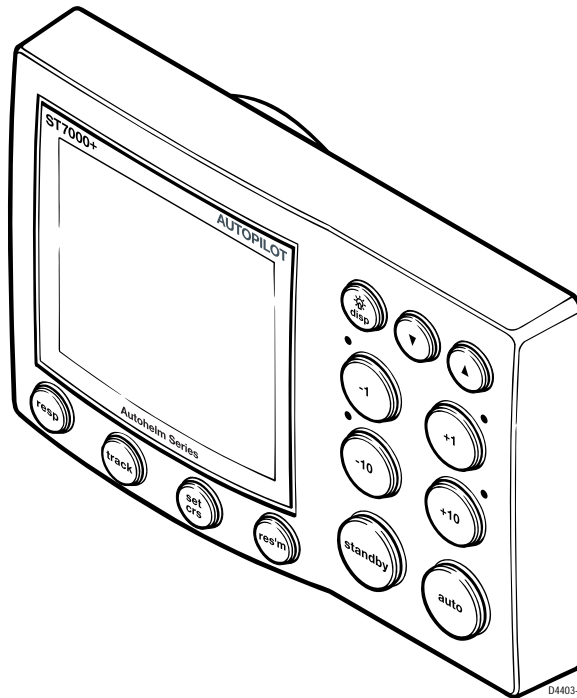


# ST7000+ Autopilot Control Head Service Manual



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## Warning

### CE Marking of Equipment/Replacement Parts

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# Chapter 1. Disassembly/Assembly

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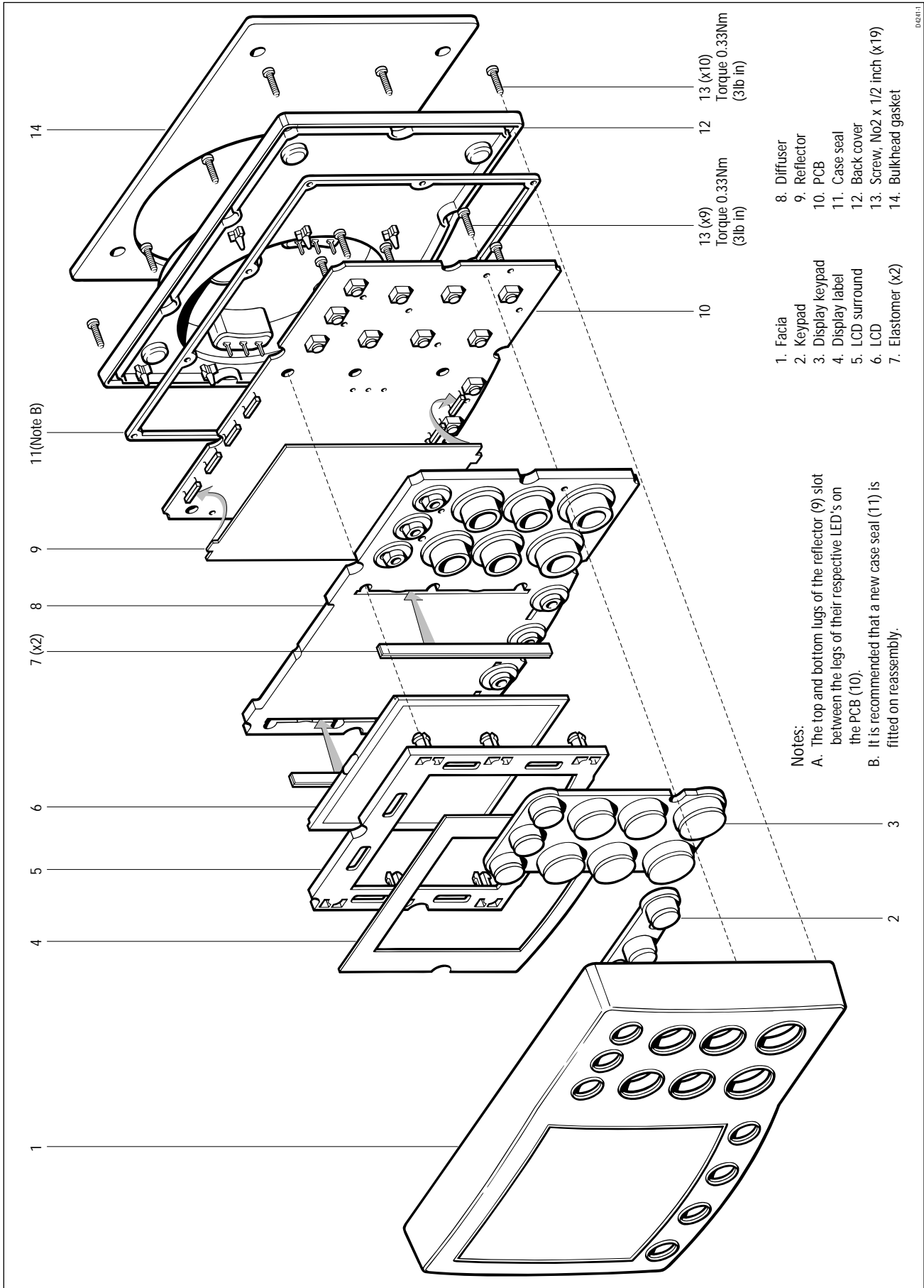


Figure 1: ST7000+ Autopilot Control Head exploded view

## 1.1 ST7000+ Autopilot Control Head spare parts list

The **item** numbers refer to

Figure 1: ST7000+ Autopilot Control Head exploded view

Item	Spare Description	Part No.	Comments
1	Facia	A18001	
2	Keypad set, <i>including</i> Keypad	A18003	
3	Display keypad		
4	Display kit, <i>including</i> Display label	A18004	
5	LCD surround		
6	LCD		
7	Elastomer (x2)		
8	Diffuser kit, <i>including</i> Diffuser	A18005	
9	Reflector		
10	PCB assembly	A18006	
11	Case seal	A18007	
12	Back cover	A18002	
14	Bulkhead gasket	A18008	
-	Sun cover	A15001	Not illustrated

On reassembly, it is recommended that the PCB assembly (10) is fixed to the facia (1) using a torque of 0.33Nm (3lb in). Similarly, fixing the rear case (12) to the facia (1) must be torqued to 0.33Nm (3lb in).

**Note:** It is recommended that a new case seal (11) is fitted on reassembly.

## Chapter 2. PCB details

### 2.1 Input/Output signals

(refer to Figure 2. ST7000+ Autopilot Control Head circuit diagram)

Wire colour	Circuit diagram reference	Description
Red	P1/P4	+12V nominal DC supply.
Yellow	P3/P6	SeaTalk data. Intermittent streams of +12V (nominal) pulses.
Screen	P2/P5	0V supply and signal return.
Red	P7	NMEA in. Data positive.
Blue	P8	NMEA in. Data negative.

Circuit diagram

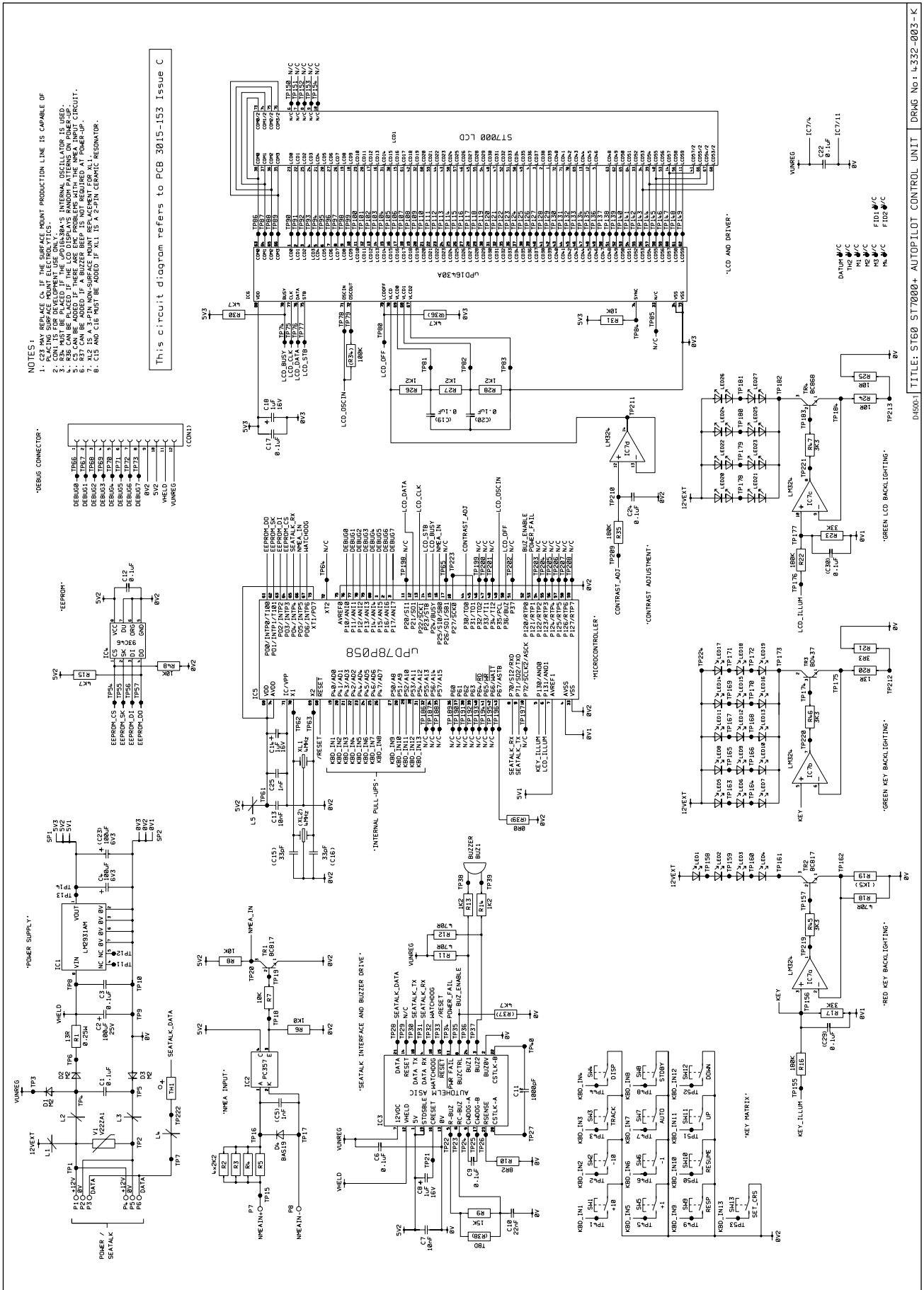
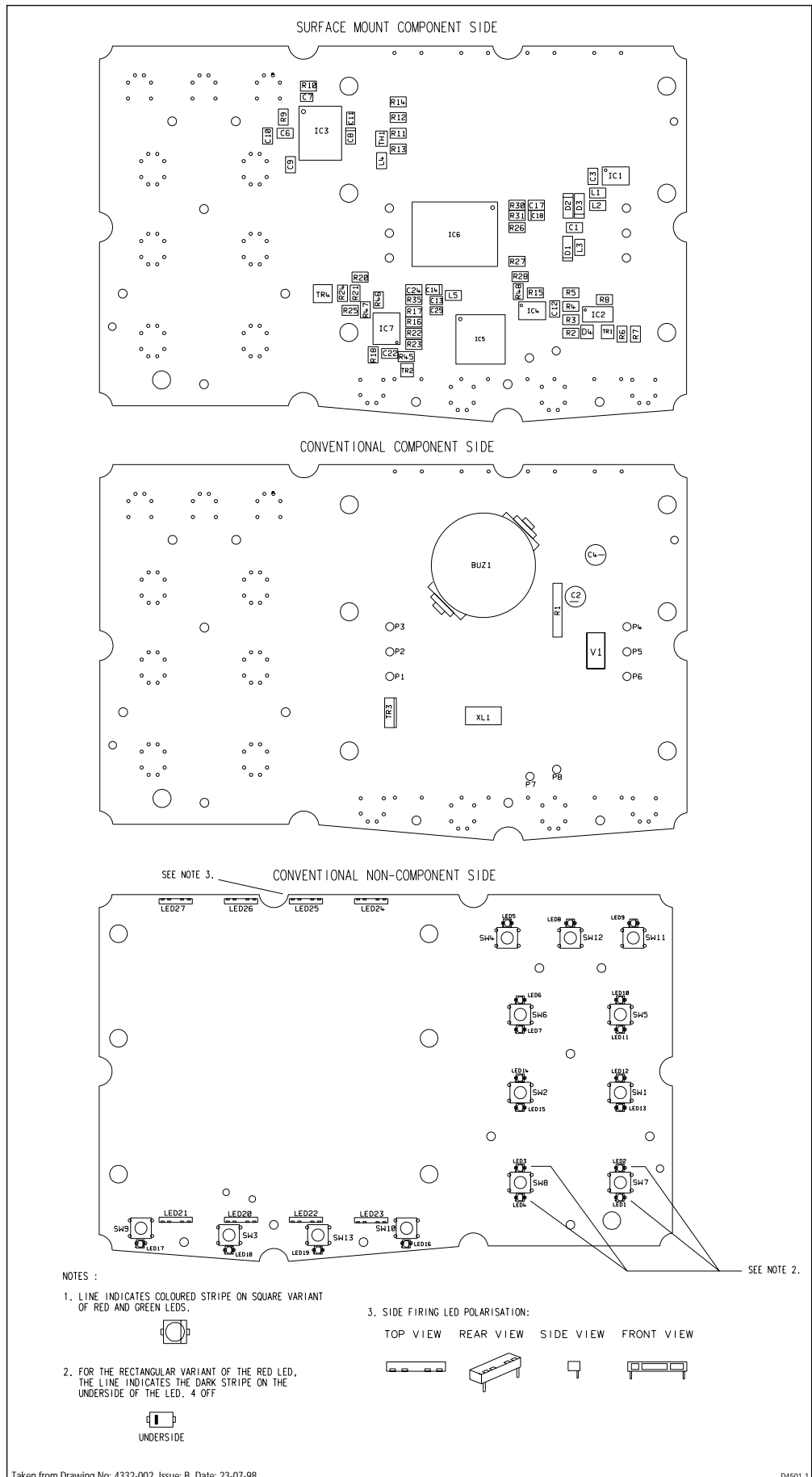


Figure 2. ST7000+ Autopilot Control Head circuit diagram

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## 2.2 PCB Layout

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## Component List

### SURFACE MOUNT COMPONENT SIDE

9600L1	5	SOLID CHIP INDUCTOR	L1-5
9600THERM3	1	THERMISTOR	TH1
9400LM324	1	IC QUAD OPAMP LM324	IC7
940016430A	1	IC LCD DRIVER $\mu$ PD16430A	IC6
940378P058	1	IC OTP MICRO 78P058 80PIN QFP (ST7000+ V1 SOFTWARE)	IC5
9400ST93C46CM1	1	IC E2PROM STC46CM1 S08	IC4
9401RLA80	1	IC ASIC RAYTHEON	IC3
9400PC357D	1	IC OPTO ISOLATOR PC357N4T	IC2
9400LM2931AM	1	IC REGULATOR LM2931AM S08	IC1
9204D1F10	3	DIODE RECTIFIER D1F10 1A 100V	D1-3
9200BAS19	1	DIODE SOT23 BAS19	D4
9500BC817	2	TRANSISTOR SOT23 BC817 NPN	TR1,2
9501BC868	1	TRANSISTOR SOT89 BC868 NPN	TR4
93091U	3	CAPACITOR TANT 1 $\mu$ F 16V 10% SIZE A	C8,14,18
93041000P	2	CAPACITOR X7R 0805 1000pF 50V 10%	C11,25
930522N	1	CAPACITOR X7R 1206 22nF 50V 5%	C10
93040U01	2	CAPACITOR X7R 0805 0.01 $\mu$ F 50V 10%	C7,13
93070U1	8	CAPACITOR X7R 1206 0.1 $\mu$ F 50V 20%	C1,3,6,9,12,17,22,24
91063K3	3	RESISTOR 1206 3K3 5% 0.125W	R45-47
910310R	2	RESISTOR 1206 10R 1% 0.125W	R24,25
91063R3	1	RESISTOR 1206 3R3 5% 0.125W	R21
910313R	1	RESISTOR 1206 13R 1% 0.125W	R20
910333K	2	RESISTOR 1206 33K 1% 0.125W	R17,23
9103180K	3	RESISTOR 1206 180K 1% 0.125W	R16,22,35
91064K7	2	RESISTOR 1206 4K7 5% 0.125W	R15,30
91031K2	5	RESISTOR 1206 1K2 1% 0.125W	R13,14,26-28
9106470R	3	RESISTOR 1206 470R 5% 0.125W	R11,12,18
91068R2	1	RESISTOR 1206 8R2 5% 0.125W	R10
910315K	1	RESISTOR 1206 15K 1% 0.125W	R9
910610K	4	RESISTOR 1206 10K 5% 0.125W	R7,8,31,48
91031K	1	RESISTOR 1206 1K 1% 0.125W	R6
91062K2	4	RESISTOR 1206 2K2 5% 0.125W	R2-5
3015-153	1	PCB ST7000+	

### CONVENTIONAL COMPONENT SIDE

3030-035-C	8	SOLDER BUCKETS	P1-8
15087	1	BUZZER KYOCERA KBS-27 DB-3T	BUZ1
01051	1	VARISTOR GE TYPE V22ZA1	V1
15314	1	RESONATOR CERAMIC MURATA CST4.00MGW	XL1
-	-	-	-
05014	1	TRANSISTOR BD437	TR3
03062	1	CAPACITOR ELEC 100 $\mu$ F 6.3V +/-20% RADIAL	C4
03100	1	CAPACITOR ELEC LOW IMP 100 $\mu$ F 25V +/-20%	C2
01183	1	RESISTOR METAL FILM SFR25 13R +/-5% 0.4W	R1

### CONVENTIONAL NON-COMPONENT SIDE

15165	8	LED SEGMENT 2 CHIP GREEN	LED20-27
02050	15	LED GREEN HLMP6505	LED5-19
02076	4	LED RED HLMPQ101	LED1-4
06030	13	SWITCH ALPMIN	SW1-13

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