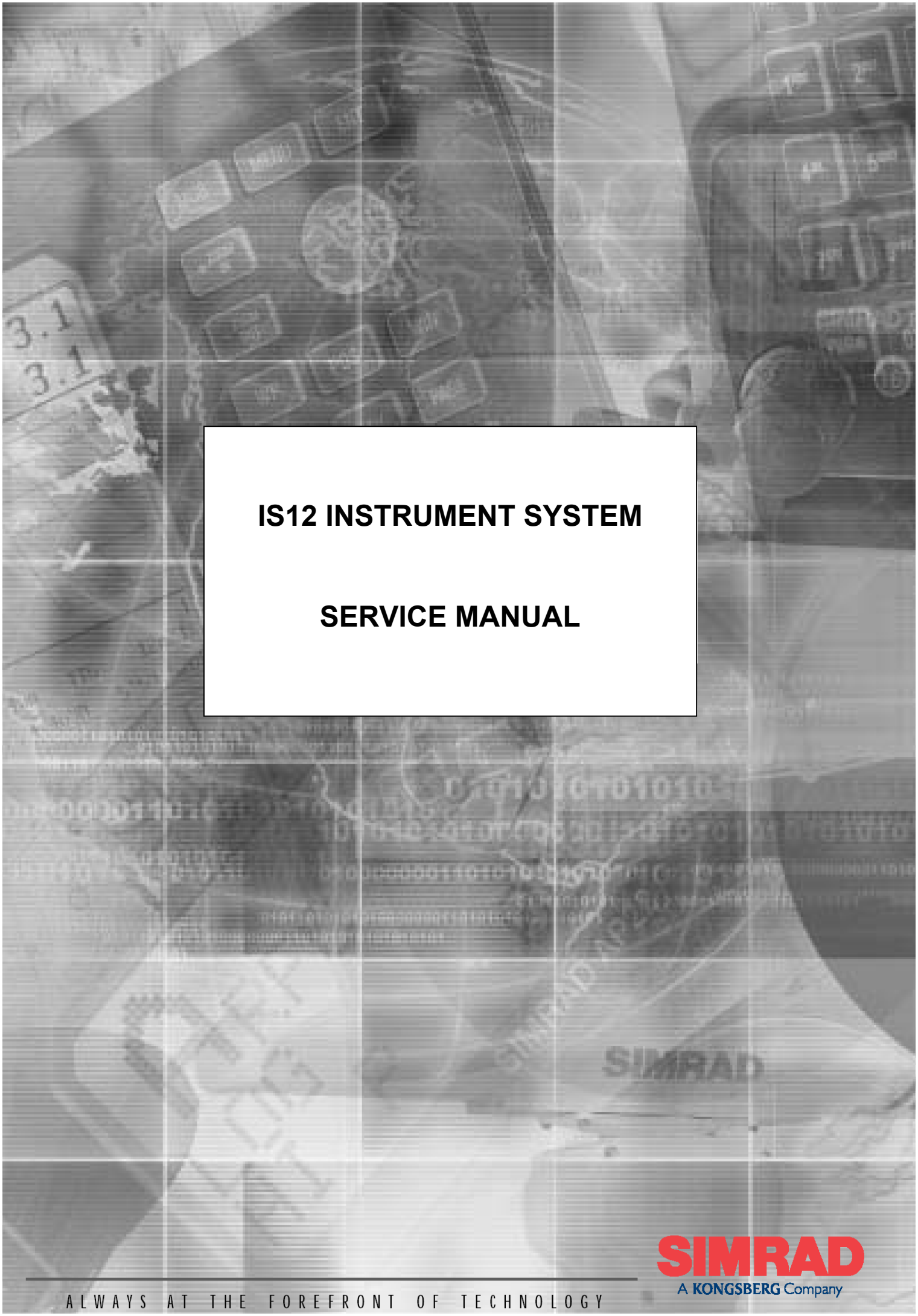


IS12 INSTRUMENT SYSTEM

SERVICE MANUAL

ALWAYS AT THE FOREFRONT OF TECHNOLOGY

SIMRAD
A KONGSBERG Company

SIMRAD

Simrad Margate Ltd

Star Lane, Margate, Kent CT9 4NP,UK
Telephone +44 (0) 1843 290290
Facsimile +44 (0) 1843 290471
E-Mail : productsupportmargate@simrad.com

CONTENTS

IS12 Instrument System

Section 1

Introduction

1. INTRODUCTION TO THE IS12 INSTRUMENT SYSTEM

The Simrad IS12 Instrument System is a flexible, modular system that offers large, clear displays, easy to operate functions and robust, weatherproof construction. The system is built around a high-speed bus network that provides simple interconnection and data share facilities.

SPEED / LOG – The IS12 Speed / Log System provides speed and water temperature data and consists of a self-sealing, through hull speed transducer, display unit and relevant cabling.

DEPTH – The IS12 Depth System provides water depth data and consists of a through hull depth transducer, display unit and relevant cabling.

COMBI SPEED / DEPTH – The IS12 Combi Speed / Depth System provides both depth, speed and water temperature data and consists of a through hull depth transducer, a self-sealing, through hull speed transducer, display unit and relevant cabling.

MEGA – The Mega Instrument is a multifunction data repeater that can display data from any IS12 master unit in the system, or act as an NMEA repeater. The unit consists of a display and 5m data cable to enable it to be linked into an existing IS12 system.

DATA – The IS12 Data Unit is a multi-line data repeater that can display information from any master unit in the system. The unit consists of a display and 0.3m data cable to enable it to be linked into an existing IS12 system.

WIND – The IS12 Wind System provides both analogue and digital wind data and consists of a masthead transducer with 30 meter cable, power cable and analogue display unit.

COMPASS – The IS12 Compass System provides both analogue and digital display of the current boat heading as either true or magnetic bearing. The system consists of a display, transducer and power cable.

CONTROLLER AND ALARM – The IS12 Controller and Alarm enables remote operation of IS12 instruments and consists of a controller, complete with cable, and a dash mount clip.

IS12 Instrument System

Section 2

Operation

2. CALIBRATING AND OPERATING IS12 INSTRUMENTS

This Service Manual only contains calibration and operational information for those features of the IS12 System which are not normally available to the end user. For details of normal calibration and operation please refer to the appropriate user manual.

IS12 Instrument System

Section 3

Dis-assembly Assembly Instructions

3 DISASSEMBLY / ASSEMBLY INSTRUCTIONS

A strong element of commonality exists between the instrument display units. The Assembly : Case Back (E04000), Assembly : Case Front (E04006) and Bezel : Square (E03799) are common throughout and disassembly and assembly of the various units can be considered to be identical with one exception, in the Wind and Compass Instruments the Piezo Sounder is fitted with a Self Adhesive Insulator Disc (E04227) to protect the Sounder from contact with the Pointer motor.

3.1 Instrument Display Units

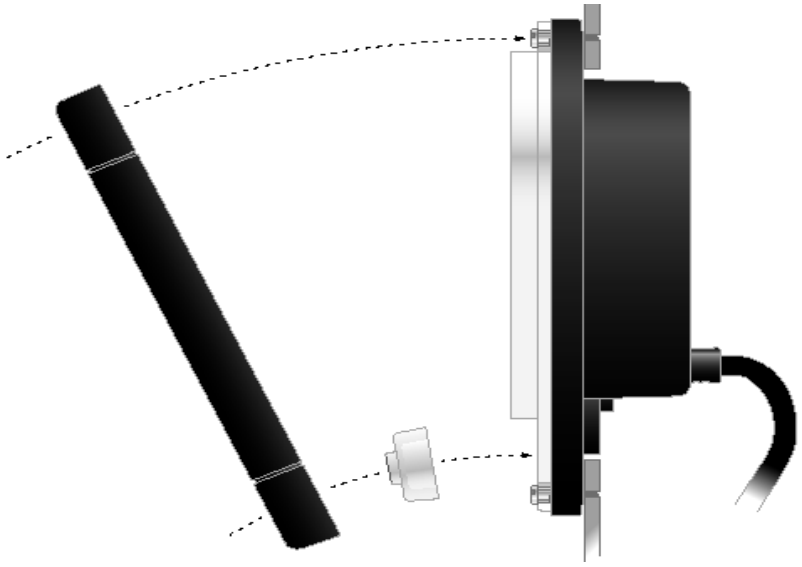
Disassembly

Remove the Bezel (E03799) by lifting the top edge of the bezel to disengage the locking clips and pull away from the instrument head thus freeing the bezel and Keypad.

Refer to Drawing Nos. E03893 and E04000 and remove the Instrument Mounting Gasket (E03837) from the Case Rear and release the 10 screws (200288). Remove the Assembly : Case Front (E04006) and ease the PCB from the case rear, the Sim Net Socket Headers ((E03995) and 7-Way Terminal Seal (E03831) will remain fixed to the PCB and the Sim Net Socket Collars ((E03803) and “O” Rings (190044) will remain with the Case Rear. De-solder the leads to the Piezo Sounder (160074) to release the PCB.

Assembly

Ensure that the Square Case Seal (E03830) is fitted securely into the seal well with the radius side into the well and the flat side facing outwards. Solder the Sounder leads into place. Ensure that the “O” Rings are in place in each Sim Net Socket Header. Guide the Sounder leads away from the sockets, to avoid trapping them, and offer up the PCB assembly to the Case Rear, locating the 7-Way Terminal Seal and the Sim Net Header Sockets into their appropriate holes. Apply firm pressure between the LCD edges and the Case Rear to press the sockets home. Locate the Case Front over the LDC / PCB and place the assembly face down on a soft cloth. Engage the 10 Screws, if re-using the case front turn each screw anti-clockwise until it engages in the thread, the screw will drop in with an audible “click” , and tighten the screws evenly until the seal is fully compressed. Locate the Keypad in the holes in the Bezel and offer up the assembly to the instrument head , angling the Bezel slightly backwards to prevent the keypad falling out. Press the Bezel into place, a sharp “click” is audible as the locking clips engage.



Fit an Instrument Mounting Gasket to the Case Rear and test the unit to specification.

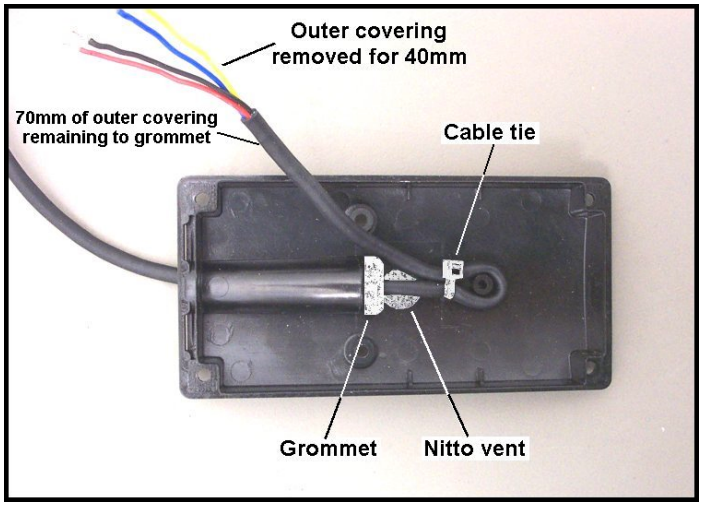
3.2 Instrument Remote Controller.

Disassembly.

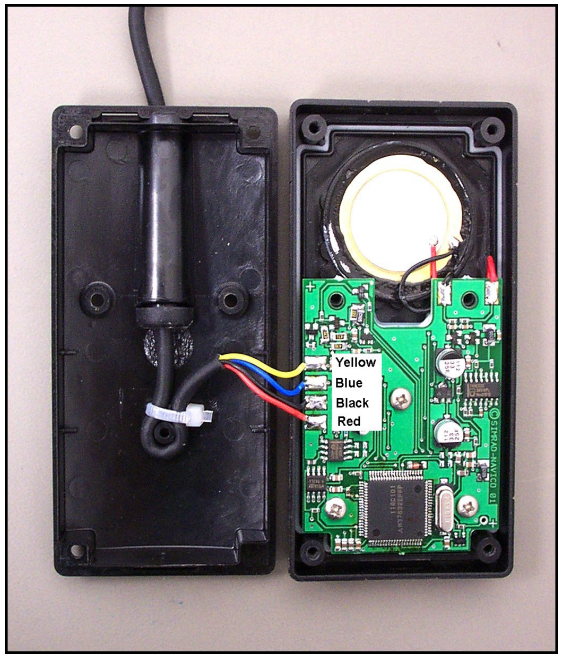
Refer to Drawing Number E03800. Remove and retain the 6 3 x 10 mm Screws (200303) from the rear of the unit and ease the front and rear cases apart. Retain the four Neoprene Spacer Washers (200184) positioned, one at each of the four corners. Remove and retain the 3 No 4 x _ Screws (200104) and release the PCB. The Keypad Shim (E03954), Keypad (E03819) and the Case Seal (E03858) may now be removed and the PCB de-soldered as required. The Hand Remote Cable (E04042) may be removed by de-soldering the 4 connections from the PCB, removing the Tie Wrap (200026) and withdrawing the cable through the Cable Grommet (E02542).

Assembly.

Locate the Case Seal (E03858) into the recess in the Front Case moulding (E03876) ensuring that the radius side is towards the case and the flat side is visible. Place the Keypad (E03819) into position ensuring that the buttons locate correctly into the apertures. Fit the Keyboard Shim (E03954) over the switches on the PCB and fit the PCB into the front case ensuring that the shim remains in position. Secure the PCB in place with the 3 No 4 x _ Screws (200104) and solder the Piezo Sounder (160074) connections to the PCB. Insert the stripped ends of the Hand Remote Cable Assembly (E04042) through the aperture in the Rear Case Moulding (E03813) and slide the Cable Grommet (E03701) over the cable ends until 70mm of the outer insulation remains protruding. Press the grommet into the aperture, fold the cable anticlockwise around the central pillar of the case and secure with a Cable Tie (200026) as shown below:



Solder the 4 cable connections to the PCB as shown below:



.

Fit the two halves of the case together, place a Neoprene Washer at each of the corner stand offs and fit the 6, 3 x 10 mm Screws (200303), and tighten down. Complete a full functional check

3.3 Mast Head Unit / Wind Transducer.

Drawings relating to the masthead unit are shown for information only. The masthead unit is a factory calibrated item and only the anemometer and the wind vane can be replaced without recalibration.

3.4 Compass Transducer.

Disassembly

Refer to Drawing Number E04439. Remove and retain the 3 screws and washers and the Case Top (E02780:BK). De-solder the Cable (E04042) connections from the PCB, remove the strain relief Cable Tie (200026) and withdraw the cable and Grommet (E03701) through the bottom Case (E02781). The PCB, complete with Gimballed Element (E02782) can then be lifted clear from the Case Bottom. If required, the Gimballed Element can be de-soldered and removed form the PCB.

Assembly

Fit the Gimballed Element (E02782) through the slot in the PCB (E03791) and twist to lock in place. The arrow on the securing flange of the Gimballed Element should be closest to the straight edge of the PCB. Terminate the element connections on the PCB. Fit the Cable (E04042) through the Case Bottom (E02781:BK) and Grommet (E03701) and secure it with a Cable Tie (200026) to provide strain relief. Terminate the cable on the PCB. Fit the PCB into the Case Bottom (E02781:BK), the Case Seal (E02783) into the recess and bring the 2 parts of the case together. Place Washer (200184) into each of the screw recesses and fit the screws ensuring that the N0.4 x _" Screw (200137) is fitted to the front of the case and the longer No. 4 x 1" Screws (200235) are fitted towards the flat edge at the rear. Tighten the screws to make a good seal and test to specification.

NB. It is advisable to replace the Case Seal to ensure that a watertight seal is made.

IS12 Instrument System

Section 4

Mechanical Assembly Drawings

4. MECHANICAL ASSEMBLY DRAWINGS

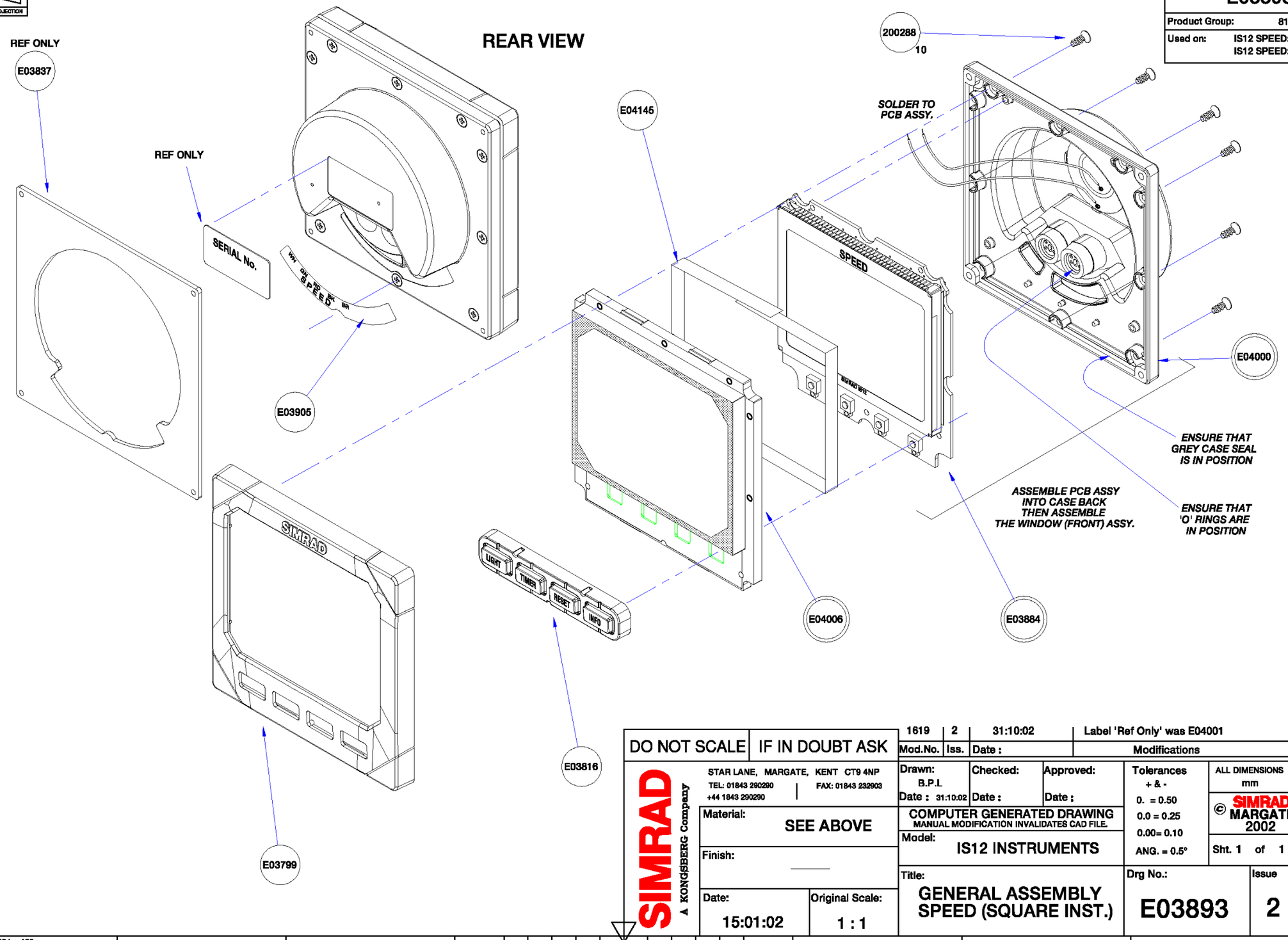
General Assembly : Speed (Square)	E03893
PCB Assembly : Speed	E03884 Sht 2
General Assembly : Depth (Square)	E03894
PCB Assembly : Depth	E03885 Sht 2
General Assembly : Combi (Square)	E03895
PCB Assembly : Combi	E03886 Sht 2
General Assembly : Mega (Square)	E04156
PCB Assembly : Mega	E04154 Sht 2
General Assembly : Data (Square)	E03896
PCB Assembly : Data	E03887 Sht 2
General Assembly : Wind (Square)	E03897
PCB Assembly : Wind	E03888 Sht 2
Assembly : Case Back	E04000
General Assembly : Remote Inst. Cont.	E03800
Masthead Cable & Connector Cover Assembly	E04221
Assembly : Top Cap Masthead	E04028
Assembly : PCBs Masthead	E04029
Assembly : Masthead Unit	E04015
Assembly : Base Masthead	E04030
MHU : Full Assembly	E04082
General Assembly : Compass Transducer	E04439

DRAWN IN ACCORDANCE WITH BS 308

3rd ANGLE PROJECTION

Drg. No:	E03893
Product Group:	810
Used on:	IS12 SPEED:S IS12 SPEED:I

REAR VIEW



DO NOT SCALE	IF IN DOUBT ASK	1619	2	31:10:02	Label 'Ref Only' was E04001
		Mod.No.	Iss.	Date :	Modifications

SIMRAD — A KONGSBERG Company

STAR LANE, MARGATE, KENT CT9 4NP
TEL: 01843 290290 | FAX: 01843 232903
+44 1843 290290

Drawn:	Checked:	Approved:
B.P.L		
Date : 31:10:02	Date :	Date :

Material: SEE ABOVE

Finish: ———

Date: 15:01:02

Original Scale: 1 : 1

COMPUTER GENERATED DRAWING
MANUAL MODIFICATION INVALIDATES CAD FILE.

Model: IS12 INSTRUMENTS

Title: GENERAL ASSEMBLY SPEED (SQUARE INST.)

Tolerances + & -	ALL DIMENSIONS mm
0. = 0.50 0.0 = 0.25 0.00= 0.10 ANG. = 0.5°	© SIMRAD MARGATE 2002 Sht. 1 of 1

Drg No.: E03893

Issue: 2

ISSUE 3 28/02/01

SIZE A2 : 594 x 420mm
LANDSCAPE

DRAWN IN ACCORDANCE WITH BS 308

3rd ANGLE PROJECTION

(PCB SM ASSY)

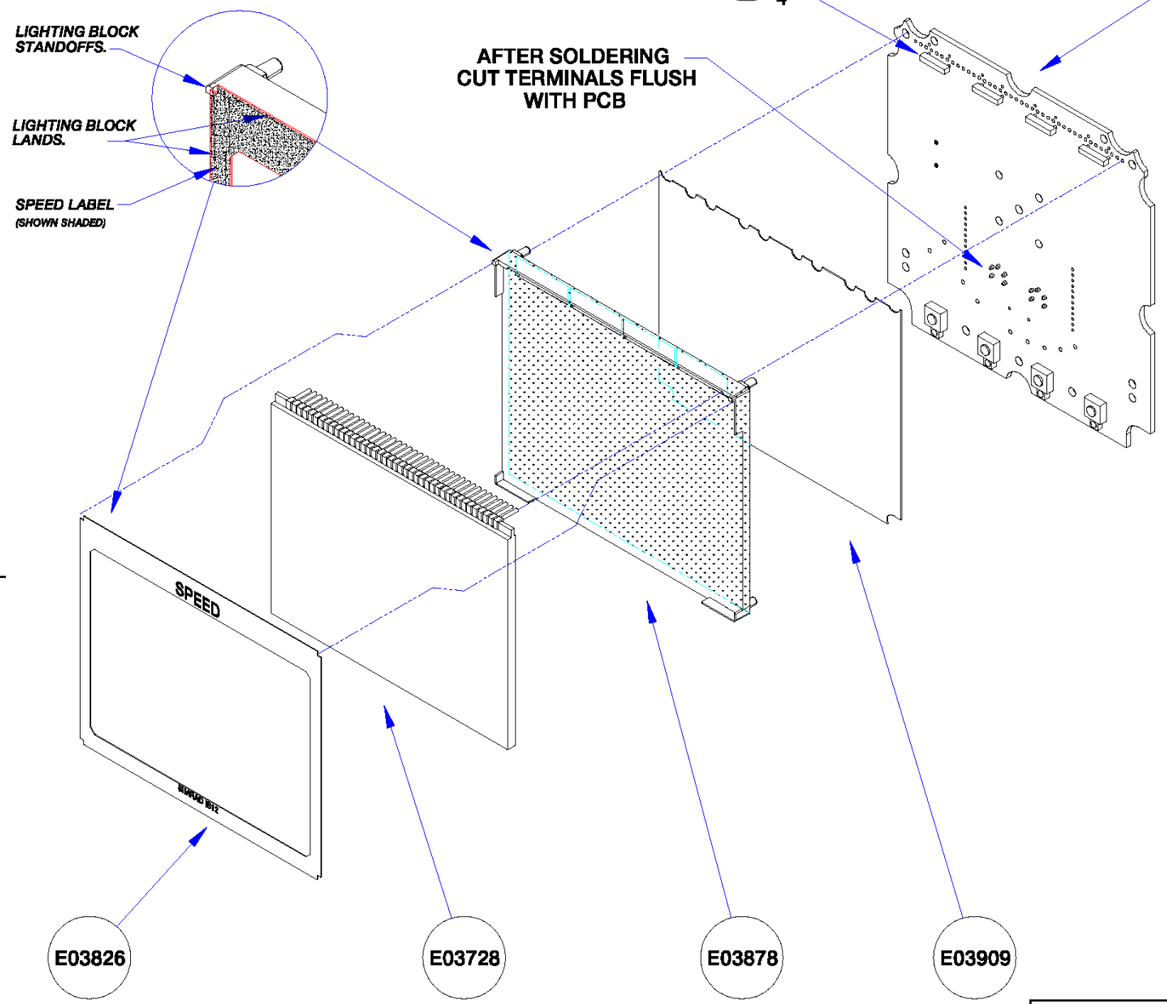
Drg. No: E03884

Product Group: 800

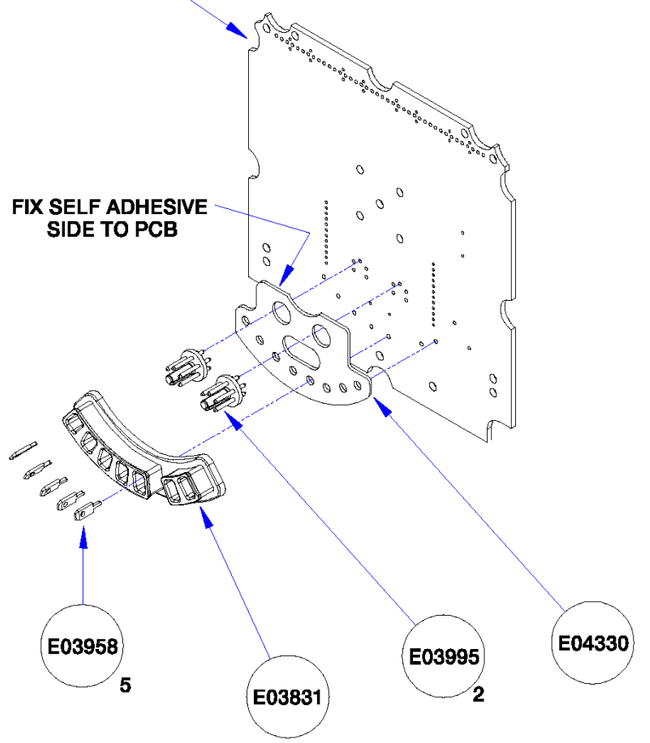
Used on: E03893

ENSURE CORNERS OF SPEED LABEL FIT SNUGLY INTO THE LIGHTING BLOCK STANDOFFS. ENSURE ADHESIVE TAKES ON LIGHTING BLOCK LANDS & FRONT FACE OF LCD.

FRONT VIEW



REAR VIEW



Mod.No.	Iss.	Date	Modifications
1636	see sheet 1	23/10/02	E04330 Compression Label added

DO NOT SCALE | IF IN DOUBT ASK

SIMRAD A KONGSBERG Company

STAR LANE, MARGATE, KENT CT9 4NP
TEL: 01843 290290 +44 1843 290290 | FAX: 01843 232903

Drawn:	Checked:	Approved:
BM/RF Date 21:02:01	Date	Date

Material: SEE ABOVE

Finish: ——

Date: 11:01:02

Original Scale: 1 : 1

COMPUTER GENERATED DRAWING
MANUAL MODIFICATION INVALIDATES CAD FILE.

Model: IS12 INSTRUMENTS

Title: PCB ASSEMBLY: SPEED

Drg No.: E03884

Issue: *SEE SHEET ONE*

Tolerances + & -
0. = 0.50
0.0 = 0.25
0.00= 0.10
ANG. = 0.5°

ALL DIMENSIONS mm

Sht. 2 of 2

ISSUE 2 25/01/99

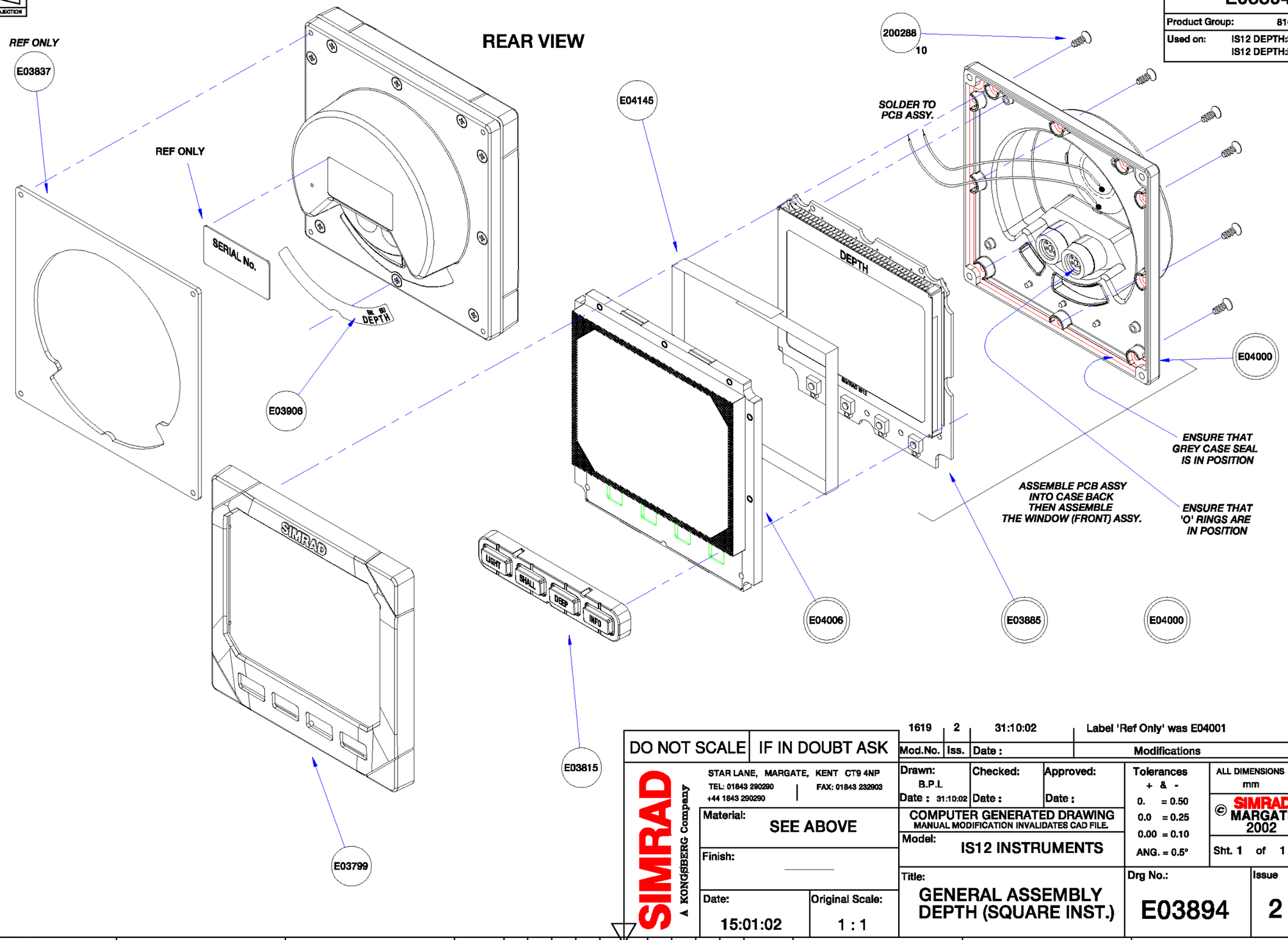
SIZE A2 : 594 x 420mm
LANDSCAPE

DRAWN IN ACCORDANCE WITH BS 308

3rd ANGLE PROJECTION

Drg. No:	E03894
Product Group:	810
Used on:	IS12 DEPTH:S IS12 DEPTH:I

REAR VIEW



1619	2	31:10:02	Label 'Ref Only' was E04001
Mod.No.	Iss.	Date :	Modifications

DO NOT SCALE | IF IN DOUBT ASK

SIMRAD A KONGSBERG Company

STAR LANE, MARGATE, KENT CT9 4NP
TEL: 01843 290290 | FAX: 01843 232903
+44 1843 290290

Drawn:	Checked:	Approved:
B.P.L		
Date : 31:10:02	Date :	Date :

Tolerances + & -
0. = 0.50
0.0 = 0.25
0.00 = 0.10
ANG. = 0.5°

ALL DIMENSIONS mm

© SIMRAD MARGATE 2002

Sht. 1 of 1

Material: SEE ABOVE

Finish: ———

Date: 15:01:02

Original Scale: 1 : 1

COMPUTER GENERATED DRAWING
MANUAL MODIFICATION INVALIDATES CAD FILE.

Model: IS12 INSTRUMENTS

Title: GENERAL ASSEMBLY DEPTH (SQUARE INST.)

Drg No.: E03894

Issue 2

SIZE A2 : 594 x 420mm
LANDSCAPE

DRAWN IN ACCORDANCE WITH BS 308

3rd ANGLE PROJECTION

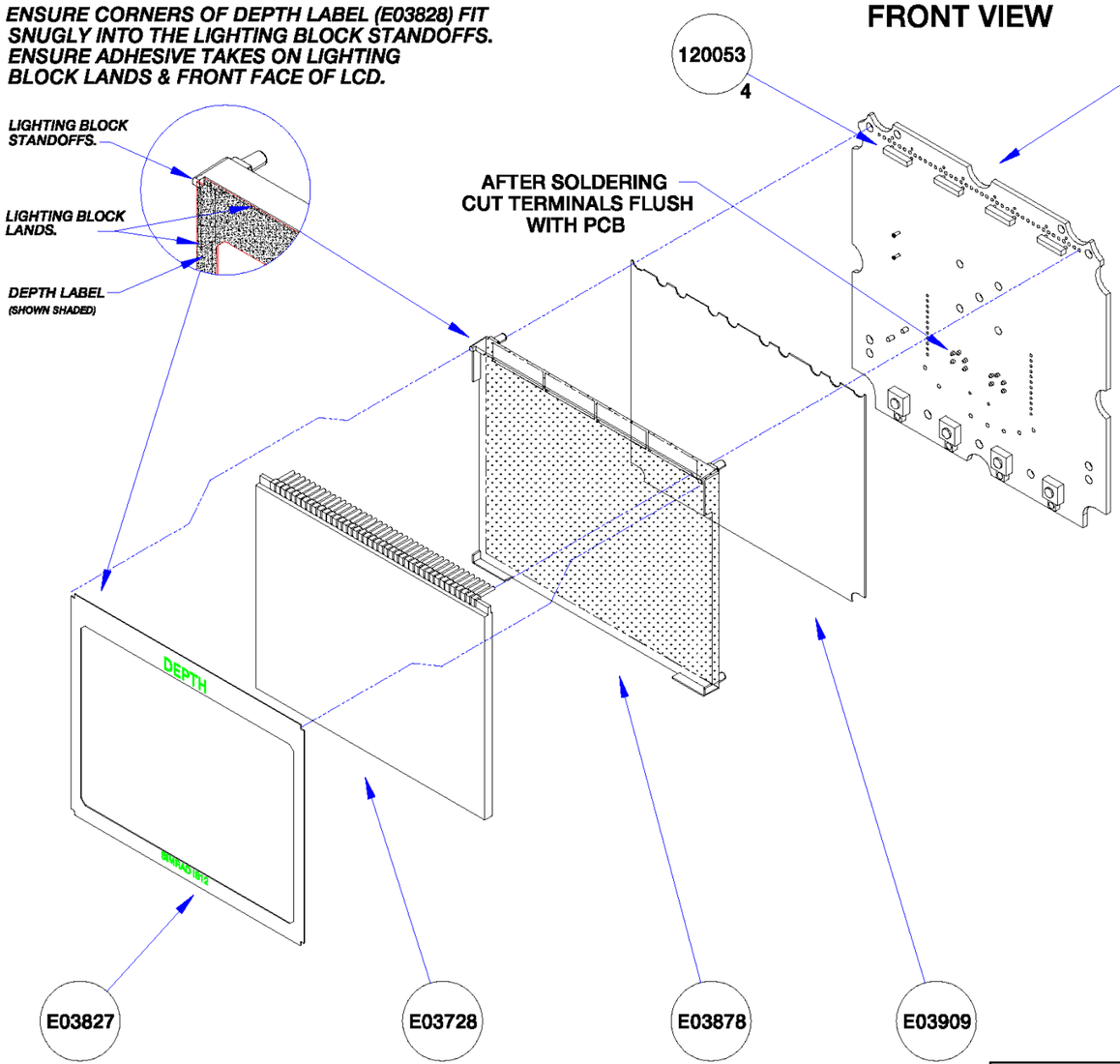
Drg. No:	E03885
Product Group:	800
Used on:	E03894

(PCB SM ASSY)

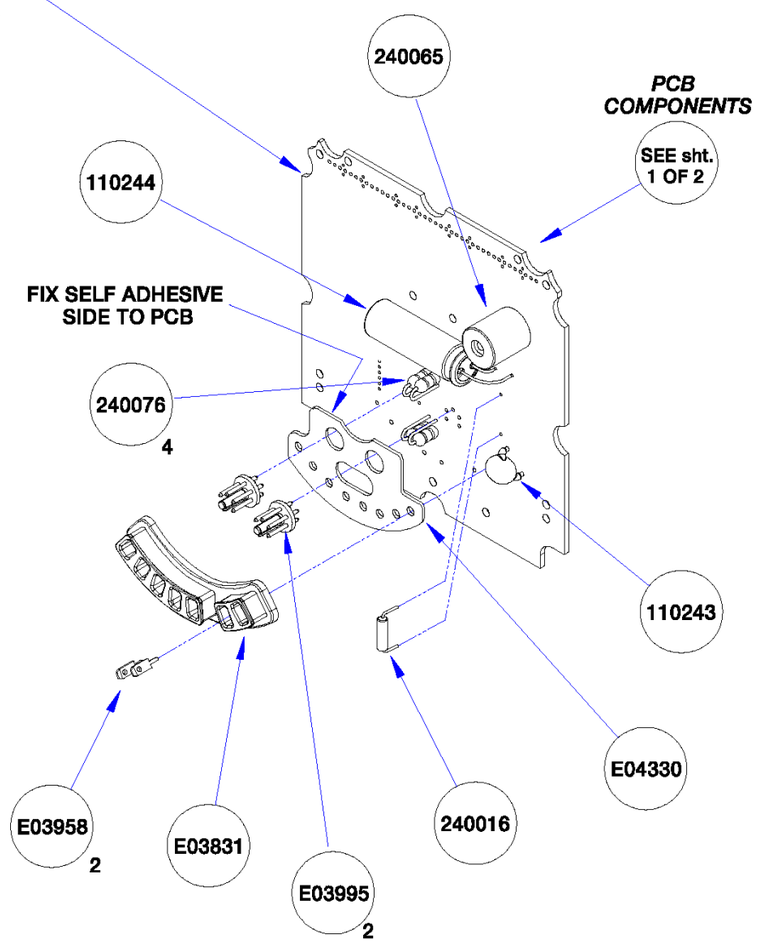
E04011

ENSURE CORNERS OF DEPTH LABEL (E03828) FIT SNUGLY INTO THE LIGHTING BLOCK STANDOFFS. ENSURE ADHESIVE TAKES ON LIGHTING BLOCK LANDS & FRONT FACE OF LCD.

FRONT VIEW



REAR VIEW



DO NOT SCALE	IF IN DOUBT ASK

Mod.No.	Iss.	Date :	Modifications
1636	See sht 1	23:10:02	Assy Revised - E04330 compression label added

SIMRAD — A KONGSBERG Company

STAR LANE, MARGATE, KENT CT9 4NP
TEL: 01843 290290 | FAX: 01843 232903
+44 1843 290290

Drawn:	Checked:	Approved:
BM/RF		
Date 16:02:01	Date	Date

Tolerances: + & - : 0. = 0.50 ; 0.0 = 0.25 ; 0.00 = 0.10 ; ANG. = 0.5°

ALL DIMENSIONS mm

© SIMRAD MARGATE 2002

Sht. 2 of 2

Material: SEE ABOVE

Finish: ——

COMPUTER GENERATED DRAWING
MANUAL MODIFICATION INVALIDATES CAD FILE.

Model: IS12 INSTRUMENTS

Date: 11:01:02

Original Scale: 1 : 1

Title: PCB ASSEMBLY: DEPTH

Drg No.: E03885

Issue: *SEE SHEET ONE*

ISSUE 2 25:01:99

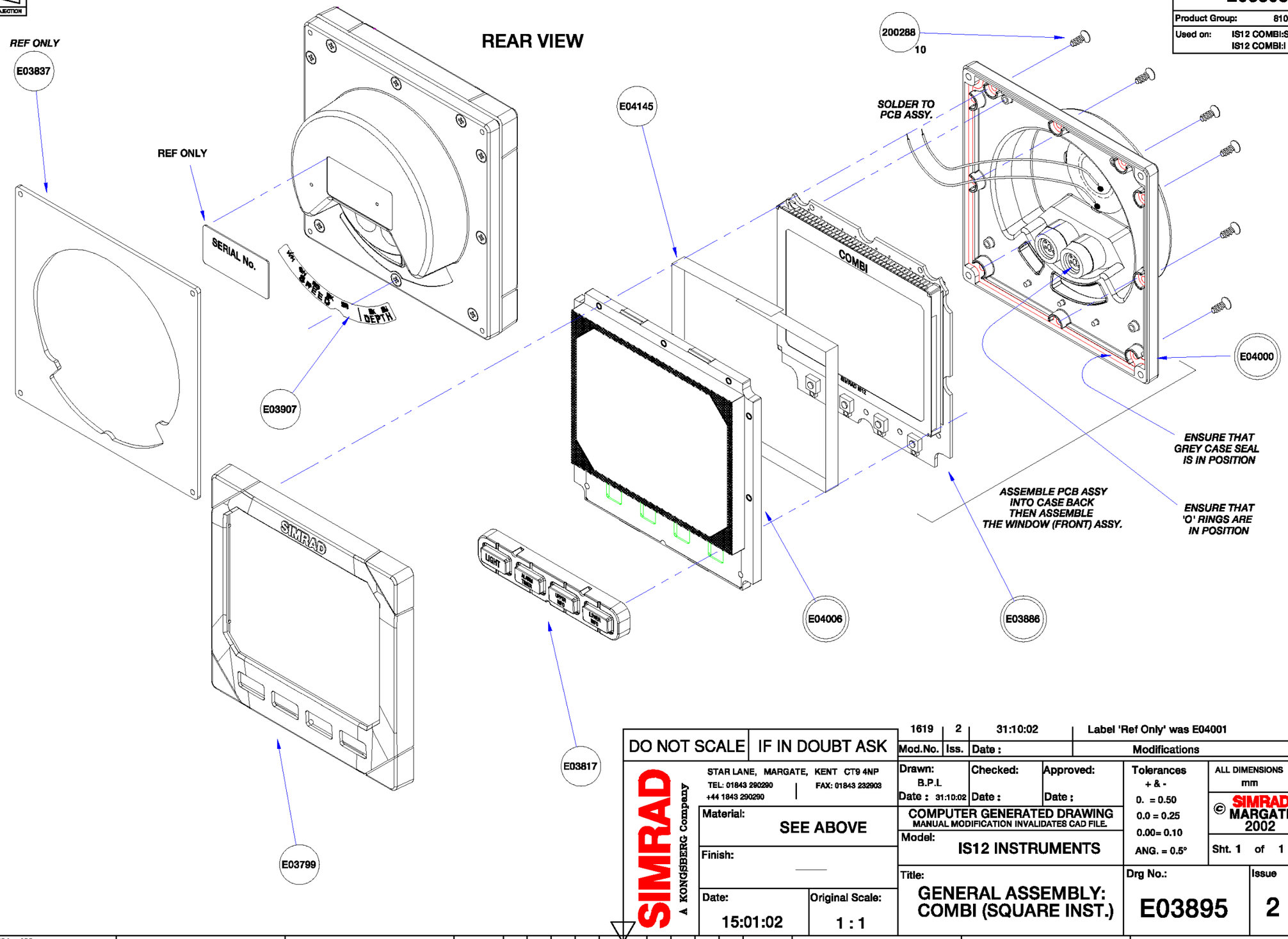
SIZE A2 : 594 x 420mm
LANDSCAPE

DRAWN IN ACCORDANCE WITH BS 308

3rd ANGLE PROJECTION

Drg. No:	E03895
Product Group:	810
Used on:	IS12 COMBI:S IS12 COMBI:I

REAR VIEW



DO NOT SCALE	IF IN DOUBT ASK	1619	2	31:10:02	Label 'Ref Only' was E04001
		Mod.No.	Iss.	Date :	Modifications

SIMRAD — A KONGSBERG Company

STAR LANE, MARGATE, KENT CT9 4NP
TEL: 01843 290290 | FAX: 01843 232903
+44 1843 290290

Drawn:	Checked:	Approved:
B.P.L		
Date : 31:10:02	Date :	Date :

Material: SEE ABOVE

Finish: ——

Date: 15:01:02

Original Scale: 1 : 1

COMPUTER GENERATED DRAWING
MANUAL MODIFICATION INVALIDATES CAD FILE.

Model: IS12 INSTRUMENTS

Title: GENERAL ASSEMBLY: COMBI (SQUARE INST.)

Tolerances + & -	ALL DIMENSIONS mm
0. = 0.50 0.0 = 0.25 0.00= 0.10 ANG. = 0.5°	© SIMRAD MARGATE 2002 Sht. 1 of 1

Drg No.: E03895

Issue: 2

SIZE A2 : 594 x 420mm
LANDSCAPE

DRAWN IN ACCORDANCE WITH BS 308

3rd ANGLE PROJECTION

Drg. No: **E03886**

Product Group: 800

Used on: E03895

(PCB SM ASSY)

E04012

ENSURE CORNERS OF COMBI LABEL FIT SNUGLY INTO THE LIGHTING BLOCK STANDOFFS. ENSURE ADHESIVE TAKES ON LIGHTING BLOCK LANDS & FRONT FACE OF LCD.

FRONT VIEW

LIGHTING BLOCK STANDOFFS.

LIGHTING BLOCK LANDS.

COMBI LABEL (SHOWN SHADED)

120053 — 4

AFTER SOLDERING CUT TERMINALS FLUSH WITH PCB

COMBI

E03828

E03680

E03878

E03909

REAR VIEW

240065

PCB COMPONENTS

SEE sht. 1 OF 2

110244

FIX SELF ADHESIVE SIDE TO PCB

240076 — 4

110243

E04330

240016

E03958 — 7

E03831

E03995 — 2

DO NOT SCALE	IF IN DOUBT ASK

Mod.No.	Iss.	Date :	Modifications
1636	See sht 1	23:10:02	Assy Revised - E04330 compression label added

SIMRAD — KONGSBERG Company

STAR LANE, MARGATE, KENT CT9 4NP
TEL: 01843 290290 FAX: 01843 290471
+44 1843 290290

Drawn:	Checked:	Approved:
BM/RF		
Date 21:02:01	Date	Date

Tolerances + & -
0. = 0.50
0.0 = 0.25
0.00 = 0.10
ANG. = 0.5°

ALL DIMENSIONS mm

Material: SEE ABOVE

Finish: ——

COMPUTER GENERATED DRAWING
MANUAL MODIFICATION INVALIDATES CAD FILE.

Model: IS12 INSTRUMENTS

Sht. 2 of 2

Date: 22:01:02

Original Scale: 1 : 1

Title: **PCB ASSEMBLY: COMBI**

Drg No.: **E03886**

Issue: *SEE SHEET ONE*

ISSUE 2 23:01:02

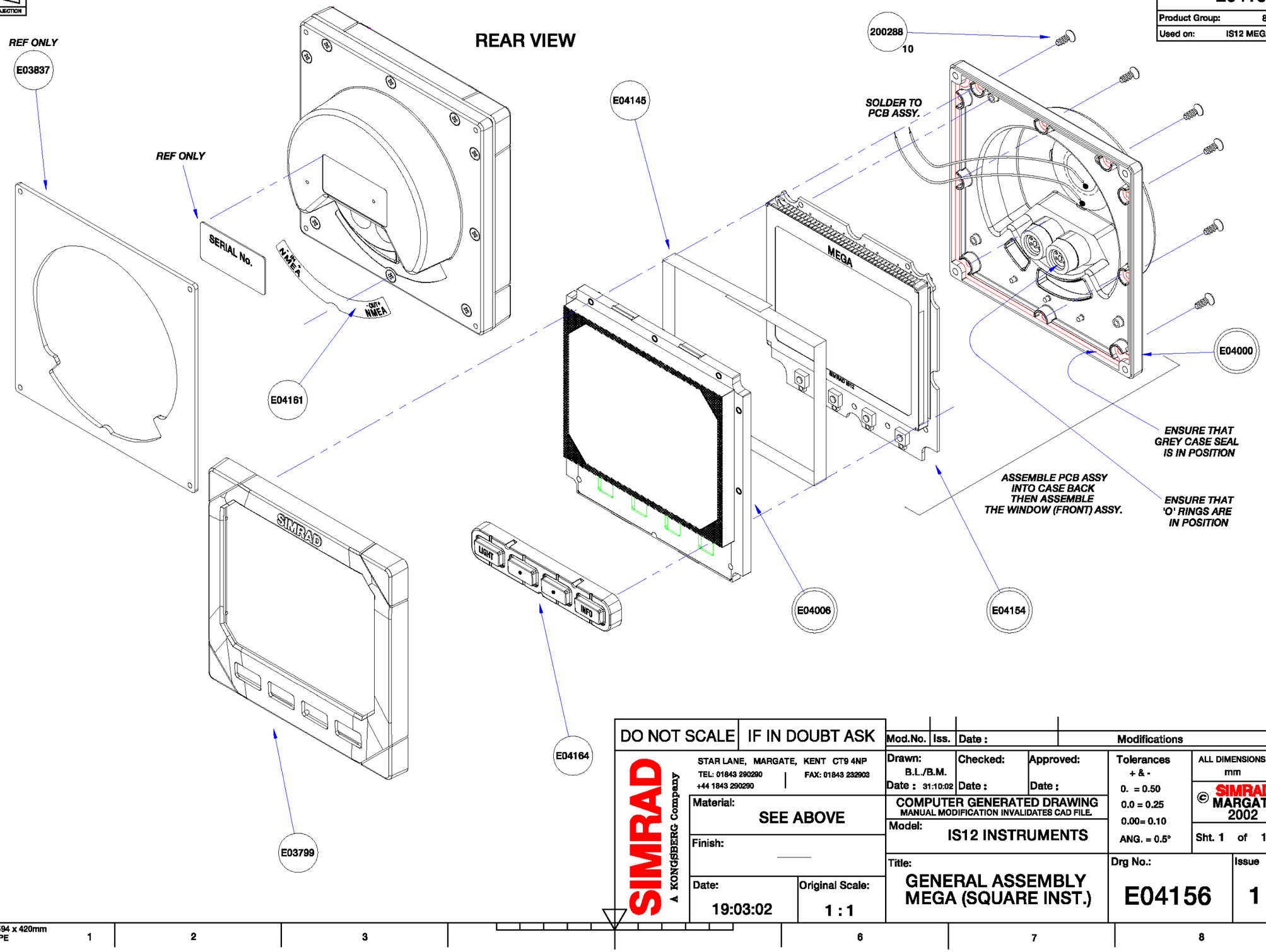
SIZE A2 : 594 x 420mm
LANDSCAPE

DRAWN IN ACCORDANCE WITH BS 308

3rd ANGLE PROJECTION

Drg. No:	E04156
Product Group:	810
Used on:	IS12 MEGA:R

REAR VIEW



DO NOT SCALE	IF IN DOUBT ASK	Mod.No.	Iss.	Date :	Modifications

SIMRAD — A KONGSBERG Company

STAR LANE, MARGATE, KENT CT9 4NP
TEL: 01843 290290 | FAX: 01843 232903
+44 1843 290290

Drawn:	Checked:	Approved:	Tolerances	ALL DIMENSIONS
B.L./B.M.			+ & -	mm
Date : 31:10:02	Date :	Date :	0. = 0.50	© SIMRAD MARGATE 2002
			0.0 = 0.25	
			0.00= 0.10	
			ANG. = 0.5°	Sht. 1 of 1

Material:	Finish:	Date:	Original Scale:
SEE ABOVE	———	19:03:02	1 : 1

COMPUTER GENERATED DRAWING
MANUAL MODIFICATION INVALIDATES CAD FILE.

Model: IS12 INSTRUMENTS

Title: GENERAL ASSEMBLY MEGA (SQUARE INST.)

Drg No.: E04156

Issue: 1

SIZE A2 : 594 x 420mm
LANDSCAPE

DRAWN IN ACCORDANCE WITH BS 308

3rd ANGLE PROJECTION

Drg. No: E04154

Product Group: 800

Used on: E04156

ENSURE CORNERS OF MEGA LABEL FIT SNUGLY INTO THE LIGHTING BLOCK STANDOFFS. ENSURE ADHESIVE TAKES ON LIGHTING BLOCK LANDS & FRONT FACE OF LCD.

LIGHTING BLOCK STANDOFFS.

LIGHTING BLOCK LANDS.

MEGA LABEL (SHOWN SHADED)

AFTER SOLDERING CUT TERMINALS FLUSH WITH PCB

FRONT VIEW

(PCB SM ASSY)

E04171

120053 4

MEGA

SIMRAD IS12

E04160

E03728

E03878

E03909

REAR VIEW

FIX SELF ADHESIVE SIDE TO PCB

E03958 4

E03831

E03995 2

E04330

DO NOT SCALE	IF IN DOUBT ASK	Mod.No.	Iss.	Date :	Modifications

SIMRAD — A KONGSBERG Company

STAR LANE, MARGATE, KENT CT9 4NP
TEL: 01843 290290 | FAX: 01843 290471
+44 1843 290290

Drawn: BM/RF Date 19:02:01	Checked: Date	Approved: Date	Tolerances + & - 0. = 0.50 0.0 = 0.25 0.00= 0.10 ANG. = 0.5°
ALL DIMENSIONS mm			

Material: SEE ABOVE

Finish: ——

COMPUTER GENERATED DRAWING
MANUAL MODIFICATION INVALIDATES CAD FILE.

© SIMRAD MARGATE 2002

Model: IS12 INSTRUMENTS

Sht. 2 of 2

Date: 19:03:02

Original Scale: 1 : 1

Title: PCB ASSEMBLY: MEGA

Drg No.: E04154

Issue: *SEE SHEET ONE*

ISSUE 2 25/01/99

SIZE A2 : 594 x 420mm
LANDSCAPE

DRAWN IN ACCORDANCE WITH BS 308

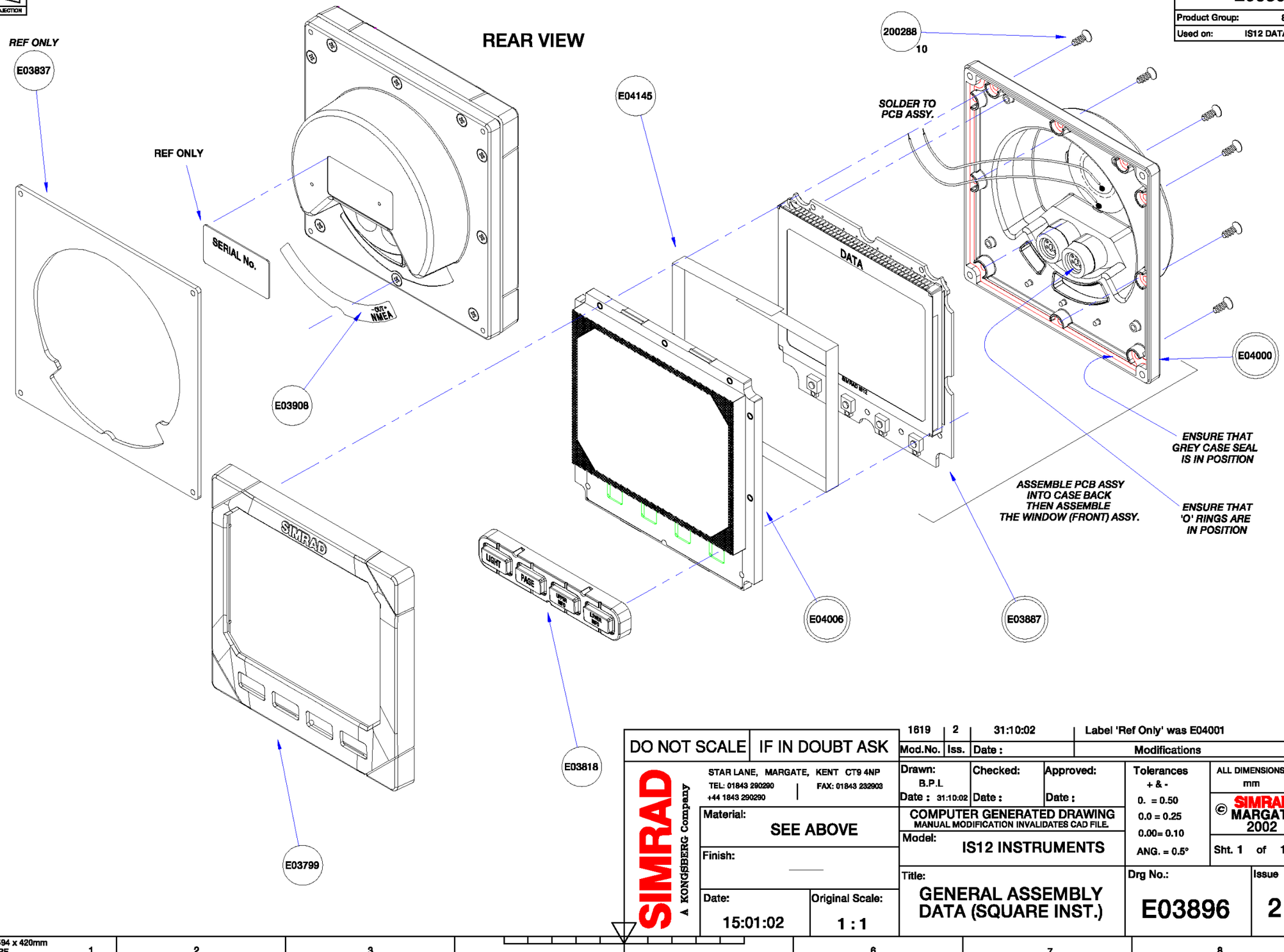
3rd ANGLE PROJECTION

Drg. No: E03896

Product Group: 810

Used on: IS12 DATA:R

REAR VIEW



DO NOT SCALE | IF IN DOUBT ASK

Mod.No.	Iss.	Date :	Modifications
1619	2	31:10:02	Label 'Ref Only' was E04001

SIMRAD A KONGSBERG Company

STAR LANE, MARGATE, KENT CT9 4NP
TEL: 01843 290290 +44 1843 290290 | FAX: 01843 232903

Material: SEE ABOVE

Finish: ——

Date: 15:01:02 | Original Scale: 1 : 1

Drawn: B.P.L Date : 31:10:02 | Checked: Date : | Approved: Date :

COMPUTER GENERATED DRAWING
MANUAL MODIFICATION INVALIDATES CAD FILE.

Model: IS12 INSTRUMENTS

Tolerances + & -
0. = 0.50
0.0 = 0.25
0.00= 0.10
ANG. = 0.5°

ALL DIMENSIONS mm

Sht. 1 of 1

Title: GENERAL ASSEMBLY DATA (SQUARE INST.)

Drg No.: E03896

Issue 2

SIZE A2 : 594 x 420mm LANDSCAPE

DRAWN IN ACCORDANCE WITH BS 308

3rd ANGLE PROJECTION

Drg. No: **E03887**

Product Group: 800

Used on: E03896

ENSURE CORNERS OF DATA LABEL FIT SNUGLY INTO THE LIGHTING BLOCK STANDOFFS. ENSURE ADHESIVE TAKES ON LIGHTING BLOCK LANDS & FRONT FACE OF LCD.

LIGHTING BLOCK STANDOFFS.

LIGHTING BLOCK LANDS.

DATA LABEL (SHOWN SHADED)

FRONT VIEW

(PCB SM ASSY)

E04013

120053 4

AFTER SOLDERING CUT TERMINALS FLUSH WITH PCB

DATA

E03829

E03680

E03878

E03909

REAR VIEW

E03995 2

E03958 2

E03831

E04330 2

FIX SELF ADHESIVE SIDE TO PCB

DO NOT SCALE | IF IN DOUBT ASK

Mod.No.	Iss.	Date :	Modifications
1636	See sheet 1	23:10:02	E04330 Compression Label added

SIMRAD A KONGSBERG Company

STAR LANE, MARGATE, KENT CT9 4NP
TEL: 01843 290290 FAX: 01843 290471
+44 1843 290290

Drawn: BM/RF Date 19:02:01 | Checked: Date | Approved: Date

Tolerances + & -
0. = 0.50
0.0 = 0.25
0.00= 0.10
ANG. = 0.5°

ALL DIMENSIONS mm

© SIMRAD MARGATE 2002

Sht. 2 of 2

Material: SEE ABOVE

Finish: ——

Date: 11:01:02

Original Scale: 1 : 1

COMPUTER GENERATED DRAWING
MANUAL MODIFICATION INVALIDATES CAD FILE.

Model: IS12 INSTRUMENTS

Title: **PCB ASSEMBLY: DATA**

Drg No.: **E03887**

Issue: *SEE SHEET ONE*

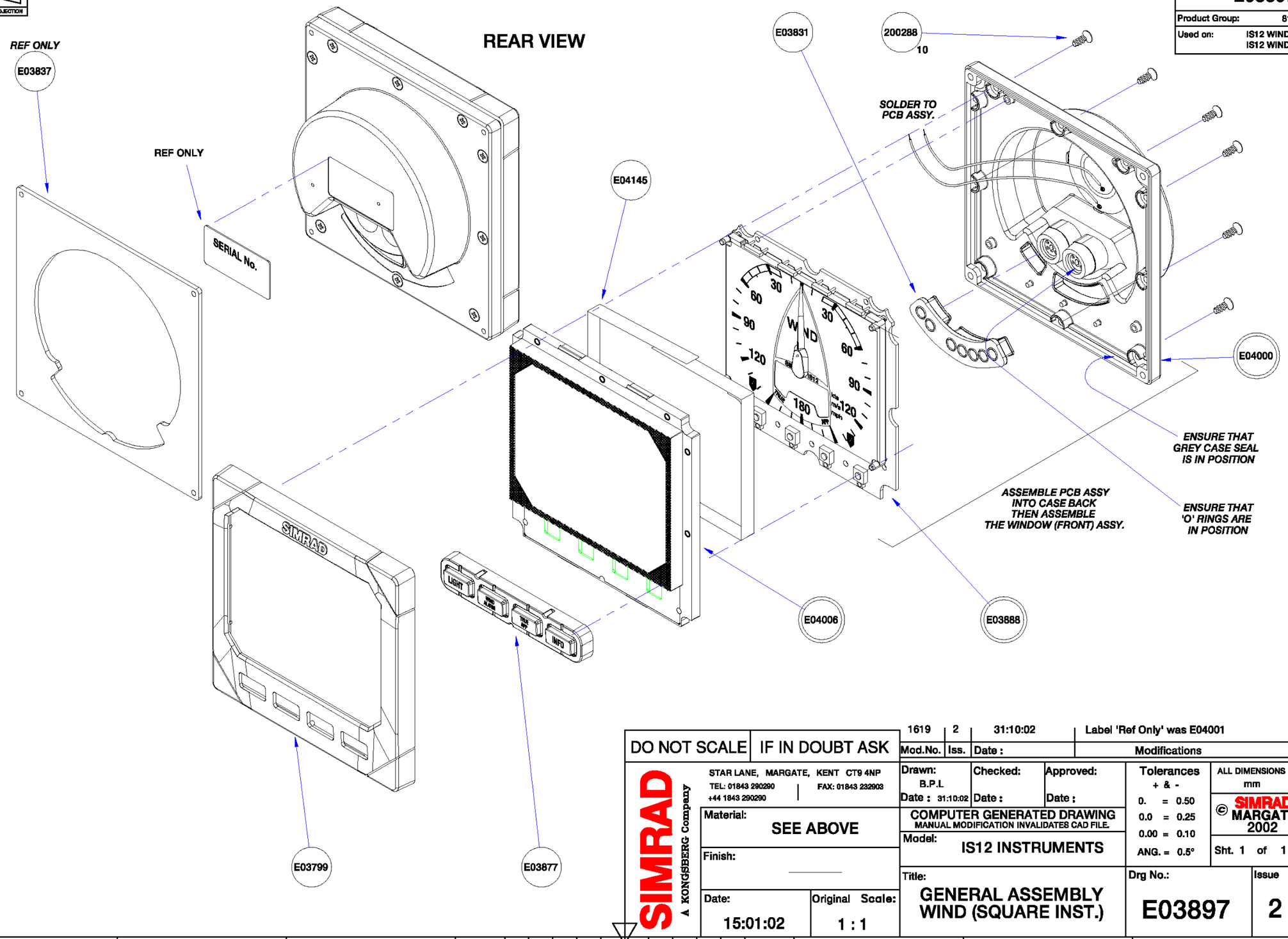
SIZE A2 : 594 x 420mm
LANDSCAPE

DRAWN IN ACCORDANCE WITH BS 308

3rd ANGLE PROJECTION

Drg. No:	E03897
Product Group:	810
Used on:	IS12 WIND:S IS12 WIND:R

REAR VIEW



DO NOT SCALE	IF IN DOUBT ASK	1619	2	31:10:02	Label 'Ref Only' was E04001
		Mod.No.	Iss.	Date :	Modifications

SIMRAD — A KONGSBERG Company

STAR LANE, MARGATE, KENT CT9 4NP
TEL: 01843 290290 | FAX: 01843 232903
+44 1843 290290

Drawn:	Checked:	Approved:
B.P.L		
Date : 31:10:02	Date :	Date :

Tolerances (+ & -)
0. = 0.50
0.0 = 0.25
0.00 = 0.10
ANG. = 0.5°

ALL DIMENSIONS mm

Sht. 1 of 1

Material: SEE ABOVE

Finish: ———

COMPUTER GENERATED DRAWING
MANUAL MODIFICATION INVALIDATES CAD FILE.

Model: IS12 INSTRUMENTS

Date: 15:01:02

Original Scale: 1 : 1

Title: GENERAL ASSEMBLY WIND (SQUARE INST.)

Drg No.: E03897

Issue 2

SIZE A2 : 594 x 420mm
LANDSCAPE

DRAWN IN ACCORDANCE WITH BS 308

3rd ANGLE PROJECTION

Drg. No:	E03888
Product Group:	800
Used on:	E03897

(PCB SM ASSY)

ENSURE CORNERS OF WIND LABEL FIT SNUGLY INTO THE LIGHTING BLOCK STANDOFFS. ENSURE ADHESIVE TAKES ON LIGHTING BLOCK.

LIGHTING BLOCK STANDOFF.

WIND LABEL

120053
4

FRONT VIEW

AFTER SOLDERING CUT TERMINALS FLUSH WITH PCB

E04014

REAR VIEW

280013

E03881

E03729

E03910

E03809

E03820

E03879

E03995
2

E04330

FIX SELF ADHESIVE SIDE TO PCB

DO NOT SCALE	IF IN DOUBT ASK

Mod.No.	Iss.	Date :	Modifications
1636	See sheet 1	23:10:02	E04330 compression label added

SIMRAD
A KONGSBERG Company

STAR LANE, MARGATE, KENT CT9 4NP
TEL: 01843 290290 | FAX: 01843 290471
+44 1843 290290

Drawn:	Checked:	Approved:
BM/RF		
Date 20:02:01	Date	Date

Material: SEE ABOVE

Finish: ——

Date: 11:01:02

Original Scale: 1 : 1

COMPUTER GENERATED DRAWING
MANUAL MODIFICATION INVALIDATES CAD FILE.

Model: IS12 INSTRUMENTS

Title: **PCB ASSEMBLY: WIND**

Tolerances	ALL DIMENSIONS
+ & -	mm
0. = 0.50	© SIMRAD MARGATE 2002
0.0 = 0.25	
0.00= 0.10	Sht. 2 of 2
ANG. = 0.5°	

Drg No.: E03888

Issue: *SEE SHEET ONE*

ISSUE 2 25/01/00

SIZE A2 : 594 x 420mm
LANDSCAPE

DRAWN IN ACCORDANCE WITH BS 308

3rd ANGLE PROJECTION

Drg. No.: **E04000**

Product Group : 811

Used on : E03893, E03894, E03895, E03896, E03897

ADHERE IN POSITION (USING BLACK TAK)

160074 — 260061

E03830

E03882

300015

VENT LABEL & VENT TO BE ADHERED TO CASE REAR VENT AREA. ACCURATE ALIGNMENT REQUIRED. BURNISH IN POSITION, NO VISUAL AIR BUBBLES ARE PERMITTED - GOOD SEAL ESSENTIAL.

CASE SEAL RADIUS SIDE

CASE SEAL FLAT SIDE

190052 — 2

E03803 — 2

E03797

Vent label was E03765 corrected to E03882

Vent changed from E03765 to 300015

Mod.No.	Iss.	Date:	Modifications
1609	2	31:10:02	

DO NOT SCALE | IF IN DOUBT ASK

SIMRAD — A KONGSBERG Company

STAR LANE, MARGATE, KENT CT9 4NP
TEL: 01843 290290 | FAX: 01843 290471
+44 1843 290290

Material: SEE ABOVE

Finish: ——

Date: 14:01:02

Original Scale: 1 : 1

Drawn: B.P.L Date 31:10:02

Checked: Date

Approved: Date

COMPUTER GENERATED DRAWING
MANUAL MODIFICATION INVALIDATES CAD FILE.

Model: IS12 INSTRUMENTS

Tolerances + & -
0. = 0.50
0.0 = 0.25
0.00 = 0.10
ANG. = 0.5°

ALL DIMENSIONS mm

Sht. 1 of 1

Title: ASSEMBLY: CASE BACK

Drg No.: E04000

Issue: 2

ISSUE 2 25:01:99

SIZE A3 :420 x 297
LANDSCAPE

DRAWN IN ACCORDANCE WITH BS 308

3rd ANGLE PROJECTION

Drg. No: **E03800**

Product Group: 810

Used on: IS12 REMOTE:F

Ref Only

SERIAL No.

REAR VIEW

E03876 E03819 E03954 E03723 E03813 E03701 200303 6 E03872 Ref. Only E03814 Ref. Only

200104 3

200184 4

E04042

ADHERE AND SEAL IN POCKET (USING SILICONE SEALANT)

E03858 160074 260054

300015 200026

VIEW SHOWING: ASSEMBLY METHOD OF CABLE RESTRAINT

CASE SEAL FLAT SIDE

CASE SEAL RADIUS SIDE

Mod.No	Iss	Date	Modifications
1692	3	26:03:03	GRID REF. 6A: PART No. E03701 WAS E02542
1640	2	28:10:02	E04048 Serial No Label changed to 'Ref Only' 4 x 200184 M3 Neoprene washers added; 3 x 200104 PCB fix screws added (missed out) Case fixing screws were 4 x 200139 & 2 x200297 - now changed to 6 x 200303

DO NOT SCALE | IF IN DOUBT ASK

SIMRAD — A KONGSBERG Company

STAR LANE, MARGATE, KENT CT9 4NP
TEL: 01843 290290 | FAX: 01843 290471
+44 1843 290290

Material: SEE ABOVE

Finish: ———

Date: 16:01:02

Original Scale: 1 : 1

Drawn: B.P.L Date 29:10:02

Checked: Date

Approved: Date

COMPUTER GENERATED DRAWING
MANUAL MODIFICATION INVALIDATES CAD FILE.

Model: IS12 INSTRUMENTS

Title: G. A.: INSTRUMENT REMOTE CONTROLLER

Tolerances + & -
0. = 0.50
0.0 = 0.25
0.00 = 0.10
ANG. = 0.5°

ALL DIMENSIONS mm

Sht. 1 of 1

Drg No.: E03800

Issue 3

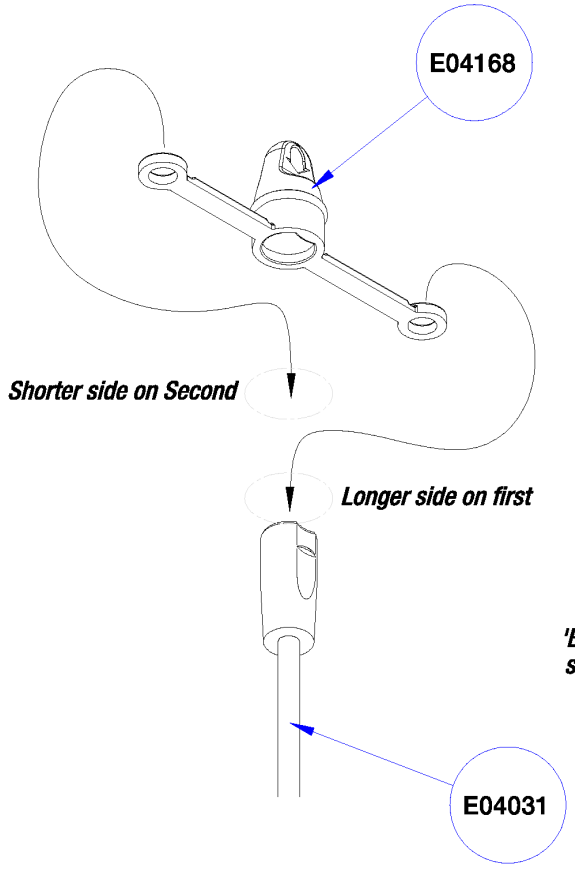
ISSUE 3 26:03:03

SIZE A2 : 594 x 420mm
LANDSCAPE

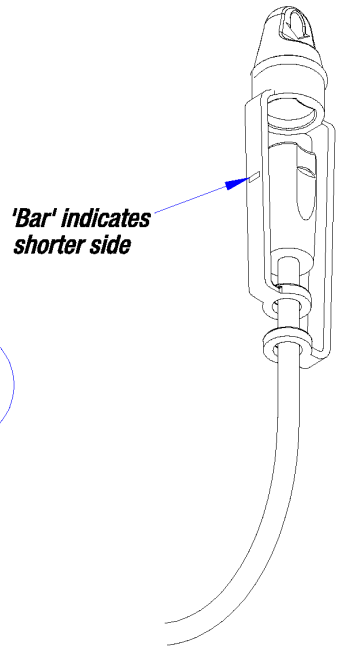
DRAWN IN ACCORDANCE WITH BS 308

3rd ANGLE PROJECTION

Drg. No.:	E04221
Tool No. :	811
Used on :	IS12 WIND:S IS12 CRUISE:S IS12:TW



FULLY ASSEMBLED



DO NOT SCALE | IF IN DOUBT ASK

Mod.No.	Issue	Date	Modifications

SIMRAD ▲ KONGSBERG Company

STAR LANE, MARGATE, KENT CT9 4NP
TEL: 01843 290290 | FAX: 01843 232903
+44 1843 290290

Drawn: B P L	Checked:	Approved:
Date 12-6-02	Date	Date

Material:

Colour:

Finish:

Date: 12 : 06 : 02

Original Scale: 1 : 1

COMPUTER GENERATED DRAWING
MANUAL MODIFICATION INVALIDATES CAD FILE.

Model: IS12 MHU

Title: MASTHEAD CABLE & CONNECTOR COVER ASSY

Drg No.: E04221

Issue: 1

Tolerances + & -
0. = 0.50
0.0 = 0.25
0.00 = 0.10
ANG. = 0.5°

ALL DIMENSIONS mm

Sht. 1 of 1

ISSUE 2:25:01:99

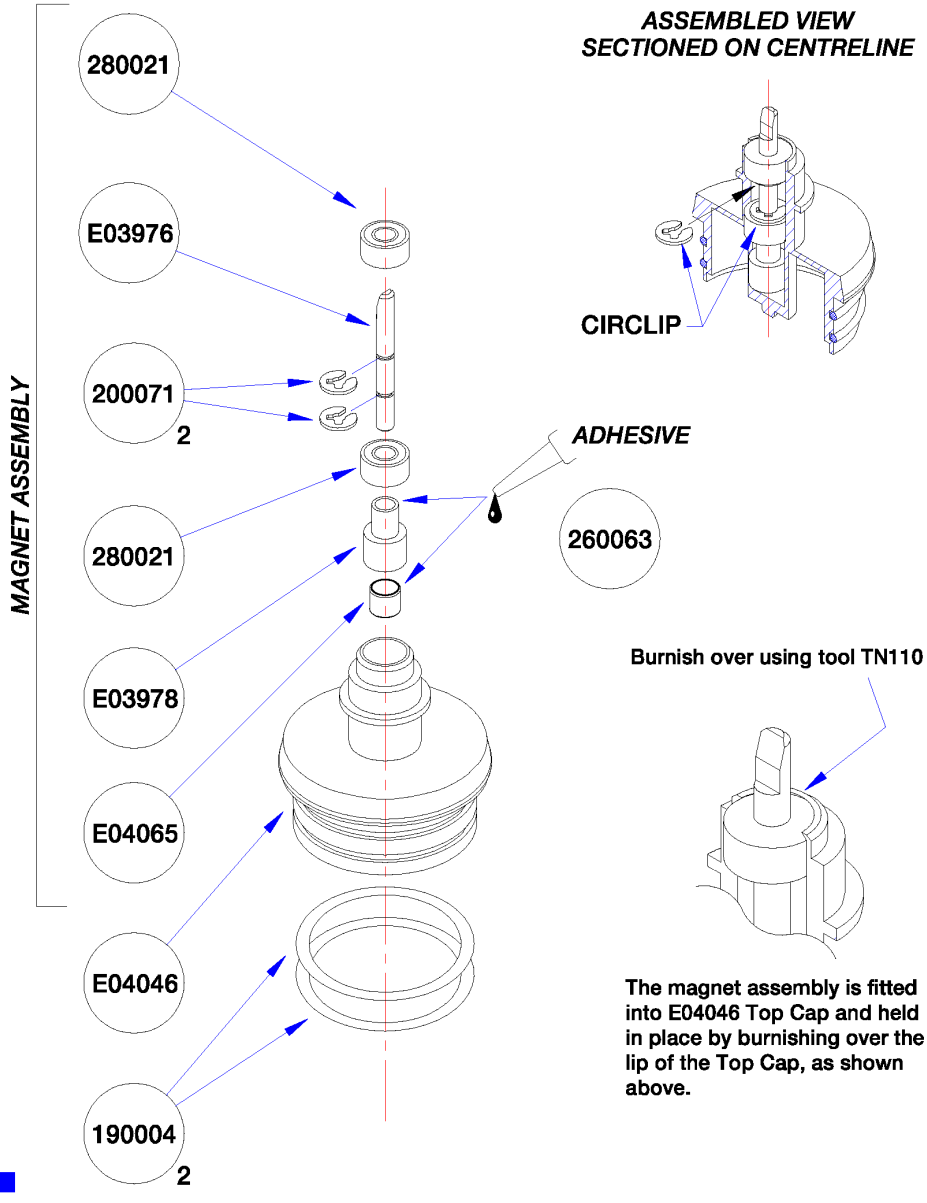
SIZE A4:210 x 297
PORTRAIT

DRAWN IN ACCORDANCE WITH BS 308

3rd ANGLE PROJECTION

Drg. No.: **E04028**

Product Group	811
Used on :	E04015



ASSEMBLED VIEW
SECTIONED ON CENTRELINE

Burnish over using tool TN110

The magnet assembly is fitted into E04046 Top Cap and held in place by burnishing over the lip of the Top Cap, as shown above.

Mod.No.	Issue	Date	Modifications
1642	2	30:10:02	Assembly notes added – Drawing updated

DO NOT SCALE | IF IN DOUBT ASK

SIMRAD — A KONGSBERG Company

STAR LANE, MARGATE, KENT CT9 4NP
TEL: 01843 290290 | FAX: 01843 290471
+44 1843 290290

Drawn: B.P.L Date 30:10:02	Checked: Date	Approved: Date

Material: SEE ABOVE

Finish: ———

Date: 08:01:02

Original Scale: 1 : 1

COMPUTER GENERATED DRAWING
MANUAL MODIFICATION INVALIDATES CAD FILE.

Model: IS12 MASTHEAD

Title: ASSEMBLY: TOP CAP MASTHEAD

Tolerances + & –
0. = 0.50
0.0 = 0.25
0.00= 0.10
ANG. = 0.5°

ALL DIMENSIONS mm

Sht. 1 of 1

Drg No.: E04028

Issue: 2

ISSUE 2:25:01:99

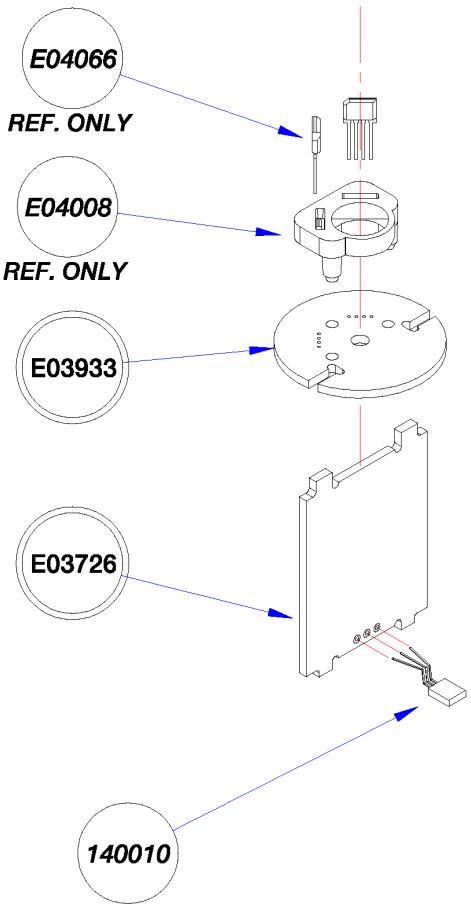
SIZE A4:210 x 297
PORTRAIT

3rd ANGLE PROJECTION

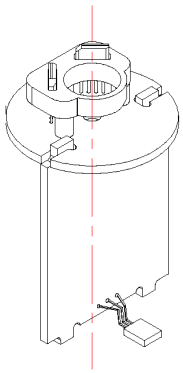
DRAWN IN ACCORDANCE WITH BS 308

Drg. No.: E04029

Product Group	800
Used on :	E04015



ASSEMBLED PCB's



Mod.No.	Issue	Date	Modifications
1681	3	05:02:03	E03933 Top PCB assy & 'ref' components added E04347 Top PCB assy & note removed
1639	2	28:10:02	Drawing revised to allow for programmed top PCB (Unprogrammed top PCB is now E04346)

DO NOT SCALE | IF IN DOUBT ASK

SIMRAD
A KONGSBERG Company

STAR LANE, MARGATE, KENT CT9 4NP
TEL: 01843 290290 | FAX: 01843 290471
+44 1843 290290

Drawn: B.P.L
Date 05:02:03

Checked:
Date

Approved:
Date

Tolerances
+ & -
0. = 0.50
0.0 = 0.25
0.00 = 0.10
ANG. = 0.5°

ALL DIMENSIONS mm

© SIMRAD MARGATE 2002

Material: SEE ABOVE

Finish:

COMPUTER GENERATED DRAWING
MANUAL MODIFICATION INVALIDATES CAD FILE.

Model: IS12 MASTHEAD

Sht. 1 of 1

Date: 08:01:02

Original Scale: 1 : 1

Title: ASSEMBLY: PCB's MASTHEAD

Drg No.: E04029

Issue 3

ISSUE 225:01:99

SIZE A4:210 x 297
PORTRAIT

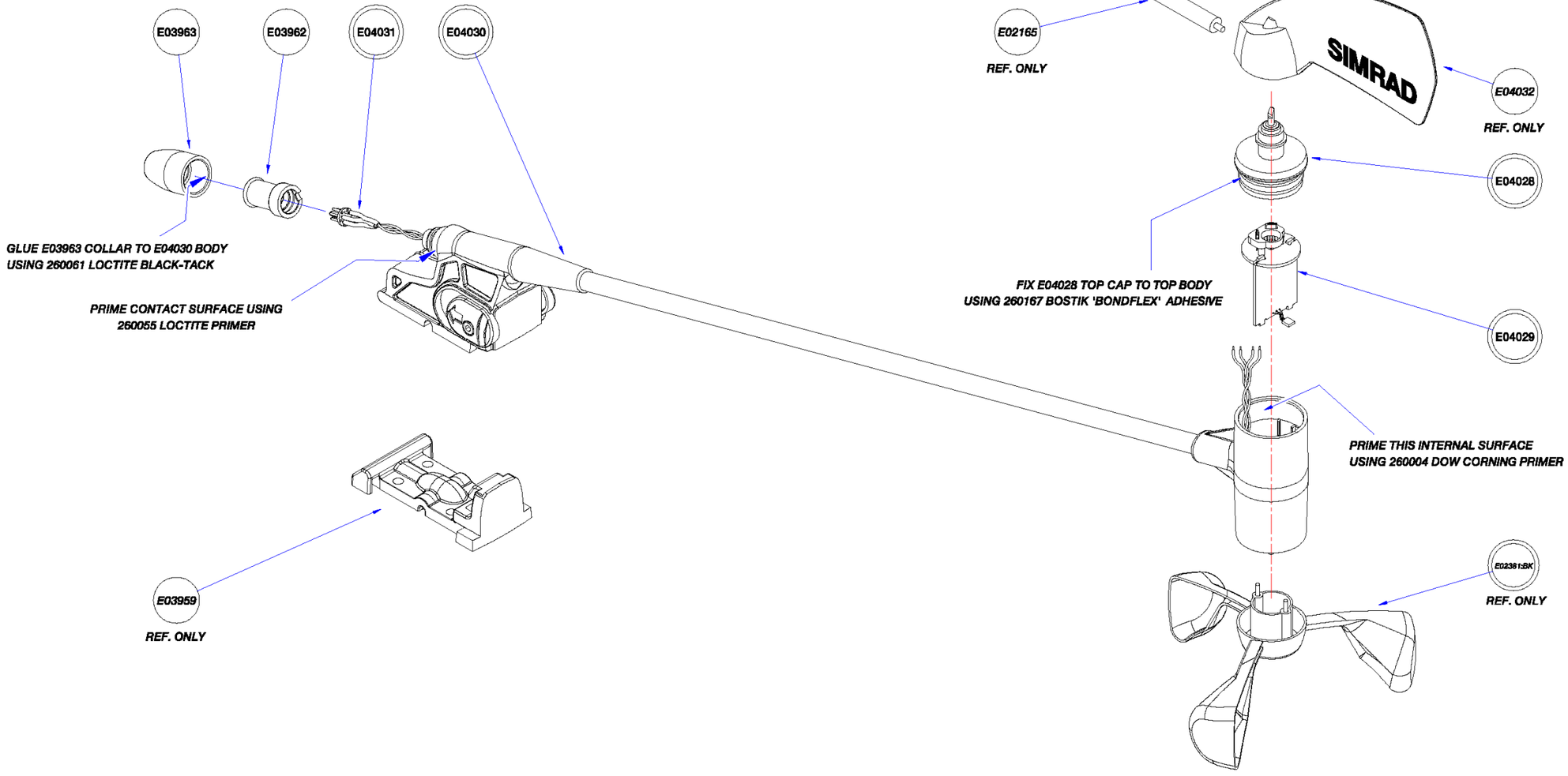
DRAWN IN ACCORDANCE WITH BS 308

3rd ANGLE PROJECTION

Drg. No: E04015

Product Group: 811

Used on: E04082



Mod.No.	Issue	Date	Modifications
1641	2	28:10:02	Drawing Revised and updated Gluing notes added

DO NOT SCALE | IF IN DOUBT ASK

SIMRAD
A KONGSBERG Company

STAR LANE, MARGATE, KENT CT9 4NP
TEL: 01843 290290 | FAX: 01843 290471
+44 1843 290290

Material: SEE ABOVE

Finish: ——

Date: 08:01:02

Original Scale: 1 : 1

Drawn: B.P.L Date 28:10:02

Checked: Date

Approved: Date

COMPUTER GENERATED DRAWING
MANUAL MODIFICATION INVALIDATES CAD FILE.

Model: IS12 MASTHEAD

Title: ASSEMBLY: MASTHEAD UNIT

Tolerances + & -
0. = 0.50
0.0 = 0.25
0.00 = 0.10
ANG. = 0.5°

ALL DIMENSIONS mm

Sht. 1 of 1

Drg No.: E04015

Issue 2

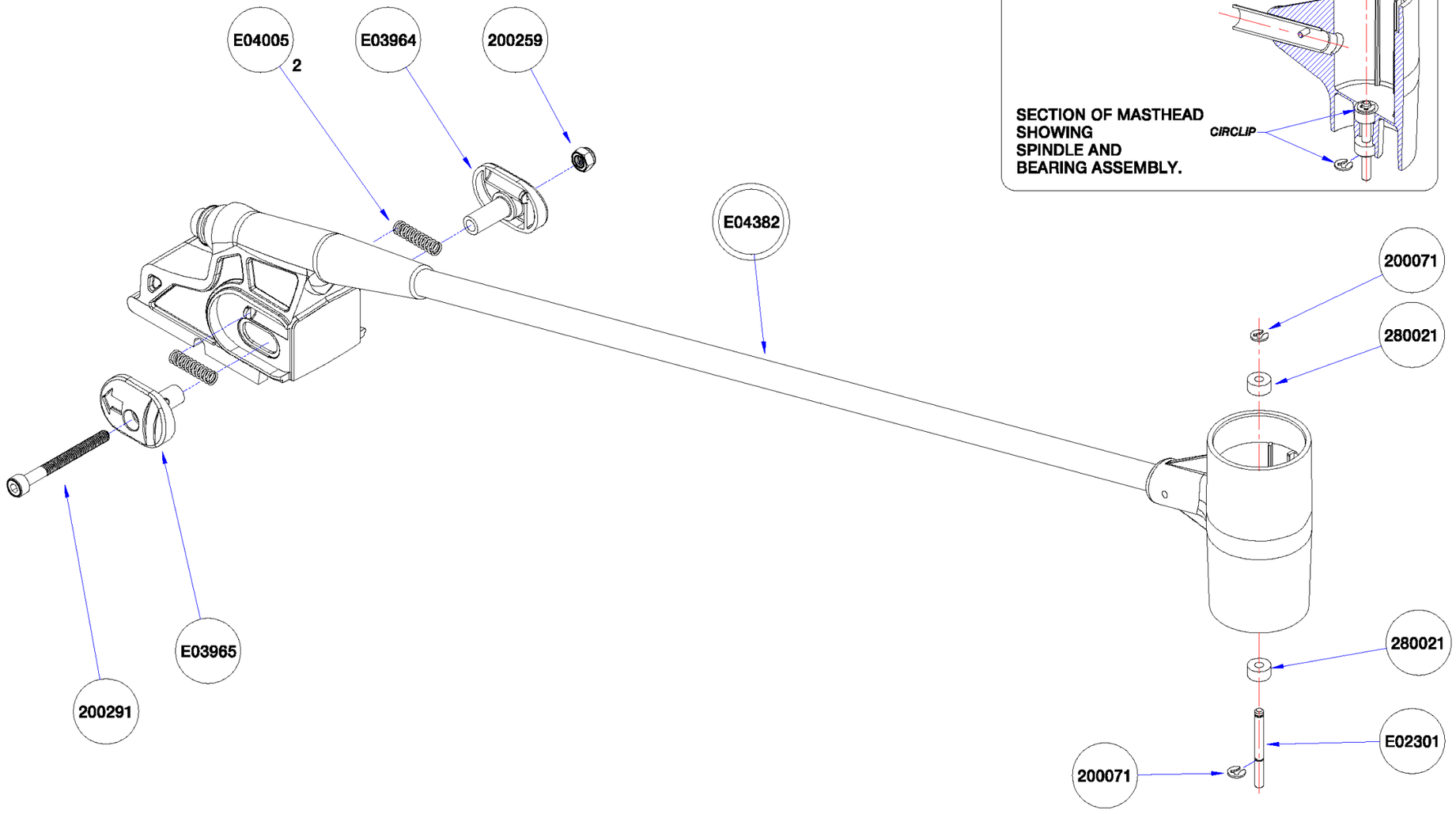
SIZE A1 : 841 x 594mm
LANDSCAPE

DRAWN IN ACCORDANCE WITH BS 308

3rd ANGLE PROJECTION

Drg. No: **E04030**

Product Group:	811
Used on:	E04015



SECTION OF MASTHEAD SHOWING SPINDLE AND BEARING ASSEMBLY.

E04382 (MHU Pole: Glued & Pinned) Added
'Adhesive' note & 'E03966 ref only' note removed
E03960 (base & pole) & E03961 (top body) removed

Mod.No.	Issue	Date	Modifications
1662	2	09:12:02	

DO NOT SCALE | IF IN DOUBT ASK

SIMRAD — A KONGSBERG Company

STAR LANE, MARGATE, KENT CT9 4NP
TEL: 01843 290290 | FAX: 01843 290471
+44 1843 290290

Material: SEE ABOVE

Finish: ———

Date: 08:01:02

Original Scale: 1 : 1

Drawn: B.P.L Date 09:12:02

Checked: Date

Approved: Date

COMPUTER GENERATED DRAWING
MANUAL MODIFICATION INVALIDATES CAD FILE.

Model: IS12 MASTHEAD

Tolerances
+ & -
0. = 0.50
0.0 = 0.25
0.00 = 0.10
ANG. = 0.5°

ALL DIMENSIONS mm

© SIMRAD MARGATE 2002

Sht. 1 of 1

Title: **ASSEMBLY: BASE MASTHEAD**

Drg No.: **E04030**

Issue: **2**

ISSUE 3 28/02/01

SIZE A2 : 594 x 420mm
LANDSCAPE

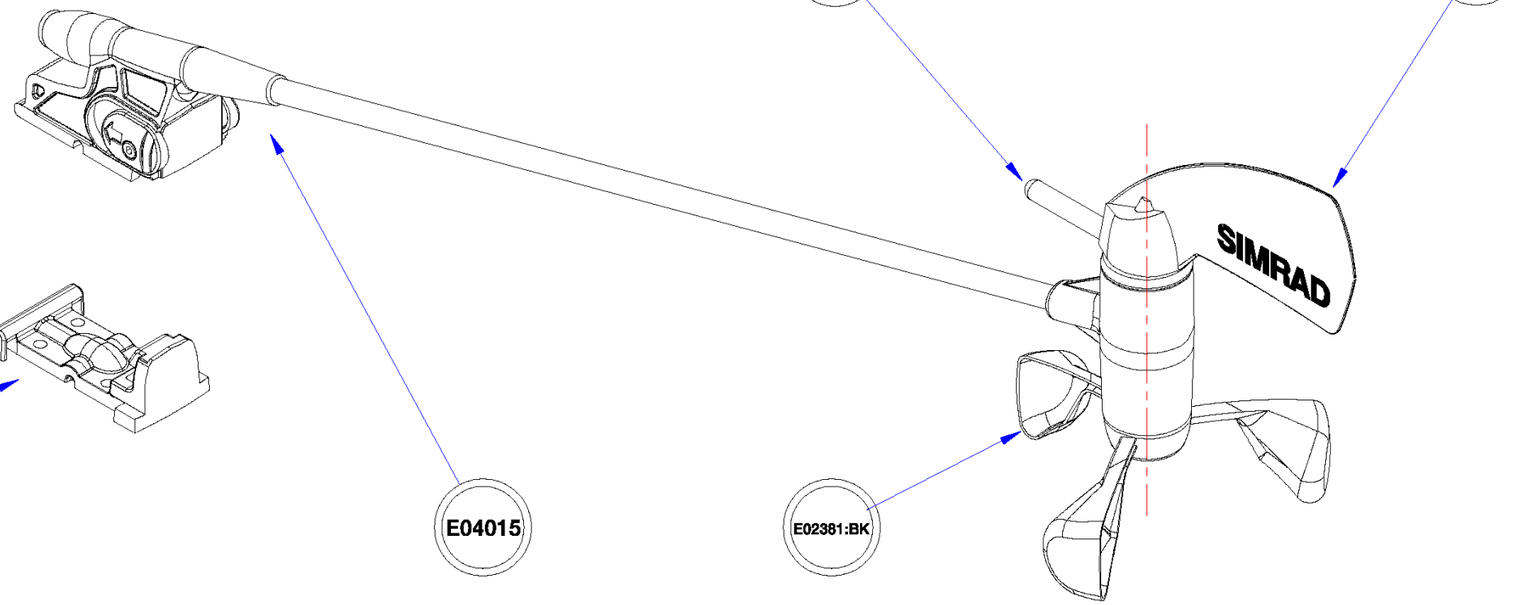
DRAWN IN ACCORDANCE WITH BS 308

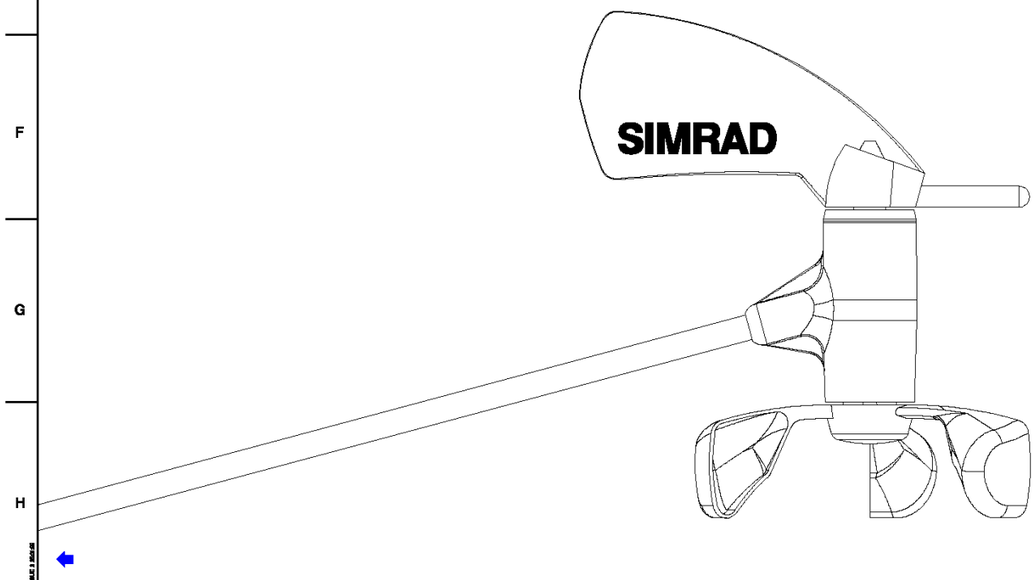
3rd ANGLE PROJECTION

Drg. No: E04082

Product Group: 810

Used on: IS12 WINDS:S





DO NOT SCALE | IF IN DOUBT ASK

Mod.No.	Issue	Date	Modifications

SIMRAD A KONGSBERG Company

STAR LANE, MARGATE, KENT CT9 4NP
TEL: 01843 290290 | FAX: 01843 232903
+44 1843 290290

Material: SEE ABOVE

Finish: ——

Date: 14:01:02

Original Scale: 1 : 1

Drawn: B.L./B.M. Date 14:01:02

Checked: Date

Approved: Date

COMPUTER GENERATED DRAWING
MANUAL MODIFICATION INVALIDATES CAD FILE.

Model: IS12 MASTHEAD

Tolerances + & -
0. = 0.50
0.0 = 0.25
0.00 = 0.10
ANG. = 0.5°

ALL DIMENSIONS mm

Sht. 1 of 1

Title: IS12 MHU FULL ASSEMBLY

Drg No.: E04082

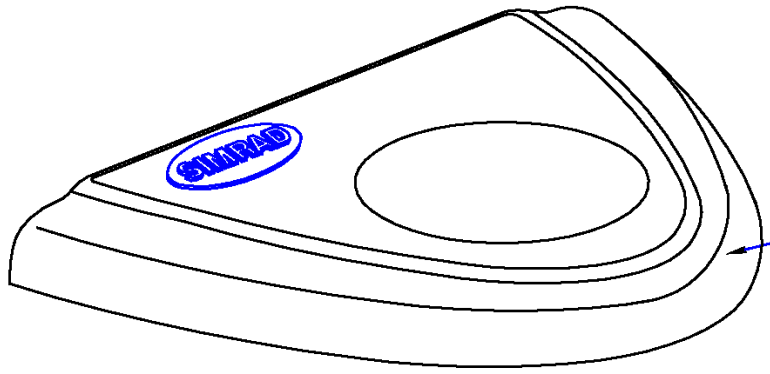
Issue: 1

SIZE A1 : 841 x 594mm
LANDSCAPE

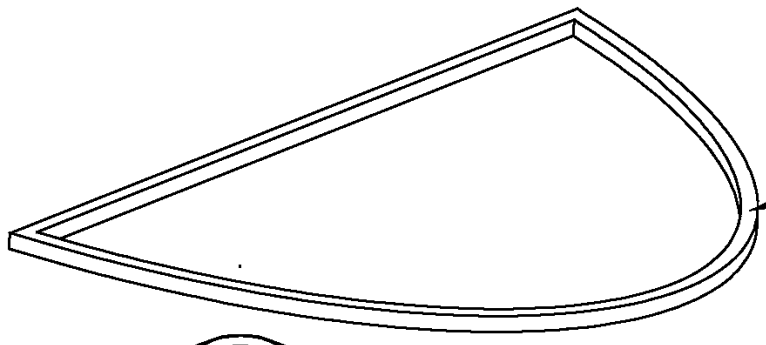
DRAWN IN ACCORDANCE WITH BS 308

3rd ANGLE PROJECTION

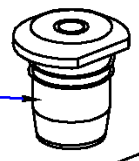
Drg. No.:	E04439
Product Group:	810
Used on:	IS12 TC



E02780:BK



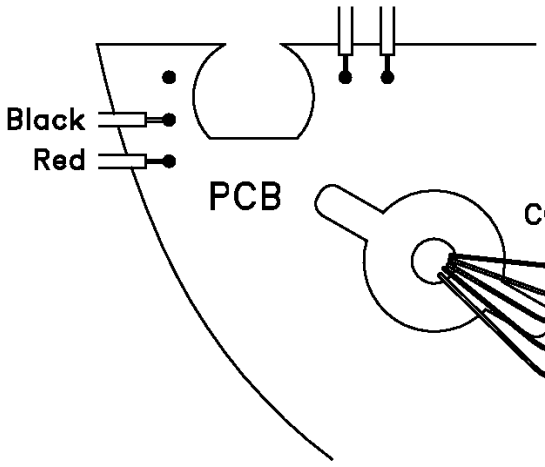
E02783



E03701

E03791

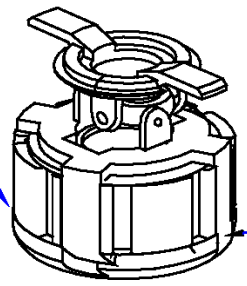
WIRING DETAILS



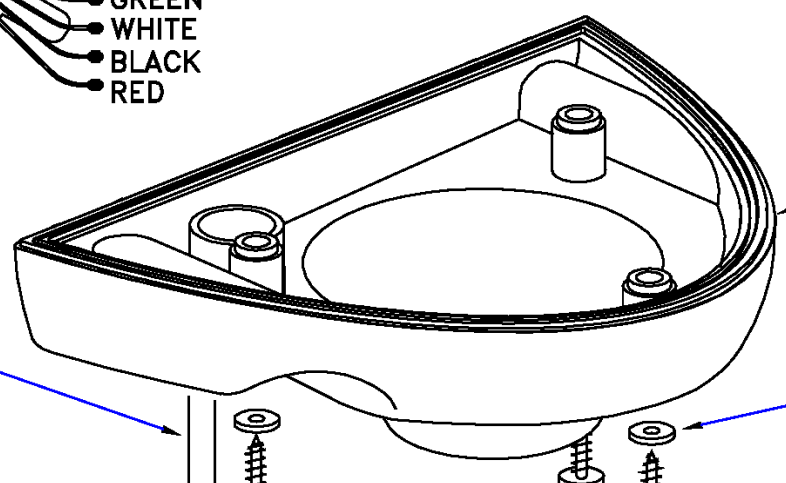
ELEMENT CONNECTIONS

BLUE
GREEN
WHITE
BLACK
RED

ARROW



E02782



E02781:BK

E04042

200184

3 POS.

200235

2 POS.

200137

DO NOT SCALE	IF IN DOUBT ASK	Mod. No.	Issue	Date:	Modifications

SIMRAD — A KONGSBERG Company

STAR LANE, MARGATE, KENT CT9 4NP
TEL: 01843 290290 | FAX: 01843 290471
+44 1843 290290

Drawn: BPL Date: 20:03:03	Checked: Date:	Approved: Date:	Tolerances + & − 0. = 0.50 0.0 = 0.25 0.00= 0.10 ANG. = 0.5°	All dimensions mm
COMPUTER GENERATED DRAWING MANUAL MODIFICATION INVALIDATES CAD FILE.				© SIMRAD 2003
Material: SEE ABOVE.				Sht. 1 of 1
Finish: ———				
Date: 20:03:03	Original Scale: NTS	Title: G.A Compass Transducer	Drg. No.: E04439	Issue: 1

ISSUE 1 27/08/95

SIZE A3 :420 x 297
PORTRAIT

IS12 Instrument System

Section 5

Circuit Descriptions

5 CIRCUIT DESCRIPTION

5.1 Square Display Unit PCB Assembly

Introduction. The PCB Assembly is a generic item which can be used for all square instrument display units. The variants are created by applying different components, software versions and hardware links to the common PCB. The various hardware options are detailed on the circuit diagram Drawing No. E03718 together with the appropriate assembly drawing. All displays employ the same software, E04007, with the exception of the Mega Instrument, which employs E04251, in position IC4. The table below gives a summary of the hardware links which select the appropriate software option for the different displays:

Instrument Type	**Resistor / Link Fitting**							
Depth Display	R100	R101	R102	R103	R104	R105	**R11**	**R10**
Speed Display	R100	R101	R102	R103	R104	**R12**	R106	**R10**
Combi Display	R100	R101	R102	R103	R104	**R12**	**R11**	**R10**
Data Display	R100	R101	R102	R103	**R13**	R105	R106	**R10**
Mega Display	R100	R101	R102	R103	**R13**	**LK1**	R106	**R10**
GPS Display	R100	R101	R102	**LK2**	**R13**	R105	R106	**R10**
Wind Display	R100	R101	R102	**R14**	R104	R105	R106	**R10**
Compass Display	R100	R101	**LK3**	**R14**	R104	R105	R106	**R10**

Resistors numbered R100 to R106 are all valued at 10k_ and act as “pull-up” devices. Resistors numbered R10 to R14 are all valued at 0 (zero) _ and act as “pull down” devices. Links LK1 to LK3 provide additional pull down options to increase flexibility of board usage e.g. a Wind Display can easily be converted to a Compass Display by making the solder link LK3.

NB. Post manufacturing changes to R100 to R106 and R10 to R14 are not recommended due to their location between the PCB and the LCD.

Supply and Regulation. The Display Unit is designed to work from a 12 V source. Protection against incorrect polarity is provided by D1. Capacitors C2 and C85 are used as reservoirs to hold up the supply voltage and reduce any supply dips. Protection against over-voltage spikes is provided by Resistor R1 and Zener Diode ZD1 and Regulator REG1 provide a 5V regulated supply. Depth and Combi units require further supply input filters comprised of Inductors L4 to L7 and Capacitors C99 to C102 to suppress emissions due to the high energy depth transmitter pulse.

Microprocessor. The Microprocessor has 60 Kbytes of ROM, for program storage, 2 Kbytes of RAM for temporary variable storage and is equipped with a CAN (Controller Area Network) module.

The Microprocessor is driven at 9.83040 MHz by Crystal XTAL1 connected to Pin 12 (Xin) and Pin 13 (Xout). Capacitors C13 and C14 form the load and integrated reset generator IC3 provides a reset LOW pulse of approximately 50mS duration at switch on and whenever a 5v supply failure occurs. In addition to the reset provided by IC3, the microprocessor has a built in watchdog timer which will create a reset if a software crash occurs for any reason.

Non-Volatile Memory (NVM). Integrated Circuit IC1 provides 1Kbit of E^2 memory for the retention of important data after power down.

CanBus Interface. The IS12 instruments are interfaced by CanBus, a true multi-talker system with high levels of error protection. The bus protocol is encoded and decoded by the dedicated CAN Module built into the microprocessor and IC2 acts as the driver providing the physical layer interface to the interconnection between products. The CanBus data connections are labelled CANL and CANH.

Crystal Display (LCD). There are 3 types of LCD dependent upon the display type, Combi and Data instruments employ a 2 line display (E03680), Depth, Speed and Mega employ a single line display (E03728) and the Wind instrument employs a small single line display (E03729). All LCD s are custom made.

The LCD s are driven by Integrated Circuit IC5, a software programmable LCD controller / driver, under serial control of the microprocessor. The driver operates from its internal clock, the frequency being set by Resistor R22. Divide by four time division multiplexing acting upon 4 common lines and 32 segments is employed to provide for up to 128 segments. LCD drive levels are set from the fixed resistor chain R18 to 20 and R110 to R112, the contrast level is therefore fixed and remains constant across the specified temperature range.

Key Switches. Switches SW1 to SW4 are directly connected to microcontroller ports P1.0 to P1.3. The lines are normally held high by Resistors R74 to R77 but are pulled to ground when the switch is operated.

Backlighting. The analogue display backlighting configuration utilises LEDs 1 to 4, 9 and 14 and 15 and the digital display LEDs 5 to 8. Both configurations are driven by the same circuit, Transistors TR13 and 14, under control of the microprocessor. The circuit provides even illumination over a variety of supply voltages and the level of illumination is controlled by the pulse width of the signal applied to the base of TR14 by the microprocessor.

Key Lighting. Key lighting is provided by Transistor TR12 from the same source as the backlighting. However, the shunt resistor R60 across TR12 provides for continuous low level illumination when the backlighting is set to off to allow the keypad to be found in very low ambient light levels.

Audio Sounder. Integrated Circuit IC12 gates IC12a and IC12b are configured as a square wave oscillator producing a constant output at 2.4KHz. The key beep is generated on any key depression by the gate applied from the microprocessor port ST3.1 to IC12c. The resulting 2.4KHz burst is applied to the Piezo Sounder positive connection via FET TR17 to provide sufficient drive.

The extra volume required for the alarm beep is produced by applying the output burst from IC12c to the input of gate IC12d, enabled by the load alarm signal from the microprocessor port ST3.0. The resultant anti-phase output from IC12d is applied to the Piezo Sounder negative connection via FET TR18.

NMEA In (Mega Instrument Only). NMEA data in is opto isolated by IC13 and fed directly to the microprocessor port P8.4.

NB. The NMEA data input employs 2 of the Speed / Log terminals. The Mega Instrument can therefore only be employed to display either NMEA or Speed / Log data.

NMEA Out (Data and Mega Instruments). NMEA data out is provided from the Microprocessor port P8.5 via a driver transistor TR15.

NB. The NMEA data output employs the Depth terminals which must be enabled by fitting a 0_ Resistor R94 into circuit. The Depth and NMEA out functions are therefore mutually exclusive.

Analogue Meter Movement Driver (Wind Instrument Only). Wind direction information is supplied in serial data format from port P8.1 of the microprocessor to IC11 which converts the serial data to analogue drives which are applied to the meter movement directly through current limiting Resistors R72 and R73.

Log, Speed and Temperature (Speed and Combi Instruments). The speed transducer is supplied from the 12v rail via Resistor R80 to energise the Hall Effect device. The returned pulses are buffered and shaped by Transistor TR16 and associated components and fed to the microprocessor port P6.6. Protection against high voltage spikes is provided by Diodes D13 and D14. The thermistor in the transducer is supplied with 5v via Resistor R84 and the voltage produced by this potential divider network, being proportional to temperature, is fed to the microprocessor port P7.0.

Depth Sounder (Depth and Combi Instruments). All functioning of the Depth sounder is controlled by the microprocessor including the timing of transmit and receive, pulse width of the transmitter, and all decisions regarding the integrity of received signals and calculations.

Integrated Circuit IC9 is a highly stable tone and frequency decoder which generates a constant output tuned to 200KHz, adjustable with Variable Resistor VR2. This output, at Pin 5, is fed to IC8b, c and d where it is gated by the transmitter synchronisation pulse from the processor, Port P6.0, at the appropriate pulse width 380µS, 1.66mS or 3.32mS. The 200KHz pulse switches on TR5 which provides a current path for C37 to discharge through the primary of the tuned pulse transformer CH1 and produces a 450v peak-to-peak pulse which is applied to the transducer discharging approximately 25w of energy. The transmitter sync pulse is also applied TR6 via IC8a which mutes the receiver for the duration of the transmit pulse. The supply to the transmitter is filtered, mainly by C75 and L1, to prevent the high energy transmit pulse causing interference to other functions.

The receiver is turned on once the transmit pulse is completed and received signals are fed from the transducer to a variable gain amplifier TR7, TR8 and TR10, TR11 via protection clamping Diodes D6 and D7 and the attenuator switch TR4. The attenuator is switched in from Port P2.0 when the microprocessor detects that the received signal level is too high, even with the variable gain amplifier set to minimum, to produce an acceptable level to be fed to the detector, tone decoder IC9. The decoder output IC9 Pin 8 is normally held high by the pull up Resistor R53 and thus holds TR9 on. When a signal is detected IC9 Pin 8 is forced low, TR9 cuts off and C47 charges through Resistor R53. This voltage is applied to Pin 2 of the comparator IC10a to be compared with the threshold stored in C48. The threshold level is generated by taking a sample of each individual transmit pulse from the source of TR5 and feeding it to C48 via Diode D9. The level stored in C48 is thus proportional to the amplitude and duration of the transmit pulse. The

threshold level is reset at the end of each receive period by the microprocessor port P2.1 via Diode D10. Any signal exceeding the threshold is passed to the microprocessor for processing.

5.2 Hand Controller PCB Assembly. Refer to Drawing Number E03721. The Hand Controller provides remote control of any display connected into an IS12 network. Individuals displays may be selected in turn and, once selected, the remote keypad provides the same services as the keypad on the desired instrument. With the exception of component labelling the circuitry is identical to that of the generic Display PCB and no further explanation is considered necessary.

5.3 Mast Head Unit. The Mast Head Unit detects the wind speed and direction and provides the information to the various instruments for display and / or data manipulation.

Motherboard PCB. Refer to Drawing Number E03724. . With the exception of component labelling the Supply and Regulation, Microprocessor, NVM and CANBUS circuitry is identical to that of the generic Display PCB and no further explanation is considered necessary.

Refer to Drawing Number E03934. Wind speed is detected by a Hall Effect Device IC3 which is triggered by 2 magnets mounted in the anemometer. The output of IC3 is fed directly to the microprocessor ports P6.4 to 6.6.

Refer to Drawing Number E03931. Wind angle is detected by a pair of matched linear Hall Effect devices, IC1 and IC2, mounted in a predetermined position at right angles to each other. A cylindrical magnet attached to the wind vane is suspended between them and the Hall Effects each produce a voltage corresponding to the position of the magnet poles and hence the position of the vane. The output of IC1 and IC2 are fed directly to the Microprocessor ports P7.0 and 7.1.

5.4 Compass System. The Compass Transducer detects the current bearing and provides the data for display in both analogue and digital form.

Refer to Drawing Number E03789. With the exception of component labelling, the Microprocessor and Reset, Supply and Regulation, NVM and CANBUS circuitry have been previously described and no further explanation is considered necessary.

The excitation coil of the fluxgate is driven at approximately 20KHz by anti-phase square waves from microprocessor ports P4.6 and P4.7. The anti-phase signals are buffered by Transistors TR1 and TR2 to provide the necessary drive. A reference level of approximately 1.5v is fed to the fluxgate coils from the junction of Resistors R25 and R26. The fluxgate coils are set at right angles and thus effectively provide analogue Sine and Cosine output signals proportional to the currents induced by the earth's magnetic field. These signals are fed to two dual slope integrating analogue to digital converters IC5 and IC6 via the electronic switch IC7. The timing of IC7 switching is controlled by the microprocessor to provide simultaneous precision analogue to digital conversion of both signals whilst avoiding possible errors caused by multiplexing of the inputs. The outputs of the comparators IC5 are fed directly to microprocessor ports P6.5 and P6.6 which provide input capture facilities. The heading is calculated by the processor and the data is output via the CANBUS.

IS12 Instrument System

Section 6

Circuit Diagrams

6 CIRCUIT DIAGRAMS

6.1 Circuit Schematics

Square Display Plus Options PCB Circuit Diagram	E03718
Hand Controller PCB Circuit Diagram	E03721
Mast Head Motherboard PCB Circuit Diagram	E03724
Mast Head Linear Analogue PCB Circuit Diagram	E03931
Mast Head Digital PCB Circuit Diagram	E03934
Conventional Mount to Surface Mount Adaptor	E04146
Compass Transducer PCB Circuit Diagram	E03789

6.2 Component Lists and Layouts

Speed Display PCB Assembly Detail	E03884 Sht 1
Depth Display PCB Assembly Detail	E03885 Sht 1
Combi Display PCB Assembly Detail	E03886 Sht 1
Mega Display PCB Assembly Detail	E04154 Sht 1
Data Display PCB Assembly Detail	E03887 Sht 1
Wind Display PCB Assembly Detail	E03888 Sht 1
Hand Controller PCB Assembly Detail	E03723
Masthead Motherboard PCB Assembly Detail	E03726
Masthead Linear Analogue PCB Assembly Detail	E03933
Masthead Digital PCB Assembly Detail	E03936
Compass Transducer PCB Assembly Detail	E03791

THIRD ANGLE PROJECTION

DRG No: E03718

BACK-LIGHTING

KEY LIGHTS

NMEA

ANALOGUE PCB OPTION

SWITCHES

NMEA IN

PCB LOG OPTION

BEEPER

M37632MFT
IC4
E04087

PD7225G
IC5

LCD1
DIGITAL

LCD2
ANALOGUE

DEPTH

NOT FITTED

NOTE:- # PROVISION MADE FOR FITTING CAPACITORS FOR EM EMISSIONS

NOTE:- C77 NOT FITTED

DO NOT SCALE	IF IN DOUBT ASK	1668	3	16-12-02	D6,D7 WAS LL4448
		1557	2	26-03-02	VALUE CHANGES TO FILTER NETWORK
		No	ISS	DATE	MODIFICATIONS

SIMRAD
A KONGSBERG Company

STAR LANE. MARGATE. KENT CT9 4NP
TEL: 0843 290288 | 44 843 290288 | FAX: 0843 290471

THIS DRAWING IS COMPUTER GENERATED ANY MANUAL MODIFICATION WILL INVALIDATE THE C.A.D. FILE

LIMITS MET	LIMITS IMP
+ & -	+ & -
0. = .50	FRAC = .015
0.0 = .25	.00 = .010
.00 = .10	.000 = .005
ANG = 0.5	ANG = 0.5

MATERIAL:

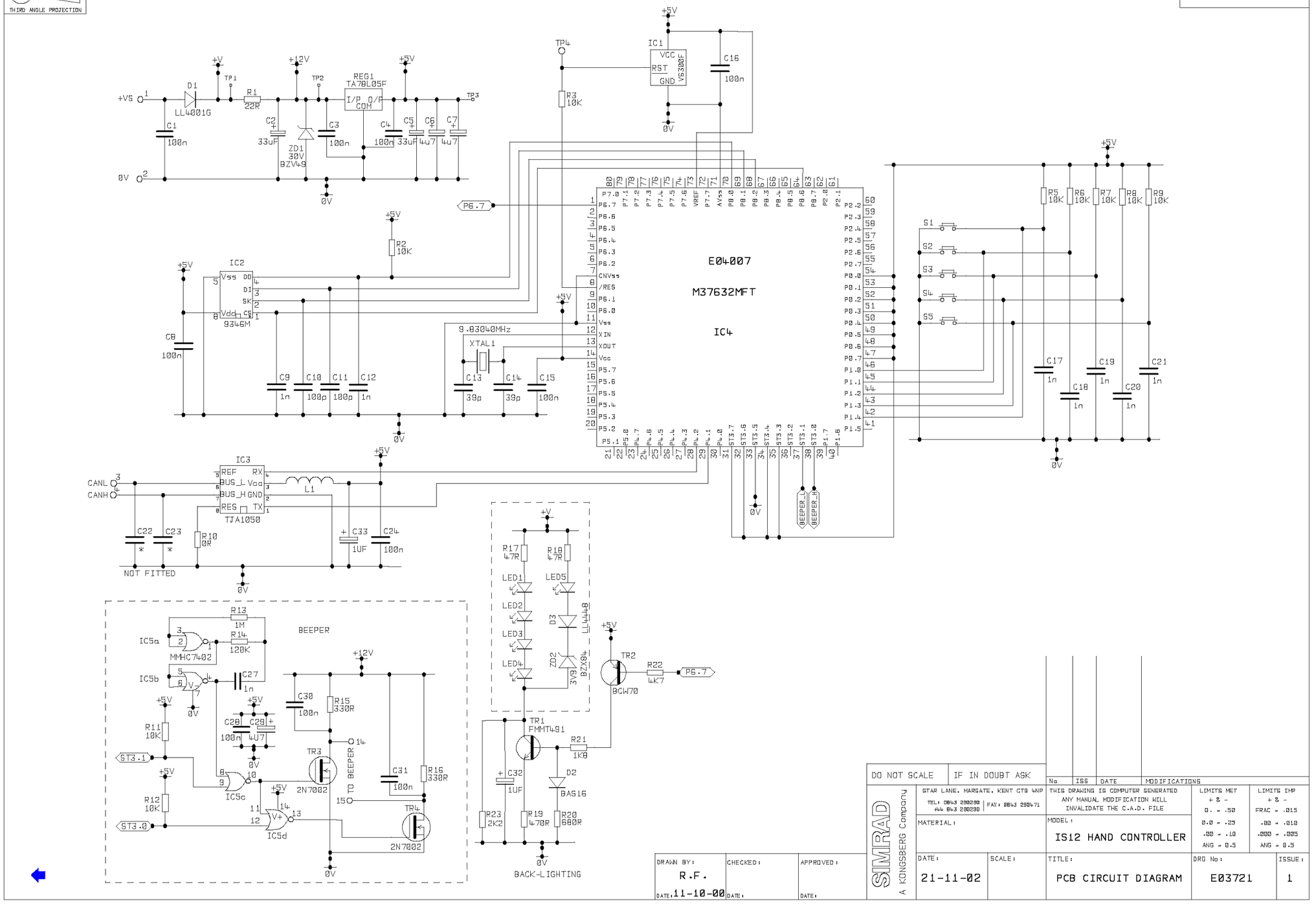
MODEL: RD0036 SQUARE DISPLAY PLUS OPTIONS

DRAWN BY:	CHECKED:	APPROVED:
R.F.		
DATE: 16-7-99	DATE:	DATE:

DATE:	SCALE:	TITLE:	DRG No:	ISSUE:
16-12-02		PCB CIRCUIT DIAGRAM	E03718	3

THIRD ANGLE PROJECTION

DRG No: E03721



DO NOT SCALE | IF IN DOUBT ASK

No	ISS	DATE	MODIFICATIONS

SMRAD — A KONGSBERG Company

STAR LANE. MARGATE. KENT CT9 4NP
TEL: 0843 290290 +44 843 290290 | FAX: 0843 290471

THIS DRAWING IS COMPUTER GENERATED. ANY MANUAL MODIFICATION WILL INVALIDATE THE C.A.D. FILE

LIMITS MET + & −	LIMITS IMP + & −
0. = .50	FRAC = .015
0.0 = .25	.00 = .010
.00 = .10	.000 = .005
ANG = 0.5	ANG = 0.5

MATERIAL:

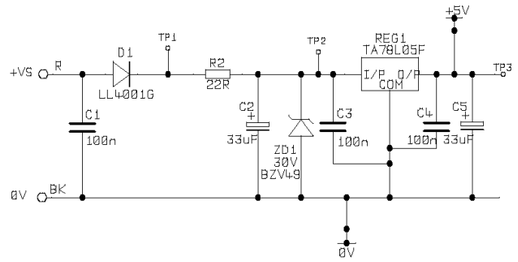
MODEL: IS12 HAND CONTROLLER

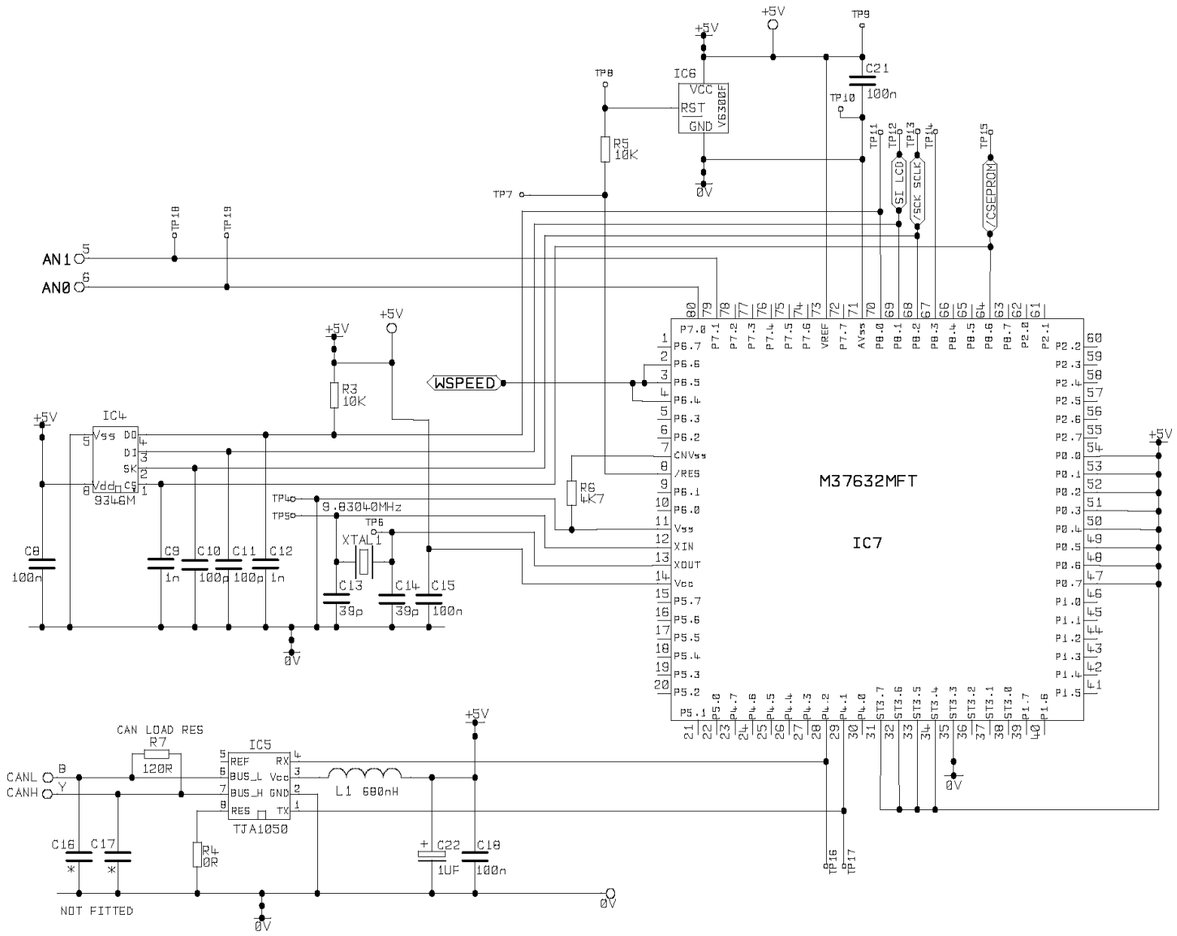
DRAWN BY:	CHECKED:	APPROVED:
R.F.		
DATE: 11-10-00	DATE:	DATE:

DATE:	SCALE:	TITLE:	DRG No:	ISSUE:
21-11-02		PCB CIRCUIT DIAGRAM	E03721	1

THIRD ANGLE PROJECTION

DRG No: E03724





DO NOT SCALE	IF IN DOUBT ASK

No	ISS	DATE	MODIFICATIONS

SIMRAD A KONGSBERG Company

STAR LANE. MARGATE. KENT CT9 4NP
TEL: 0843 290290 | FAX: 0843 290471
44 843 290290

THIS DRAWING IS COMPUTER GENERATED
ANY MANUAL MODIFICATION WILL
INVALIDATE THE C.A.D. FILE

LIMITS MET	LIMITS IMP
+ & -	+ & -
0. = .50	FRAC = .015
0.0 = .25	.00 = .010
.00 = .10	.000 = .005
ANG = 0.5	ANG = 0.5

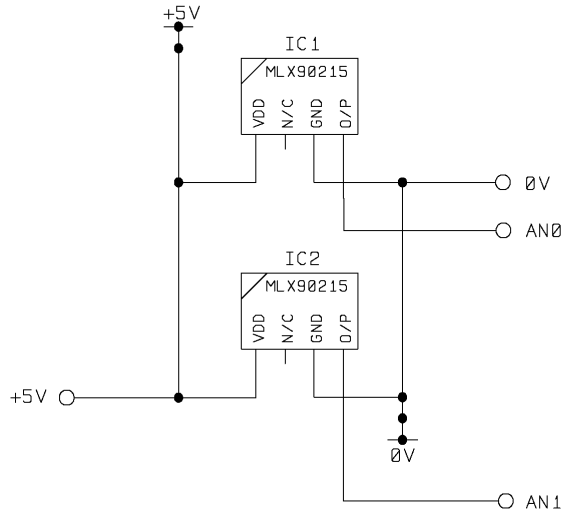
MATERIAL:

MODEL: IS12 MAST HEAD MOTHERBOARD

DRAWN BY:	CHECKED:	APPROVED:
R.F.		
DATE: 15-10-00	DATE:	DATE:

DATE:	SCALE:	TITLE:	DRG No:	ISSUE:
21-01-02		PCB CIRCUIT DIAGRAM	E03724	1

DRG No: E03931



DO NOT SCALE | IF IN DOUBT ASK

No	ISS	DATE	MODIFICATIONS

SIMRAD
A KONGSBERG Company

STAR LANE, MARGATE, KENT CT9 4NP
TEL: 0843 888888 +44 843 888888 | FAX: 0843 888871

THIS DRAWING IS COMPUTER GENERATED
ANY MANUAL MODIFICATION WILL
INVALIDATE THE C.A.D. FILE

LIMITS MET	LIMITS IMP
+ & -	+ & -
0. = .50	FRAC = .015
0.0 = .25	.00 = .010
.00 = .10	.000 = .005
ANG = 0.5	ANG = 0.5

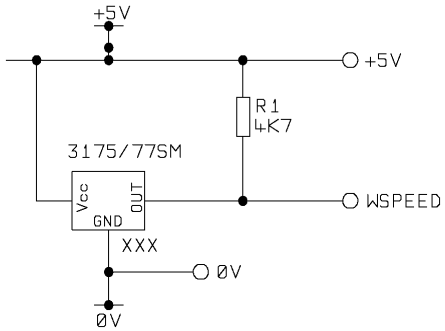
MATERIAL:

MODEL: IS12
MASTHEAD
LINEAR ANALOGUE

DRAWN BY:	CHECKED:	APPROVED:
R.F.		
DATE: 19-9-00	DATE:	DATE:

DATE:	SCALE:	TITLE:	DRG No:	ISSUE:
02-07-02		PCB CIRCUIT DIAGRAM	E03931	1

DRG No: E03934



DO NOT SCALE | IF IN DOUBT ASK

No	ISS	DATE	MODIFICATIONS

SIMRAD A KONGSBERG Company

STAR LANE, MARGATE, KENT CT9 4JP
TEL: 0843 888888 | FAX: 0843 888811

THIS DRAWING IS COMPUTER GENERATED
ANY MANUAL MODIFICATION WILL
INVALIDATE THE C.A.D. FILE

LIMITS MET ± &
0. = .50
0.0 = .25
.00 = .10
ANG = 0.5

LIMITS IMP ± &
FRAC = .015
.00 = .010
.000 = .005
ANG = 0.5

MATERIAL:

MODEL: IS12
MASTHEAD DIGITAL

DRAWN BY: R.F. DATE: 19-9-00
CHECKED: DATE:
APPROVED: DATE:

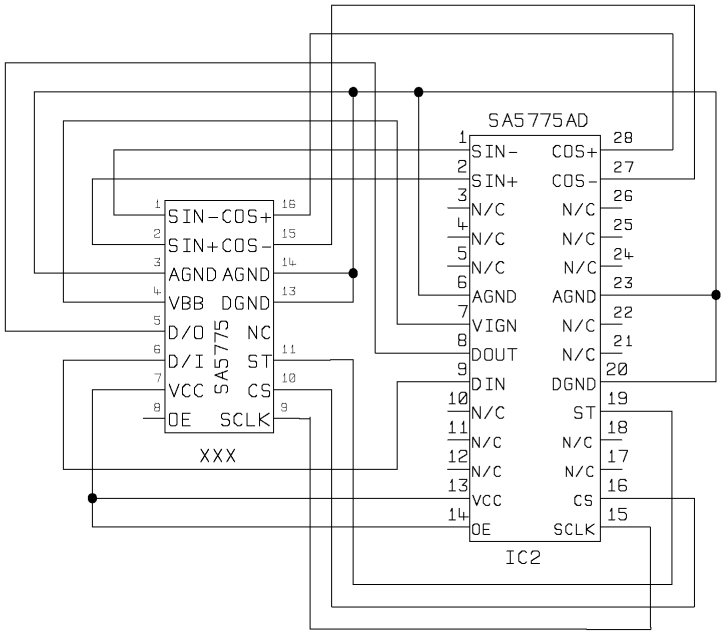
DATE: 21-01-02
SCALE:

TITLE: PCB CIRCUIT DIAGRAM

DRG No: E03934

ISSUE: 1

DRG No: E04146



DO NOT SCALE | IF IN DOUBT ASK

No	ISS	DATE	MODIFICATIONS

SIMRAD — A KONGSBERG Company

STAR LANE, MARGATE, KENT CT9 4NP
TEL: 01843 290290 | FAX: 01843 290478

THIS DRAWING IS COMPUTER GENERATED
ANY MANUAL MODIFICATION WILL
INVALIDATE THE C.A.D. FILE

LIMITS MET + & -	LIMITS IMP + & -
0. = .50	FRAC = .015
0.0 = .25	.00 = .010
.00 = .10	.000 = .005
ANG = 0.5	ANG = 0.5

MATERIAL:

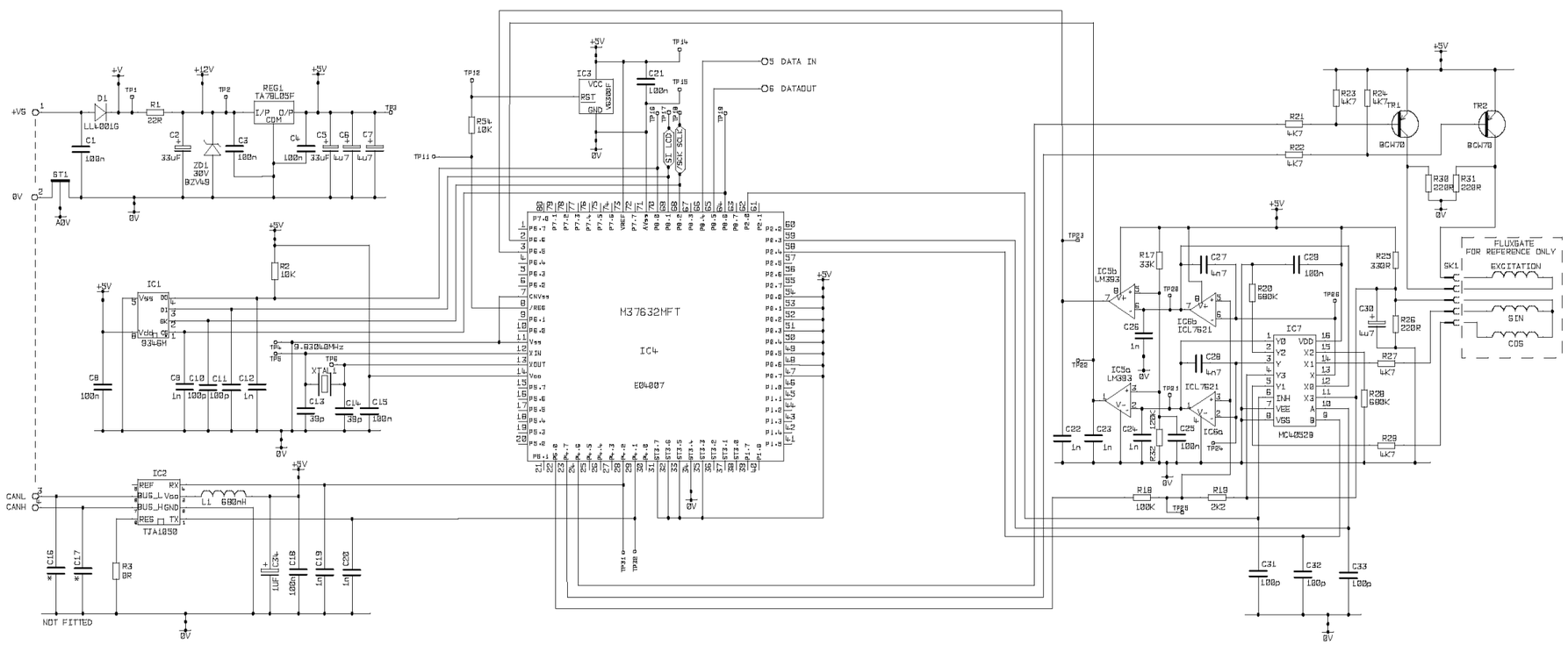
MODEL: IS12 CM TO SM ADAPTOR

DRAWN BY:	CHECKED:	APPROVED:
R.F.		
DATE: 10-01-02	DATE:	DATE:

DATE:	SCALE:	TITLE:	DRG No:	ISSUE:
22-11-02		PCB CIRCUIT DIAGRAM	E04146	1

THIRD ANGLE PROJECTION

DRG No: E03789



DRAWN BY: R.F. DATE: 16-10-00	CHECKED: DATE:	APPROVED: DATE:

DO NOT SCALE | IF IN DOUBT ASK

No	ISS	DATE	MODIFICATIONS

SIMRAD
A KONGSBERG Company

STAR LANE. MARGATE. KENT CT9 4NP
TEL: 0843 290290 | +44 843 290290 | FAX: 0843 290471

THIS DRAWING IS COMPUTER GENERATED
ANY MANUAL MODIFICATION WILL
INVALIDATE THE C.A.D. FILE

LIMITS MET	LIMITS IMP
+ & -	+ & -
0. = .50	FRAC = .015
0.0 = .25	.00 = .010
.00 = .10	.000 = .005
ANG = 0.5	ANG = 0.5

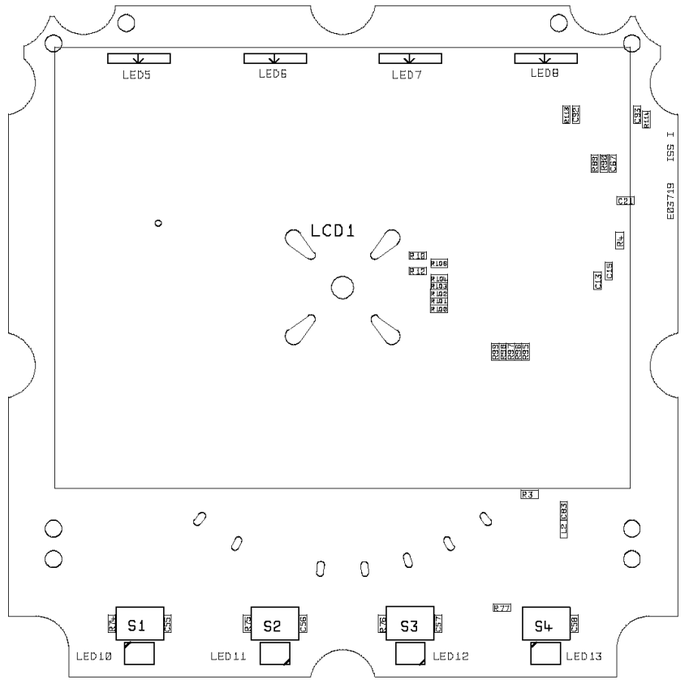
MATERIAL:

MODEL: IS12 COMPASS TRANSDUCER

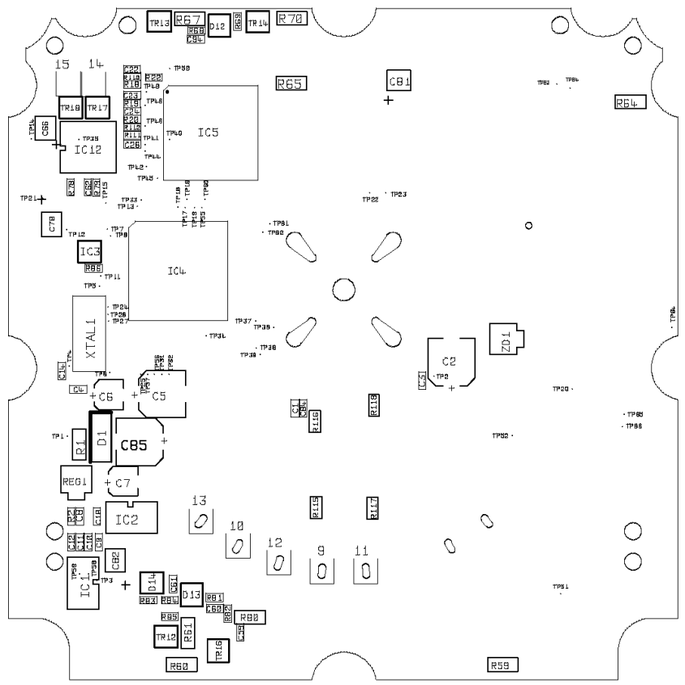
DATE:	SCALE:	TITLE:	DRG No:	ISSUE:
24-30-30		PCB CIRCUIT DIAGRAM	E03789	1

DRG No: E03884

FRONT VIEW



REAR VIEW



SURFACE MOUNT COMPONENTS - REF E04010

ITEM	QTY	PART No.	COMP REF	DESCRIPTION
1	1	E03719	-	PCB DRILLED
2	1	100124	R80	1206 470R
3	3	100125	R64,R65,R67	1206 10R
4	1	100126	R1	1206 22R
5	1	100127	R61	1206 47R
6	1	100128	R59	1206 1K
7	1	100131	R70	1206 4K7
8	1	100129	R60	1206 2K2
9	4	100256	R115,R116,R117,R118	0805 0R
10	1	100336	R68	0603 680R
11	2	100332	R113,R114	0603 330R
12	1	100341	R69	0603 1K8
13	4	100346	R81,R82,R85,R86	0603 4K7
14	21	100350	R2,R4,R74,R75,R76,R77,R83,R84,R89,R90,R95,R96,R97,R98,R99 R100,R101,R102,R103,R104,R106	0603 10K
15	2	100351	R18,R20	0603 12K
16	1	100352	R19	0603 15K
17	1	100361	R112	0603 82K
18	1	100363	R79	0603 120K
19	1	100364	R111	0603 150K
20	1	100365	R110	0603 180K
21	2	100374	R22,R78	0603 1M
22	3	100395	R3,R10,R12	0603 0R
23	3	110102	C2,C5,C85	33UF ELECT
24	1	110157	C66	4U7 TANT
25	2	110169	C6,C7	4U7 25V ELECT
26	11	110194	C9,C12,C22,C23,C24,C55,C56,C57,C58,C62,C83	0603 1n X7R
27	1	110196	C60	0603 10n X7R
28	14	110199	C1,C3,C4,C8,C15,C18,C21,C26,C59,C61,C67,C92,C93,C94	0603 100n X7R
29	2	110218	C13,C14	0603 39p
30	3	110223	C10,C11,C84	0603 100p
31	3	110237	C78,C81,C82	1UF TANT
32	1	120036	D12	BAS16T
33	1	120038	ZD1	BZV49 30V
34	1	120040	D1	LL4001G
35	2	120043	D13,D14	BAV99
36	4	120058	LED10,LED11,LED12,LED13	HSMG-T600
37	1	130028	TR16	BC846B
38	1	130029	TR14	BCW70
39	2	130033	TR12,TR13	FMMT491
40	2	130052	TR17,TR18	2N7002
41	1	140077	IC1	NMC9346
42	1	140092	REG1	TA78L05F
43	1	140140	IC12	MMHC7402
44	1	140147	IC3	V6300F
45	1	140176	IC5	PD7225G
46	1	140187	IC2	TJA1050
47	1	160066	XTAL1	HC49 9.830MHz
48	4	210035	S1,S2,S3,S4	SM_SWITCH
49	1	240059	L2	CHOKE 680nH
50	1	E04007	IC4	PROG'D MICRO

CONVENTIONAL MOUNT COMPONENTS

ITEM	QTY	PART No.	COMP REF	DESCRIPTION
51	4	120053	LED5,LED6,LED7,LED8	LL-1-2-G
52	1	E03728	LCD1	DIGITAL LCD
53	1	E03826	-	MASK:SPEED IS12
54	1	E03831	-	SEAL: TERMINAL 7-WAY
55	1	E03878	-	PRTD LIGHT BLOCK DIGITAL
56	1	E03909	-	REFLECTOR CARD: DIGITAL
57	5	E03958	9,10,11,12,13	SPADE TERMINAL
58	2	E03995	NC,ANC	SIMNET SOCKET HEADER
59	1	E04330	-	COMPRESSION LABEL

No	ISS	DATE	MODIFICATIONS
1636	3	24-10-02	COMPRESSION LABEL ADDED
1557	2	24-01-02	EMC REVISION

DO NOT SCALE | IF IN DOUBT ASK

SIMRAD A KONGSBERG Company

STAR LANE. MARGATE. KENT CT9 4NP
TEL: 0843 290290 +44 843 290290 | FAX: 0843 290471

THIS DRAWING IS COMPUTER GENERATED ANY MANUAL MODIFICATION WILL INVALIDATE THE C.A.D. FILE

LIMITS MET + & -: 0. = .50 | 0.0 = .25 | .00 = .10 | ANG = 0.5

LIMITS IMP + & -: FRAC = .015 | .00 = .010 | .000 = .005 | ANG = 0.5

MATERIAL:

MODEL: IS12 SPEED DISPLAY

DRAWN BY: R.F. DATE: 06-02-01

CHECKED: DATE:

APPROVED: DATE:

DATE: 24-10-02

SCALE:

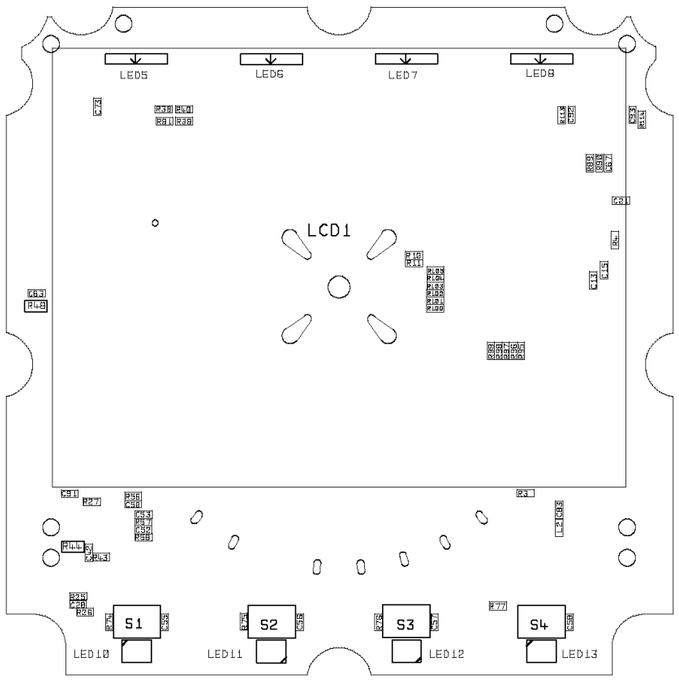
TITLE: PCB ASSEMBLY DETAIL

DRG No: E03884 SHT 1 OF 2

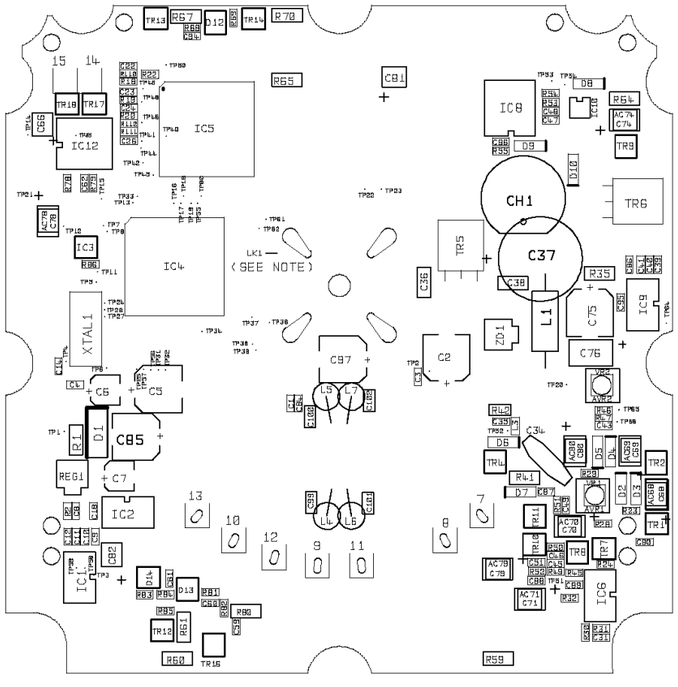
ISSUE: 3

DRG No: E03885

FRONT VIEW



REAR VIEW



SURFACE MOUNT COMPONENTS - REF E04011

ITEM	QTY	PART No.	COMP REF	DESCRIPTION
1	1	E03719	-	PCB DRILLED
2	1	100124	R80	1206 470R
3	5	100125	R35.R41.R64.R65.R67	1206 10R
4	1	100126	R1	1206 22R
5	1	100127	R61	1206 47R
6	1	100128	R59	1206 1K
7	1	100129	R60	1206 2K2
8	1	100131	R70	1206 4K7
9	1	100314	R32	0805 10R
10	1	100336	R68	0603 680R
11	2	100332	R113.R114	0603 330R
12	1	100338	R45	0603 1K
13	1	100341	R69	0603 1K8
14	4	100346	R81.R82.R85.R86	0603 4K7
15	30	100350	R2.R4.R23.R27.R43.R47.R50.R54.R55.R56.R74.R75.R76.R77.R83.R84 R89.R90.R91.R95.R96.R97.R98.R99.R100.R101.R102.R103.R104.R105	0603 10K
16	2	100351	R18.R20	0603 12K
17	1	100352	R19	0603 15K
18	1	100361	R112	0603 82K
19	5	100362	R24.R25.R30.R31.R53	0603 100K
20	1	100363	R79	0603 120K
21	1	100364	R111	0603 150K
22	1	100365	R110	0603 180K
23	3	100374	R22.R26.R78	0603 1M
24	5	100381	R38.R39.R40.R52.R57	0603 51R
25	3	100385	R3.R10.R11	0603 0R
26	3	100396	R49.R51.R58	0603 2K
27	1	100397	R48	0805 5ik
28	1	100398	R42	0805 249R
29	1	100399	R44	0805 499R
30	3	100403	R28.R29.R46	0603 5K1
31	4	110102	C2.C5.C75.C85	33UF 25V ELECT
32	2	110105	C36.C38	1206 100n
33	1	110117	C76	47UF TANT
34	2	SEE NOTE 2	C101.C102	0805 220p
35	2	110139	C99.C100	0805 68p
36	1	110157	C66	4U7 TANT
37	2	110169	C6.C7	4U7 25V ELECT
38	26	110194	C9.C12.C22.C23.C24.C28.C40.C41.C43.C46.C50.C51.C53.C55.C56.C57 C58.C62.C83.C86.C88.C89.C90.C91.C95.C96	0603 1n X7R
39	4	110196	C31.C39.C47.C60	0603 10n X7R
40	19	110199	C1.C3.C4.C8.C15.C18.C21.C26.C35.C42.C48.C59.C61.C63.C67.C73.C92.C93.C94	0603 100n X7R
F1	2	110218	C13.C14	0603 39p
F2	4	110223	C10.C11.C84.C87	0603 100p
F3	3	110231	C45.C49.C52	0603 470p
F4	10	110237	C68.C69.C70.C71.C74.C78.C79.C80.C81.C82	1UF TANT
F5	1	110248	C97	100uF 35V ELECT
F6	1	120036	D12	BAS16T
F7	1	120038	ZD1	BZV49 30V
F8	1	120040	D1	LL4001G
F9	2	120043	D13.D14	BAV99
F0	4	120050	LED10.LED11.LED12.LED13	HSMG-T600
51	7	120094	D2.D3.D4.D5.D8.D9.D10	LL4448
52	2	120097	D6.D7	LL103A SHOTTKY
53	1	130028	TR16	BC848B
54	1	130029	TR14	BCW70
55	2	130033	TR12.TR13	FMMT491
56	6	130052	TR1.TR2.TR4.TR9.TR17.TR18	2N7002
57	3	130073	TR8.TR10.TR11	MMBT4401
58	1	130074	TR7	MMBT4403
59	2	130075	TR5.TR6	RFD15N06
60	1	140051	IC6	LM358
61	1	140077	IC1	NMC9346
62	1	140092	REG1	TA8L05F
63	2	140148	IC8.IC12	MMHC7402
64	1	140147	IC3	VG30F
65	1	140165	IC10	LMV393MM
66	1	140176	IC5	PD7225G
67	1	140177	IC9	NE567
68	1	140187	IC2	TJA1050
69	1	150048	VR2	10K POT
70	1	150042	VR1	1K POT
71	1	160066	XTAL1	HC49 9.830MHz
72	4	210035	S1.S2.S3.S4	SM_SWITCH
73	2	240059	L2.L3	CHOKE 680nH
74	1	E04007	IC4	PROG'D MICRO

CONVENTIONAL MOUNT COMPONENTS

ITEM	QTY	PART No.	COMP REF	DESCRIPTION
75	1	110243	C34	1n CERAMIC
76	1	110244	C37	2200UF ELECT
77	4	120053	LED5.LED6.LED7.LED8	LL-1-2-G
78	1	240016	L1	CHOKE 1mH
79	1	240065	CH1	T650
80	4	240076	L4.L5.L6.L7	CHOKE 220uH
81	1	E03728	LCD1	DIGITAL LCD
82	1	E03827	-	MASK:DEPTH IS12
83	1	E03831	-	SEAL: TERMINAL 7-WAY
84	1	E03878	-	PRTD LIGHT BLOCK DIGITAL
85	1	E03909	-	REFLECTOR CARD:DIGITAL
86	2	E03956	7.8	SPADE TERMINAL
87	2	E03995	NC.ANC	SIMNET SOCKET HEADER
88	1	E04330	-	COMPRESSION LABEL

NOTE 1 :- LINK LK1 TO CONVERT DEPTH TO COMBI
ADD PINS 9 - 13
NOTE 2 :- C101.C102 SM PLACE 100p (110118)
PIGGY-BACK WITH 220p (110126)

No	ISS	DATE	MODIFICATIONS
1668	4	16-12-02	SEE MOD SHEET 1668
1636	3	24-10-02	COMPRESSION LABEL ADDED
1557	2	24-01-02	EMC REVISION

DO NOT SCALE | IF IN DOUBT ASK

SIMRAD
A KONGSBERG Company

STAR LANE. MARGATE. KENT CT9 4NP
TEL: 0843 290290 | FAX: 0843 290471
444 843 290290

THIS DRAWING IS COMPUTER GENERATED
ANY MANUAL MODIFICATION WILL
INVALIDATE THE C.A.D. FILE

LIMITS MET + & -	LIMITS IMP + & -
0. = .50	FRAC = .015
0.0 = .25	.00 = .010
.00 = .10	.000 = .005
ANG = 0.5	ANG = 0.5

MATERIAL:

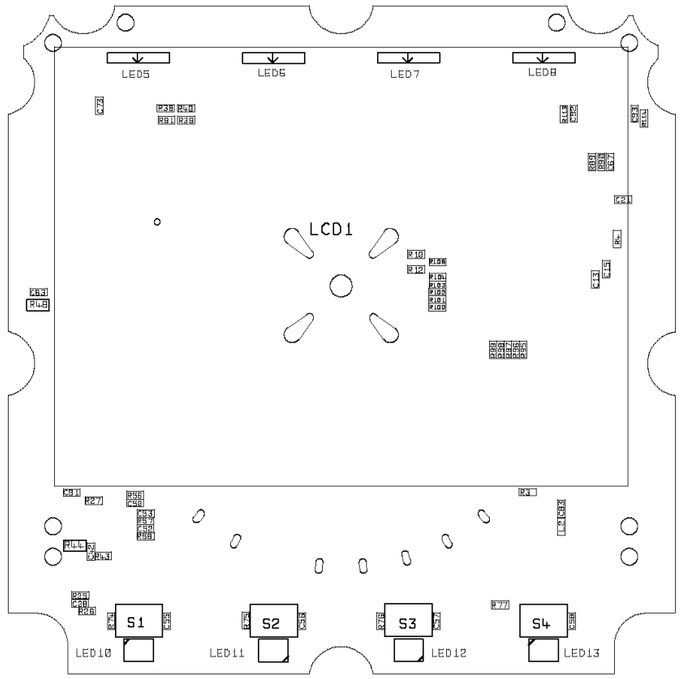
MODEL: IS12 DEPTH DISPLAY

DRAWN BY:	CHECKED:	APPROVED:
R.F.		
DATE: 05-02-01	DATE:	DATE:

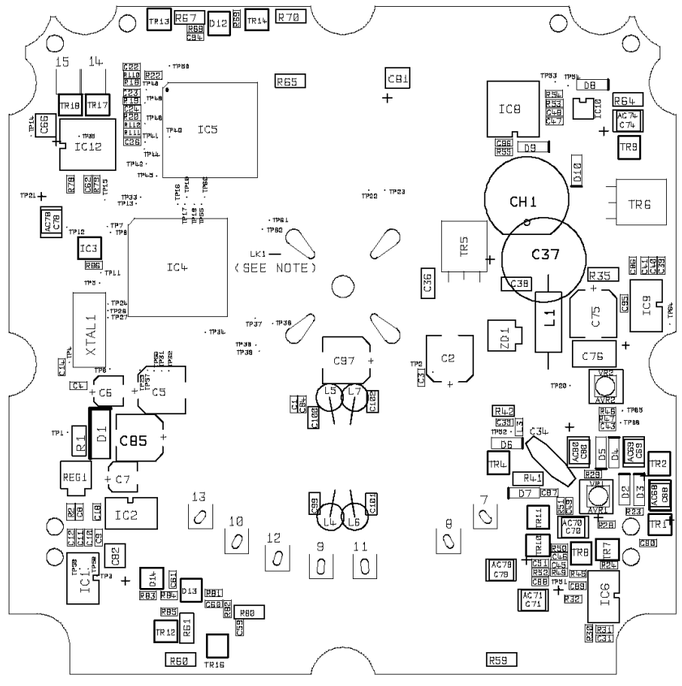
DATE: 16-12-02
SCALE:
TITLE: PCB ASSEMBLY DETAIL
DRG No: E03885
SHT 1 OF 2
ISSUE: 4

DRG No: E03886

FRONT VIEW



REAR VIEW



SURFACE MOUNT COMPONENTS - REF E04012

ITEM	QTY	PART No.	COMP REF	DESCRIPTION
1	1	E03719	-	PCB DRILLED
2	1	100124	R80	1206 470R
3	5	100125	R35.R41.R64.R65.R67	1206 10R
4	1	100126	R1	1206 22R
5	1	100127	R61	1206 47R
6	1	100128	R59	1206 1K
7	1	100129	R60	1206 2K2
8	1	100131	R70	1206 4K7
9	1	100314	R32	0805 10R
10	1	100336	R68	0603 680R
11	2	100332	R113.R114	0603 330R
12	1	100338	R45	0603 1K
13	1	100341	R69	0603 1K8
14	4	100346	R81.R82.R85.R86	0603 4K7
15	30	100350	R2.R4.R23.R27.R43.R47.R50.R54.R55.R56.R74.R75.R76.R77.R83.R84 R89.R90.R91.R95.R96.R97.R98.R99.R100.R101.R102.R103.R104.R106	0603 10K
16	2	100351	R16.R20	0603 12K
17	1	100352	R19	0603 15K
18	1	100361	R112	0603 82K
19	5	100362	R24.R25.R30.R31.R53	0603 100K
20	1	100363	R79	0603 120K
21	1	100364	R111	0603 150K
22	1	100365	R110	0603 180K
23	3	100374	R22.R26.R78	0603 1M
24	5	100381	R38.R39.R40.R52.R57	0603 51R
25	3	100385	R3.R10.R12	0603 0R
26	3	100396	R49.R51.R58	0603 2K
27	1	100397	R48	0805 51K
28	1	100398	R42	0805 249R
29	1	100399	R44	0805 499R
30	3	100403	R28.R29.R46	0603 5K1
31	4	110102	C2.C5.C75.C85	33UF 25V ELECT
32	2	110105	C36.C38	1206 100n
33	1	110117	C76	47UF TANT
34	2	SEE NOTE 2	C101.C102	0805 220p
35	2	110139	C99.C100	0805 68p
36	1	110157	C66	4U7 TANT
37	2	110169	C6.C7	4U7 25V ELECT
38	26	110194	C9.C12.C22.C23.C24.C28.C40.C41.C43.C46.C50.C51.C53.C55.C56.C57 C58.C62.C83.C86.C88.C89.C90.C91.C95.C96	0603 1n X7R
39	4	110196	C31.C39.C47.C60	0603 10n X7R
40	19	110199	C1.C3.C4.C8.C15.C18.C21.C26.C35.C42.C48.C59.C61.C63.C67.C73.C92.C93.C94	0603 100n X7R
41	2	110218	C13.C14	0603 39p
42	4	110223	C10.C11.C84.C87	0603 100p
43	3	110231	C45.C49.C52	0603 470p
44	10	110237	C68.C69.C70.C71.C74.C78.C79.C80.C81.C82	1UF TANT
45	1	110248	C97	100uF 35V ELECT
46	1	120035	D12	BAS16T
47	1	120038	ZD1	BZV49 30V
48	1	120040	D1	LL4001G
49	2	120043	D13.D14	BAV99
50	4	120058	LED10.LED11.LED12.LED13	HSMG-T600
51	7	120094	D2.D3.D4.D5.D8.D9.D10	LL4448
52	2	120097	D6.D7	LL103A SHOTTKY
53	1	130028	TR16	BC846B
54	1	130029	TR14	BCW70
55	2	130033	TR12.TR13	FMMT491
56	6	130052	TR1.TR2.TR4.TR9.TR17.TR18	2N7002
57	3	130073	TR8.TR10.TR11	MMBT4401
58	1	130074	TR7	MMBT4403
59	2	130075	TR5.TR6	RFD15N06
60	1	140051	IC6	LM358
61	1	140077	IC1	NMC9346
62	1	140092	REG1	TA78L05F
63	2	140140	IC8.IC12	MMHC7402
64	1	140147	IC3	V6300F
65	1	140165	IC10	LMV393MM
66	1	140176	IC5	PD7225G
67	1	140177	IC9	NE567
68	1	140187	IC2	TJA1050
69	1	150048	VR2	10K POT
70	1	150042	VR1	1K POT
71	1	160066	XTAL1	HC49 9.830MHz
72	4	210035	S1.S2.S3.S4	SM SWITCH
73	2	240059	L2.L3	CHOKE 680nH
74	1	E04007	IC4	PROG'D MICRO

CONVENTIONAL MOUNT COMPONENTS

ITEM	QTY	PART No.	COMP REF	DESCRIPTION
75	1	110243	C34	1n CERAMIC
76	1	110244	C37	2200UF ELECT
77	4	120053	LED5.LED6.LED7.LED8	LL-1-2-G
78	1	240016	L1	CHOKE 1mH
79	1	240065	CH1	T650
80	4	240076	L4.L5.L6.L7	CHOKE 220uH
81	1	E03680	LCD1	DIGITAL LCD
82	1	E03828	-	MASK:COMBI IS12
83	1	E03831	-	SEAL: TERMINAL 7-WAY
84	1	E03878	-	PRTD LIGHT BLOCK DIGITAL
85	1	E03909	-	REFLECTOR CARD:DIGITAL
86	7	E03958	7,8,9,10,11,12,13	SPADE TERMINAL
87	2	E03995	NC.ANC	SIMNET SOCKET HEADER
88	1	E04330	-	COMPRESSION LABEL

NOTE 1 :- LINK LK1 TO CONVERT DEPTH TO COMBI

NOTE 2 :- C101,C102 SM PLACE 100p (110118)
PIGGY-BACK WITH 220p (110126)

No	QTY	DATE	MODIFICATIONS
1668	4	17-12-02	SEE MOD SHEET 1668
1636	3	24-10-02	COMPRESSION LABEL ADDED
1557	2	24-01-02	EMC REVISION

DO NOT SCALE | IF IN DOUBT ASK

SIMRAD
A KONGSBERG Company

STAR LANE. MARGATE. KENT CT9 4NP
TEL: 0843 290290 | FAX: 0843 290471
44 843 290290

THIS DRAWING IS COMPUTER GENERATED
ANY MANUAL MODIFICATION WILL
INVALIDATE THE C.A.D. FILE

LIMITS MET + & -	LIMITS IMP + & -
0. = .50	FRAC = .015
0.0 = .25	.00 = .010
.00 = .10	.000 = .005
ANG = 0.5	ANG = 0.5

MATERIAL:

MODEL:
IS12 COMBI
DISPLAY

DRAWN BY:	CHECKED:	APPROVED:
R.F.		
DATE: 05-02-01	DATE:	DATE:

DATE: 17-12-02

SCALE:

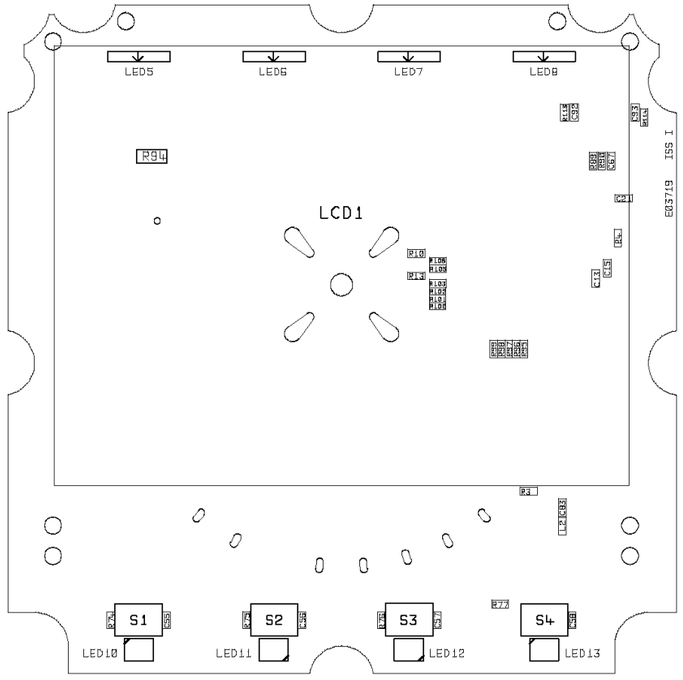
TITLE:
PCB ASSEMBLY DETAIL

DRG No: E03886
SHT 1 OF 2

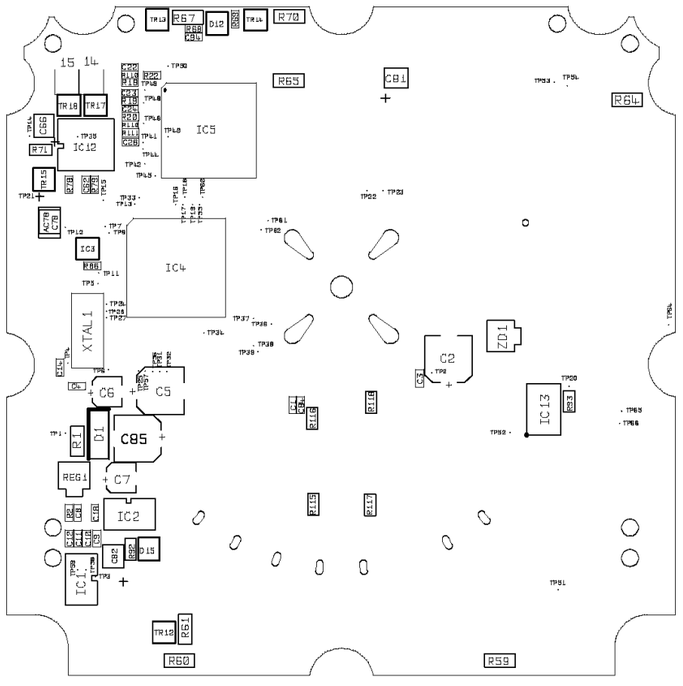
ISSUE: 4

DRG No: E04154

FRONT VIEW



REAR VIEW



SURFACE MOUNT COMPONENTS - REF E04171

ITEM	QTY	PART No.	COMP REF	DESCRIPTION
1	1	E03719	-	PCB DRILLED
2	3	100125	R64.R65.R67	1206 10R
3	1	100126	R1	1206 22R
4	1	100127	R61	1206 47R
5	1	100128	R59	1206 1K
6	1	100129	R60	1206 2K2
7	1	100131	R70	1206 4K7
8	1	100175	R92	0805 470R
9	1	100181	R71	0805 10R
10	1	100188	R93	0805 4K7
11	1	100211	R94	1206 0R
12	4	100256	R115.R116.R117.R118	0805 0R
13	1	100336	R68	0603 680R
14	2	100332	R113.R114	0603 330R
15	1	100341	R69	0603 1K8
16	1	100346	R86	0603 4K7
17	19	100350	R2.R4.R74.R75.R76.R77.R89.R90.R95.R96.R97.R98.R99.R100.R101 R102.R103.R105.R106	0603 10K
18	2	100351	R18.R20	0603 12K
19	1	100352	R19	0603 15K
20	1	100361	R112	0603 82K
21	1	100363	R79	0603 120K
22	1	100364	R111	0603 150K
23	1	100365	R110	0603 100K
24	2	100374	R22.R78	0603 1M
25	3	100385	R3.R10.R13	0603 0R
26	3	110102	C2.C5.C85	33UF ELECT
27	1	110157	C66	4U7 TANT
28	2	110169	C6.C7	4U7 25V ELECT
29	11	110194	C9.C12.C22.C23.C24.C55.C56.C57.C58.C62.C83	0603 1n X7R
30	12	110199	C1.C3.C4.C8.C15.C18.C21.C26.C67.C92.C93.C94	0603 100n X7R
31	2	110218	C13.C14	0603 39p
32	3	110223	C10.C11.C84	0603 100p
33	3	110237	C78.C81.C82	1UF TANT
34	2	120036	D12.D15	BAS16T
35	1	120038	ZD1	BZV49 30V
36	1	120040	D1	LL4001G
37	4	120058	LED10.LED11.LED12.LED13	HSMG-T600
38	1	130029	TR14	BCW70
39	2	130033	TR12.TR13	FMMT491
40	2	130052	TR17.TR18	2N7002
41	1	130053	TR15	DTA123YK
42	1	140075	IC13	PC357
43	1	140077	IC1	NMC9346
44	1	140092	REG1	TA78L05F
45	1	140140	IC12	MMHC7402
46	1	140147	IC3	V6300F
47	1	140176	IC5	PD7225G
48	1	140187	IC2	TJA1050
49	1	160066	XTAL1	HC49 8.830MHz
50	4	210035	S1.S2.S3.S4	SM_SWITCH
51	1	240059	L2	CHOKE 680nH
52	1	E04251	IC4	PROG'D MICRO

CONVENTIONAL MOUNT COMPONENTS

ITEM	QTY	PART No.	COMP REF	DESCRIPTION
53	4	120053	LED5.LED6.LED7.LED8	LL-1-2-G
54	1	E03728	LCD1	DIGITAL LCD
55	1	E04160	-	MASK:MEGA
56	1	E03831	-	SEAL: TERMINAL 7-WAY
57	1	E03878	-	PRTD LIGHT BLOCK DIGITAL
58	1	E03909	-	REFLECTOR CARD: DIGITAL
59	4	E03958	1.2.7.8	SPADE TERMINAL
60	2	E03995	NC.ANC	SIMNET SOCKET HEADER
61	1	E04330	-	COMPRESSION LABEL

DO NOT SCALE | IF IN DOUBT ASK

No	ISS	DATE	MODIFICATIONS

SIMRAD A KONGSBERG Company

STAR LANE. MARGATE. KENT CT9 4NP
TEL: 0843 290290 +44 843 290290 | FAX: 0843 290471

THIS DRAWING IS COMPUTER GENERATED ANY MANUAL MODIFICATION WILL INVALIDATE THE C.A.D. FILE

LIMITS MET + & -	LIMITS IMP + & -
0. = .50	FRAC = .015
0.0 = .25	.00 = .010
.00 = .10	.000 = .005
ANG = 0.5	ANG = 0.5

MATERIAL:

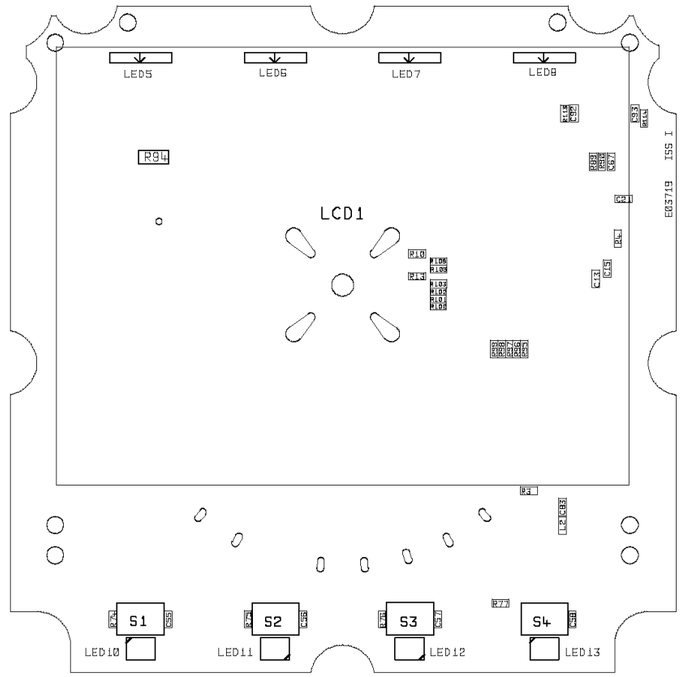
MODEL: IS12 MEGA DISPLAY

DRAWN BY:	CHECKED:	APPROVED:
R.F.		
DATE: 06-02-01	DATE:	DATE:

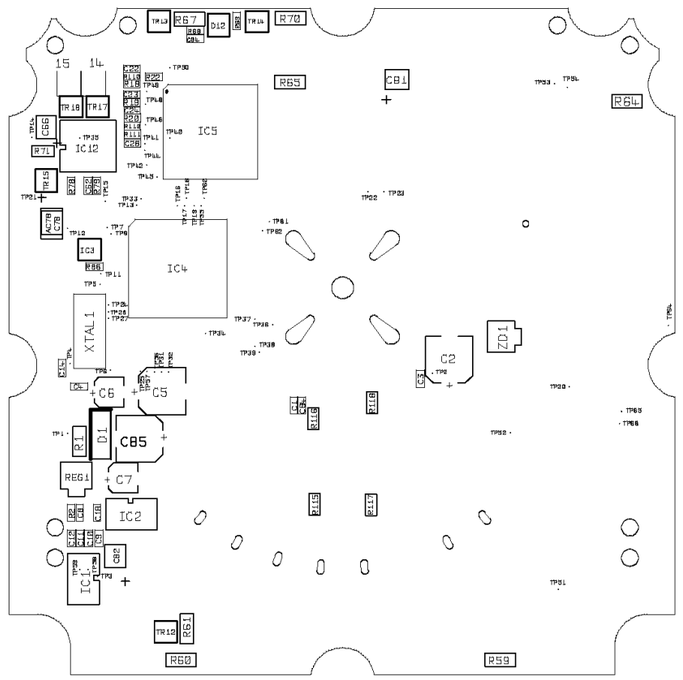
DATE:	SCALE:	TITLE:	DRG No:	ISSUE:
02-07-02		PCB ASSEMBLY DETAIL	E04154 SHT 1 OF 2	1

DRG No: E03887

FRONT VIEW



REAR VIEW



SURFACE MOUNT COMPONENTS - REF E04013

ITEM	QTY	PART No.	COMP REF	DESCRIPTION
1	1	E03719	-	PCB DRILLED
2	3	100125	R64.R65.R67	1206 10R
3	1	100126	R1	1206 22R
4	1	100127	R61	1206 47R
5	1	100128	R59	1206 1K
6	1	100129	R60	1206 2K2
7	1	100131	R70	1206 4K7
8	1	100181	R71	0805 10R
9	1	100211	R94	1206 0R
10	4	100256	R115.R116.R117.R118	0805 0R
11	1	100336	R68	0603 680R
12	2	100332	R113.R114	0603 330R
13	1	100341	R69	0603 1K8
14	1	100346	R86	0603 4K7
15	19	100350	R2.R4.R74.R75.R76.R77.R89.R90.R95.R96.R97.R98.R99.R100.R101 R102.R103.R105.R106	0603 10K
16	2	100351	R18.R20	0603 12K
17	1	100352	R19	0603 15K
18	1	100361	R112	0603 82K
19	1	100363	R79	0603 120K
20	1	100364	R111	0603 150K
21	1	100365	R110	0603 180K
22	2	100374	R22.R78	0603 1M
23	3	100385	R3.R10.R13	0603 0R
24	3	110102	C2.C5.C85	33UF ELECT
25	1	110157	C66	4U7 TANT
26	2	110169	C6.C7	4U7 25V ELECT
27	11	110194	C9.C12.C22.C23.C24.C55.C56.C57.C58.C62.C83	0603 1n X7R
28	12	110199	C1.C3.C4.C8.C15.C18.C21.C26.C67.C92.C93.C94	0603 100n X7R
29	2	110218	C13.C14	0603 39p
30	3	110223	C10.C11.C84	0603 100p
31	3	110237	C78.C81.C82	1UF TANT
32	1	120036	D12	BAS16T
33	1	120038	ZD1	BZV49 30V
34	1	120040	D1	LL4001G
35	4	120058	LED10.LED11.LED12.LED13	HSMG-T600
36	1	130029	TR14	BCW70
37	2	130033	TR12.TR13	FMMT491
38	2	130052	TR17.TR18	2N7002
39	1	130053	TR15	DTA123YK
40	1	140077	IC1	NMC9346
41	1	140092	REG1	TA78L05F
42	1	140140	IC12	MMHC7402
43	1	140147	IC3	VG300F
44	1	140176	IC5	PD7225G
45	1	140187	IC2	TJA1050
46	1	160066	XTAL1	HC49 9.830MHz
47	5	210035	S1.S2.S3.S4	SM_SWITCH
48	1	240059	L2	CHOKE 680nH
49	1	E04007	IC4	PROG'D MICRO

CONVENTIONAL MOUNT COMPONENTS

ITEM	QTY	PART No.	COMP REF	DESCRIPTION
50	4	120053	LED5.LED6.LED7.LED8	LL-1-2-G
51	1	E03680	LCD1	DIGITAL LCD
52	1	E03829	-	MASK:DATA
53	1	E03831	-	SEAL: TERMINAL 7-WAY
54	1	E03878	-	PRTD LIGHT BLOCK DIGITAL
55	1	E03909	-	REFLECTOR CARD: DIGITAL
56	2	E03958	7.8	SPADE TERMINAL
57	2	E03995	NC.ANC	SIMNET SOCKET HEADER
58	1	E04330	-	COMPRESSION LABEL

No	ISS	DATE	MODIFICATIONS
1636	3	24-10-02	COMPRESSION LABEL ADDED
1557	2	24-01-02	EMC REVISION

DO NOT SCALE | IF IN DOUBT ASK

SIMRAD A KONGSBERG Company

STAR LANE. MARGATE. KENT CT9 4NP
TEL: 0843 290290 +44 843 290290 | FAX: 0843 290471

THIS DRAWING IS COMPUTER GENERATED ANY MANUAL MODIFICATION WILL INVALIDATE THE C.A.D. FILE

LIMITS MET + & -	LIMITS IMP + & -
0. = .50	FRAC = .015
0.0 = .25	.00 = .010
.00 = .10	.000 = .005
ANG = 0.5	ANG = 0.5

MATERIAL:

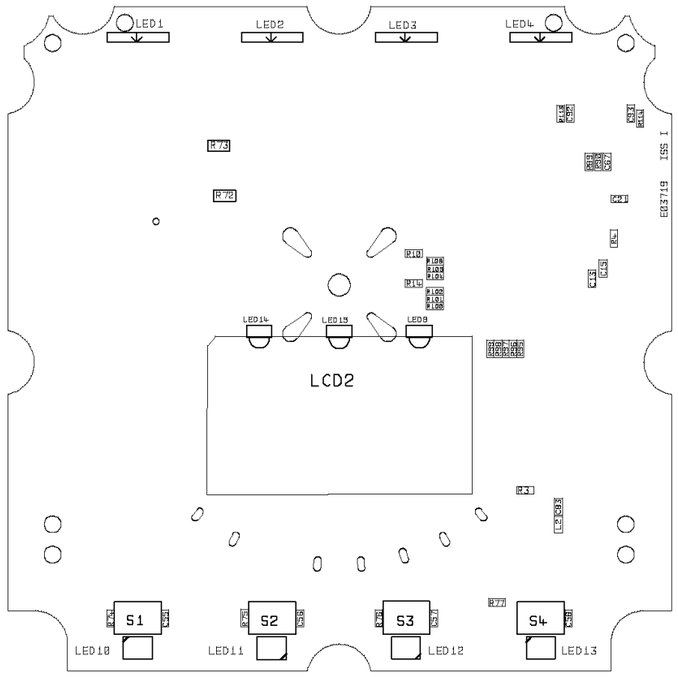
MODEL: IS12 DATA DISPLAY

DRAWN BY:	CHECKED:	APPROVED:
R.F.		
DATE: 06-02-01	DATE:	DATE:

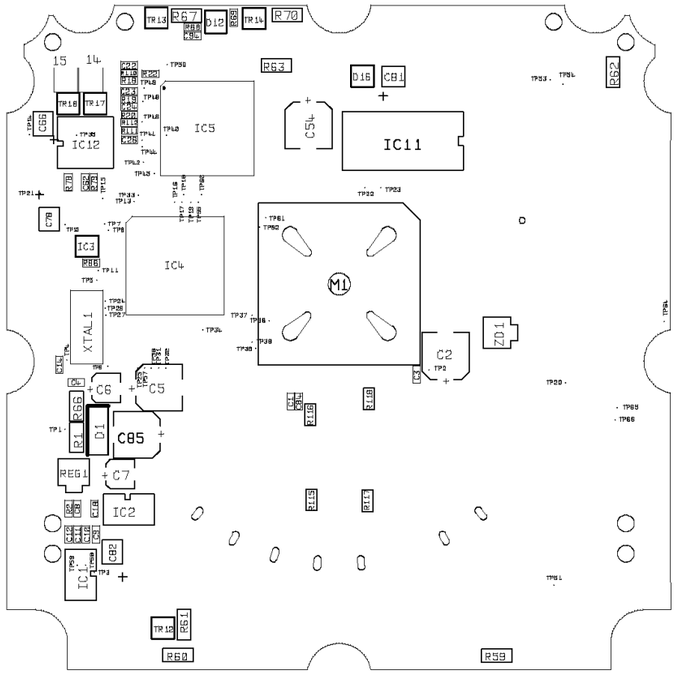
DATE:	SCALE:	TITLE:	DRG No:	ISSUE:
24-10-02		PCB ASSEMBLY DETAIL	E03887 SHT 1 OF 2	3

DRG No: E03888

FRONT VIEW



REAR VIEW



SURFACE MOUNT COMPONENTS - REF E04010

ITEM	QTY	PART No.	COMP REF	DESCRIPTION
1	1	E03719	-	PCB DRILLED
2	3	100125	R66.R67	1206 10R
3	1	100126	R1	1206 22R
4	1	100127	R61	1206 47R
5	1	100128	R59	1206 1K
6	1	100129	R60	1206 2K2
7	1	100131	R70	1206 4K7
8	4	100256	R115.R116.R117.R118	0805 0R
9	1	100257	R72.R73	0805 33R
10	2	100272	R62.R63	1206 5R
11	1	100336	R68	0603 680R
12	2	100332	R113.R114	0603 330R
13	1	100341	R69	0603 1K8
14	1	100346	R86	0603 4K7
15	19	100350	R2.R4.R74.R75.R76.R77.R89.R90.R95.R96.R97.R98.R99.R100.R101 R102.R104.R105.R106	0603 10K
16	2	100351	R18.R20	0603 12K
17	1	100352	R19	0603 15K
18	1	100361	R112	0603 82K
19	1	100363	R79	0603 120K
20	1	100364	R111	0603 150K
21	1	100365	R110	0603 180K
22	2	100374	R22.R78	0603 1M
23	3	100385	R3.R10.R14	0603 0R
24	4	110102	C2.C5.C54.C85	33UF ELECT
25	1	110157	C66	4U7 TANT
26	2	110169	C6.C7	4U7 25V ELECT
27	11	110194	C9.C12.C22.C23.C24.C55.C56.C57.C58.C62.C83	0603 1n X7R
28	12	110199	C1.C3.C4.C8.C15.C18.C21.C26.C67.C92.C93.C94	0603 100n X7R
29	2	110218	C13.C14	0603 39p
30	3	110223	C10.C11.C84	0603 100p
31	3	110237	C78.C81.C82	1UF TANT
32	1	120036	D12	BAS16T
33	1	120038	ZD1	BZV49 30V
34	1	120040	D1	LL4001G
35	1	120043	D16	BAV99
36	4	120058	LED10.LED11.LED12.LED13	HSMG-T680
37	3	120098	LED9.LED14.LED15	SM LED
38	1	130029	TR14	BCW70
39	2	130033	TR12.TR13	FMMT491
40	2	130052	TR17.TR18	2N7002
41	1	140077	IC1	NMC9346
42	1	140092	REG1	TA78L05F
43	1	140095	IC11	SA5775
44	1	140140	IC12	MMHC7402
45	1	140147	IC3	V6300F
46	1	140176	IC5	PD7225G
47	1	140187	IC2	TJA1050
48	1	160066	XTAL1	HC49 8.830MHz
49	4	210035	S1.S2.S3.S4	SM_SWITCH
50	1	240059	L2	CHOKE 680nH
51	1	E04007	IC4	PROG'D MICRO

CONVENTIONAL MOUNT COMPONENTS

ITEM	QTY	PART No.	COMP REF	DESCRIPTION
52	4	120053	LED1.LED2.LED3.LED4	LL-1-2-G
53	1	280013	M1	IK5108 SYNCHRO MOTOR
54	1	E03729	LCD2	ANALOGUE LCD
55	1	E03820	-	MASK:WIND IS12
56	1	E03831	-	SEAL: TERMINAL 7-WAY
57	1	E03879	-	PRTD LIGHT BLOCK DIGITAL
58	1	E03881	-	PAINTED LIGHT BLOCK : SMALL
59	1	E03910	-	REFLECTOR CARD: DIGITAL
60	2	E03995	NC,ANC	SIMNET SOCKET HEADER
61	1	E04330	-	COMPRESSION LABEL

No	ISS	DATE	MODIFICATIONS
3	1636	24-10-02	COMPRESSION LABEL ADDED
2	1557	24-01-02	EMC REVISION

DO NOT SCALE | IF IN DOUBT ASK

SIMRAD
A KONGSBERG Company

STAR LANE. MARGATE. KENT CT9 4NP
TEL: 0843 290290 +44 843 290290 | FAX: 0843 290471

THIS DRAWING IS COMPUTER GENERATED ANY MANUAL MODIFICATION WILL INVALIDATE THE C.A.D. FILE

MATERIAL:

MODEL: IS12 WIND DISPLAY

LIMITS MET + & -	LIMITS IMP + & -
0. = .50	FRAC = .015
0.0 = .25	.00 = .010
.00 = .10	.000 = .005
ANG = 0.5	ANG = 0.5

DRAWN BY:	CHECKED:	APPROVED:
R.F.		
DATE: 06-02-01	DATE:	DATE:

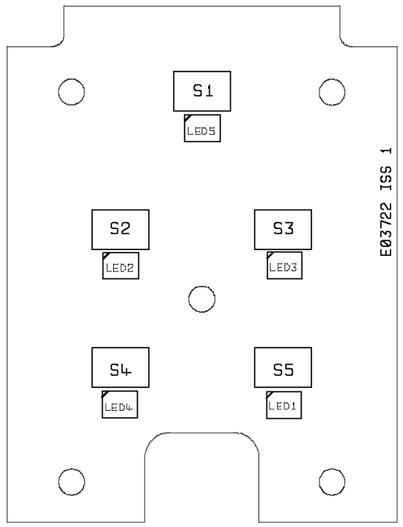
DATE: 24-10-02 | SCALE:

TITLE: PCB ASSEMBLY DETAIL

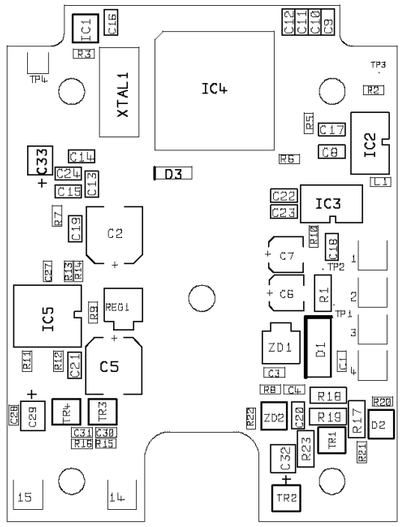
DRG No: E03888 SHT 1 OF 2 | ISSUE: 3

DRG No: E03723

FRONT VIEW



REAR VIEW



SURFACE MOUNT COMPONENTS

ITEM	QTY	PART No.	COMP REF	DESCRIPTION
1	1	E03722	-	PCB DRILLED
2	1	100124	R19	1206 470R
3	1	100126	R1	1206 22R
4	2	100127	R17,R18	1206 47R
5	1	100129	R23	1206 2K2
6	2	100332	R15,R16	0603 330R
7	1	100336	R20	0603 680R
8	1	100341	R21	0603 1K8
9	1	100346	R22	0603 4K7
10	9	100350	R2,R3,R5,R6,R7,R8,R9,R11,R12	0603 10K
11	1	100363	R14	0603 120K
12	1	100374	R13	0603 1M
13	1	100385	R10	0603 0R
14	2	110102	C2,C5	33UF ELECT
15	7	110115	C9,C12,C17,C18,C19,C20,C21	0805 1n
16	2	110118	C10,C11	0805 100p
17	2	110129	C13,C14	0805 39p
18	1	110157	C29	NR5475M10 4U7 TANT
19	2	110169	C6,C7	4U7 ELECT
20	4	110186	C8,C15,C16,C24	0805 100n
21	1	110194	C27	0603 1n
22	6	110199	C1,C3,C4 ,C28,C30,C31	0603 100n
23	2	110237	C32,C33	NRS106M10 1UF 35V TANT
24	1	120036	D2	BAS16
25	1	120038	ZD1	BZV49 30V ZENER
26	1	120040	D1	LL4001G
27	5	120058	LED1,LED2,LED3,LED4,LED5	HSMG-T600
28	1	120065	ZD2	BZX84 3V9 ZENER
29	1	120094	D3	LL4448
30	1	130029	TR2	BCW70
31	1	130033	TR1	FMMT491
32	2	130052	TR3,TR4	2N7002
33	1	140077	IC2	9346M
34	1	140092	REG1	TA78L05F
35	1	140185	IC3	TJA1050
36	1	140140	IC5	MMHC7402
37	1	140147	IC1	V6300F
38	1	160066	XTAL1	HC49-4 9.83040MHz
39	5	210035	S1,S2,S3,S4,S5	SWITCH DTSJW66N-TR
40	1	240059	L1	0603 CHOKE 680nH
41	1	E04007	IC4	M37632MFT 140178 PROG'D

NOTE:- C22,C23 NOT FITTED

DO NOT SCALE | IF IN DOUBT ASK

No	ISS	DATE	MODIFICATIONS

SIMRAD A KONGSBERG Company

STAR LANE. MARGATE. KENT CT9 4NP
TEL: 0843 290290 | 44 843 290290 FAX: 0843 290471

THIS DRAWING IS COMPUTER GENERATED
ANY MANUAL MODIFICATION WILL
INVALIDATE THE C.A.D. FILE

LIMITS MET + & -	LIMITS IMP + & -
0. = .50	FRAC = .015
0.0 = .25	.00 = .010
.00 = .10	.000 = .005
ANG = 0.5	ANG = 0.5

MATERIAL:

MODEL: IS12 HAND CONTROLLER

DRAWN BY:	CHECKED:	APPROVED:
R.F.		
DATE: 29-03-01	DATE:	DATE:

DATE: 29-01-02

SCALE:

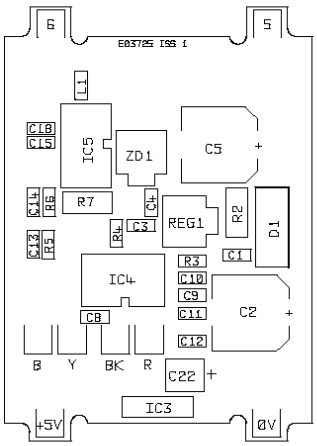
TITLE: PCB ASSEMBLY DETAIL

DRG No: E03723

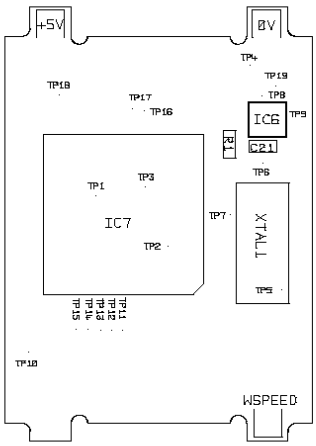
ISSUE: 1

DRG No:
E03726

FRONT VIEW



REAR VIEW



SURFACE MOUNT COMPONENTS

ITEM	QTY	PART No.	COMP REF	DESCRIPTION
1	1	E03725	-	PCB DRILLED
2	1	100126	R2	1206 22R
3	1	100174	R7	1206 120R
4	2	100346	R1,R6	0603 4K7
5	2	100350	R3,R5	0603 10K
6	1	100385	R4	0603 0R
7	2	110102	C2,C5	33UF ELECT
8	1	110154	C22	NRS106M10 1UF TANT
9	2	110194	C9,C12	0603 1n
10	7	110199	C1,C3,C4,C8,C15,C18,C21	0603 100n
11	2	110218	C13,C14	0603 39p
12	2	110223	C10,C11	0603 100p
13	1	120038	ZD1	BZV49 30V
14	1	120040	D1	LL4001G
15	1	140077	IC4	9346M
16	1	140092	REG1	TA78L05F
17	1	140147	IC6	V6300F
18	1	140187	IC5	TJA1050
19	1	160066	XTAL1	HC49-4 9.83040MHz
20	1	240059	L1	0603 CHOKE 680nH
21	1	E04007	IC7	PROG'D MICRO

NOTE:- IC3 NOT FITTED

DO NOT SCALE | IF IN DOUBT ASK

No	DRN	DATE	MODIFICATIONS

SIMRAD A KONGSBERG Company

STAR LANE. MARGATE. KENT CT9 4HP

THIS DRAWING IS COMPUTER GENERATED
ANY MANUAL MODIFICATION WILL
INVALIDATE THE C.A.D. FILE

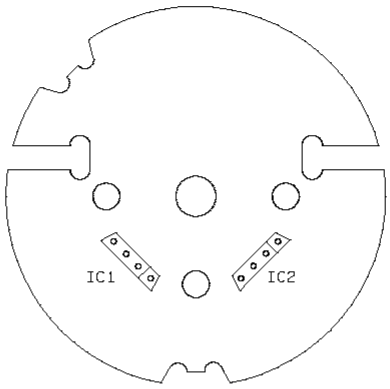
LOCITS MET	LOCITS IMP
+ & -	+ & -
0. = .500	FRAC = .015
0.0 = .25	.00 = .010
.000 = .10	.000 = .005
ANG = 0.5	ANG = 0.25

MATERIAL:

MODEL: IS12 MAST HEAD MOTHERBOARD

DRAWN BY:	CHECKED:	APPROVED:	DATE:	SCALE:	TITLE:	DRG No:	ISSUE:
R.F. 27-03-01	DATE:	DATE:	19-02-02		PCB ASSEMBLY DETAIL	E03726	1

DRG No: E03933



SURFACE MOUNT COMPONENTS

ITEM	QTY	PART No.	COMP REF	DESCRIPTION
1	1	E03932	-	PCB DRILLED
2	2	E04066	IC1.IC2	MLX90215

DO NOT SCALE | IF IN DOUBT ASK

No	ISS	DATE	MODIFICATIONS

SIMRAD Company
A KONGSBERG

STAR LANE. MARGATE. KENT CT9 4HP

THIS DRAWING IS COMPUTER GENERATED
ANY MANUAL MODIFICATION WILL
INVALIDATE THE C.A.D. FILE

LIMITS MET	LIMITS INF
± & -	± & -
0. = .50	FRAC = .015
0.5 = .25	.00 = .010
.00 = .10	.000 = .005
ANG = 0.5	ANG = 0.5

MATERIAL:

MODEL: IS12
MASTHEAD
LINEAR ANALOGUE

DRAWN BY:	CHECKED:	APPROVED:
R.F.		
DATE: 27-03-01	DATE:	DATE:

DATE: 17-04-02

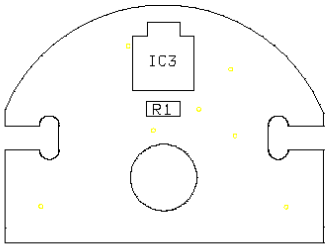
SCALE:

TITLE: PCB ASSEMBLY DETAIL

DRG No: E03933

ISSUE: 1

DRG No: E03936



SURFACE MOUNT COMPONENTS

ITEM	QTY	PART No.	COMP REF	DESCRIPTION
1	1	E03935	-	PCB DRILLED
2	1	140182	IC3	UGN-3177U

NOTE:- R1 NOT FITTED

DO NOT SCALE | IF IN DOUBT ASK

No | ISS | DATE | MODIFICATIONS

SIMRAD A KONGSBERG Company

STAR LANE. MARGATE. KENT CT9 4HP

THIS DRAWING IS COMPUTER GENERATED
ANY MANUAL MODIFICATION WILL
INVALIDATE THE C.A.D. FILE

LIMITS UNLESS STATED
± 0. = .500
0.X = .25
.00 = .10
ANG = 0.5

LIMITS IMP
± 0. =
FRAC = .015
.00 = .010
.000 = .005
ANG = 0.25

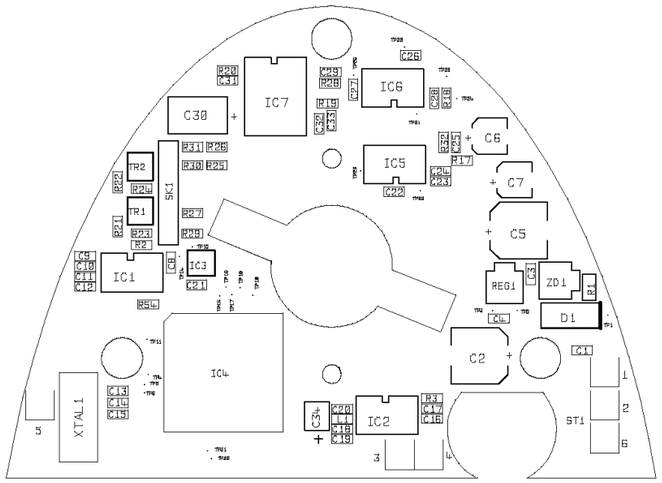
MATERIAL:

MODEL: IS12 MASTHEAD DIGITAL

DRAWN BY: R.F. DATE: 26-03-01
CHECKED: DATE:
APPROVED: DATE:
DATE: 21-01-02
SCALE:
TITLE: PCB ASSEMBLY DETAIL
DRG No: E03936
ISSUE: 1

THIRD ANGLE PROJECTION

DRG No: E03791



SURFACE MOUNT COMPONENTS

ITEM	QTY	PART No.	COMP REF	DESCRIPTION
3	1	100268	R1	0805 22R
4	3	100330	R26.R30.R31	0603 220R
5	1	100332	R25	0603 330R
6	1	100342	R19	0603 2K2
7	6	100346	R21.R22.R23.R24.R27.R29	0603 4K7
8	2	100350	R2.R54	0603 10K
9	1	100356	R17	0603 33K
10	1	100362	R18	0603 100K
11	1	100363	R32	0603 120K
12	2	100372	R20.R28	0603 680K
13	1	100385	R3	0603 0R
14	2	110102	C2.C5	33UF 25V ELECT
15	1	110104	C30	4U7 16V ELECT
16	2	110169	C6.C7	4U7 25V ELECT
17	8	110194	C9.C12.C19.C20.C22.C23.C24.C26	0603 1n X7R
18	2	110195	C27.C28	0603 4n7 X7R
19	9	110199	C1.C3.C4.C8.C15.C18.C21.C25.C29	0603 100n X7R
20	2	110218	C13.C14	0603 39p COG
21	5	110223	C10.C11.C31.C32.C33	0603 100p COG
22	1	110237	C34	1UF 35V TANT
23	1	120038	ZD1	BZV49 30V
24	1	120040	D1	LL4001G
25	2	130029	TR1.TR2	BCW70
26	1	140068	IC6	ICL7621
27	1	140069	IC5	LM393
28	1	140070	IC7	MC4052B
29	1	140077	IC1	9346M
30	1	140092	REG1	TA78L05F
31	1	140147	IC3	V6300F
32	1	140187	IC2	TJA1050
33	1	160066	XTAL1	HC49 9.83040 MHZ
34	1	240059	L1	0603 CHOKE 680nH
35	1	E04445	IC4	PROG'D MICRO

CONVENTIONAL MOUNT COMPONENTS

ITEM	QTY	PART No.	COMP REF	DESCRIPTION
1	1	E03790	-	PCB DRILLED
2	1	170078	SK1	5 WAY

NOTE:- C16.C17 NOT FITTED

DO NOT SCALE | IF IN DOUBT ASK

No	ISS	DATE	MODIFICATIONS

SIMRAD A KONGSBERG Company

STAR LANE. MARGATE. KENT CT9 4NP
TEL: 0843 289289 44 843 289289 | FAX: 0843 289471

THIS DRAWING IS COMPUTER GENERATED
ANY MANUAL MODIFICATION WILL INVALIDATE THE C.A.D. FILE

MATERIAL:

MODEL: IS12 COMPASS TRANSDUCER

LIMITS MET + & -	LIMITS IMP + & -
0. = .50	FRAC = .015
0.0 = .25	.00 = .010
.00 = .10	.000 = .005
ANG = 0.5	ANG = 0.5

DRAWN BY:	CHECKED:	APPROVED:
R.F.		
DATE: 04-01-00	DATE:	DATE:

DATE: 24-03-03 | SCALE:

TITLE: PCB ASSEMBLY DETAIL

DRG No: E03791 | ISSUE: 1

IS12 Instrument System

Section 7

Programming and Configuration

7 PROGRAMMING AND CONFIGURATION

This Service Manual only contains programming and configuration information for those features of the Instrument System which are not normally available to the end user. For details of normal programming and configuration please refer to the appropriate user manual.

IS12 Instrument System

Section 8

Fault Finding

8 FAULT FINDING

8.1 Common User Faults

None Yet Identified

8.2 Common Technical Faults

None Yet Identified

IS12 Instrument System

Section 9

Spare Parts Detail

9 SPARE PARTS DETAIL

9.1 Spares

ISPK01	SPR BEZEL AND KEYPAD : SPEED	
ISPK02	SPR BEZEL AND KEYPAD : DEPTH	
ISPK03	SPR BEZEL AND KEYPAD : WIND	
ISPK04	SPR BEZEL AND KEYPAD : COMBI	
ISPK05	SPR BEZEL AND KEYPAD : DATA	
ISPK06	SPR BEZEL AND KEYPAD : COMPASS	
ISPK07	SPR BEZEL AND KEYPAD : MEGA	
ISPK08	SPR MASTHEAD UNIT VANE ASSEMBLY	
ISPK09	SPR MASTHEAD UNIT ANEMOMETER ASSEMBLY	
ISPK10	SPR REMOTE CONTROL DASH CLIP	
ISPK11	SPR INSTRUMENT COVER : PIC	(Qty 5 items per pack)
ISPK12	SPR INSTRUMENT BEZEL : SQUARE	(Qty 5 items per pack)
ISPK13	SPR CASE FRONT ASSEMBLY	
ISPK14	SPR KEYPAD SPEED	(Qty 5 items per pack)
ISPK15	SPR KEYPAD DEPTH	(Qty 5 items per pack)
ISPK16	SPR KEYPAD WIND	(Qty 5 items per pack)
ISPK17	SPR KEYPAD COMBI	(Qty 5 items per pack)
ISPK18	SPR KEYPAD DATA	(Qty 5 items per pack)
ISPK19	SPR KEYPAD COMPASS	(Qty 5 items per pack)
ISPK20	SPR KEYPAD MEGA	(Qty 5 items per pack)
ISPK21	SPR ASSEMBLY CASE BACK	
ISPK22	SPR REAR LABEL : SPEED	(Restricted availability)
ISPK23	SPR REAR LABEL : DEPTH	(Restricted availability)
ISPK24	SPR REAR LABEL : COMBI	(Restricted availability)
ISPK25	SPR REAR LABEL : DATA	(Restricted availability)
ISPK26	SPR REAR LABEL : COMPASS	(Restricted availability)
ISPK27	SPR REAR LABEL : MEGA	(Restricted availability)
ISPK28	SPR PCB ASSEMBLY : SPEED	
ISPK29	SPR PCB ASSEMBLY : DEPTH	
ISPK30	SPR PCB ASSEMBLY : WIND	
ISPK31	SPR PCB ASSEMBLY : COMBI	
ISPK32	SPR PCB ASSEMBLY : DATA	
ISPK33	SPR PCB ASSEMBLY : COMPASS	
ISPK34	SPR PCB ASSEMBLY : MEGA	
ISPK35	SPR MASTHEAD POLE ASSEMBLY	
ISPK36	SPR MOUNTING BRACKET : MHU	
ISPK37	SPR ASSEMBLY : TOP CAP MASTHEAD	
ISPK38	SPR ASSEMBLY : PCBs MASTHEAD	

9.2 Accessories

IS12TS	SPARE SPEED TRANSDUCER
STP	NETWORK TERMINATOR
IS12TD	SPARE DEPTH TRANSDUCER

IS12 Instrument System

Section 10

Technical Notes

10 TECHNICAL NOTES

None yet issued.