

# Service Manual



Teletrend  
Multitrend  
Circuitrend



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## Chapter 1: Introduction

This manual is intended as a guide to stripping down **Honeywell** recorders for the purposes of replacing or installing hardware (such as Comms cards or PSU boards) or upgrading firmware (EPROMs). **Honeywell** recorders are designed for ease of assembly and, as such, stripping down a unit is relatively straightforward.

There are, however, very few user-serviceable components - stripping down a recorder should only be performed under the following circumstances:

- When an item of hardware requires individual replacement.
- When an item of hardware is to be retrospectively fitted.
- When the recorder firmware requires upgrading.

In all other instances it is recommended that the complete unit be returned for service to an authorised agent or service centre.

For ALL procedures EXCEPT fitting of alarm cards *Circuitrend V5* models should be returned to an approved Service Centre.

The procedure for stripping down a **Honeywell** recorder is generally the same throughout the range. Where differences occur, instructions are provided in separate sections to avoid confusion. Before attempting to strip down a **Honeywell** recorder, it is advisable to clear a sufficient workspace so components such as the front panel can be rested on the work surface without risk of being scratched or damaged.

### **WARNING**

#### **ENSURE SAFETY EARTH CONNECTION**

Ensure all power to the recorder is disconnected before attempting all maintenance procedures.

Full anti-static precautions **MUST** be observed when in contact with the electronics of your recorder.

Upon completion of service procedures detailed in this manual two basic safety tests should be performed in order to ensure continued safe operation of the instrument.

1. Earth Resistance; 25 Adc applied between case and protective earth, bonding resistance should be < 0.1 Ohm.
2. Insulation Resistance; 500 Vdc applied between the earth terminal, and the live and neutral terminal shorted together, insulation resistance to be > 2.0 MOhm. (Megaohm, NOT miliohm).

**Failure to comply with these instructions could result in death or serious injury.**

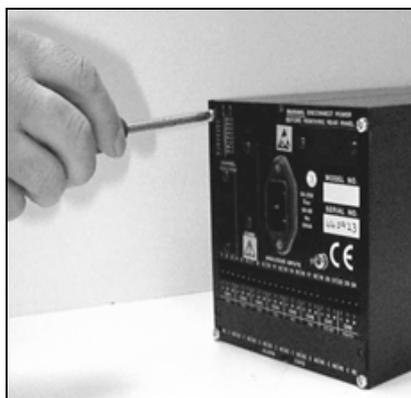


## Chapter 2: Alarm Card Installation

Removal of the rear panel (ONLY) is necessary when this operation is intended.

### Removing the rear panel

- To remove the rear panel of the recorder, loosen and remove the four No 6 x 3/4" self tap screws at each corner of the rear panel, taking care to retain the toothed washer under each screw head.



**FIGURE 2.1** Removing the rear panel

- If fitted, loosen and remove the mounting clamp screws at the top and bottom of the extrusion to allow removal of the back panel.  
NB. Only one of the two screws may have to be removed while loosening the other will be sufficient.
- Loosen and remove the small earth screws (M3 x 6 mm) and toothed washers on either side of the extrusion to enable the PCB assembly to slide out.

#### **NOTICE**

Due to the internal wiring the PCB assembly will only slide out approx. 30 mm.

## Inserting the alarm card

- DO NOT disconnect any wiring from the mains socket on the rear panel, gently move the rear panel to the side of the extrusion to allow internal access.
- Connect one end of the cable ribbon to the socket underneath the motherboard and the other end of the cable ribbon to the socket on the alarm card.  
NB. Both ends of the ribbon cable are identical.
- Slide the alarm card into the extrusion underneath the motherboard ensuring the card fits between the guide tracks on the inner sides of the extrusion.



FIGURE 2.2 Inserting the Alarm card

## Re-assembling the unit

- Tuck in the cable ribbon as a loose "S" shape between the motherboard and alarm card.
- Remove the plastic blanking plate safety cover on the bottom of the rear panel by pushing out the push rivets from behind.
- Slide the PCB assembly carefully back into the extrusion, until the fixing pillars on both sides of the vertically aligned PCBs are in line with the single fixing holes on either side of the extrusion. Ensure that no internal wiring is damaged as the PCB assembly is returned.
- Replace the earth screws and toothed washers on either side of the extrusion, torque to 120cNm.
- Replace the rear panel, reposition the toothed washers and replace and tighten the four No 6 x 3/4" self tap screws at each corner of the rear panel.
- Replace and/or tighten the mounting clamp screws at the top and bottom of the extrusion.

## Chapter 3: Teletrend V5 Display Replacement

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### Removing the front display panel

- Loosen and remove the four No 4 x 3/8" countersunk screws from the extrusion which holds the front surround panel and remove the front surround.

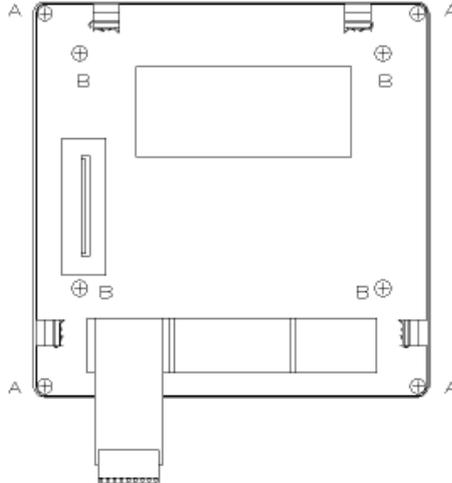


**FIGURE 3.1** Removing the front panel

- Disconnect the cable ribbons from the keypad and display.
- Place the display assembly face down on a soft, clean surface to avoid scratch damage.

## Removing the mounting plate

- Remove the mounting plate from the front surround by removing the four No 4 x  $\frac{3}{8}$ " countersunk screws. (Those marked A in 4)



**FIGURE 4.1 Teletrend V5 mounting plate**

- Remove the display from the mounting plate by removing the four M3 x 6 mm Philips screws. (Those marked B in 4) Discard the old display unit.

## Installing the new display unit

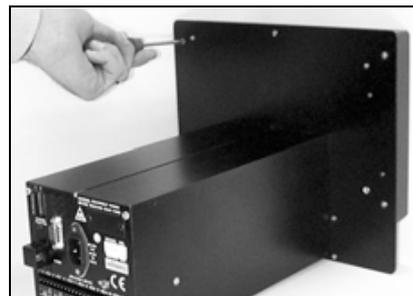
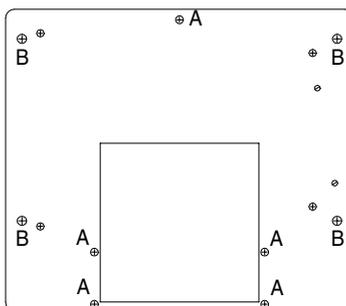
- Place the new display unit face down on a smooth dust free area. Place the mounting plate over the display unit so that the four M3 x 6 mm Philips screws can be replaced and tightened.
- Lay a section of plastic film over the inside of the front surround to help remove any dust.
- Carefully remove the plastic film from the LCD and the inside of the front surround and place the LCD into the front surround unit. Check that no dust particles have remained inside the unit.

## Re-assembling the Teletrend V5

- Replace the four No 4 x  $\frac{3}{8}$ " countersunk screws which hold the mounting plate to the front surround. (Those marked A in 4)
- Reconnect the cable ribbon to the keypad, keeping it straight and the cable ribbon to the display, ensuring that the metal contacts face forwards.
- Secure the front surround panel by replacing and tightening the four No 4 x  $\frac{3}{8}$ " countersunk screws on the extrusion.

## Chapter 4: Multitrend V5 Display Replacement

### Removing the front display panel



**FIGURE 4.1 Multitrend V5 mounting plate**

- Loosen and remove the four No 6 x  $\frac{5}{8}$ " self tapping screws (those marked B in FIGURE 4.1 ) from the mounting plate.
- Loosen and remove the five No 4 x  $\frac{1}{2}$ " self tapping screws (those marked A in FIGURE 4.1 ) from the mounting plate.
- Carefully, turn the recorder whilst holding together the display and mounting plate, so that the recorder stands on the rear panel.
- Disconnect the cable ribbon from the keypad.



**FIGURE 4.2 Removing the front surround and the display unit from the mounting plate pillars on the Multitrend V5**

- Place the front surround face down on a soft, clean dust free surface to avoid scratch damage.
- Cover the inside of the display unit screen with protective plastic.

- Loosen and remove the four M3 x 8 mm pan pozi screws which hold the display unit to the mounting plate pillars.
- Disconnect the white backlight power connector from the inverter PCB.
- Disconnect the ribbon cable from the display unit to the motherboard.
- Discard the old display unit.



**FIGURE 4.3** The inverter

## Re-assembling the Multitrend V5

- Reconnect the ribbon cable to the display unit from the motherboard.
- Reconnect the backlight connector to the inverter PCB.
- Place the new display unit on the mounting plate pillars.
- Replace the four M3 x 8 mm pan pozi screws which hold the display unit to the mounting plate.
- Carefully remove the plastic film from the LCD and the inside of the front surround.
- Reconnect the cable ribbon to the keypad.
- Secure the front surround panel to the mounting plate by replacing and tightening the five No 4 x ½" self tapping screws (those marked A in FIGURE 4.1 on page 7).
- Replace the four No 6 x 5/8" self tapping (those marked B in FIGURE 4.1 on page 7) to the mounting plate.

## Chapter 5: Keypad Replacement

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### Removing the front display panel - Teletrend V5

- Loosen and remove the four No 4 x 3/8" countersunk screws from the extrusion which holds the front surround panel and remove the front surround.



FIGURE 5.1 Removing the front panel

- Disconnect the cable ribbons from the keypad and display.
- Place the display assembly face down on a soft, clean surface to avoid scratch damage.

### Removing the keypad assembly - Multitrend V5

- Removal of the front cover is NOT necessary in the case of this model.
- Open the keypad flap and gently push to one side allowing the securing tab on one side to move clear of its locking position. Gently remove the other tab from its locking position. Then the keypad flap can be detached.  
NB Great care should be taken to avoid overstressing the delicate plastic securing tabs.
- Disconnect the cable ribbon from the display.

### Fitting the new keypad assembly

- Fit the new assembly by connecting the keypad cable ribbon to the keypad extension.
- Slide the connectors through the disk drive aperture so that the connection is behind the front mounting panel and inside the extrusion.

## Re-assembling the unit

### **Teletrend V5 ONLY**

- Push the keypad through the aperture on the front display unit.
- Secure the front surround panel by replacing and tightening the four No 4 x  $\frac{3}{8}$ " countersunk screws on the extrusion.
- Reconnect the cable ribbon to the keypad, keeping it straight and the cable ribbon to the display, ensuring that the metal contacts are face forwards.
- Insert one securing tab of the keypad into its locking position. Place the other securing tab at the opposite diagonal corner of the aperture and move the keypad upwards to move the securing tab into its locking position.

### **Multitrend V5 ONLY**

- Insert one securing tab of the keypad into its locking position. Place the other securing tab at the opposite diagonal corner of the aperture and move the keypad upwards to move the securing tab into its locking position.

## Chapter 6: Expansion Card Installation

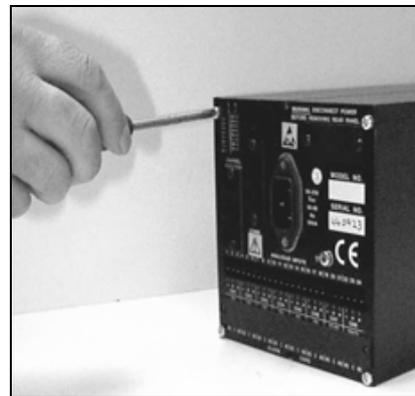
Removal of BOTH front and rear panels is necessary when these operations are intended.

### Removing the rear panel

#### All models

- To remove the rear panel of the recorder, loosen and remove the four panpozi screws at each corner of the rear panel, taking care to retain the toothed washer under each screw head.
- If fitted, loosen and remove the mounting clamp screws at the top and bottom of the extrusion to allow removal of the back panel.

NB. Only one of the two screws may have to be removed while loosening the other will be sufficient.



**FIGURE 6.1** Removing the rear panel

- DO NOT disconnect the brown and blue wires from the rear panel, but disconnect the 2 pin connector carrying these wires from the power supply board.
- DO NOT disconnect the green/yellow earth wire from the power supply board, but disconnected it from the rear panel.
- Loosen and remove the two small earth screws (M3 x 6 mm) and toothed washers on either side of the extrusion to enable the PCB assembly to slide out.

#### **NOTICE**

Due to the internal wiring the PCB assembly will only slide out approx 30 mm which is NOT far enough for access to the sockets for these procedures. The front display MUST first be removed.

## Removing the front display panel - Teletrend V5

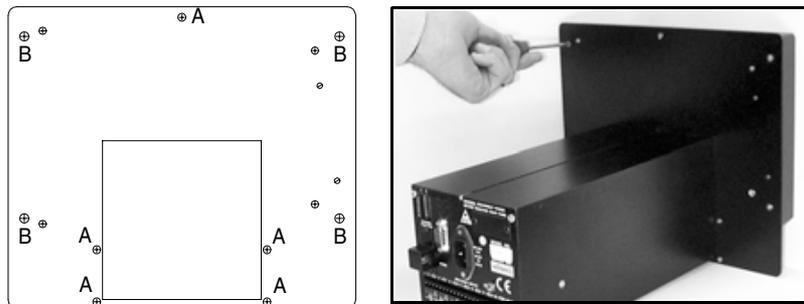
- Loosen and remove the four No 4 x 3/8" countersunk screws from the extrusion which holds the front surround panel and remove the front surround.



**FIGURE 6.2** Removing the front panel

- Disconnect the cable ribbons from the keypad and display.
- Place the display assembly face down on a soft, clean surface to avoid scratch damage.
- Continue with [“Installing the RS485 Trendbus Communications Card” on page 14](#), or [“Installing the Modbus Communications Card” on page 15](#) or [“Installing the Options Key” on page 15](#).

## Removing the front display panel - Multitrend V5



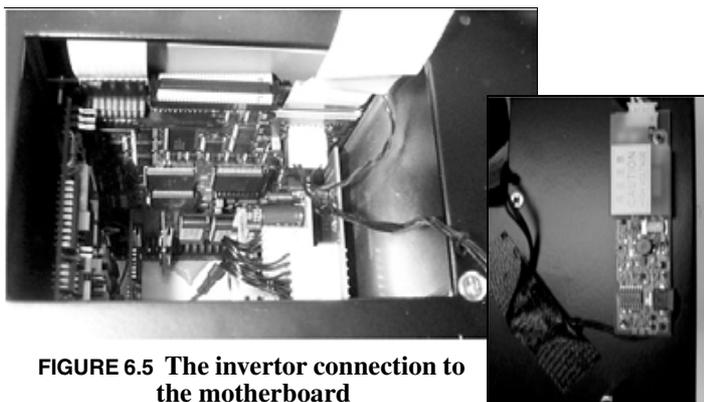
**FIGURE 6.3** Multitrend V5 mounting plate

- Loosen and remove the four No 6 x 5/8" self tapping screws (those marked B in FIGURE 6.3 “Multitrend V5 mounting plate,” on page 12) from the mounting plate.
- Loosen and remove the five No 4 x 1/2" self tapping screws (those marked A in FIGURE 6.3 “Multitrend V5 mounting plate,” on page 12) from the mounting plate.
- Carefully, turn the recorder whilst holding together the display and mounting plate, so that the recorder stands on the rear panel.
- Disconnect the cable ribbon from the keypad.



**FIGURE 6.4 Removing the front surround and the display unit from the mounting plate pillars on the Multitrend Plus**

- Place the front surround face down on a soft, clean dust free surface to avoid scratch damage.
- Cover the LCD and the inside of the display unit screen with protective plastic.
- Loosen and remove the four M3 x 8 mm pan pozi screws which hold the display unit to the mounting plate pillars.

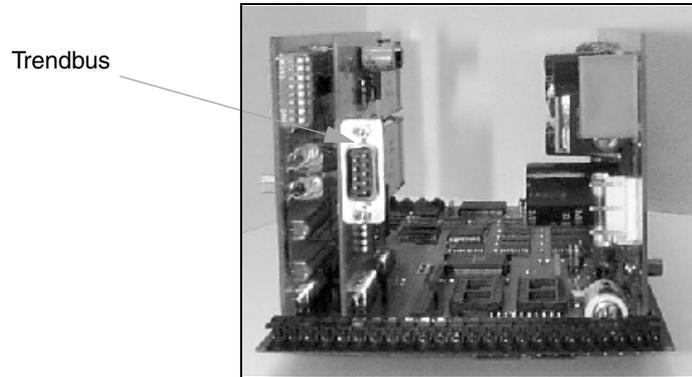


**FIGURE 6.5 The inverter connection to the motherboard**

- Disconnect the inverter lead from point J20 on the motherboard.
- Disconnect the ribbon cable from the display unit to the motherboard.
- Disconnect the power lead from the motherboard to the disk drive.
- Continue with [“Installing the RS485 Trendbus Communications Card” on page 14](#), or [“Installing the Modbus Communications Card” on page 15](#) or [“Installing the Options Key” on page 15](#).

## Installing the RS485 Trendbus Communications Card

- Slide all the PCB assembly from the extrusion, supporting the motherboard.



**FIGURE 6.6** The position of the Trendbus communications card

- Fit the RS485 Trendbus card in connector position J9 and J18 on the left side of the motherboard ensuring the pins are in the correctly corresponding ports. That is, the pins on the communications card match the indents on the ports, (i.e the card is placed in its sockets so that pin 1 of the card is fitted to pin 1 of the socket.)
- Remove the appropriate plastic blanking plate safety cover on the left of the rear panel by pushing out the push rivets from behind to allow the communication socket to fit through the rear panel.
- Continue with instructions [“Re-assembling the unit” on page 15.](#)

## Installing the Modbus Communications Card

- Slide all the PCB assembly from the extrusion, supporting the motherboard.
- Insert the RS486 (Modbus) card in connectors J9 and J18 on the left side of the motherboard ensuring the pins are in the correctly corresponding ports. That is, the pins on the communications card match the indents on the ports, (i.e the card is placed in its sockets so that pin 1 of the card is fitted to pin 1 of the socket).

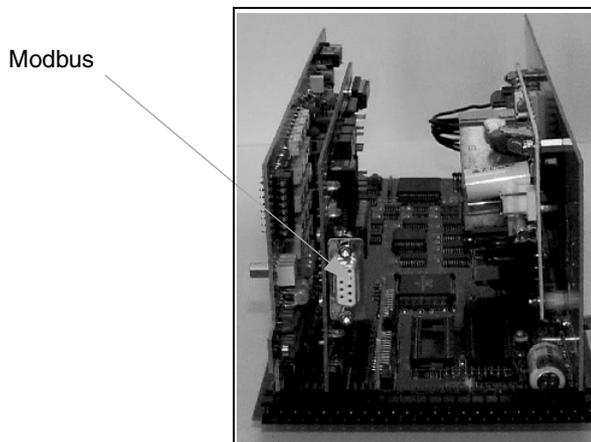


FIGURE 6.7 The position of Modbus communication card

## Installing the Options Key

- Slide all the PCB assembly from the extrusion, supporting the motherboard.
- Remove any existing Options Key.
- Insert the new Options Key to expansion slot 2 on the motherboard. This is positioned next to the even EPROM socket.
- If no expansion sockets are fitted to the motherboard of your recorder, please contact our Customer Services Department.
- Continue with the following section on "Re-assembling the unit".

## Re-assembling the unit

### **All Models**

- Slide all the PCB assembly into the extrusion, until the fixing pillars on both sides of the vertically aligned PCBs are in line with the single fixing holes on either side of the extrusion. Ensure that the ribbon cable to the disk drive forms a soft "S" shape to prevent damage.
- If previously fitted reconnect the alarm card by connecting one end of the cable ribbon to the socket underneath the motherboard and the other end of the cable ribbon to the socket on the alarm card.  
NB. Both ends of the ribbon cable are identical.
- Slide the alarm card into the extrusion underneath the motherboard ensuring the card fits between the guide tracks on the inner sides of the extrusion.

- Tuck in the cable ribbon as a loose "S" shape between the motherboard and alarm card.

## Teletrend V5 ONLY

- Secure the front surround panel by replacing and tightening the four No 4 x  $\frac{3}{8}$ " "countersunk screws on the extrusion.
- Reconnect the cable ribbon to the keypad, keeping it straight and the cable ribbon to the display, ensuring that the metal contacts are face forwards.

## Multitrend V5 ONLY

- Reconnect the power lead to the motherboard from the disk drive.
- Reconnect the ribbon cable to the display unit from the motherboard.
- Reconnect the inverter lead to point J20 on the motherboard.
- Place the display unit on the mounting plate pillars.
- Replace the four M3 x 8 mm pan pozi screws which hold the display unit to the mounting plate.
- Carefully remove the plastic film from the LCD and the inside of the front surround.
- Reconnect the cable ribbon to the keypad.
- Secure the front surround panel to the mounting plate by replacing and tightening the five No 4 x  $\frac{1}{2}$ " self tapping screws (those marked A in FIGURE 6.3 on page 12).
- Replace the four No 6 x  $\frac{5}{8}$ " self tapping (those marked B in FIGURE 6.3 on page 12) to the mounting plate.

## All Models

- Replace and tighten the two small earth screws (M3 x 6 mm) and toothed washers on either side of the extrusion, torque to 120cNm.
- Reconnect the 2 pin connector carrying the brown and blue wires to the power supply board.
- Reconnect the flying earth lead from the power supply board to the earth terminal on the filtered mains connector on the rear panel.
- Reposition the toothed washers and replace and tighten the four No 6 x  $\frac{3}{4}$ " self tap screws at each corner of the rear panel.
- If fitted, replace and tighten the mounting clamp screws at the top and bottom of the extrusion.

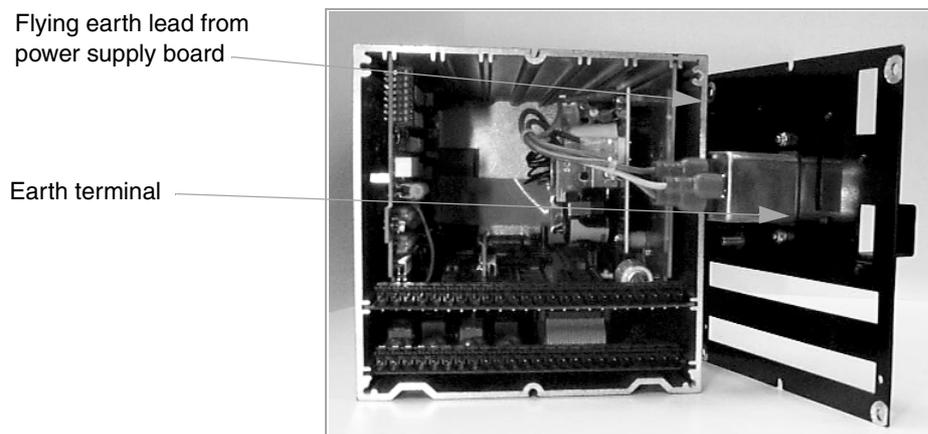


FIGURE 6.8 Reconnecting the flying earth lead

## Chapter 7: Upgrading Firmware

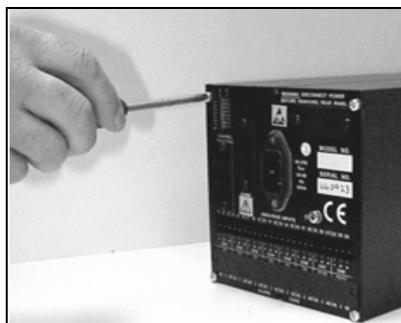
Removal of BOTH front and rear panels is necessary when this operation is intended.

### Removing the rear panel

#### All models

- To remove the rear panel of the recorder, loosen and remove the four panpozi screws at each corner of the rear panel, taking care to retain the toothed washer under each screw head.
- If fitted, loosen and remove the mounting clamp screws at the top and bottom of the extrusion to allow removal of the back panel.

NB. Only one of the two screws may have to be removed while loosening the other will be sufficient.



**FIGURE 7.1** Removing the rear panel

- DO NOT disconnect the brown and blue wires from the rear panel, but disconnect the 2 pin connector carrying these wires from the power supply board.
- DO NOT disconnect the green/yellow earth wire from the power supply board, but disconnected it from the rear panel.
- Loosen and remove the two small earth screws (M3 x 6 mm) and toothed washers on either side of the extrusion to enable the PCB assembly to slide out.

#### **NOTICE**

Due to the internal wiring the PCB assembly will only slide out approx 30 mm which is NOT far enough for access to the sockets for these procedures. The front display MUST first be removed.

## Removing the front display panel - Teletrend V5

- Loosen and remove the four No 4 x  $\frac{3}{8}$ " countersunk screws from the extrusion which holds the front surround panel and remove the front surround.



FIGURE 7.2 Removing the front panel

- Disconnect the cable ribbons from the keypad and display.
- Place the display assembly face down on a soft, clean surface to avoid scratch damage.
- Continue with [“Replacing EPROMs” on page 20](#).

## Removing the front display panel - Multitrend V5

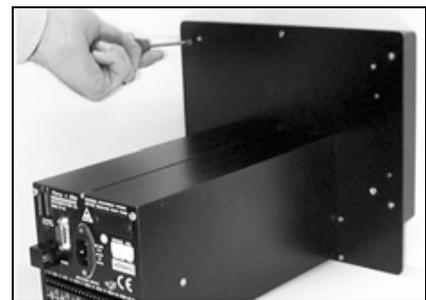
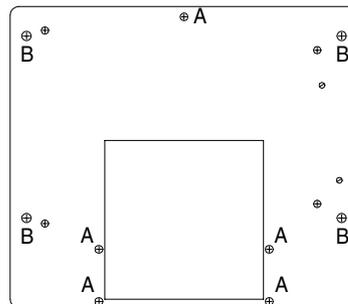
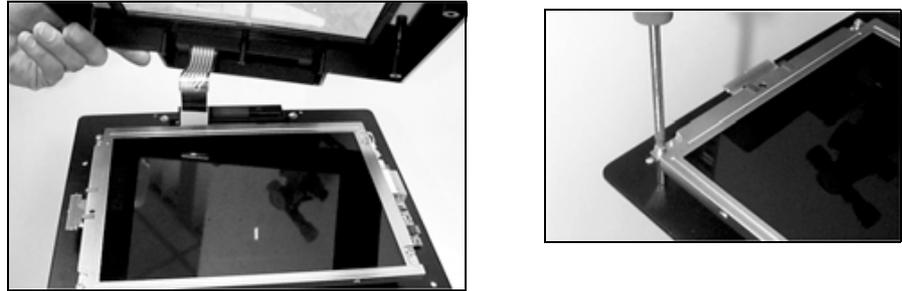


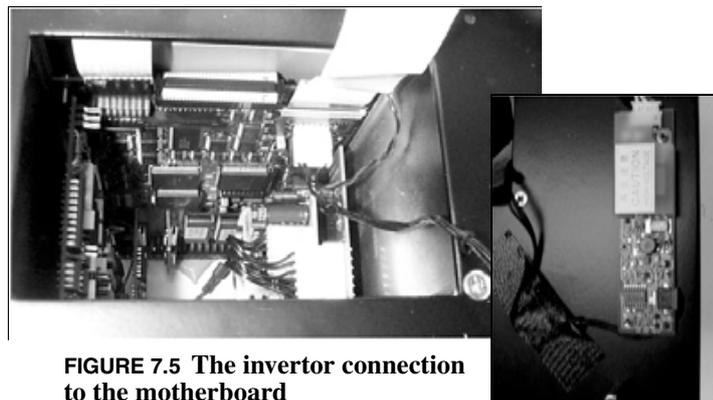
FIGURE 7.3 Multitrend Plus mounting plate

- Loosen and remove the four No 6 x  $\frac{5}{8}$ " self tapping screws (those marked B in FIGURE 7.3 “Multitrend Plus mounting plate,” on page 18) from the mounting plate.
- Loosen and remove the five No 4 x  $\frac{1}{2}$ " self tapping screws (those marked A in FIGURE 7.3 “Multitrend Plus mounting plate,” on page 18) from the mounting plate.
- Carefully, turn the recorder whilst holding together the display and mounting plate, so that the recorder stands on the rear panel.
- Disconnect the cable ribbon from the keypad.



**FIGURE 7.4 Removing the front surround and the display unit from the mounting plate pillars on the Multitrend Plus**

- Place the front surround face down on a soft, clean dust free surface to avoid scratch damage.
- Cover the LCD and the inside of the display unit screen with protective plastic.
- Loosen and remove the four M3 x 8 mm pan pozi screws which hold the display unit to the mounting plate pillars.

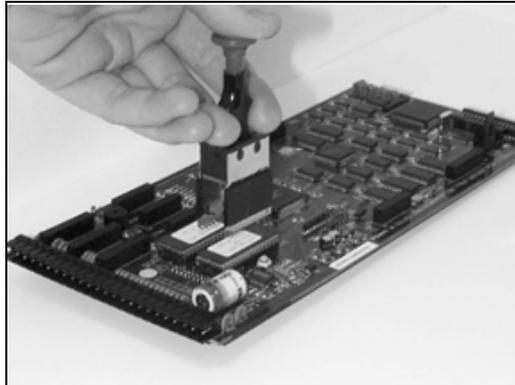


**FIGURE 7.5 The inverter connection to the motherboard**

- Disconnect the inverter lead from point J20 on the motherboard.
- Disconnect the ribbon cable from the display unit to the motherboard.
- Disconnect the power lead from the motherboard to the disk drive.
- Continue with the following section.

## Replacing EPROMs

- Slide all the PCB assembly from the extrusion, supporting the motherboard.



**FIGURE 7.6 Removing EPROMs**

- Gently remove the EPROMs with a suitable IC extractor. This is an extremely delicate operation which may require gradual pressure and levering to remove the EPROMs. Care **MUST** be taken to avoid inflicting damage to the motherboard.
- Insert the new EPROMs ensuring that the EPROM labelled "ODD" and "EVEN" are placed in the correctly corresponding socket and that the indent on each EPROM match the indent on the socket (i.e. the EPROMs are placed in their sockets so that pin 1 of the EPROM is fitted to pin 1 of the socket)
- Continue with the following section "Re-assembling the unit".

## Re-assembling the unit

### All Models

- Slide all the PCB assembly into the extrusion, until the fixing pillars on both sides of the vertically aligned PCBs are in line with the single fixing holes on either side of the extrusion. Ensure that the ribbon cable to the disk drive forms a soft "S" shape to prevent damage.
- If previously fitted reconnect the alarm card by connecting one end of the cable ribbon to the socket underneath the motherboard and the other end of the cable ribbon to the socket on the alarm card.  
NB. Both ends of the ribbon cable are identical.
- Slide the alarm card into the extrusion underneath the motherboard ensuring the card fits between the guide tracks on the inner sides of the extrusion.
- Tuck in the cable ribbon as a loose "S" shape between the motherboard and alarm card.

### **Teletrend V5 ONLY**

- Secure the front surround panel by replacing and tightening the four No 4 x  $\frac{3}{8}$ " countersunk screws on the extrusion.
- Reconnect the cable ribbon to the keypad, keeping it straight and the cable ribbon to the display, ensuring that the metal contacts are face forwards.

## Multitrend V5 ONLY

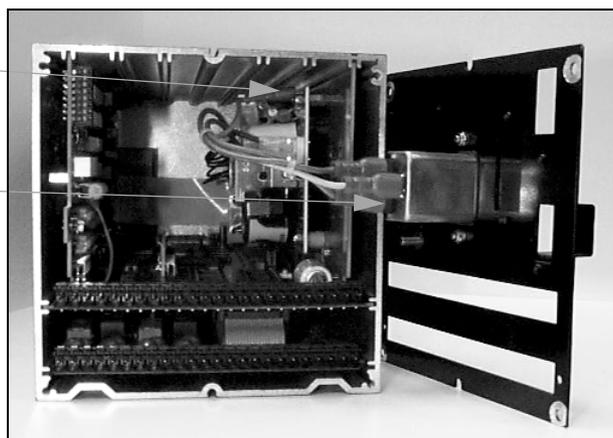
- Reconnect the power lead to the motherboard from the disk drive.
- Reconnect the ribbon cable to the display unit from the motherboard.
- Reconnect the inverter lead to point J20 on the motherboard.
- Place the display unit on the mounting plate pillars.
- Replace the four M3 x 8 mm pan pozi screws which hold the display unit to the mounting plate.
- Carefully remove the plastic film from the LCD and the inside of the front surround.
- Reconnect the cable ribbon to the keypad.
- Secure the front surround panel to the mounting plate by replacing and tightening the five No 4 x 1/2" self tapping screws (those marked A in FIGURE 7.3 on page 18).
- Replace the four No 6 x 5/8" self tapping (those marked B in FIGURE 7.3 on page 18) to the mounting plate.

## All Models

- Replace and tighten the two small earth screws (M3 x 6 mm) and toothed washers on either side of the extrusion, torque to 120cNm.
- Reconnect the 2 pin connector carrying the brown and blue wires to the power supply board.
- Reconnect the flying earth lead from the power supply board to the earth terminal on the filtered mains connector on the rear panel.
- Reposition the toothed washers and replace and tighten the four No 6 x 3/4" self tap screws at each corner of the rear panel.
- If fitted, replace and tighten the mounting clamp screws at the top and bottom of the extrusion.

Flying earth lead from power supply board

Earth terminal



**FIGURE 7.7** Reconnecting the flying earth lead



## Chapter 8: PCB Installation

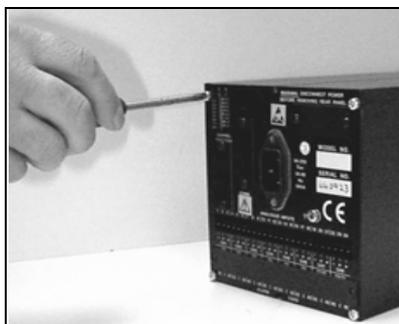
Removal of BOTH front and rear panels is necessary when this operation is intended.

### Removing the rear panel

#### All models

- To remove the rear panel of the recorder, loosen and remove the four panpozi screws at each corner of the rear panel, taking care to retain the toothed washer under each screw head.
- If fitted, loosen and remove the mounting clamp screws at the top and bottom of the extrusion to allow removal of the back panel.

NB. Only one of the two screws may have to be removed while loosening the other will be sufficient.



**FIGURE 8.1** Removing the rear panel

- DO NOT disconnect the brown and blue wires from the rear panel, but disconnect the 2 pin connector carrying these wires from the power supply board.
- DO NOT disconnect the green/yellow earth wire from the power supply board, but disconnected it from the rear panel.
- Loosen and remove the two small earth screws (M3 x 6 mm) and toothed washers on either side of the extrusion to enable the PCB assembly to slide out.

#### **NOTICE**

Due to the internal wiring the PCB assembly will only slide out approx 30 mm which is NOT far enough for access to the sockets for these procedures. The front display MUST first be removed.

## Removing the front display panel of the Teletrend V5

- Loosen and remove the four No 4 x  $\frac{3}{8}$ " countersunk screws from the extrusion which holds the front surround panel and remove the front surround.



FIGURE 8.2 Removing the front panel

- Disconnect the cable ribbons from the keypad and display.
- Place the display assembly face down on a soft, clean surface to avoid scratch damage.
- Continue with [“Installing the Universal Card” on page 26](#) or [“Replacing the motherboard” on page 26](#).

## Removing the front display panel of the Multitrend V5

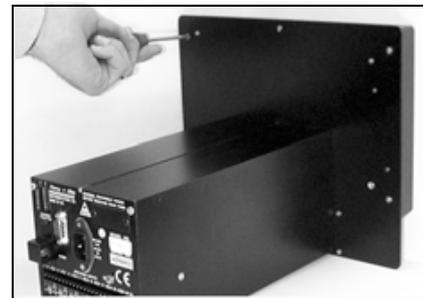
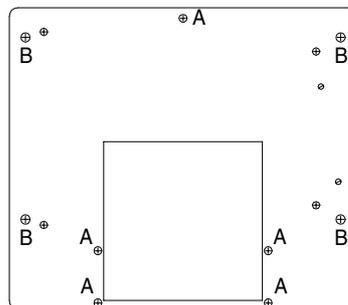
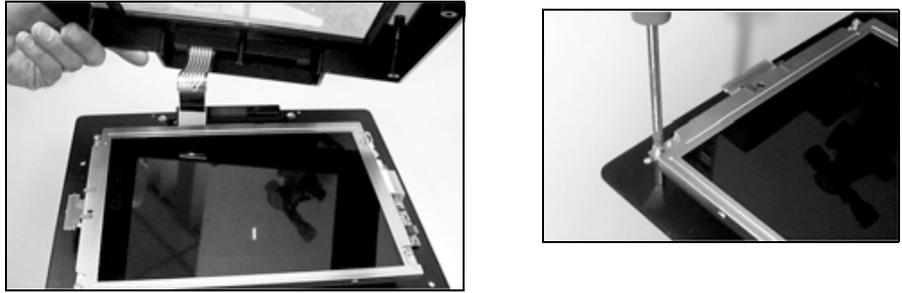


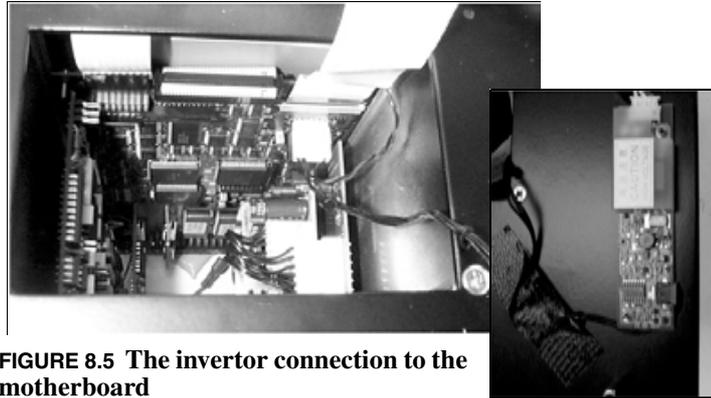
FIGURE 8.3 Multitrend Plus mounting plate

- Loosen and remove the four No 6 x  $\frac{5}{8}$ " self tapping screws (those marked B in FIGURE 8.3 “Multitrend Plus mounting plate,” on page 24) from the mounting plate.
- Loosen and remove the five No 4 x  $\frac{1}{2}$ " self tapping screws (those marked A in FIGURE 8.3 “Multitrend Plus mounting plate,” on page 24) from the mounting plate.
- Carefully, turn the recorder whilst holding together the display and mounting plate, so that the recorder stands on the rear panel.
- Disconnect the cable ribbon from the keypad.



**FIGURE 8.4 Removing the front surround and the display unit from the mounting plate pillars on the Multitrend Plus**

- Place the front surround face down on a soft, clean dust free surface to avoid scratch damage.
- Cover the LCD and the inside of the display unit screen with protective plastic.
- Loosen and remove the four M3 x 8 mm pan pozi screws which hold the display unit to the mounting plate pillars.



**FIGURE 8.5 The inverter connection to the motherboard**

- Disconnect the inverter lead from point J20 on the motherboard.
- Disconnect the ribbon cable from the display unit to the motherboard.
- Disconnect the power lead from the motherboard to the disk drive.
- Continue with [“Installing the Universal Card” on page 26](#) or [“Replacing the motherboard” on page 26](#).

## Installing the Universal Card

- Slide all the PCB assembly from the extrusion, supporting the motherboard.

Universal card

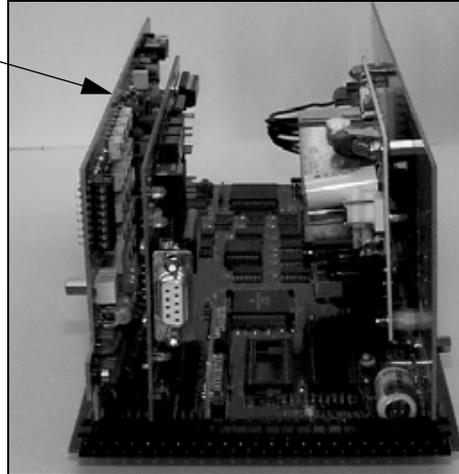


FIGURE 8.6 The position of the Universal card

- If fitted, disconnect the alarm card ribbon cable from the motherboard and remove the alarm card.
- Remove the existing universal card from the motherboard. Fit the new universal card in connectors J8 and J19 so that the flying earth lead is connected to J16 on the motherboard.
- Continue with [“Re-assembling the unit” on page 27](#).

## Replacing the motherboard

The entire assembly must be carefully dismantled and re-assembled on the new motherboard.

- Disconnect the ribbon cable from the front of the motherboard to the display assembly.
- Slide all the PCB assembly from the extrusion, supporting the motherboard.
- If fitted, disconnect the alarm card ribbon cable from the motherboard and remove the alarm card.
- Remove all boards from the motherboard, eg the analogue board, the comms board, and the power supply board so that all the components can be fitted to the new motherboard.

## Removing the EPROMs From the Motherboard

- Gently remove the EPROMs with a suitable IC extractor. This is an extremely delicate operation which may require gradual pressure and levering to remove the EPROMs.

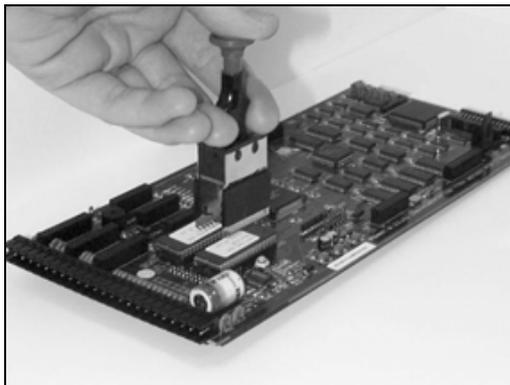


FIGURE 8.7 Removing EPROMs

## Replacing the motherboard

- Fit the EPROMs to the new motherboard ensuring that the EPROM labelled "ODD" and "EVEN" are placed in the correctly corresponding socket and that the indent on each EPROM match the indent on the socket, (i.e the EPROMs are placed in their sockets so that pin 1 of the EPROM is fitted to pin 1 of the socket.)
- Fit the analogue board to connectors J8 and J19 so that the flying earth lead is connected to J16 on the motherboard. Replace the comms board to connectors J9 and J18 next to the analogue board and the power supply board to connectors J10 and J16 on the opposite side of the motherboard, ensuring that the pins are correctly placed in their sockets.
- Continue with [“Re-assembling the unit” on page 27](#).

## Re-assembling the unit

### All Models

- Slide all the PCB assembly into the extrusion, until the fixing pillars on both sides of the vertically aligned PCBs are in line with the single fixing holes on either side of the extrusion. Ensure that the ribbon cable to the disk drive forms a soft "S" shape to prevent damage.
- If previously fitted reconnect the alarm card by connecting one end of the cable ribbon to the socket underneath the motherboard and the other end of the cable ribbon to the socket on the alarm card.  
NB. Both ends of the ribbon cable are identical.
- Slide the alarm card into the extrusion underneath the motherboard ensuring the card fits between the guide tracks on the inner sides of the extrusion.
- Tuck in the cable ribbon as a loose "S" shape between the motherboard and alarm card.

## Teletrend V5 ONLY

- Secure the front surround panel by replacing and tightening the four No 4 x  $\frac{3}{8}$ " countersunk screws on the extrusion.
- Reconnect the cable ribbon to the keypad, keeping it straight and the cable ribbon to the display, ensuring that the metal contacts are face forwards.

## Multitrend V5 ONLY

- Reconnect the power lead to the motherboard from the disk drive.
- Reconnect the ribbon cable to the display unit from the motherboard.
- Reconnect the inverter lead to point J20 on the motherboard.
- Place the display unit on the mounting plate pillars.
- Replace the four M3 x 8 mm pan pozi screws which hold the display unit to the mounting plate.
- Carefully remove the plastic film from the LCD and the inside of the front surround.
- Reconnect the cable ribbon to the keypad.
- Secure the front surround panel to the mounting plate by replacing and tightening the five No 4 x  $\frac{1}{2}$ " self tapping screws (those marked A in FIGURE 8.3 on page 24).
- Replace the four No 6 x  $\frac{5}{8}$ " self tapping (those marked B in FIGURE 8.3 on page 24) to the mounting plate.

## All Models

- Replace and tighten the two small earth screws (M3 x 6 mm) and toothed washers on either side of the extrusion, torque to 120cNm.
- Reconnect the 2 pin connector carrying the brown and blue wires to the power supply board.
- Reconnect the flying earth lead from the power supply board to the earth terminal on the filtered mains connector on the rear panel.
- Reposition the toothed washers and replace and tighten the four No 6 x  $\frac{3}{4}$ " self tap screws at each corner of the rear panel.
- If fitted, replace and tighten the mounting clamp screws at the top and bottom of the extrusion.

Flying earth lead from power supply board

Earth terminal

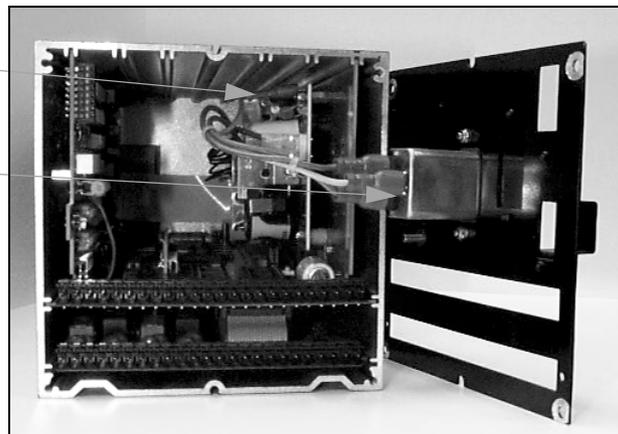


FIGURE 8.8 Reconnecting the flying earth lead

## Please take a moment to complete this questionnaire

<b>1</b>	<b>Reputation</b>
<p>How would you rate the reputation of <b>Honeywell</b>?</p> <p>Tick as appropriate</p> <p><input type="checkbox"/> A very reputable, successful company</p> <p><input type="checkbox"/> A reputable company</p> <p><input type="checkbox"/> A disreputable company</p> <p><input type="checkbox"/> No views either way</p>	

<b>2</b>	<b>Service</b>																																														
<p>How do you rate or perceive the following service levels provided by our sales staff?</p> <p>Tick as appropriate      Excellent      Good      Fair</p> <table border="0"> <tr> <td>Response speed</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> <tr> <td>Quality of response</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> <tr> <td>Follow up response</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> <tr> <td>Overall level of service</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> </table> <p>How do you rate or perceive the following service levels provided by our Technical Support Service?</p> <p>Tick as appropriate      Excellent      Good      Fair</p> <table border="0"> <tr> <td>Response speed</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> <tr> <td>Quality of response</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> <tr> <td>Follow up response</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> <tr> <td>Overall level of service</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> </table> <p>How could our service be improved upon?</p> <p>.....</p> <p>.....</p> <p>How many times do you receive a visit from one of our Sales representatives? Visits every:</p> <p>1-3 months <input type="checkbox"/>    3-6 months <input type="checkbox"/>    6-12 months <input type="checkbox"/></p> <p>How does that compare to our competitors?</p> <p>More <input type="checkbox"/>    Less <input type="checkbox"/>    The same <input type="checkbox"/></p> <p>Score on a level of 1-10, with 10 being the best</p> <table border="0"> <tr> <td>Quality of manuals / sales literature</td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> <tr> <td>Administration / documentation and letters</td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> <tr> <td>Technical expertise of our sales staff</td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> <tr> <td>Sales staff ability to give informed advice</td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> <tr> <td>The quality of the <b>Honeywell</b> sales team.</td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> <tr> <td>Pricing</td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> <tr> <td><b>Honeywell</b> understanding of your industry.</td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> </table>		Response speed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Quality of response	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Follow up response	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Overall level of service	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Response speed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Quality of response	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Follow up response	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Overall level of service	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Quality of manuals / sales literature	<input type="checkbox"/>	Administration / documentation and letters	<input type="checkbox"/>	Technical expertise of our sales staff	<input type="checkbox"/>	Sales staff ability to give informed advice	<input type="checkbox"/>	The quality of the <b>Honeywell</b> sales team.	<input type="checkbox"/>	Pricing	<input type="checkbox"/>	<b>Honeywell</b> understanding of your industry.	<input type="checkbox"/>
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Pricing	<input type="checkbox"/>																																														
<b>Honeywell</b> understanding of your industry.	<input type="checkbox"/>																																														

<b>3</b>	<b>Products</b>
<p>How do you perceive our range of products?</p> <p>Tick as appropriate</p> <p><input type="checkbox"/> Products offered are <b>better</b> than those of competitors</p> <p><input type="checkbox"/> Products offered are <b>worse</b> than those of competitors</p> <p><input type="checkbox"/> Products offered are the <b>same</b> as those of competitors</p> <p>Any other comments</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>Are there any products that we do not provide that you would like us to provide - or any we could improve on?</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>Improvements to existing products.....</p> <p>.....</p> <p>.....</p>	

<b>4</b>	<b>General</b>
<p>If you are an existing or new customer, what made you choose <b>Honeywell</b>?</p> <p><input type="checkbox"/> Only on price</p> <p><input type="checkbox"/> Price plus a combination of factors</p> <p><input type="checkbox"/> Prefer to deal with a reputable company</p> <p><input type="checkbox"/> <b>Honeywell</b> offers more than the competition in terms of 'added value' over and above the product itself</p>	

<p><b>Thank you for completing this questionnaire.</b></p> <p><b>Please fill out your name and address below.</b></p> <p><b>Photo copy this form and Fax to us on</b></p> <p style="font-size: 1.2em;"><b>+44 (0)1202 476501</b></p> <p><b>Name</b> .....</p> <p><b>Company name</b> .....</p> <p><b>Address</b> .....</p> <p>.....</p> <p><b>County</b>..... <b>Postcode</b>.....</p> <p><b>Tel:</b>..... <b>Fax</b>.....</p> <p><b>Company business</b> .....</p> <p>.....</p>	
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## Sensing and Control

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