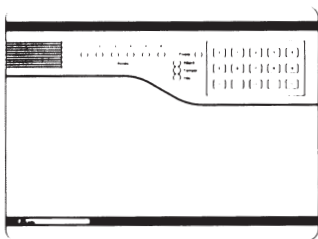

Intruder Alarm Control System Engineering Information



- ▶ 6 pre-programmed security zones
- ▶ Separate PA and tamper
- ▶ 8 event memory recall
- ▶ Built-in internal sounder with control of low volume tones
- ▶ User may omit any zone, automatically allowing zone 2 to become timed when part setting
- ▶ Chime on any zone
- ▶ On board back-lit keypad
- ▶ Separate 4 digit user and engineer PIN codes
- ▶ NVM for protection of engineer programme
- ▶ Quick set feature

1. INTRODUCTION

The Citadel XR1 is a microprocessor based intruder alarm control system designed to comply with the installation requirements of BS 4737 1986/87.

Housed in a slim line 'compact' polycarbonate case, the control panel is operated and programmed via an onboard 15 button keypad. The keypad is back-lit for use in low light conditions.

Separate user and engineer codes are available. Both are 4 digit and may be programmed to any code number between 0000 and 9999.

Please read carefully through this manual and the Operating Instructions (attached to the back cover) before beginning any planning or installation work.

2. INSTALLATION

2.1 Installation Design

Carefully plan the position of each part of the alarm system and the cable runs. Detectors should be carefully sited with particular regard to the degree of coverage required and the function of each of the zones.

The control panel should be sited in a position which is convenient for the user, typically within the entry/exit route. The chosen location of the panel will depend on the overall layout of the building, but it is worth taking time to consider the convenience of a mains supply and ease of access for alarm cables coming from various parts of the installation.

Finally note that the total current output of this control system (in alarm condition) is 1 Amp when supported by a fully charged battery. Carefully calculate the total current consumption of every part of the system including the bell/sounders, strobes, and detectors to ensure that this rating is not exceeded.

2.2 Fixing

The mounting position for the control panel may be determined using the fixing template printed on the back of the cardboard carton. The base may then be fixed to the wall easily and quickly without removing the Printed Circuit Board (PCB) using the keyhole mounting slot and the two bottom fixing holes.

Alternatively the PCB may be removed and the base aligned and fixed to the wall using the keyhole and the top and bottom fixing holes.

Removing the PCB

Remove the front covers from the control panel and unscrew the transformer wires from the AC terminals. Carefully remove the PCB by gently pushing down the holding clips on the bottom edge of the PCB and withdraw it from the base.

Replace the PCB by aligning it on the round support pillars to the bottom and allow it to click down past the clips at the top of the case. Refit the transformer wires into the terminals. These are not polarity conscious and may be connected either way round.

Cable entry holes are provided in the rear of the base and around the outside edges through the thinned out plastic sections which may be cut away as required. It is recommended that the round 20mm hole or the entry point adjacent to the keypad bracket is used for the mains cable.

2.3 Wiring - Power Up

Before you begin, bring all of the alarm cables into the base. Wire the speaker (fitted on the underside of the top cover) to the LS terminals 17 and 18. Fit the cover on to the base and leave it in position throughout the rest of the installation.

- 1) Check that the 9 factory fitted links are fitted into the PCB terminals at the positions marked.
- 2) Carefully fit the battery wires to the BATT terminals at the far right of the PCB, Red to + and Black to -.
- 3) Connect the battery. The system will now go in to alarm condition.
- 4) Enter the user code (factory set at 0123). The alarm condition will cease and the **Tamper** indicator will show.
- 5) Depress and hold down the tamper spring at the bottom centre of the PCB and the system will go to Day mode. Press PROG and immediately enter the engineer code (9999). The **Day** and **Attack** indicators will now show and the tamper spring may be released.
- 6) The system is now in engineering mode and it may now be carefully and systematically wired. Connect each of the zones, the PA, and the tamper circuits (series wired into the TAMP terminals 15 & 16). Finish by wiring any additional internal sounders, external bell/sounder, strobe and the 13V supplies.
- 7) Connect the mains supply following the recommendations listed in section 2.4 and then refer to the commissioning section.

2.4 Mains Connection

The mains power should be connected using a 3 core cable of not less than 0.75mm² from a fused spur to the mains connector inside the control panel. The fused spur must be located close to the control panel and have a 2 Amp fuse.

WARNING

The mains supply should only be connected by a technically competent person and according to current IEE wiring regulations.

to avoid the risk of electrical shock you must always totally isolate the mains supply before opening the control panel cover(s).

Mains Input Fuse

The mains input fuse inside the control panel is located within the mains terminal block connector. Only replace this fuse with the correct value, which is 125mA, 250V type T (anti surge) and of a type approved to IEC 127, part 2 sheet III.

2.5 Final Commissioning

On completion of the installation the red **Power** indicator should be showing. Position the speaker wiring so that it does not foul the tamper spring/switch. Replace the bottom front cover and press the RESET key. The system should go to Day mode, showing the green **Day** indicator. If any faults are present, refer to section 5 of this manual.

The system should now be fully tested and programmed. Fill in the Installation Log at the back of the manual and retain it for future reference.

Finally explain the operation of the system to the end user. The Operating Instructions are attached to the back page of this manual. Detach them at the perforation and leave them with the user.

2.6 Power Up Reset - Clear NVM

If the engineer code has been lost or forgotten or in extreme circumstances, where a software crash has occurred, it will be necessary to clear the Non Volatile Memory (NVM) and return to factory set conditions.

- 1) Remove the mains supply and cause an alarm condition by removing the bottom front cover. Disconnect the battery.
- 2) Remove all wires from terminals 13 (PA) and 23 (SET +). Fit a wire link between terminals 13 and 23 and apply power.

- 3) The system will now power up with no alarm condition. Remove the wire link and replace the original wiring, checking that the **Attack** indicator goes off.
- 4) The indicators will now show in response to each of the zones and circuits as they operate. Refit the front cover checking that the **Tamper** indicator goes off.
When ALL of the zones and circuits become clear the system will go to Day mode and at that moment the NVM will be cleared and factory set conditions will apply.
- 5) The system may now be programmed, tested and re-commissioned.

3. PCB LAYOUT

A PCB layout diagram is provided on the inside back cover of this manual. Refer to it as necessary.

3.1 Zones

As supplied, wire service links are fitted across each of the zones to represent a closed circuit. These are removed during installation as the zone wiring is connected, but their positions are marked for future reference with a \square symbol.

The majority of detection devices use normally closed contacts. These are connected together in a series loop across the zone input. There are also a small minority of sensors that use normally open contacts (pressure mats). These should be connected in parallel together and finally wired between the zone and the tamper circuit.

3.2 Zone 1

(Terminals 1 & 2)

This zone is *timed* and used to protect the main entry/exit door. Activating zone 1 whilst the system is Set will cause the entry timer to start and allow time to Unset the system.

The entry and exit timers are both separately programmable.

3.3 Zone 2

(Terminals 3 & 4)

Zone 2 is for protection of the route between the main entry/exit door and the control panel and from the 'Full Set' condition the zone will activate the alarm, but it also has a *time inhibit* function.

This means the zone will not operate during entry to the building after the entry timer has been started, and will allow access through zone 2 detectors in order to reach the control panel.

However the zone changes its function from *time inhibit* to *timed* if any zone is omitted. This is particularly useful for domestic installations where a PIR on zone 2 is used in a hallway or through lounge. The action of omitting, for example an upstairs zone at night, automatically allows zone 2 to start the entry timer the following morning. Basically this feature removes the requirement for a pressure mat on the stairs operating zone 1.

Note that when zone 2 is not to be used as part of a prescribed entry route and where the *time inhibit* and *timed* functions are not required, it should either be left linked or used for lower security areas e.g. perimeter protection.

3.4 Zone 3

(Terminals 5 & 6)

This zone is factory set as an immediate zone and will cause a full alarm condition if activated whilst Set. Where required it may be selected as a time inhibit zone from the Engineer Programming mode.

3.5 Zones 4, 5 & 6

(Terminals 7 - 12)

These are all immediate zones and will cause a full alarm condition if activated whilst they are Set.

3.6 PA

(Terminals 13 & 14)

Any quantity of normally closed type personal attack sensors may be wired in series and then connected to the PA circuit.

Operational in Day and Set, the PA circuit will cause a full alarm condition when activated. PA is indicated on the control panel as **Attack**.

3.7 Tamper Network

(Terminals 15 & 16, T & A)

The tamper circuit is used to protect all cables and detectors on the system from unauthorised access including the control panel front covers.

The zone and PA tampers should be series wired and connected to the TAMP terminals 15 & 16. Terminals T & A are for the external bell/sounder tamper.

Tamper alarms which occur in the Day mode operate internal sounders only. Tamper alarms in Set cause a full alarm condition. Tamper is indicated on the panel by the **Tamper** indicator.

3.8 Internal Sounder

(Terminals 17 & 18)

Mounted on the underside of the top cover, the loudspeaker produces high volume alarm tones and low volume entry/exit fault tones.

Up to two 16 Ω extension speakers may also be wired across the LS terminals 17 & 18. Mounted in convenient positions within the installation the extension speakers will reproduce all of the alarm tones generated by the control panel.

A control marked VOLUME in the centre of the PCB may be used to adjust the low volume entry/exit tones to suit environmental conditions. To adjust this control, partially lift up the top cover.

3.9 Strobe Output

(Terminals 19 & 20)

Activated by all types of alarm condition, the STROBE output will continue to operate after automatic reset of The external sounders.

The output will also remain active after entry of the user code and will not stop until the RESET key is pressed.

The strobe output is a 12V supply. Terminal 19 is permanently +Ve and terminal 20 is switched -Ve in alarm.

3.10 Bell Output

Terminals T A D B are for connection to the external bell or sounder. These terminals provide a power/hold-off supply, sounder trigger and tamper circuit to protect the external sounder housing.

The terminals are summarised as follows:

T -	-Ve tamper return
A -	-Ve supply (0V)
D -	+Ve supply (12V)
B -	-Ve sounder trigger

Where self contained/powered sounders are used, carefully follow the manufacturers instructions, matching each of the terminals to those above.

Where a discrete bell or sounder is used, it should be connected to terminals D & B. Terminals T & A are then used for tamper protection for the sounder housing.

For ease of installation of the Citadel Defender and ADE Sonade see the appendices (back cover).

3.11 13v Supply

(Terminals 21 & 22)

The 13V output is to power detectors which require a voltage supply (PIR detectors etc). The supply is present at all times and may be used to supply a total load of up to 350 mA.

This output, marked SET + is used with latching detectors. The output becomes positive on correct Set of the system and is removed at the commencement of entry time or entry of the user code.

3.13 Fuses

There are two fuses mounted on the PCB, both are 1.6A 20mm quick blow.

The fuse to the left protects the STROBE +Ve terminal 19, the BELL +Ve terminal D and the 13V +Ve terminal 21.

The fuse to the right is in the -Ve battery line and prevent excessive current being drawn from the battery. The fuse will also blow if the battery is inadvertently reverse polarity connected during installation.

3.14 Battery Back Up

It is essential that this control system is used with a rechargeable 12V battery. Either a 1.2 or 2.1 Ah capacity rechargeable battery may be used, as required.

The BATT terminals should be connected to the system battery only, and must not be connected to any other battery or used for any other form of power supply or distribution.

4. SYSTEM DESCRIPTION

4.1 User Operation

Day Mode This is when the system is turned off, with only tamper and PA circuits active. Day mode is indicated on the control panel by the green **Day** indicator.

To Set the System From the Day mode, enter the four digit user code. The sounder will produce a beep tone and the building can be exited. The system will Set as the tone stops.

Faults During Setting Faults are shown by the zone indicators, accompanied by a broken beep tone, one beep for zone 1, two beeps for zone 2 etc.

To Omit Zones Any of the zones may be omitted when Setting the system. After entering the user code press the OMIT button, followed by the zone number(s) to be omitted. Selected zones will show their indicators. When selection is complete press SET and the exit tone will continue. A maximum of 5 zones may be omitted in this way.

To Quick Set Pressing SET during the exit period will cause the exit tone to stop and the system to Set within about 5 seconds.

To Unset the System Enter the user code and the system will return to Day mode. If the alarm has been activated then entering the code will stop the alarm and the cause of the alarm will be displayed.

Press RESET to clear the indication and return to Day mode.

4.2 Keypad Tamper

During the Set and entry periods, attempts to incorrectly enter the user code will operate the keypad tamper. Nineteen incorrect keypushes will result in a full alarm activation.

4.3 Chime

Chime is a low security alarm warning system which will operate a series of tones through the internal sounder when a zone is triggered during Day mode.

Any zone can be programmed to be on chime by the user, by pressing the CHIME key and entering the zone number(s) to be chimed.

4.4 Factory Set Conditions

User Code	0123
Engineer Code	9999
Exit Time	30 seconds
Entry Time	30 seconds
Bell Duration	20 minutes
Zone 3 Status	Immediate

4.5 Auto Reset and Re-arm

In alarm condition the sounders will operate for the programmed bell duration. The sounders will then shut down but the strobe will continue to operate.

Each circuit is then scrutinised and if clear will be re-armed. Any circuit in fault condition is automatically omitted.

4.6 Non Volatile Memory (NVM)

The Citadel XR1 uses an NVM circuit to retain all programmed information in the event of power fail, disconnection or system faults. And thereby provides the system with a high degree of security.

Where the user code has been lost or forgotten it will be necessary to clear the NVM. This procedure is given in section 2.6. Note that the 8 event alarm memory is not held in NVM.

Fault conditions are often the result of minor installation errors or misinterpretation of the equipment being installed. The following points outline the most common installation and commissioning faults.

- 1) As supplied the user code is 0123 and the engineer code is 9999. Both codes will revert back to these default settings on clearing the NVM.
- 2) The Engineer Programme is accessed directly from Day mode via the engineer code.
- 3) If a tamper or PA fault is present on the system, it will go to a lock out condition (showing the appropriate indication). The keypad will not produce any audible responses and the system will not operate until the fault has been found and rectified.
- 4) The most common cause of a zone not responding to detectors is incorrect wiring. Normally closed detectors must be wired together in a series loop before connecting into the appropriate ZONE terminals. Tampers are series wired in the same manner.
- 5) Where a permanent zone fault is showing and the loop resistance is found to be in order, the most probable cause is a short circuit between the zone wiring and the tamper wiring. When measured with a meter the resistance between the zone and tamper wiring should be infinitely high.
- 6) If totally lost as to the cause of a fault, remove ALL wiring from the PCB. Re-fit the 9 service links and test the system. Never fit links to any positions other than those marked on the PCB.
- 7) Before testing or replacing any fuses, ALL power must be removed. Fuses which fail continually are almost certainly the result of a short circuit or low resistance across the 13V supply (terminal 21), strobe output (terminal 19) or the external bell supply (terminal D)

Remove all wiring and test for low resistances with a multimeter, by cross checking between each wire. Blown fuses are very seldom caused by faulty equipment.
- 8) Finally, whenever working close to the mains supply or connector, you should exercise extreme caution.

Whenever possible isolate the mains supply before removing the control panel covers.

Specifications

Indicators	Zones 1-6, Power, Attack, Tamper, Day
6 Zones	Positive loop, dedicated functions
Tamper	Negative loop, internal sounders in Day - Full alarm in Set
PA	Positive loop, always active
Bell Output	12V, adjustable timer (1-99 mins) or continuous
Strobe Output	12V latching
Extension Speaker	16 Ω (2 max) 130mA each
Exit/entry Timers	Programmable 1-990 seconds
Zone Input Delay	250ms
Set +Ve Output	0V in Day (Sinking 40mA) 12V in Set (Sourcing 10mA)
Current Consumption	Standby 80mA Alarm 250mA
Low Voltage Output	13.8V dc stabilised (+/- 5%) up to 350mA
Rechargeable Battery	12V, 1.2 or 2.1 Ah
Charge Voltage	13.8V dc (+/- 5%)
PCB Fuses	1.6A 20mm quick blow
Mains Input Fuse	125mA, 250V type T (anti-surge) type approved to IEC 127, part 2 sheet III
Total Current Output	1 Amp when supported by a fully charged battery
Mains Supply Voltage	230V (+/-10%) 50Hz max load 0.2A
Ambient Operating Temperature	0° - 40°C
Cabinet Construction	3mm Polycarbonate
Dimensions	H 200mm W 253mm D 55mm

Engineer Programming

Follow the instructions below to change any of the engineering programme or test the system. Before you begin, check that the system is in Day mode with the green **Day** indicator showing. Once you are in engineering any section may be changed in any order. Once you have finished exit from the engineering mode and check that the system is back in Day.

To Enter Engineer programming

From Day mode

Day indicator showing

Press **PROG**

All indicators show

Enter the engineer code (9999)

? **?** **?** **?**

Day and **Attack** indicators show

The system is now in the engineer programming mode.

Alarm Tests

Press **0** **Day, Tamper** and **Attack** indicators show
The system is now in the test routine

Strobe Test

Press

2

0

to stop

External Bell/Sounder Test

Press

3

0

to stop

Low Volume Internal Sounder Test

Press

4

0

to stop

High Volume Internal Sounder Test

Press

2

4

0

to stop

Walk Test

Press

5

During the walk test the internal sounder will beep and the respective **Zone, Tamper, Attack** indicator will show as each circuit is tested.

Press **0** to stop

Press **RESET** to return to programming mode

Exit Timer

Press **1** **Zone 1** and **Zone 2** indicators show

Enter the required time in 10 second increments, divided by 10.

Eg 10 seconds $\div 10 = 1$, so enter 01.

10 seconds = 01, 20 seconds = 02, 30 seconds = 03 etc.

On entering the 2 digits, the system returns to programming mode.

Entry Timer

Press **2** **Zone 1** and **Zone 2** indicators show

Enter the required time as for exit.

On entering the 2 digits, the system returns to programming mode.

External Bell/Sounder Timer

Press **3** **Zone 1** and **Zone 2** indicators show

Enter the required time in minutes.

01 = 1 minute, 20 = 20 minutes, 99 = 99 minutes, 00 = continuous sounder operation

On entering the 2 digits, the system returns to programming mode.

Zone 3 Status

Press **5** The **Zone** indicators will show which zones are time inhibited

Press **5** again to select or de-select zone 3 as time inhibited

Indicator On, Zone 3 = Time Inhibited, Indicator Off, Zone 3 = Immediate

Press **RESET** to return to programming mode

User Code Change

Press **8** **Zone** indicators 1, 2, 3, 4 show

Enter new code (4 digits) **?** **?** **?** **?**

A series of rapid blips will be heard and the system will return to programming mode.

Engineer Code Change

Press **9** **Zone** indicators 1, 2, 3, 4 show

Enter new code (4 digits) **?** **?** **?** **?**

A series of rapid blips will be heard and the system will return to programming mode.

Alarm Memory Recall

Press **CHIME** The last 8 alarm events will now be scrolled and displayed.

The sounder will beep as each new condition is shown

When complete the system returns to programming mode.

To Exit from Engineer Programming

After completing tests and programming, the **Day** and **Attack** indicators should be showing:

Press **RESET**

The system will return to Day mode with the **Day** (and **Power** Indicators showing).

Reset to Factory Set Conditions

From Engineer programming mode - with the **Day** and **Attack** indicators showing :

Press **SET**

The system will return to Day mode with factory set conditions re-instated.

Installation Log

Site Address

Contact Name

Telephone

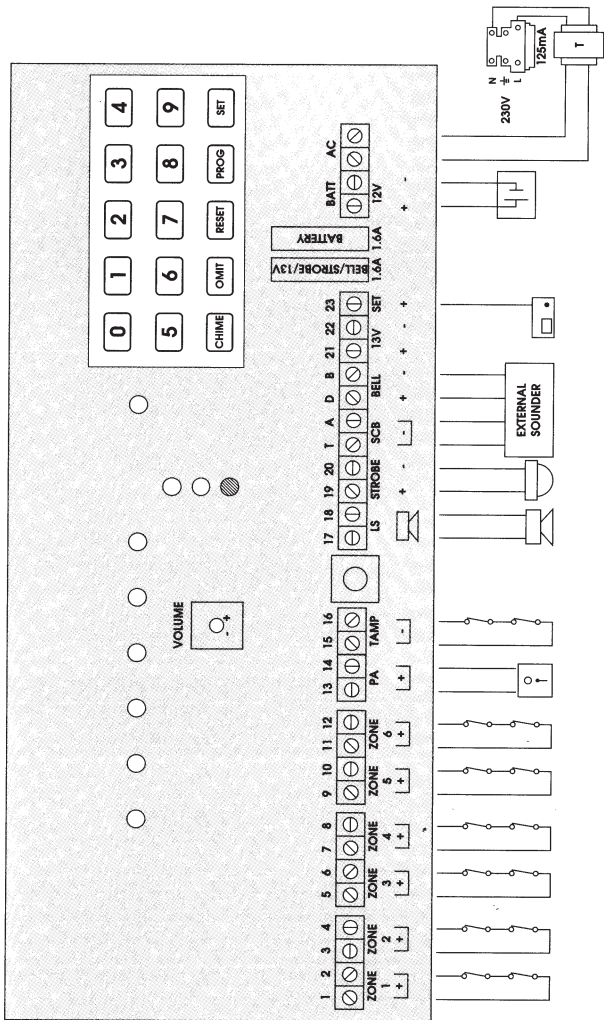
Date of Installation

	RESISTANCE	PROTECTION AND EQUIPMENT USED
ZONE 1		
ZONE 2		
ZONE 3		
ZONE 4		
ZONE 5		
ZONE 6		
PA		
TAMP		



XRI

PCB LAYOUT



Intruder Alarm Control System

TO SET THE SYSTEM (Turn On)

The green **Day** indicator should be showing. Enter your code number. Check that the system is clear (none of the **Zone** indicators are showing).

The sounder will now produce an exit beep tone and you should leave by the approved route.

After leaving the protected area it is absolutely essential that you wait until the tone stops, before assuming that the system has Set.

If the system is not clear the sounder will produce a broken beep tone and the fault will be displayed. Either re-enter your code to turn off and investigate or omit the faulty zone(s) from the system.

TO UNSET THE SYSTEM (Turn Off)

Enter your code. If the system has not been previously activated, the green **Day** indicator will come on. If the system has been activated, then entering the code will turn the alarm off and the cause of the alarm will be displayed.

Press **RESET** to clear the indication.

TO OMIT A ZONE

The **Day** indicator should be showing. Enter your code and the exit tone will start. Press the **OMIT** button and the exit tone will change to a rapid omit tone. Now enter the zone numbers you wish to omit. For example pressing 2 then 4 will remove zones 2 and 4 from the system. The **Zone 2** and **Zone 4** indicators will now be showing.

If you make a mistake, press 0 to cancel and then enter the correct zone number(s).

When the selection is complete press **SET**. The exit tone will now continue and you should leave the protected area by the approved route.

NOTE

A special feature in the Citadel XR1, automatically changes the function of zone 2 to become Timed if any zone(s) is omitted when Setting the system.

QUICK SET

During the exit period (after entering your code) the system may be Set quickly by pressing **SET**. This removes the time period usually allowed for exit and would be used if you are not leaving the premises.

If you omit zones and require Quick Set, you will need to press **SET** twice.



- Operating Instructions

CHIME

Chime is a low security monitoring system for use when the system is Unset. When a zone that is set to chime is operated, the internal sounder will produce a low volume two stage warning tone and the **Zone** indicator will show. The indicator may be cancelled by pressing **RESET**.

Chime is particularly useful in a shop to warn of a customers presence or in a house to warn that a door or a particular area has been accessed.

Any zone may set to be on or off chime by pressing the **CHIME** key and then keying in the required zone number(s). Key **0** to cancel all zones from chime. After a few seconds the system will automatically return to the Day mode.

POWER INDICATOR

The red **Power** indicator on the control panel should be showing at all times. If the indicator goes off, the mains supply has failed or been disconnected. If in doubt consult the Engineer.

FAULTS/PROBLEMS

It is important that you fully understand the operation of your alarm system and that it is regularly tested by the Engineer.

If any faults occur, or if any fault indicators remain on, contact the Engineer for assistance.

Engineer Details

ALARM COMPANY NAME.....

.....

TEL. NO.....

ACCOUNT NO.....

DATE OF INSTALLATION.....

	AREA PROTECTED
ZONE 1	
ZONE 2	
ZONE 3	
ZONE 4	
ZONE 5	
ZONE 6	

Customer Programming

To test your alarm system, change your code or recall the alarm memory, follow the instructions below.

Before you begin check that the **Day** indicator is showing and that it shows again when you have finished programming or testing.

CODE CHANGE

Press **PROG**

All indicators will show.

Enter your code

Day and **Tamper** indicators show.

Press **8**

Zone indicators
1, 2, 3 and 4 show.

Now enter your
new code (4 digits)

The system will bleep twice and the **Day** and **Tamper** indicators show again.

The new code is now in the memory.

Press **RESET**

Day indicator shows.

ALARM MEMORY RECALL

Press **PROG**

All indicators will show.

Enter your code

Day and **Tamper** indicators show.

Press **CHIME**

The indicators will now scroll to show the last 8 alarm conditions. The sounder will bleep as each new condition is shown. When complete the **Day** and **Tamper** indicators show again.

Press **RESET**

Day indicator shows.

ALARM TESTS

Press **PROG**

All indicators will show.

Enter your code

? **?** **?** **?**

Day and **Tamper** indicators show.

Press

0

Day, Tamper and **Attack** indicators show.

The system is now in the test routine

Press

2

To test the strobe.

Press

0

to stop

Press

3

To test the external bell/sounder.

Press

0

to stop

Press

4

To test low volume internal sounder.

Press

0

to stop

Press

2

To test high volume internal sounder.

Press

0

to stop

Press

5

To enter walk test.
The internal sounder will beep and the relevant indicator will show as each zone is tested.

Press

0

to stop

Press

RESET

RESET

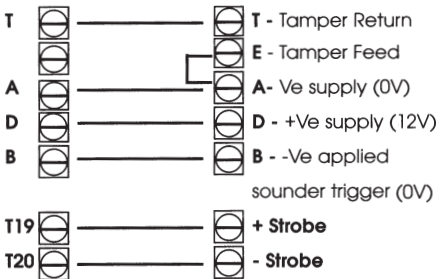
Day indicator shows.



ADE SONADE:

Control panel PCB

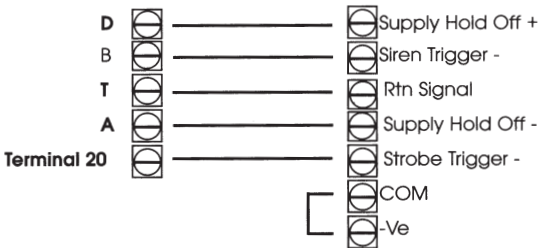
SONADE



Citadel Defender:

Control panel PCB

Citadel Defender



Due to continuous product development, ADE reserve the right to change specifications as and when required without prior notice.



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TECHNICAL 0151-549 1550



Certificate No: FM32384
BS EN ISO 9002: 1994



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