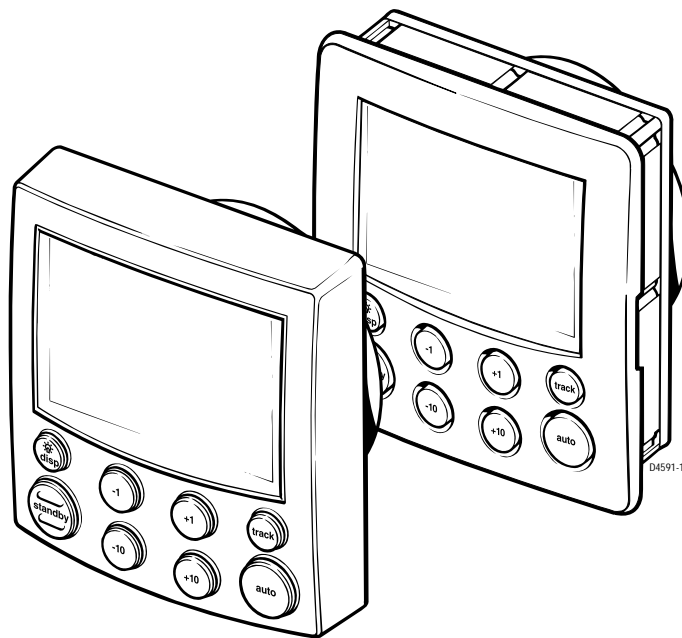


ST6000 Plus Autopilot Control Head Service Manual

Z299, Standard Control Head (dark grey)

A12022, Standard Control Head (light grey)

E12025, Flush Mount Control Head (light grey)



Warning

CE Marking of Equipment/Replacement Parts

If the Raytheon equipment under repair, test, calibration, installation or setting to work carries the European CE mark, only parts and components supplied or approved for such use by Raytheon should be used in order to maintain compliance with the relevant CE requirements.

Incorporation, use or attachment, by any means, of parts or components not supplied for or not approved for such use by Raytheon or, if supplied or approved for use by Raytheon, not properly fitted in accordance with instructions published, provided or recommended by Raytheon, may cause the equipment to malfunction and, in particular, to become unsafe or to no longer meet the relevant CE requirements. In these circumstances, Raytheon Marine Europe Ltd excludes liability to the fullest extent permissible in law for any loss or damage including any liability for its contribution to such loss or damage by its negligent acts or omissions.

Chapter 1. Disassembly/Assembly

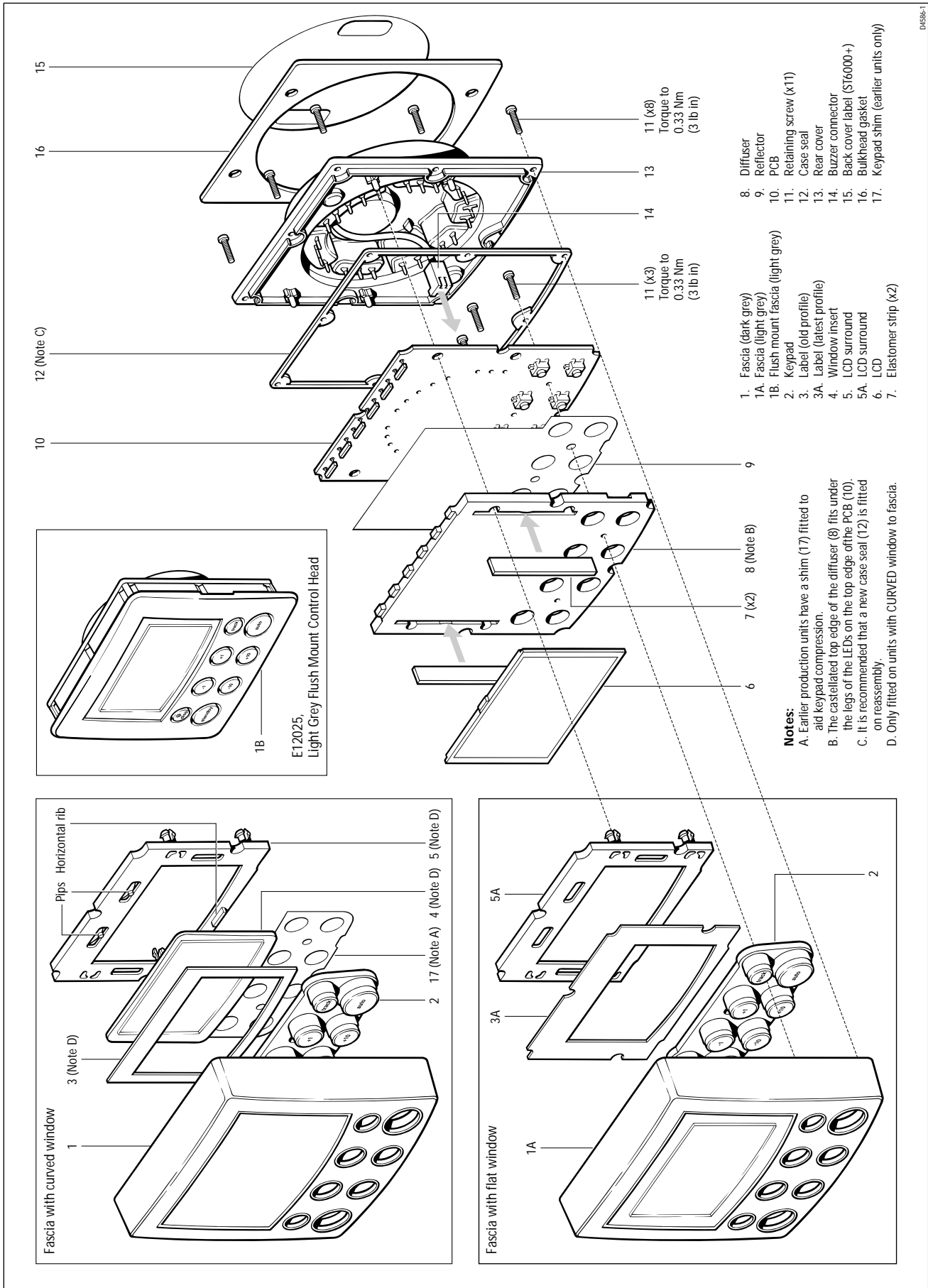


Figure 1: ST6000 Plus Autopilot Control Head exploded view

1.1 ST6000 Plus Autopilot Control Head spare parts list

The **item** numbers refer to

Figure 1: ST6000 Plus Autopilot Control Head exploded view

Item	Spare/Accessory Description	Part No.	Comments
1	Fascia, dark grey (standard mount)	W115	Z299 only
	Fascia, light grey (standard mount) kit, <i>including</i>	A18018	A12022 only
1A	Fascia, light grey (standard mount)		
3A	Label (latest profile)		
5A	LCD surround		
1B	Flush mount fascia, light grey	A18030	E12025 only
2	Keypad	Q219	
	Display kit, <i>including</i>	Q220	To be obsolete when stocks are used up.
3	Label (4000+, 5000+ and 6000+)		Old profile. Curved window only.
4	Window insert		
5A	LCD surround		
6	LCD		
7	Elastomer (x2)		
	Universal Display kit, <i>including</i>	A18012	
3	Label, (4000+, 5000+ and 6000+)		Old profile. Curved window only.
3A	Label, (4000+, 5000+ and 6000+)		Latest profile. Flat window only.
4	Window insert		
5A	LCD surround		
6	LCD		
7	Elastomer (x2)		
	Diffuser kit, <i>including</i>	W117	
8	Diffuser		
9	Reflector		
10	PCB	Q222	
	Fixing kit, <i>including</i>	W120	
11	Screw (x11)		
12	Case seal	W118	
	Back cover assembly, <i>including</i>	W119	
13	Back cover		<i>Comes fitted with,</i> Gortex filter, Sleeving, Buzzer & Buzzer connector
14			
15	Back cover label (selection)		Fit ST6000+ label
16	Bulkhead gasket	W125	
	Sun cover (standard mount)	D340	Not illustrated
	Sun cover (flush mount)	A25005	Not illustrated

Note: It is recommended that a new case seal (12) is fitted on reassembly.

Fascia replacement

Dark Grey Fascia (there is no printing on this fascia) - use spare no. W115. This is a straight replacement where spare consists of the fascia only.

Light Grey Fascia with CURVED window (these units will have a clear ‘window insert’ (Item 4) fitted between the LCD surround (Item 5) and the Fascia window) - use spare no. A18018.

This spare consists of a flat window fascia (Item 1A), latest LCD surround (Item 5A) and a set of latest labels (Item 3A).

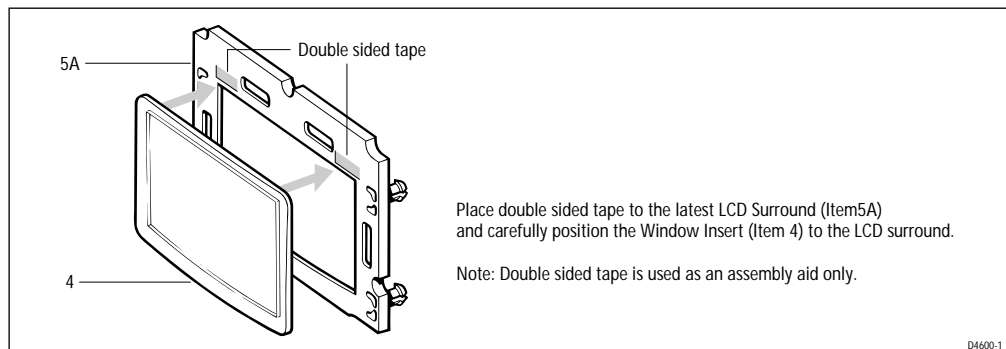
Discard the window insert (Item 4) and label (Item3) fitted. Select the appropriate label (ST4000+, ST5000+ or ST6000+)

If the LCD surround fitted has two ‘pips’ and a horizontal rib (Item 5), replace with the latest LCD surround (Item 5A) supplied.

Light Grey Fascia with FLAT window (these units will NOT have a clear ‘insert’ fitted) - use spare no. A18018. Fit fascia only.

Flush Light Grey Fascia - use spare no. A18030. This is a straight replacement; the spare consists of the fascia only.

LCD Surround replacement for fascias with curved windows



Chapter 2. PCB details

2.1 Input/Output signals

(refer to Figure 2. ST6000 Plus Autopilot Control Head circuit diagram)

Pin No.	Signal	Description
PL1/1	+12V	Nominal 12V dc
PL1/2	0V in	0V
PL1/3	SeaTalk	Intermittent streams of (nominal) 12V pulses
PL2/1	+12V	Nominal 12V dc
PL2/2	0V in	0V
PL2/3	SeaTalk	Intermittent streams of (nominal) 12V pulses
NMEA in+	NMEA+	Intermittent streams of (nominal) 12V pulses
NMEA in-	NMEA-	0V

Circuit diagram

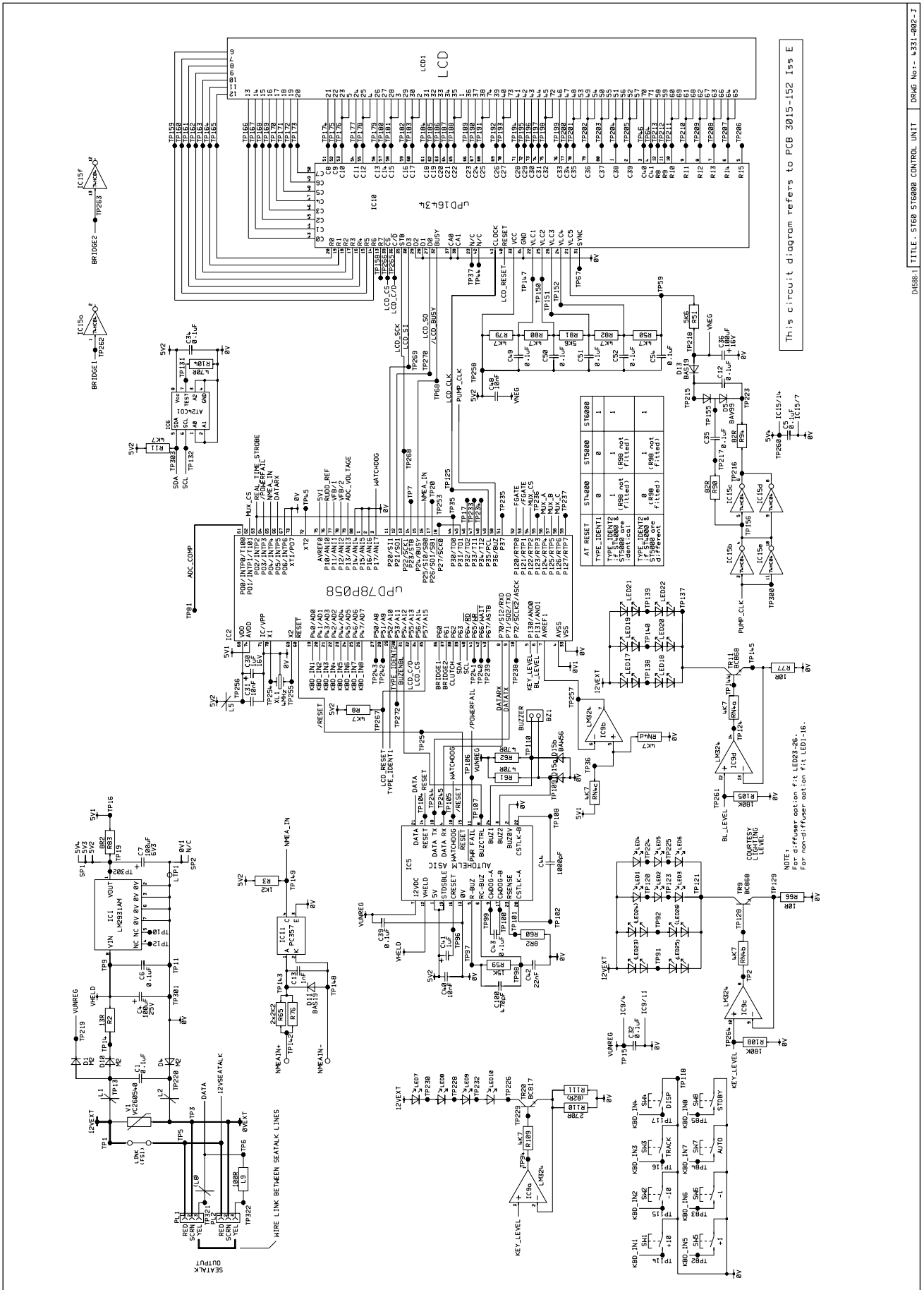


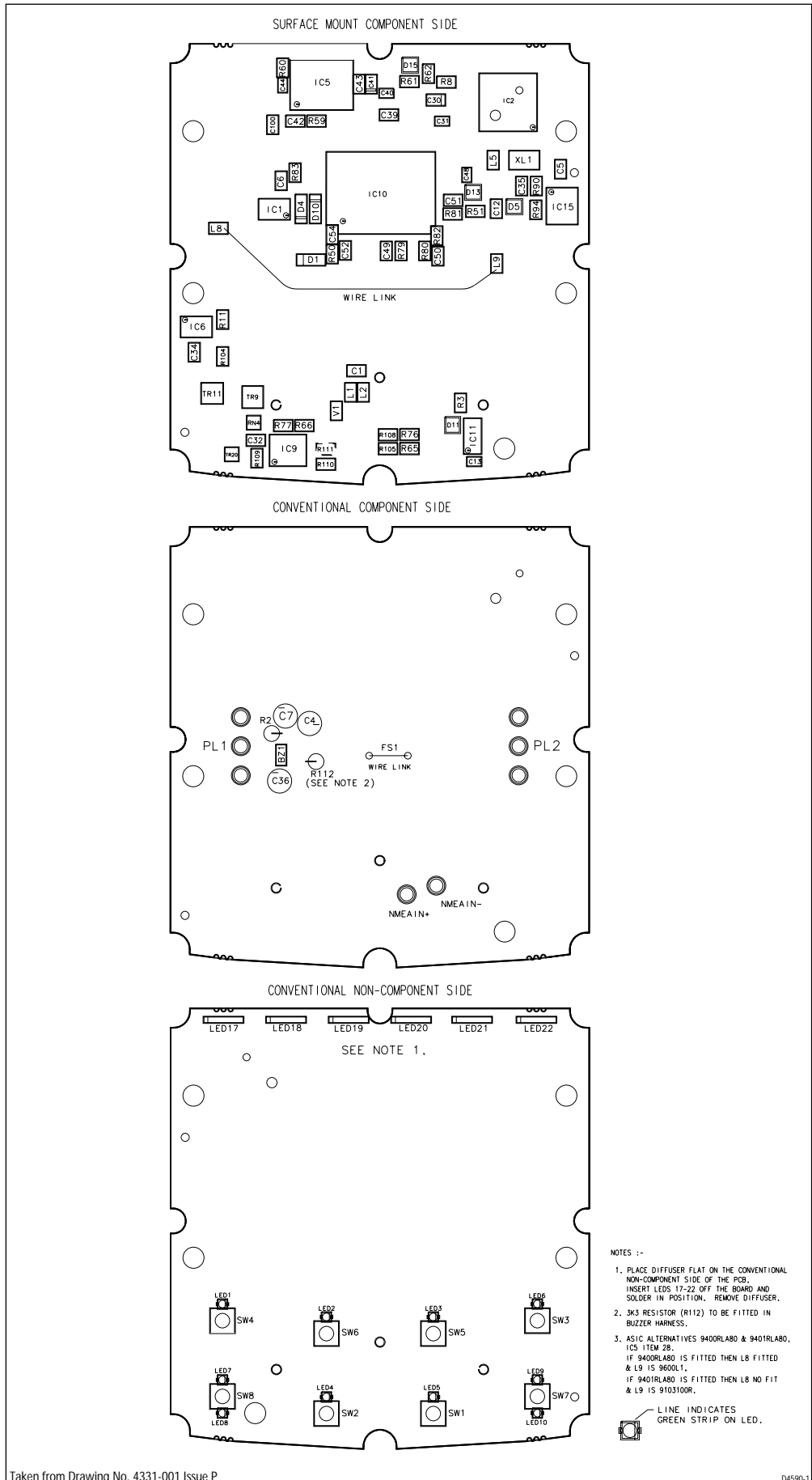
Figure 2. ST6000 Plus Autopilot Control Head circuit diagram

Z299, A12022, E12025

DA5881 TITLE: ST6000 PLUS CONTROL UNIT DRAW No: 4-331-982-7

2.2 PCB Layout

Z299, A12022, E12025



Taken from Drawing No. 4331-001 Issue P

D4590-1

Component List

SURFACE MOUNT COMPONENT SIDE

9600L1	3	SOLID CHIP INDUCTOR	L1,2,5,(8)
9600RES4M0	1	RESONATOR 4MHz	XL1
9108VC260540	1	VARISTOR VC260540	V1
940074HC04	1	IC HEX INVERTING BUFFER 74HC04	IC15
9400PC317	1	IC OPTO ISOLATOR PC357 S016	IC11
940016434	1	IC LCD DRIVER μ PD16434	IC10
9400LM324	1	IC QUAD OPAMP LM324	IC9
940024C01A	1	IC CMOS EEPROM AT24C01	IC6
		ASIC ALTERNATIVES - FIT EITHER	SEE NOTE 3.
9400RLA80	0	IC RAYTHEON ASIC	
		OR	
9401RLA80	1	IC RAYTHEON ASIC	IC5
		AND	
9103100R	1	RESISTOR WCR 1206 100R 1% 0.125W	L9
940078P058	1	IC MICROPROCESSOR μ PD78P058 80PIN QFP	IC2
9400LM2931AM	1	IC REGULATOR LM2931AM 5V S08	IC1
9501BC868	2	TRANSISTOR SOT89 BC868 NPN	TR9,11
9500BC817	1	TRANSISTOR SOT23 BC817 NPN	TR20
930522N	1	CAPACITOR X7R 22nF 5% 50V 1206	C42
93041000P	2	CAPACITOR X7R 1000pF 10% 50V 0805	C13,44
93091U	2	CAPACITOR TANT 1 μ F 10% 16V TANTA	C30,41
93040U01	3	CAPACITOR X7R 0.01 μ F 10% 50V 0805	C31,40,48
93070U1	14	CAPACITOR X7R 0.1 μ F 20% 50V 1206	C1,5,6,12,32,34,35,39,43,49-52,54
9317470P	1	CAPACITOR COG 470pF 20% 50V 1206	C100
9200M2SYM	3	DIODE M2-SYM 10A 100V	D1,4,10
9200BAV99	1	DIODE BAV99 SOT23	D5
9200BAS19	2	DIODE BAS19 SOT23	D11,13
9200BAW56	1	DIODE BAW56 SOT23	D15
91124K7	1	RESISTOR NETWORK 4K7	RN4
9103270R	1	RESISTOR WCR 1206 270R 1% 0.125W	R110
91035K6	2	RESISTOR WCR 1206 5K6 1% 0.125W	R51,81
9103180K	2	RESISTOR WCR 1206 180K 1% 0.125W	R105,108
91031K2	1	RESISTOR WCR 1206 1K2 1% 0.125W	R3
9106470R	3	RESISTOR WCR 1206 470R 5% 0.125W	R61,62,104
91062K2	2	RESISTOR WCR 1206 2K2 5% 0.125W	R65,76
910310R	2	RESISTOR WCR 1206 10R 1% 0.125W	R66,77
910315K	1	RESISTOR WCR 1206 15K 1% 0.125W	R59
910382R	3	RESISTOR WCR 1206 82R 1% 0.125W	R90,94,(111)
91064K7	7	RESISTOR WCR 1206 4K7 5% 0.125W	R8,11,50,79,80,82,109
91068R2	2	RESISTOR WCR 1206 8R2 5% 0.125W	R60,83
3015-152	1	PCB ST60 ST4/5/6000 CONTROL UNIT + AUTOPILOT	

CONVENTIONAL COMPONENT SIDE

01229	1	RESISTOR 3K3 5% 1/8W	SEE NOTE 2. R112
3030-035-B	8	SOLDER BUCKETS	PL1,2,NMEA1N+,NMEA1N-
07266	1	HEADER MOLEX 2WAY	BZ1
03062	1	CAPACITOR ELEC 100 μ F 6V3 20%	C7
03074	1	CAPACITOR ELEC 100 μ F 16V 20%	C36
03100	1	CAPACITOR ELEC LOW IMP 100 μ F 25V 20%	C4
01183	1	RESISTOR 13R 5% 0.4W SFR25	R2

CONVENTIONAL NON-COMPONENT SIDE

XXXXX	1	WIRE LINK	FS1
02076	4	LED HLMPQ102	LED7-10
15165	6	LED 202	LED17-22
02050	6	LED HLMP6505	LED1-6
06030	8	SWITCHES ALPMIN	SW1-8

Taken from Drawing No: 4331-001 Issue: P

D4589-1

Z299, A12022, E12025

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