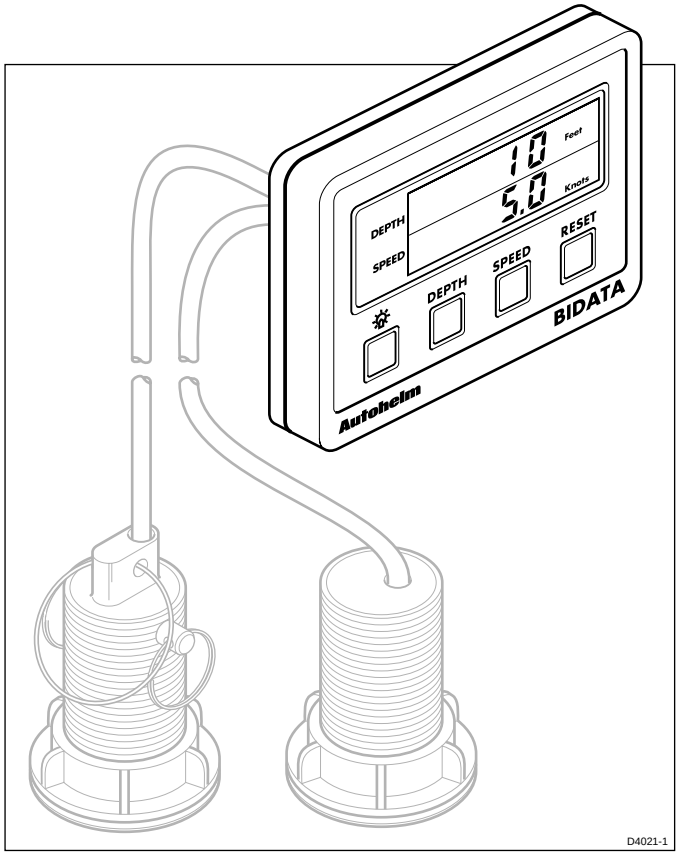

Z171, ST30 Bidata Service Manual

Warning

CE Marking of Equipment/Replacement Parts

If the Autohelm 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 Autohelm 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 Autohelm or, if supplied or approved for use by Autohelm, not properly fitted in accordance with instructions published, provided or recommended by Autohelm, 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. Special Functions

Special functions available on the ST30 Bidata are:

1. Calibration lock/unlock
2. Boatshow mode
3. Damping

For security reasons, extended calibration features are selected by an extended hold (14 seconds) of ☼ and DEPTH until CAL is displayed for the second time, followed by momentary depression of both the SPEED and RESET keys.

To cycle the features, press the DEPTH key until the required option is displayed.

1.1 Calibration Lock/Unlock

Calibration lock/unlock eliminates the risk of accidentally changing all but the extended calibration values.

This feature is particularly useful for operators of charter boats who spend a great deal of time tuning the pilot to the vessel, only to find a customer alters the settings at a later date.

This feature is displayed as C1 or C0.

C1 = unlocked (normal access)

C0 = calibration is locked (no access).

The mode is changed by pressing the RESET key.

Calibration lock/unlock is stored by pressing ☼ and DEPTH for 2 seconds.

1.2 Boatshow Mode

Boatshow mode (S0 = disabled, S1 = enabled) is a demonstration programme to show the features of the instrument.

The mode is changed by pressing RESET.

Note: Boatshow Mode automatically resets to normal mode if a transducer is connected directly to the instrument or if the instrument is powered down. However, boatshow mode can be stored by:

1. Setting the instrument to repeater mode
2. Selecting Boatshow Mode
3. Exiting from repeater mode

1.3 Damping

Damping controls the sensitivity to speed and depth changes detected by the transducer. The damping range is from 1 to 15; the factory setting is 04.

To change the damping factor, press RESET or ☼, as required to obtain the desired setting.

Damping is stored by pressing ☼ and DEPTH for 2 seconds.

ZAZ1

Chapter 2. Dismantle/Assembly

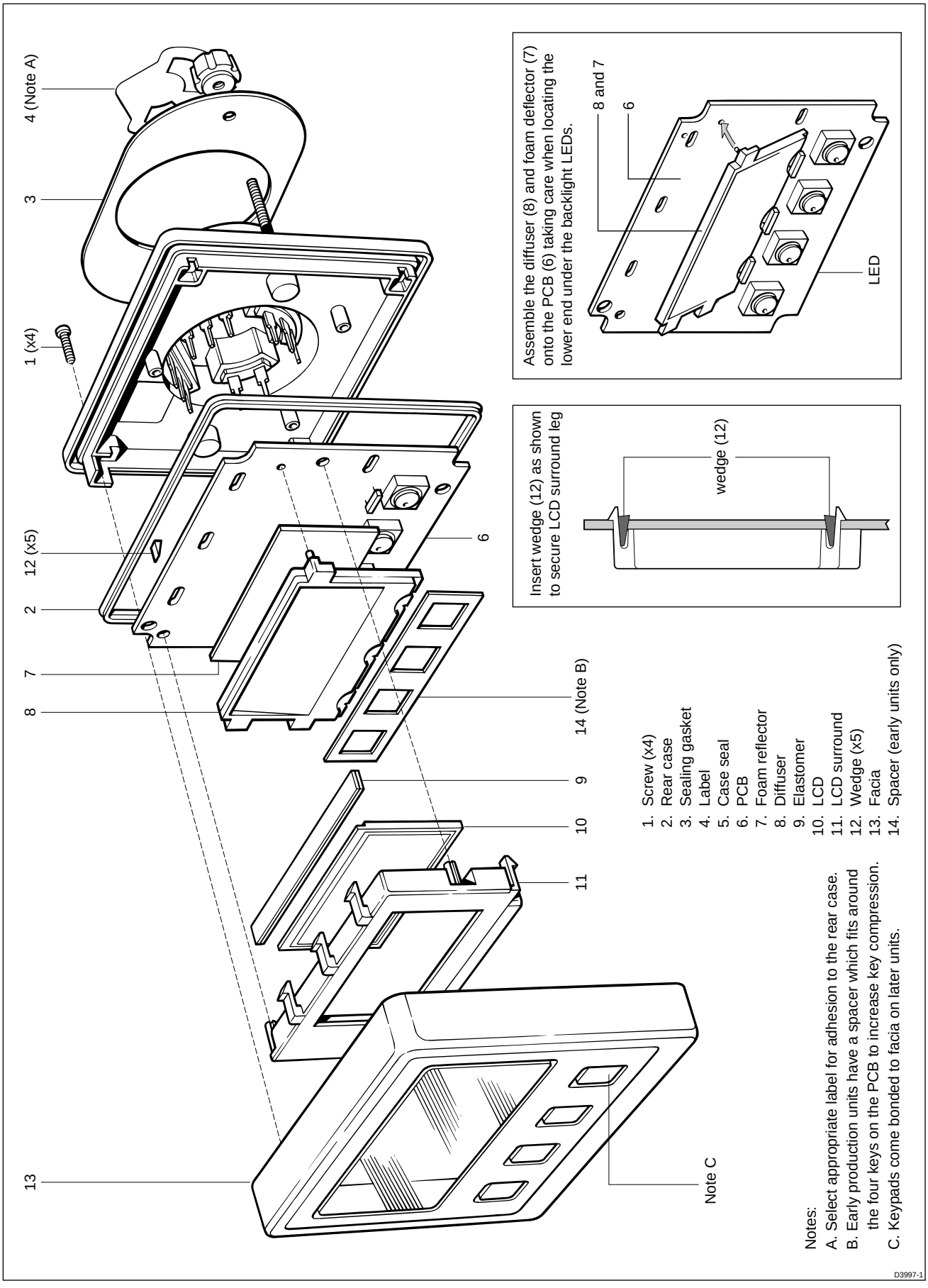

Figure 1: ST30 Bidata display unit

2.1 Spare Parts List

ST30 Bidata display unit

The **item** numbers refer to Figure 1: ST30 Bidata display unit.

Item	Spare Description	Part No.	Comments
	Rear case assembly, *including*	W005	
2	Rear case		
3	Sealing gasket		Affixed to rear case
4	Labels (selection)		Fit appropriate label
3	Sealing gasket	Q084	Pack of 5
3	Sealing gasket	W043	Pack of 10
5	Case seal	Q080	Pack of 5
	PCB assembly, *including*	Q077	
6	PCB		
7	Foam reflector		Also part of Q078
8	Diffuser		Also part of Q078
	Digital LCD kit, *including*	Q078	
7	Foam reflector		Also part of Q077
8	Diffuser		Also part of Q077
9	Elastomer		
10	LCD		
11	LCD surround		
12	Locking wedge (x5)		
13	Facia	W008	Keypads bonded to facia
	Female spade connector kit	Q085	Not illustrated

Chapter 3. PCB Details

3.1 PCB Setting

The ST30 Bidata and Depth instrument PCBs are the same. Therefore, it is necessary to ensure that the PCB is correctly set after fitting to a unit.

1. Connect the instrument to a 12 volt power supply
2. Observe the display. If the PCB is correctly set the display will show speed and depth information
3. If the display shows unintelligible information the PCB is set for use as a depth instrument.

Note: The PCB can be reset as a depth unit as follows.

1. Turn the power supply to the instrument off
2. Press and hold down all four keys
3. Turn the power supply on and observe the display
4. Depth and speed only information should now be displayed.

3.2 Input/Output Signals (refer to Figure 2 Circuit Diagram)

Wire colour	Circuit diagram reference	Description
Red	P1/P2	+12V nominal dc supply
Yellow	P3/P4	SeaTalk data. Intermittent streams of +12V (nominal) pulses.
Screen	P5/P6	0V supply and signal return
Red	P7	Speed transducer supply. 12V dc nominal.
Green	P8	Speed transducer – Log signal
Screen	P9	Speed transducer, 0V
Red	P10	Depth +, echoes from transducer
Black	P11	Depth, 0V

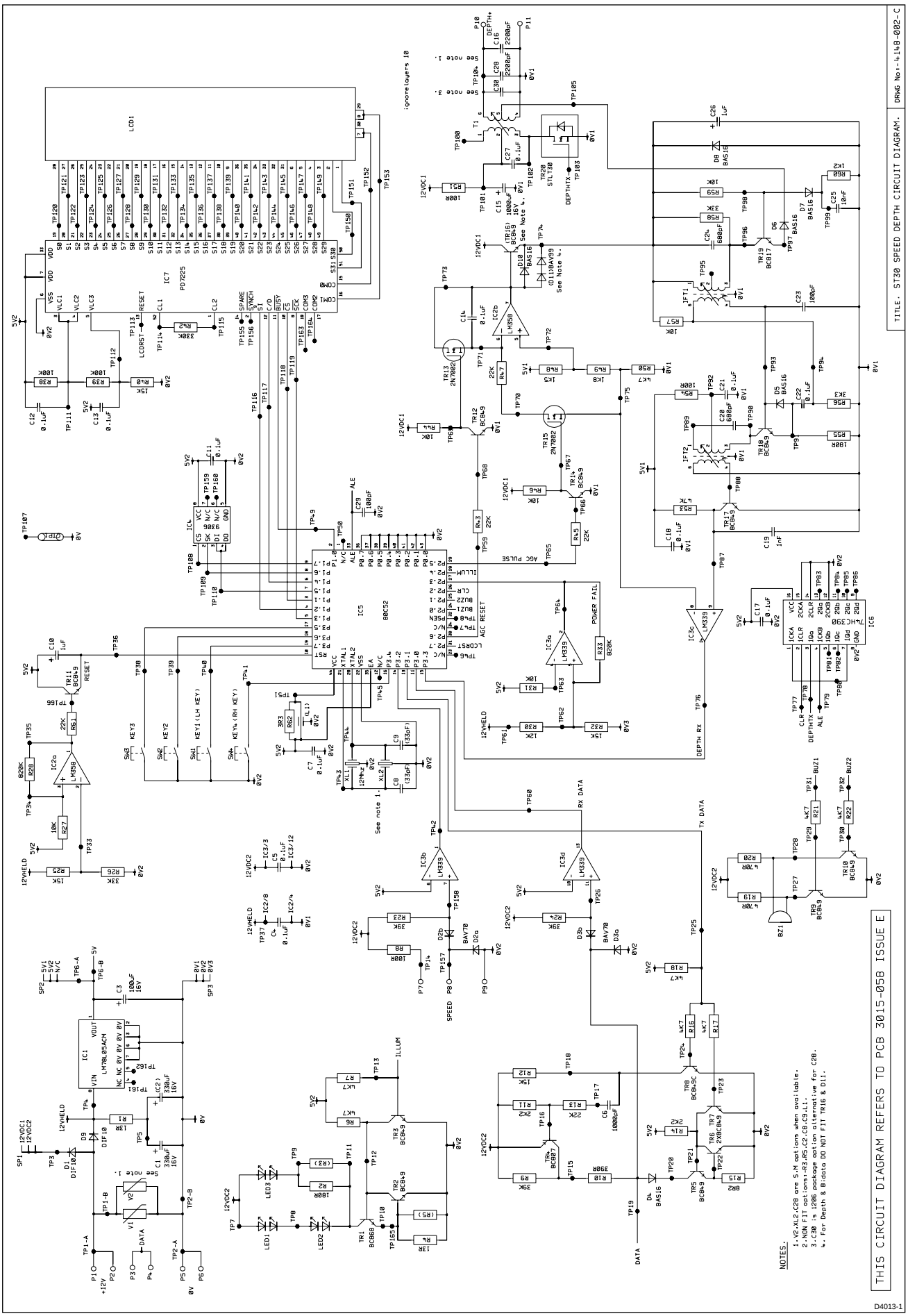

Figure 2: Circuit diagram

ZL71

3.3 PCB Layout

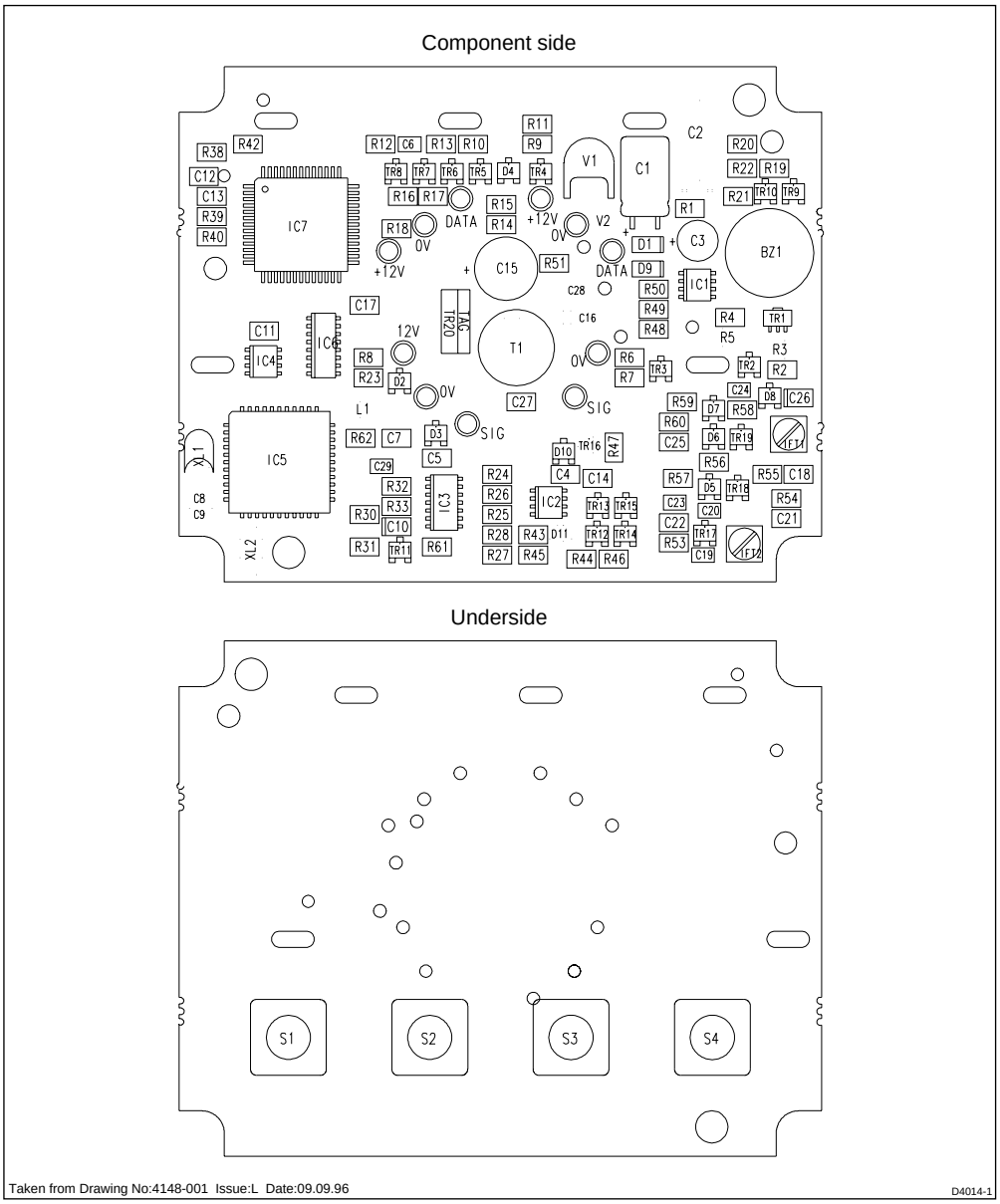

Figure 3: PCB component layout

Component side

3015-058	PCB	
3030-035	SOLDER SOCKET	P1,2,3,4,5,6,7,8,9,10,11
01051	VARISTOR TYPE GE V22ZA1	V1
9602001	TRANSIENT VOLTAGE SURPRESSOR - (AVX VC1206-180 400)	(V2)
9600001	SURPRESSION FILTER EMI THO°-LINE (EMFIL) NFM41R10C223	(L1)
15156	CRYSTAL XTAL 12.0 MHz	(XL2)
03083	CAPACITOR CERAMIC DISC 1KV 2200pF ø10%	(C16)
03065	CAPACITOR RADIAL ELECTROLYTIC 100uF +80%/-20% 16V	C3
03066	CAPACITOR RADIAL ELECTROLYIC 1000uF +80%/-20% 16V	C15
15133	INTERMEDIATE FREQUENCY TRANSFORMER 5PLC-2086A TOKO	IFT1,IFT2
15134	INVERTER TRANSFORNER 12VXA016 TOKO	T1
9200BAS16	DIODE SOT23 BAS16	D4,5,6,7,8,10
9319222M	CAPACITOR X7R 2200pF ø20% 1KV (GR530-X7R-222M-1KV)	(C28)
930133P	CAPACITOR COG 0805 33pF 5% 50V[AVX-0805-5A-330-JN3-TR]	(C8,9)
9301680P	CAPACITOR COG 0805 680pF 5% 50V[AVX-0805-5A-681-JN3-TR]	C20,24
9302100P	CAPACITOR COG 0805 100pF 10% 50V[AVX-0805-5A-101-KN3-TR]	C23,29
9307U01	CAPACITOR X7R 1206 0,01uF 20%50V[AVX-1206-5C-103-MN3-TR]	C25
93041000P	CAPACITOR X7R 0805 1000pF 10% 50V[AVX-0805-5C-102-KN3-TR]	C6,19
93070U1	CAPACITOR X7R 1206 0,1uF 20% 50V[AVX-1206-5C-104-MN3-TR]	C4,5,7,11,12,13,14,17,18,21,22,27
93091U	CAPACITOR TAN 293D 1uF10% 16V SIZE A[SPRAGUE 293D-105-X9-01]	C10,26
940093061	EEPROM 16x16 M93061M1	IC4
9400LM358	DUAL OP AMP LM358M NAT SEMI	IC2
9500BC807	TRANSISTOR SOT23 BC807 PNP	TR4
9501BC868	TRANSISTOR SOT BC868 NPN	TR1
9500BC849C	TRANSISTOR SOT23 BC849C NPN	TR2,3,5,6,7,8,9,10,11,12,14,(16),17,18
9405S80C52	MICRO MASK 80C52 ST30 VERSION 4	IC5
15166	RESONATOR 12 MHz MURATA CST 12.0 MTW	XL1
9400LM78L05	VOLTAGE REGULATOR LM78L05ACM	IC1
94077225G	LCD DISPLAY DRIVER 7225G-00(NEC)	IC7
9400LM339	QUAD OP AMP	IC3
940074HC390	DUAL BCD COUNTER MM 74HC390M NATIONAL SEMICONDUCTOR	IC6
95002N7002	FET 2N7002	TR13,15
05038	FET STLT30 60V 25A	TR20
9200BAV99	DIODE SOT23 BAV99	(D11)
9204DIF10	DIODE D1F10	D1,9
9200BAV70	DIODE DUAL BAV70	D2,D3
03068	CAPACITOR RADIAL ELECTROLYTIC 330uF +80%/-20%	C1,(2)
9500BC817	TRANSISTOR SOT23 BC817 NPN	TR19
910313R	RESISTOR WCR 1206 13R 1% 0.125W	R1,R4
9103100R	RESISTOR WCR 1206 100R 1% 0.125W	R8,51,54
91062K2	RESISTOR WCR 1206 2K2 5% 0.125W	R11,14
9106390R	RESISTOR WCR 1206 390R 5% 0.125W	R10
910639K	RESISTOR WCR 1206 39K 5% 0.125W	R9,23,24
910622K	RESISTOR WCR 1206 22K 5% 0.125W	R13,43,45,47,61
91068R2	RESISTOR WCR 1206 8R2 5% 0.125W	R15
91064K7	RESISTOR WCR 1206 4K7 5% 0.125W	R6,7,18,21,22,50
9106470R	RESISTOR WCR 1206 470R 5% 0.125W	R19,20
910612K	RESISTOR WCR 1206 12K 5% 0.125W	R30
91063R3	RESISTOR WCR 1206 3R3 5% 0.125W	R62
910315K	RESISTOR WCR 1206 15K 1% 0.125W	R12,25,32,40
910647K	RESISTOR WCR 1206 47K 5% 0.125W	R53
9106820K	RESISTOR WCR 1206 820K 5% 0.125W	R28,33
9106100K	RESISTOR WCR 1206 100K 5% 0.125W	R38,39
910610K	RESISTOR WCR 1206 10K 5% 0.125W	R27,31,44,46,57,59
9106330K	RESISTOR WCR 1206 330K 5% 0.125W	R42
91031K5	RESISTOR WCR 1206 1K5 1% 0.125W	R48
91061K8	RESISTOR WCR 1206 1K8 5% 0.125W	R49
9106180R	RESISTOR WCR 1206 180R 5% 0.125W	R2,55
91063K3	RESISTOR WCR 1206 3K3 5% 0.125W	R56
910333K	RESISTOR WCR 1206 33K 1% 0.125W	R26,58
91031K2	RESISTOR WCR 1206 1K2 1% 0.125W	R16,17,60
15136	BUZZER SERIES AT-17 SUB MINIATURE	BZ1

Taken from Drawing No:4148-001 Issue:L Date:21.03.94 D4015-1

Underside

06026	ALP SWITCH SKHCAD	S1,2,3,4

Taken from Drawing No:4148-001 Issue:L Date:21.03.94 D4016-1

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