc (2 x 1.5V "AA" alkaline cells)

### Cordless Door/Window Contact Detector

Type	Magnetically-actuated switch with option for external wired contacts
Housing	ABS
Test LED	Yes
Power Supply	3V dc (2 x 1.5V "AAA" alkaline cells)

### Wired Movement Detector/PIR

Type	Dual Pyroelectric element with hemispherical lens
Housing	ABS
Test LED	Selectable (on/off)
Mounting height	2-2.5m
Detection Range	Up to 20m
Power Supply	12V dc nominal (supplied from CU)

### Siren/Strobe Unit

Type	External siren with integral high intensity strobe light and battery
Housing	Polycarbonate
Siren Output	110dB min. at 1m
Power Supply	12V dc nominal (from CU) or 7.2V Ni-Cd battery (Cable Protector)
Auto Cut-off	20 minutes maximum

### Rechargeable Battery

Type	Sealed lead-acid battery (non-cyclic use)
Voltage	12V
Capacity	1.2 Ah

This product complies with the EC directive on Electromagnetic Compatibility (89/336/EEC) and the Electrical Equipment (Safety) Regulations 1994.



ZONE 1 = FRONT DOOR

ZONE 2 = LIVING ROOM

ZONE 3 = KITCHEN

ZONE 4 = ~~2nd Floor~~ <sup>BED ROOM</sup>

# HELPLINE

If you should experience any problems or difficulties  
whilst installing or programming your alarm system,  
please call the

**Yale Helpline on 01902 635998.**



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