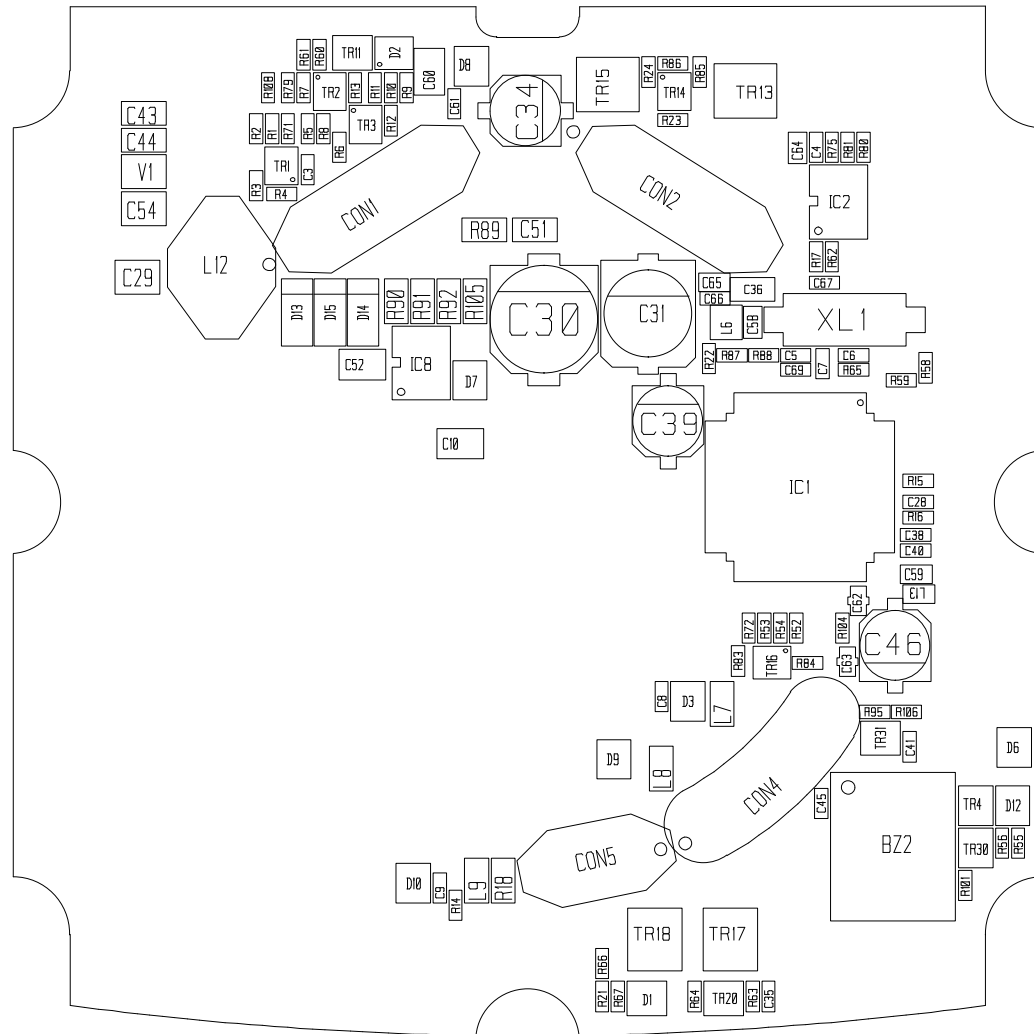


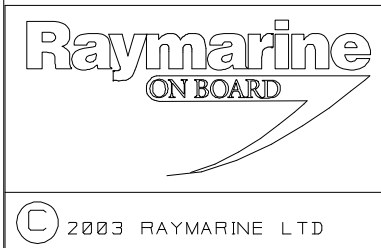
PCB 3015-386

SURFACE MOUNT COMPONENT SIDE



MODIFICATION/AMENDMENT

ISS	DATE	COMMENTS
A	25.07.05	First Issue
B	21.10.05	PPP 3015-386_001
C	10.06.08	Added D6 & D9.



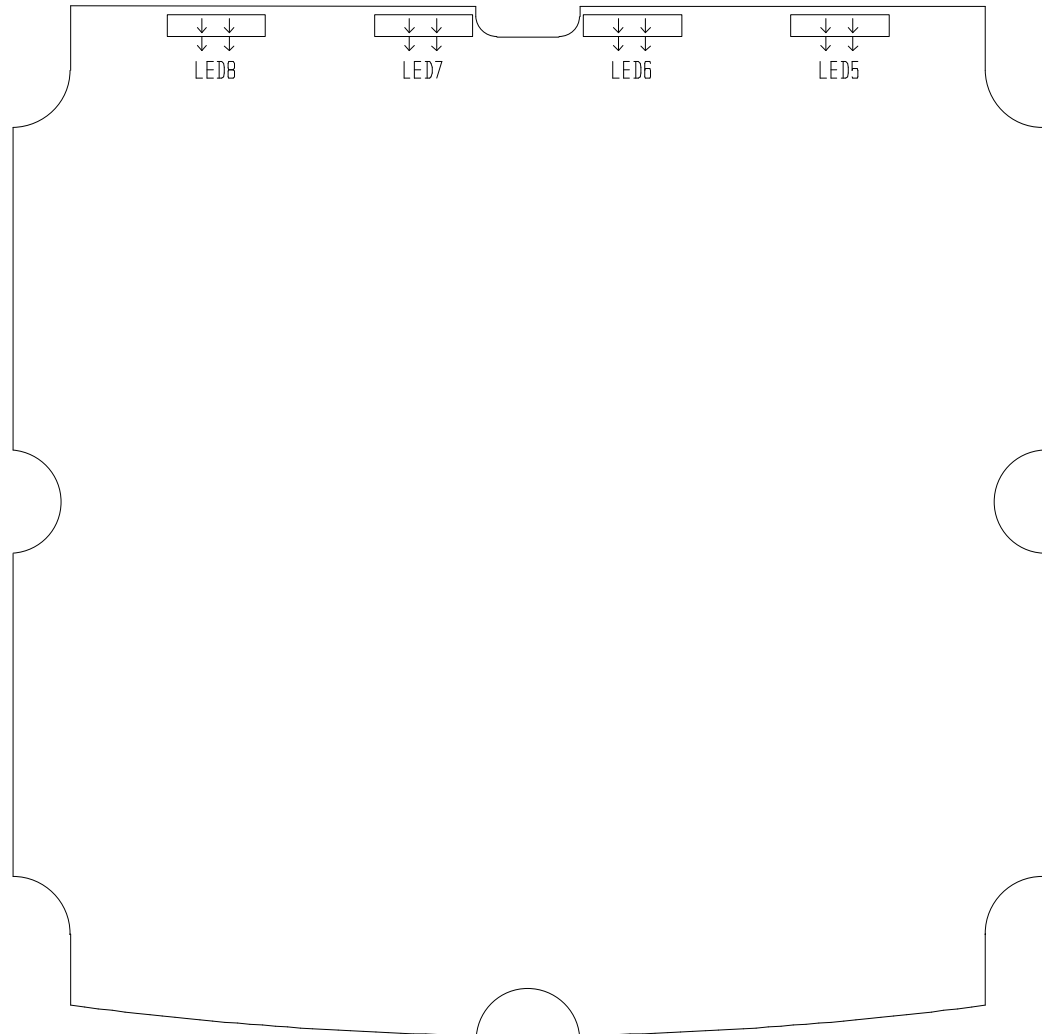
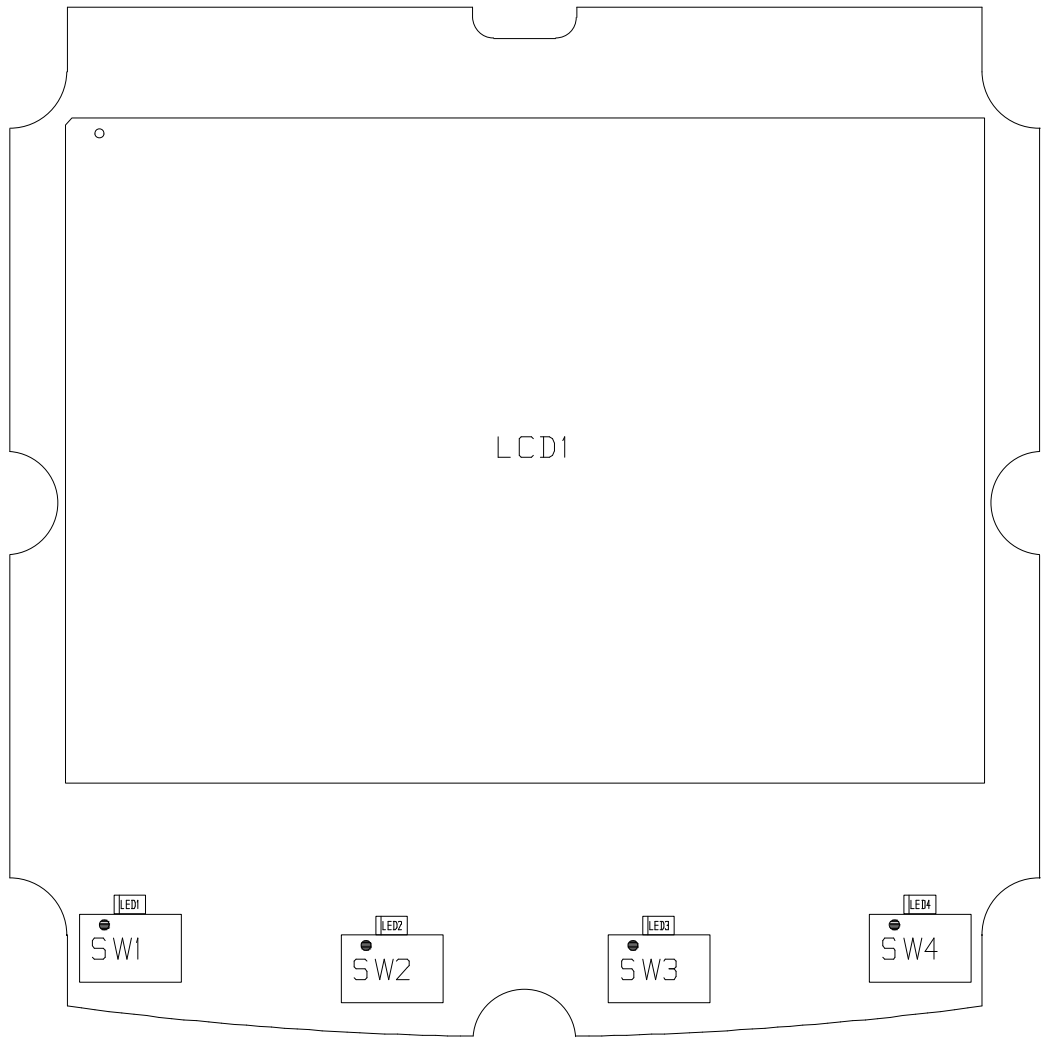
THE INFORMATION CONTAINED HEREIN SHALL NOT BE REPRODUCED WITHOUT THE PRIOR WRITTEN PERMISSION OF RAYMARINE LTD

DO NOT SCALE	REMOVE ALL BURRS AND SHARP EDGES UNLESS OTHERWISE STATED	DRAWN LM	CHKD DW	DATE 25.07.05
PROJ D624	TITLE ST60+ Digital - Speed	SCALE 1:1	DRWG No:- 4624-001 Sheet 1 of 2	

PCB 3015-386

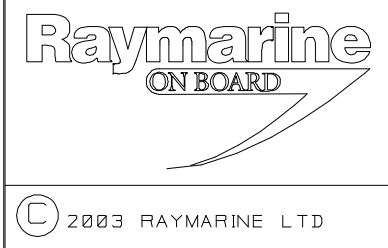
SURFACE MOUNT UNDERSIDE

CONVENTIONAL UNDERSIDE



MODIFICATION/AMENDMENT

ISS	DATE	COMMENTS
A	25.07.05	First Issue
B	21.10.05	PPP 3015-386_001
C	10.06.08	Up issued to be in line with sheet 1.



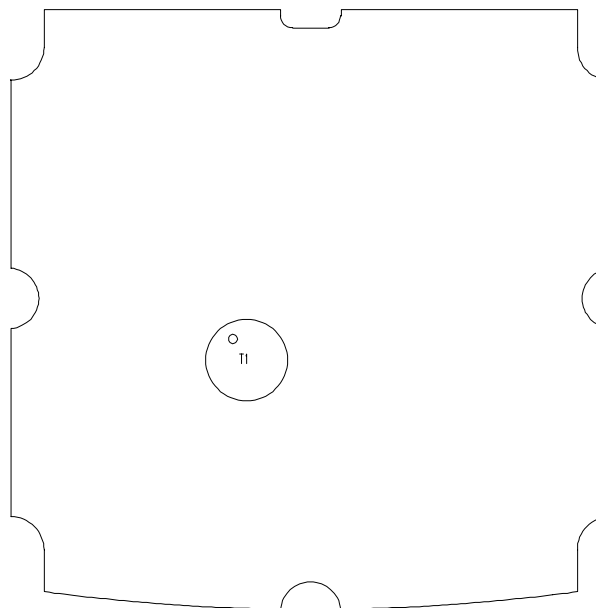
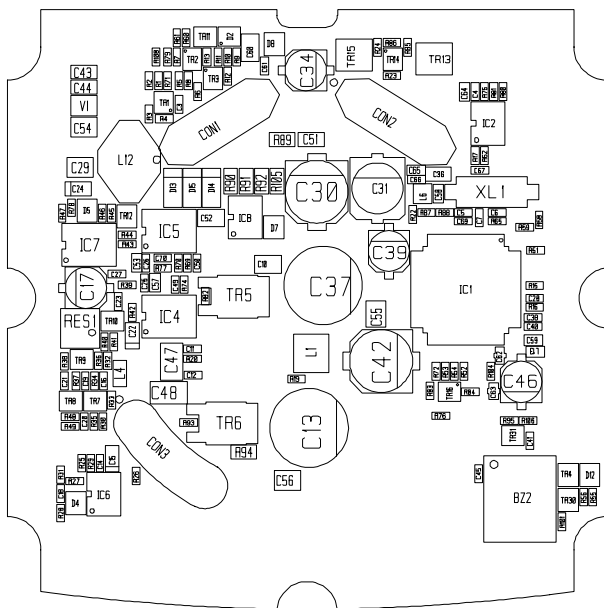
THE INFORMATION CONTAINED HEREIN SHALL NOT BE REPRODUCED WITHOUT THE PRIOR WRITTEN PERMISSION OF RAYMARINE LTD

DO NOT SCALE	REMOVE ALL BURRS AND SHARP EDGES UNLESS OTHERWISE STATED	DRAWN LM	CHKD DW	DATE 25.07.05
PROJ D624	TITLE . ST60+ Digital - Speed	SCALE 1:1	DRWG No:- 4624-001 Sheet 2	

PCB 3015-386

SURFACE MOUNT COMPONENT SIDE

CONVENTIONAL COMPONENT SIDE



MODIFICATION / AMENDMENT

ISS	DATE	COMMENTS
A	25.07.05	First Issue
B	21.10.05	PPF 3015-386_001



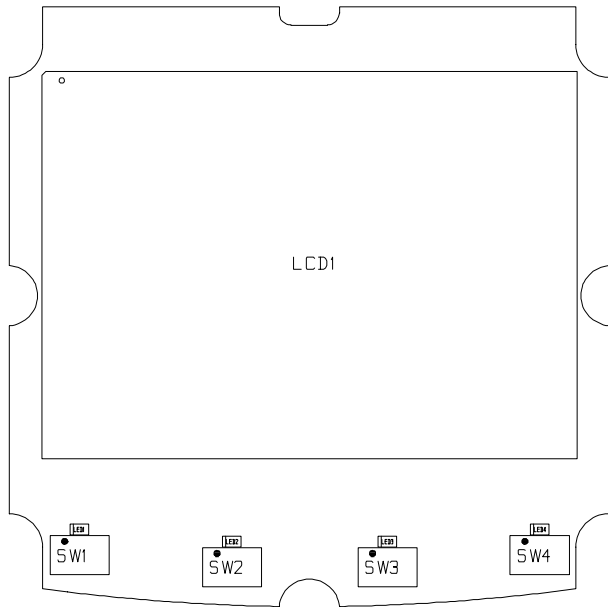
THE INFORMATION CONTAINED HEREIN SHALL NOT BE REPRODUCED WITHOUT THE PRIOR WRITTEN PERMISSION OF RAYMARINE LTD

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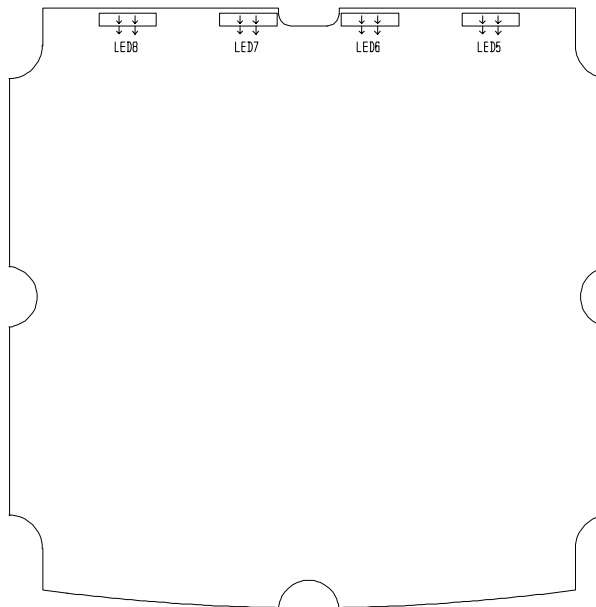
DO NOT SCALE	REMOVE ALL BURRS AND SHARP EDGES UNLESS OTHERWISE STATED	DRAWN LM	CHKD DW	DATE 25.07.05
PROJ D624	TITLE . ST60+ Digital - Depth	SCALE 1:1	DRWG No:- 4624-002	Sheet 1 of 2

PCB 3015-386

SURFACE MOUNT UNDERSIDE



CONVENTIONAL UNDERSIDE



MODIFICATION/AMENDMENT		
ISS	DATE	COMMENTS
A	25.07.05	First Issue
B	21.10.05	PPP 3015-386_001



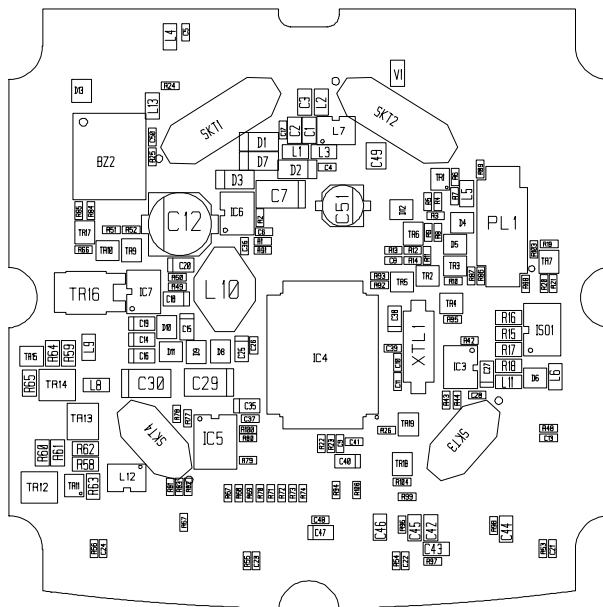
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DO NOT SCALE	REMOVE ALL BURRS AND SHARP EDGES UNLESS OTHERWISE STATED	DRAWN LM	CHKD DW	DATE 25.07.05
PROJ D624	TITLE . ST60+ Digital - Depth	SCALE 1:1	DRWG No:- 4624-002 Sheet 2	

PCB 3015-388

SURFACE MOUNT COMPONENT SIDE



MODIFICATION / AMENDMENT		
ISS	DATE	COMMENTS
A	18.10.05	First Issue



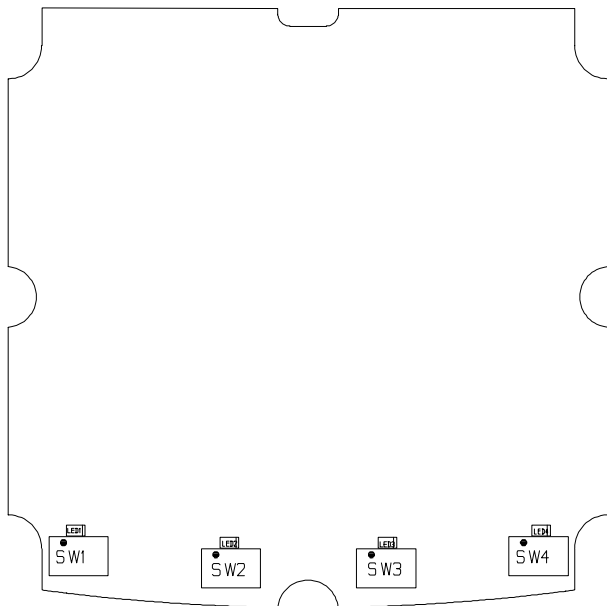
THE INFORMATION CONTAINED HEREIN SHALL NOT BE REPRODUCED WITHOUT THE PRIOR WRITTEN PERMISSION OF RAYMARINE LTD

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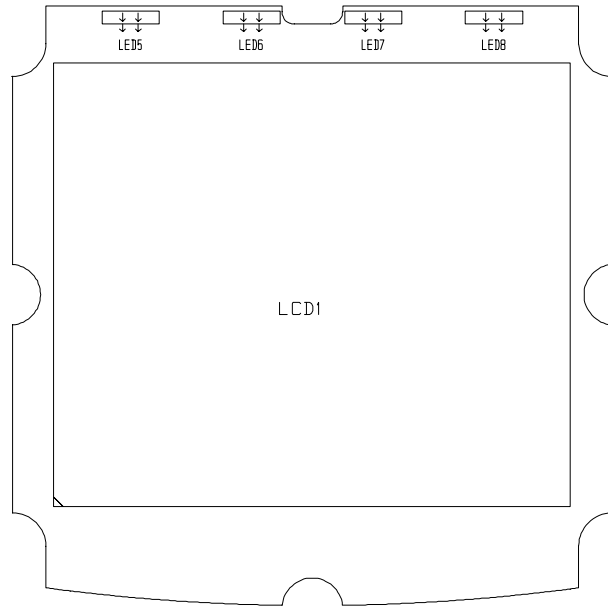
DO NOT SCALE	REMOVE ALL BURRS AND SHARP EDGES UNLESS OTHERWISE STATED	DRAWN LM	CHKD DW	DATE 18.10.05
PROJ D624	TITLE ST60+ GRAPHIC Assembly	SCALE 1:1	DRWG No:- 4624-003 Sheet 1 of 2	

PCB 3015-388

SURFACE MOUNT UNDERSIDE



CONVENTIONAL UNDERSIDE



MODIFICATION/AMENDMENT		
ISS	DATE	COMMENTS
A	18.10.05	First Issue



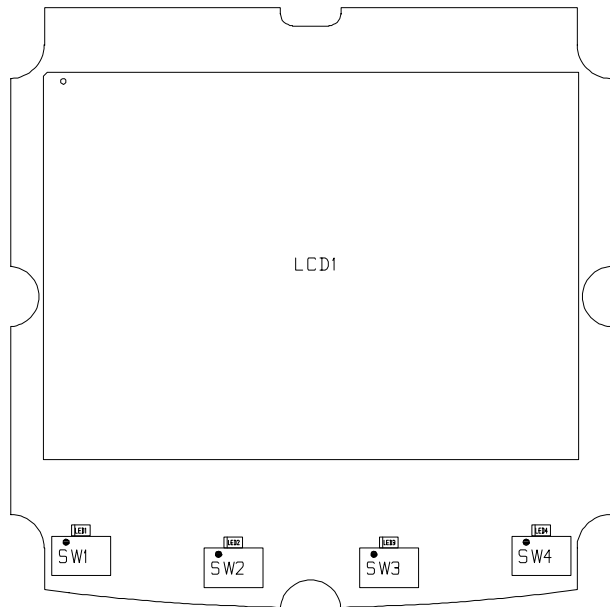
THE INFORMATION CONTAINED HEREIN SHALL NOT BE REPRODUCED WITHOUT THE PRIOR WRITTEN PERMISSION OF RAYMARINE LTD

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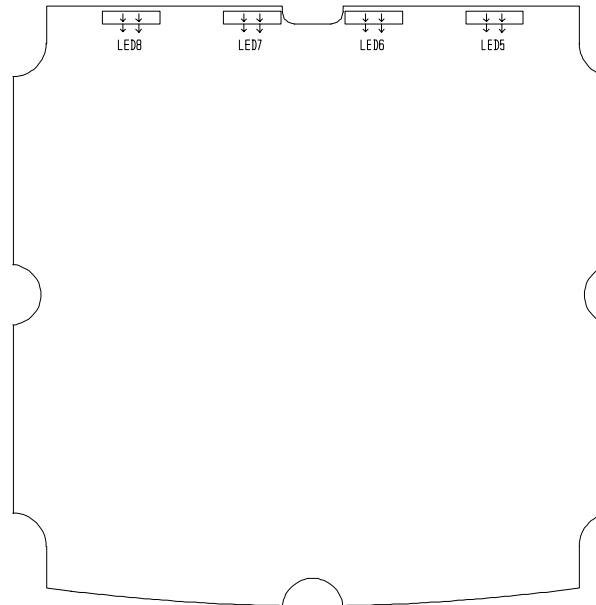
DO NOT SCALE	REMOVE ALL BURRS AND SHARP EDGES UNLESS OTHERWISE STATED	DRAWN LM	CHKD DW	DATE 18.10.05
PROJ D624	TITLE ST60+ GRAPHIC Assembly	SCALE 1:1	DRWG No:- 4624-003 Sheet 2	

PCB 3015-386

SURFACE MOUNT UNDERSIDE



CONVENTIONAL UNDERSIDE



MODIFICATION/AMENDMENT

ISS	DATE	COMMENTS
A	25.07.05	First Issue
B	21.10.05	PPP 3015-386_001



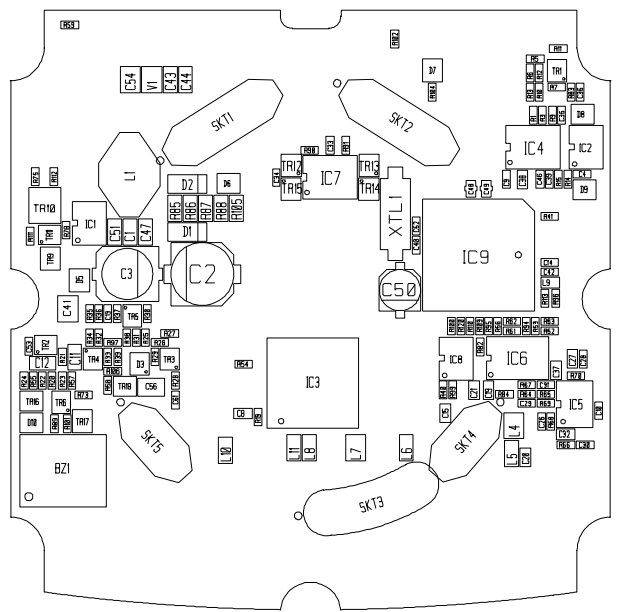
THE INFORMATION CONTAINED HEREIN SHALL NOT BE REPRODUCED WITHOUT THE PRIOR WRITTEN PERMISSION OF RAYMARINE LTD

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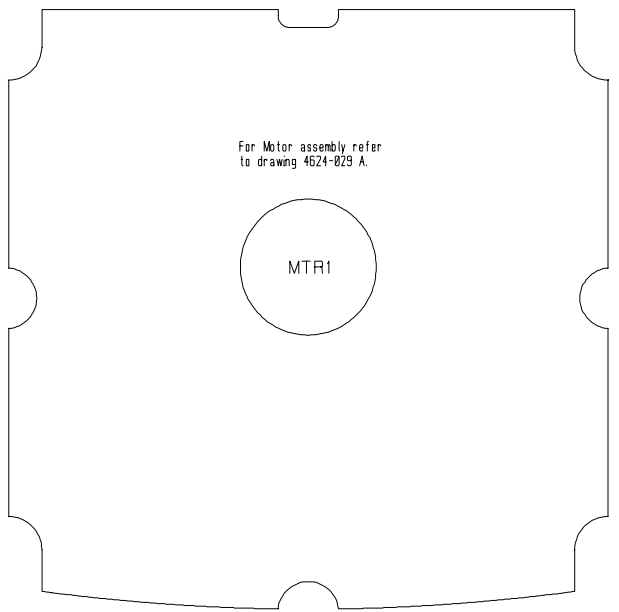
DO NOT SCALE	REMOVE ALL BURRS AND SHARP EDGES UNLESS OTHERWISE STATED	DRAWN LM	CHKD DW	DATE 25.07.05
PROJ D624	TITLE . ST60+ Digital - Tridata	SCALE 1:1	DRWG No:- 4624-004 Sheet 2	

PCB 3015-387

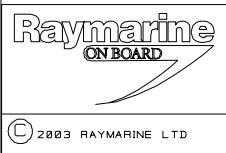
SURFACE MOUNT COMPONENT SIDE



CONVENTIONAL COMPONENT SIDE



MODIFICATION / AMENDMENT		
ISS	DATE	COMMENTS
A	01.07.05	First Issue
B	27.07.05	PPP 3015-387_001
C	31.08.05	PPP 3015-387_002/003.
D	24.11.05	PPP 3015-387_004.



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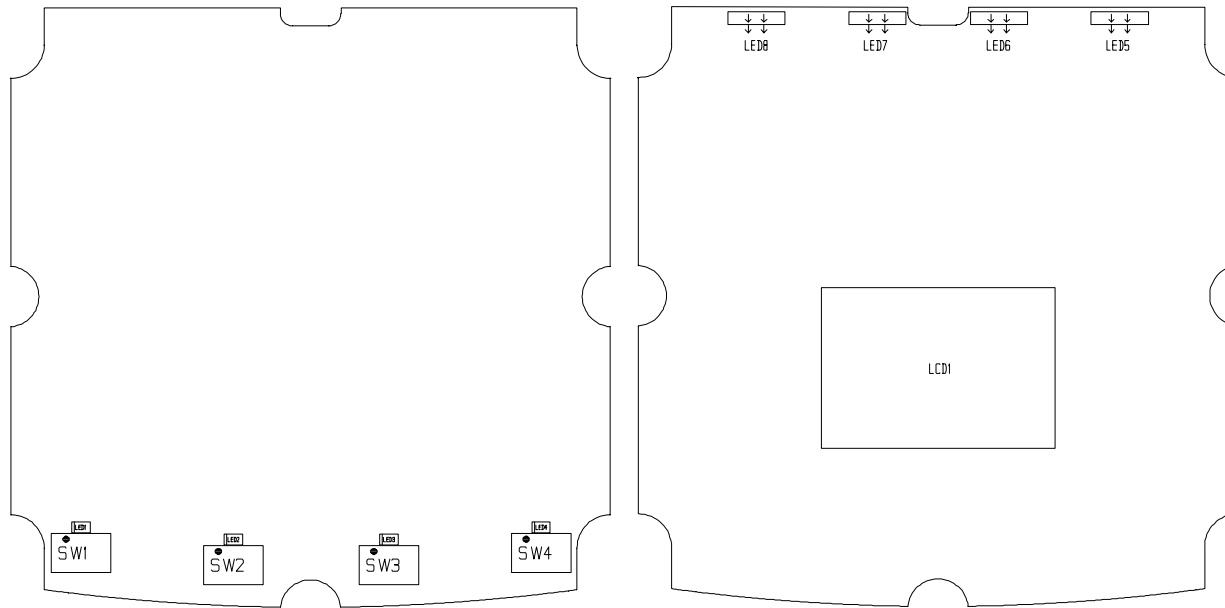
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DO NOT SCALE	REMOVE ALL BURRS AND SHARP EDGES UNLESS OTHERWISE STATED	DRAWN LM	CHKD DW	DATE 01.07.05
PROJ D624	TITLE ST60+ WIND PCB Assembly	SCALE 1:1	DRWG No:- 4624-005 Sheet 1 of 2	

PCB 3015-387

SURFACE MOUNT UNDERSIDE

CONVENTIONAL UNDERSIDE



MODIFICATION/AMENDMENT		
ISS	DATE	COMMENTS
A	01.07.05	First Issue
B	27.07.05	PPP 3015-387-001
C	31.08.05	Up issued to be in line with sheet 1.
D	24.11.05	Up issued to be in line with sheet 1.



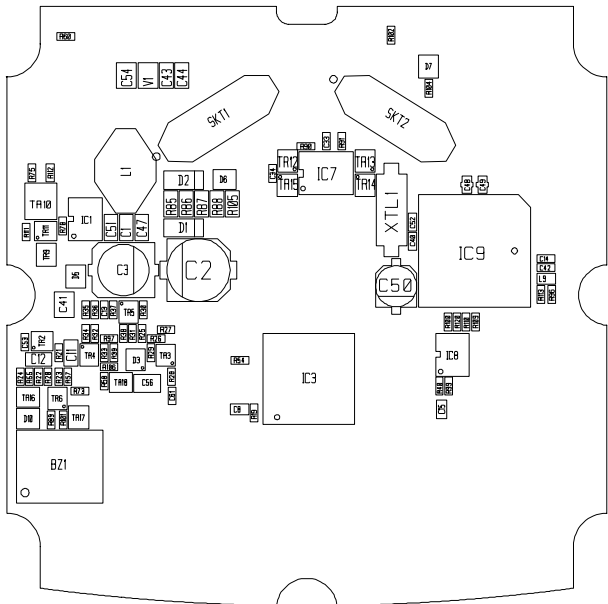
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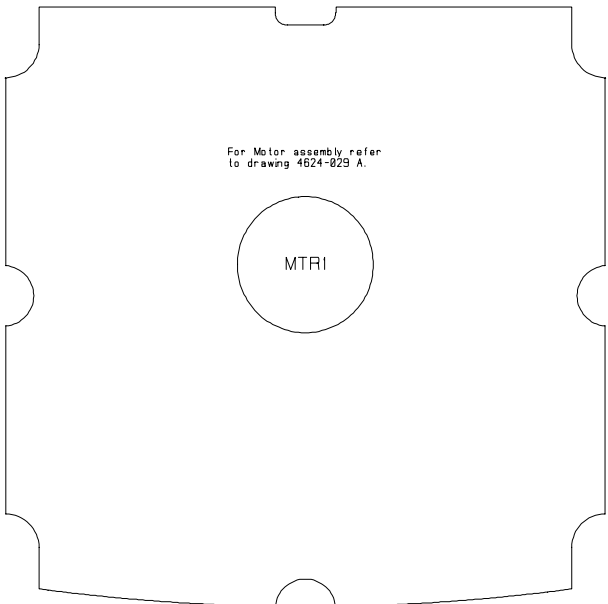
DO NOT SCALE	REMOVE ALL BURRS AND SHARP EDGES UNLESS OTHERWISE STATED	DRAWN LM	CHKD DW	DATE 01.07.05
PROJ D624	TITLE ST60+ WIND PCB Assembly	SCALE 1:1	DRWG No:- 4624-005 Sheet 2	

PCB 3015-387

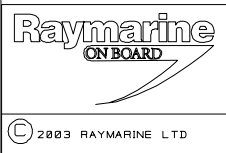
SURFACE MOUNT COMPONENT SIDE



CONVENTIONAL COMPONENT SIDE



MODIFICATION / AMENDMENT		
ISS	DATE	COMMENTS
A	01.07.05	First Issue
B	27.07.05	PPP 3015-387_001
C	31.08.05	APP 3015-387_002/003.
D	24.11.05	APP 3015-387_004.



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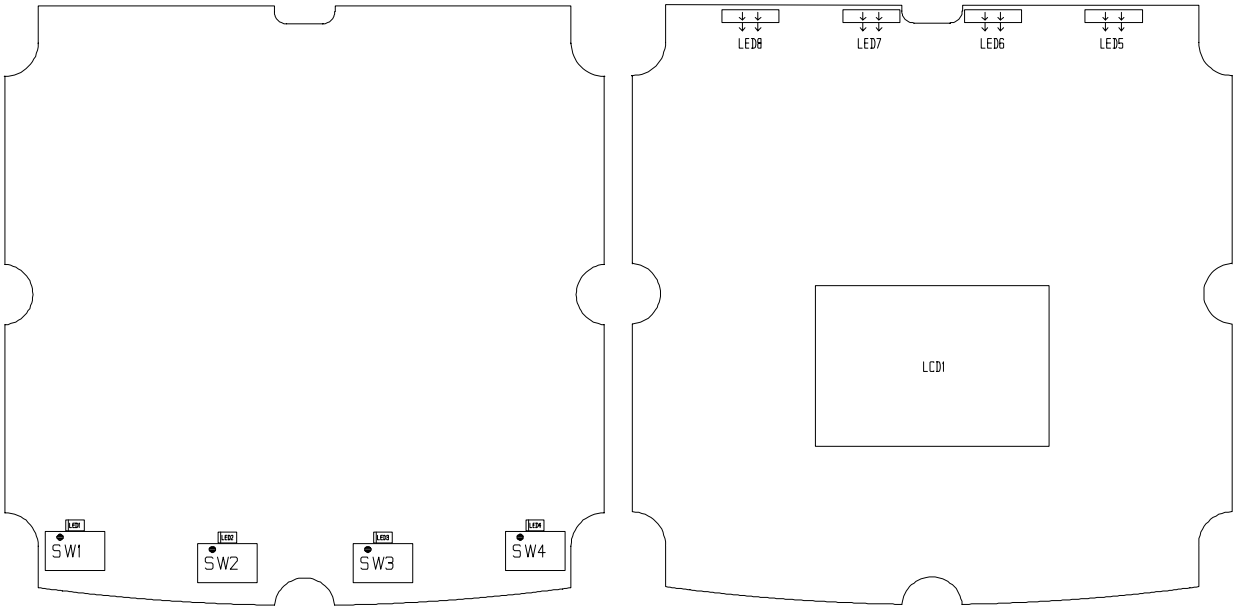
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DO NOT SCALE	REMOVE ALL BURRS AND SHARP EDGES UNLESS OTHERWISE STATED	DRAWN LM	CHKD DW	DATE 01.07.05
PROJ D624	TITLE ST60+ CH WIND PCB Assembly	SCALE 1:1	DRWG No:- 4624-006 Sheet 1 of 2	

PCB 3015-387

SURFACE MOUNT UNDERSIDE

CONVENTIONAL UNDERSIDE



MODIFICATION / AMENDMENT		
ISS	DATE	COMMENTS
A	01.07.05	First Issue
B	27.07.05	PPP 3015-387-001
C	31.08.05	Up issued to be in line with sheet 1.
D	24.11.05	Up issued to be in line with sheet 1.



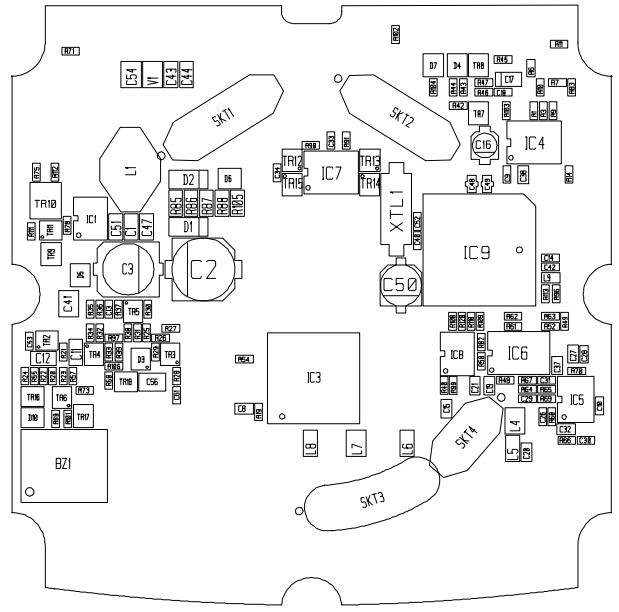
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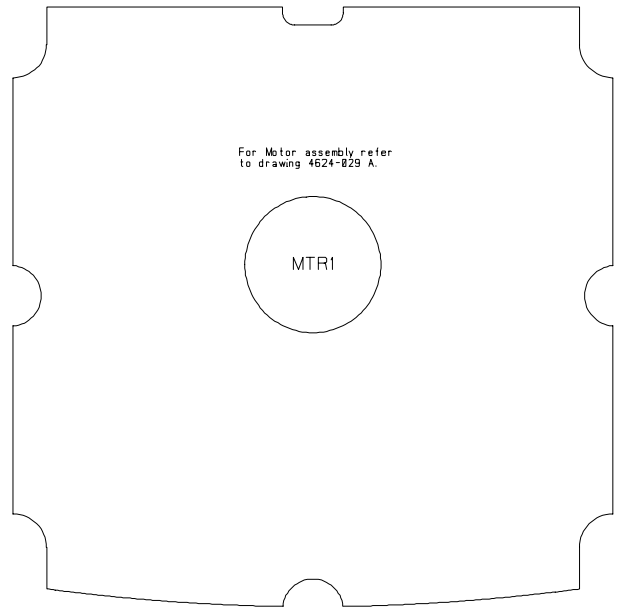
DO NOT SCALE	REMOVE ALL BURRS AND SHARP EDGES UNLESS OTHERWISE STATED	DRAWN LM	CHKD DW	DATE 01.07.05
PROJ D624	TITLE ST60+ CH WIND PCB Assembly	SCALE 1:1	DRWG No:- 4624-006 Sheet 2	

PCB 3015-387

SURFACE MOUNT COMPONENT SIDE



CONVENTIONAL COMPONENT SIDE



MODIFICATION / AMENDMENT		
ISS	DATE	COMMENTS
A	01.07.05	First Issue
B	27.07.05	PPP 3015-387_001
C	30.08.05	PPP 3015-387_002/003.
D	24.11.05	PPP 3015-387_004.



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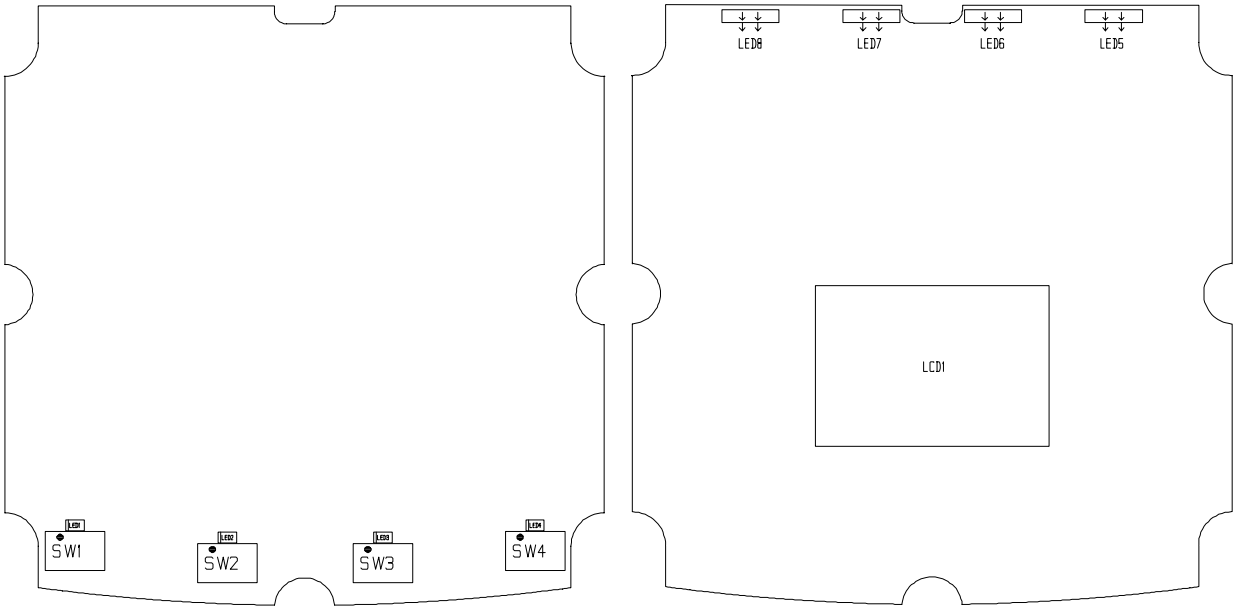
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DO NOT SCALE	REMOVE ALL BURRS AND SHARP EDGES UNLESS OTHERWISE STATED	DRAWN LM	CHKD DW	DATE 01.07.05
PROJ D624	TITLE ST60+ COMPASS PCB Assembly	SCALE 1:1	DRWG No:- 4624-007 Sheet 1 of 2	

PCB 3015-387

SURFACE MOUNT UNDERSIDE

CONVENTIONAL UNDERSIDE



MODIFICATION/AMENDMENT		
ISS	DATE	COMMENTS
A	01.07.05	First Issue
B	27.07.05	PPP 3015-387-001
C	31.08.05	Up issued to be in line with sheet 1.
D	24.11.05	Up issued to be in line with sheet 1.



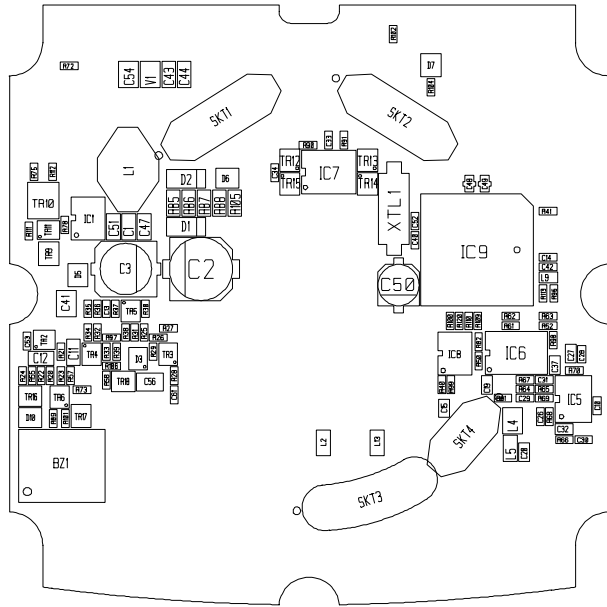
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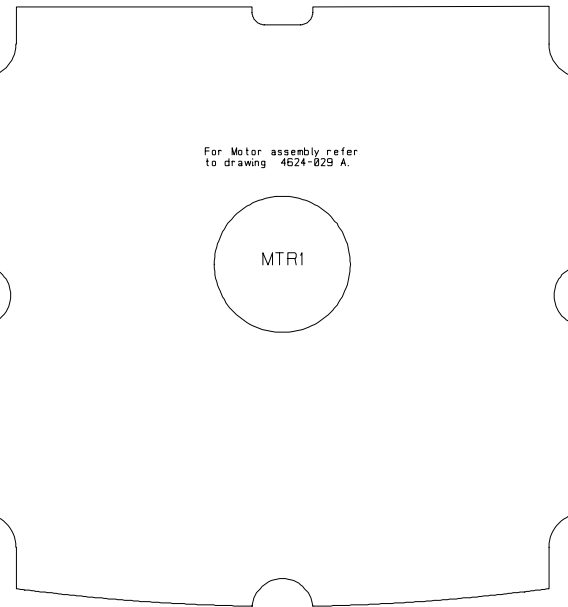
DO NOT SCALE	REMOVE ALL BURRS AND SHARP EDGES UNLESS OTHERWISE STATED	DRAWN LM	CHKD DW	DATE 01.07.05
PROJ D624	TITLE ST60+ COMPASS PCB Assembly	SCALE 1:1	DRWG No:- 4624-007 Sheet 2	

PCB 3015-387

SURFACE MOUNT COMPONENT SIDE



CONVENTIONAL COMPONENT SIDE



MODIFICATION / AMENDMENT		
ISS	DATE	COMMENTS
A	01.07.05	First Issue
B	27.07.05	PPP 3015-387_001
C	31.08.05	PPP 3015-387_002/003.
D	24.11.05	PPP 3015-387_004.



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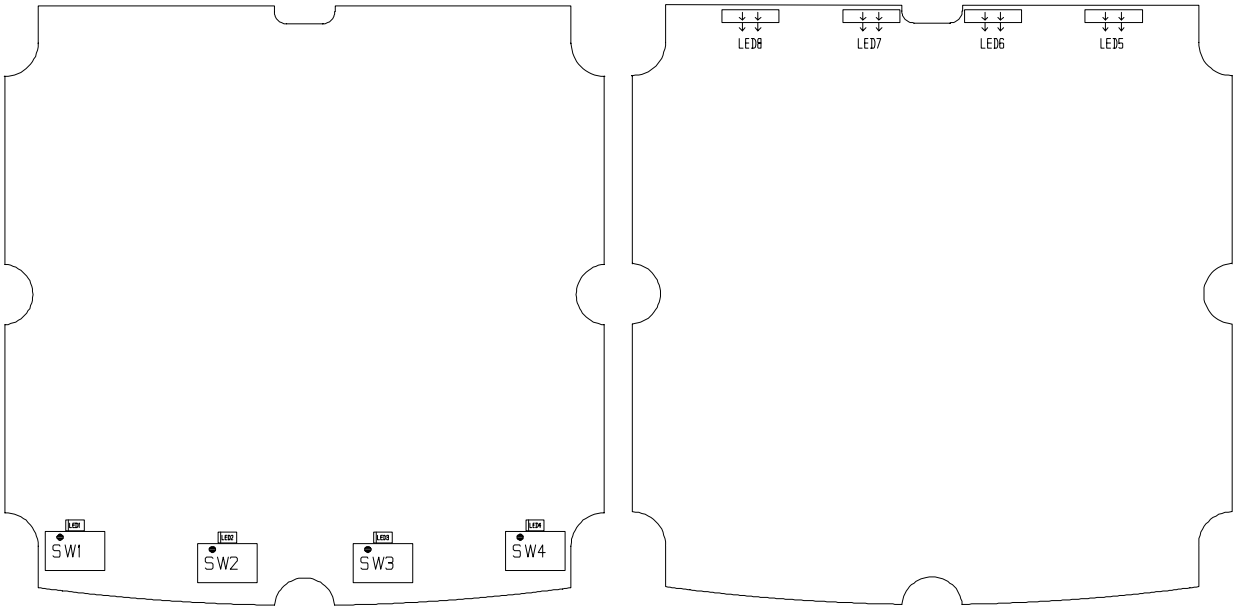
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DO NOT SCALE	REMOVE ALL BURRS AND SHARP EDGES UNLESS OTHERWISE STATED	DRAWN LM	CHKD DW	DATE 01.07.05
PROJ D624	TITLE ST60+ RUDDER PCB Assembly	SCALE 1:1	DRWG No:- 4624-008 Sheet 1 of 2	

PCB 3015-387

SURFACE MOUNT UNDERSIDE

CONVENTIONAL UNDERSIDE



MODIFICATION/AMENDMENT		
ISS	DATE	COMMENTS
A	01.07.05	First Issue
B	27.07.05	PPP 3015-387-001
C	31.08.05	Up issued to be in line with sheet 1.
D	24.11.05	Up issued to be in line with sheet 1.



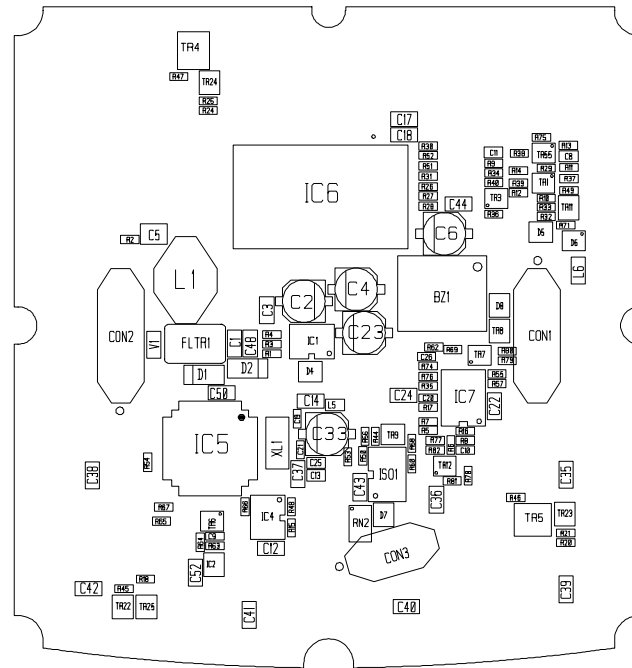
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DO NOT SCALE	REMOVE ALL BURRS AND SHARP EDGES UNLESS OTHERWISE STATED	DRAWN LM	CHKD DW	DATE 01.07.05
PROJ D624	TITLE ST60+ RUDDER PCB Assembly	SCALE 1:1	DRWG No:- 4624-008 Sheet 2	

PCB 3015-389

SURFACE MOUNT COMPONENT SIDE



MODIFICATION/AMENDMENT

ISS	DATE	COMMENTS
A	27.06.05	FIRST ISSUE
B	03.08.05	Added C19,21,26, R74,76-79,81-82, TR12 & D5. PPP 4624-025-01
C	13.10.05	R19,C32 deleted. PPP 4624-025-02



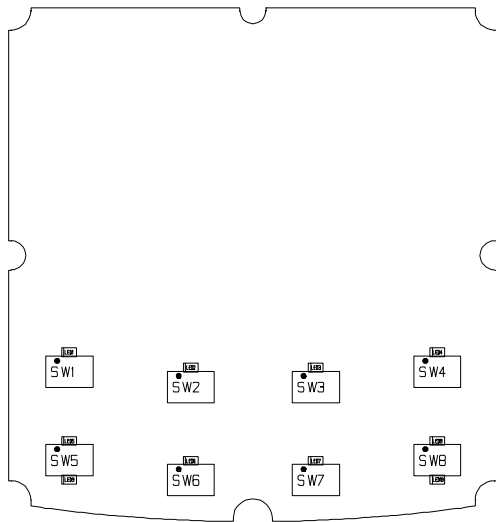
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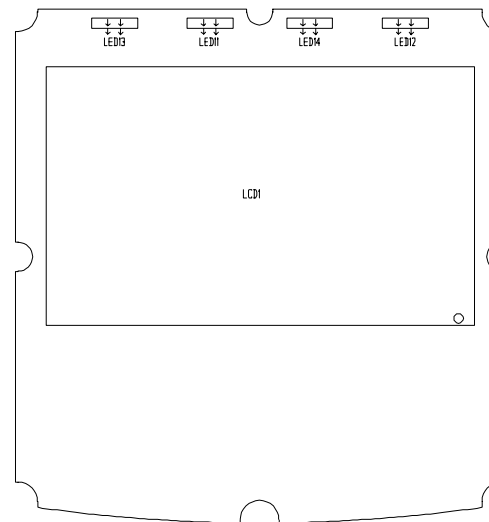
DO NOT SCALE	REMOVE ALL BURRS AND SHARP EDGES UNLESS OTHERWISE STATED	DRAWN LM	CHKD IW	DATE 27.06.05
PROJ 624	TITLE ST6002 AUTOPILOT HEAD	SCALE 1:1	DRWG No.- 4624-010 SHT 1 OF 2	

PCB 3015-389

SURFACE MOUNT UNDERSIDE



CONVENTIONAL UNDERSIDE



MODIFICATION/AMENDMENT

ISS	DATE	COMMENTS
A	27.06.05	FIRST ISSUE
B	03.08.05	Conventional build added.
C	13.10.05	Up issued to be in line with sheet 1. PPP 4624-025-02



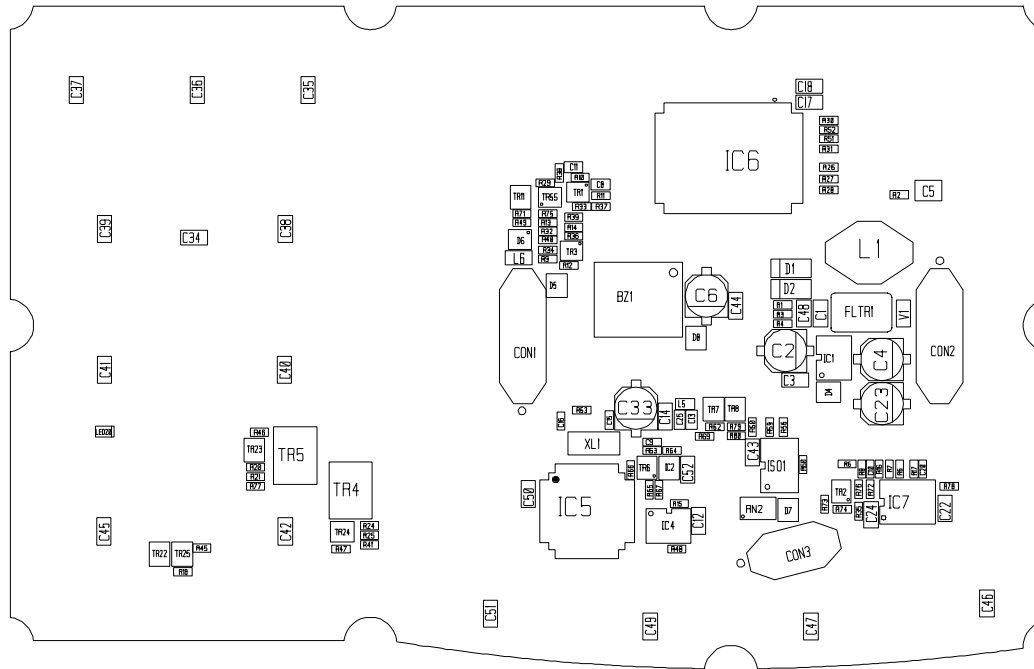
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DO NOT SCALE	REMOVE ALL BURRS AND SHARP EDGES UNLESS OTHERWISE STATED	DRAWN LM	CHKD IW	DATE 27.06.05
PROJ 624	TITLE . ST6002 AUTOPILOT HEAD	SCALE 1:1	DRWG No:- 4624-010 SHT 2	

PCB 3015-390

SURFACE MOUNT COMPONENT SIDE



MODIFICATION/AMENDMENT

ISS	DATE	COMMENTS
A	21.07.05	New issue.
B	19.08.07	See PPP 4624-026_001
C	13.10.05	C32 deleted. PPP 4624-026_002



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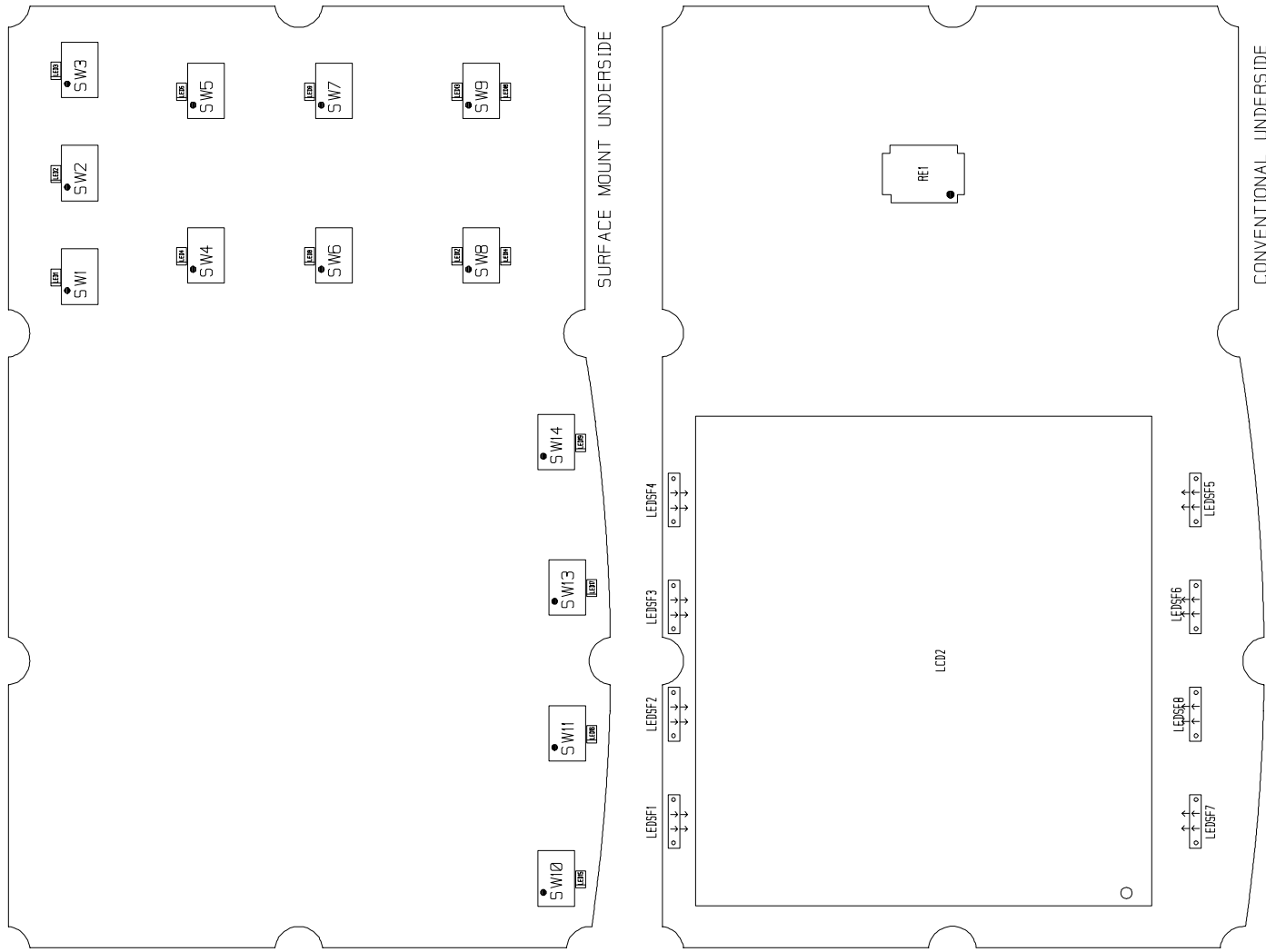
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DO NOT SCALE	REMOVE ALL BURRS AND SHARP EDGES UNLESS OTHERWISE STATED	DRAWN I.T.	CHKD I.W.	DATE 21.07.05
PROJ	TITLE . ST8002 AUTOPILOT HEAD.	SCALE 1:1	DRWG No :- 4624-011	sh1 1 of 2

PCB 3015-390

MODIFICATION/AMENDMENT

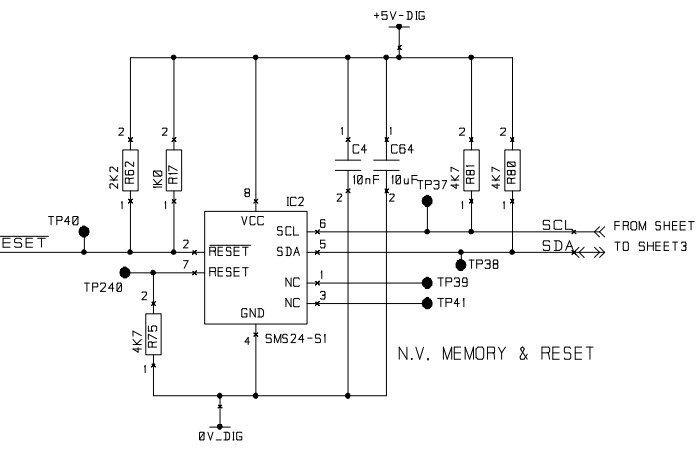
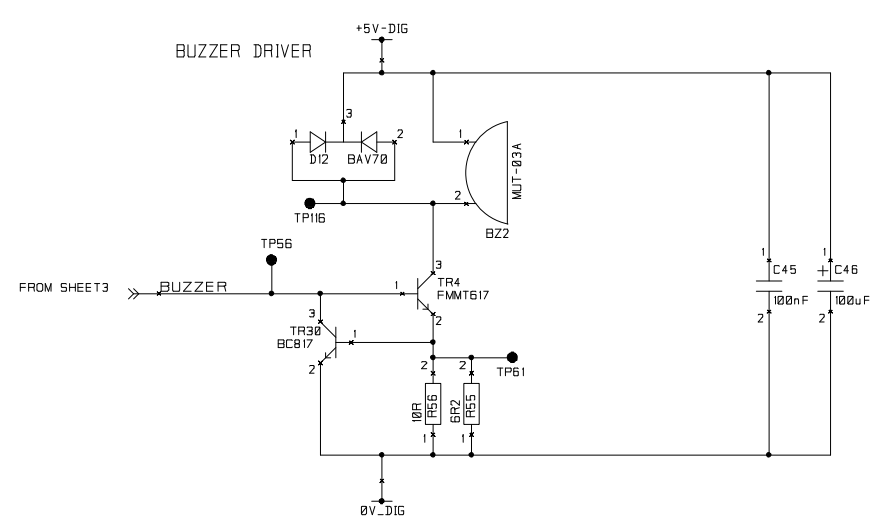
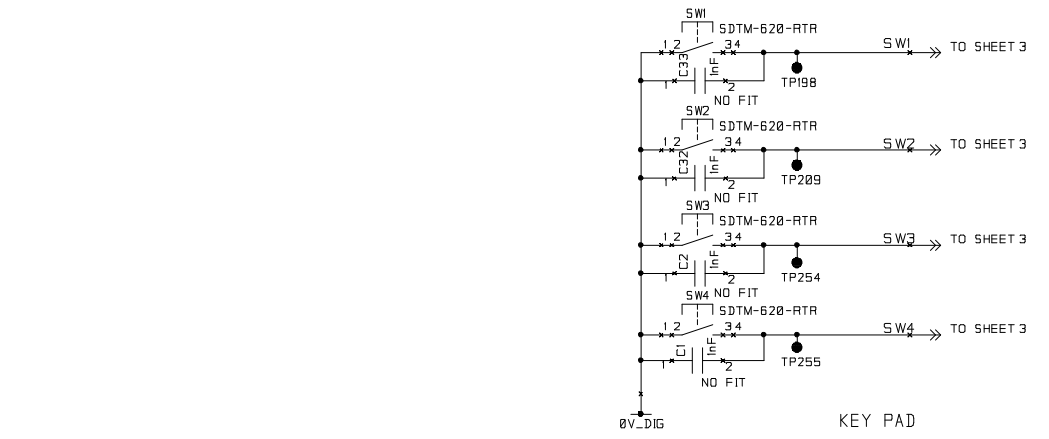
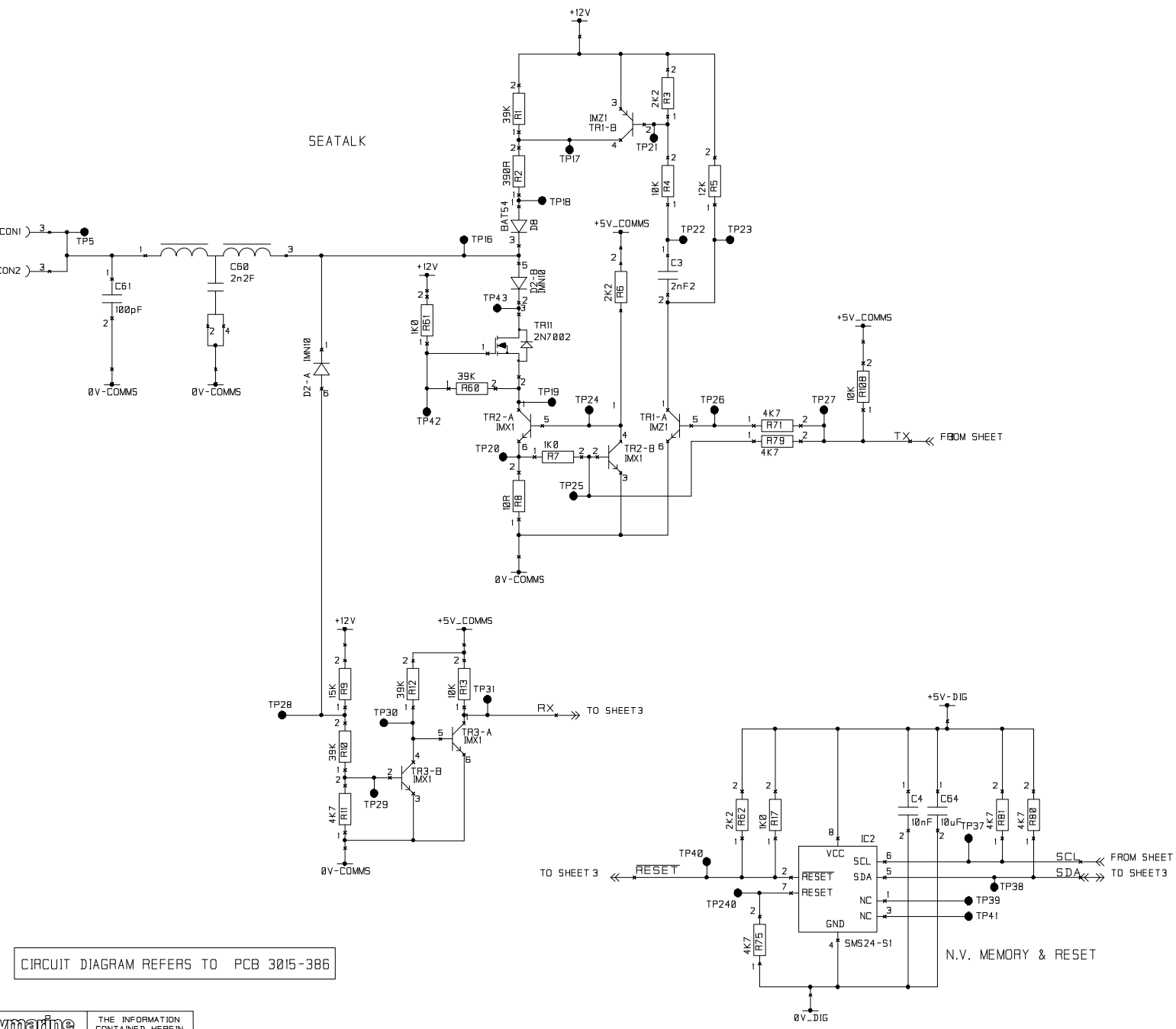
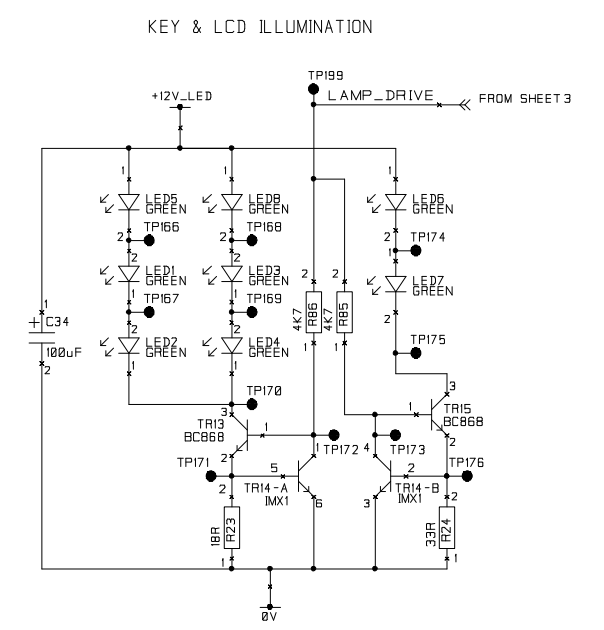
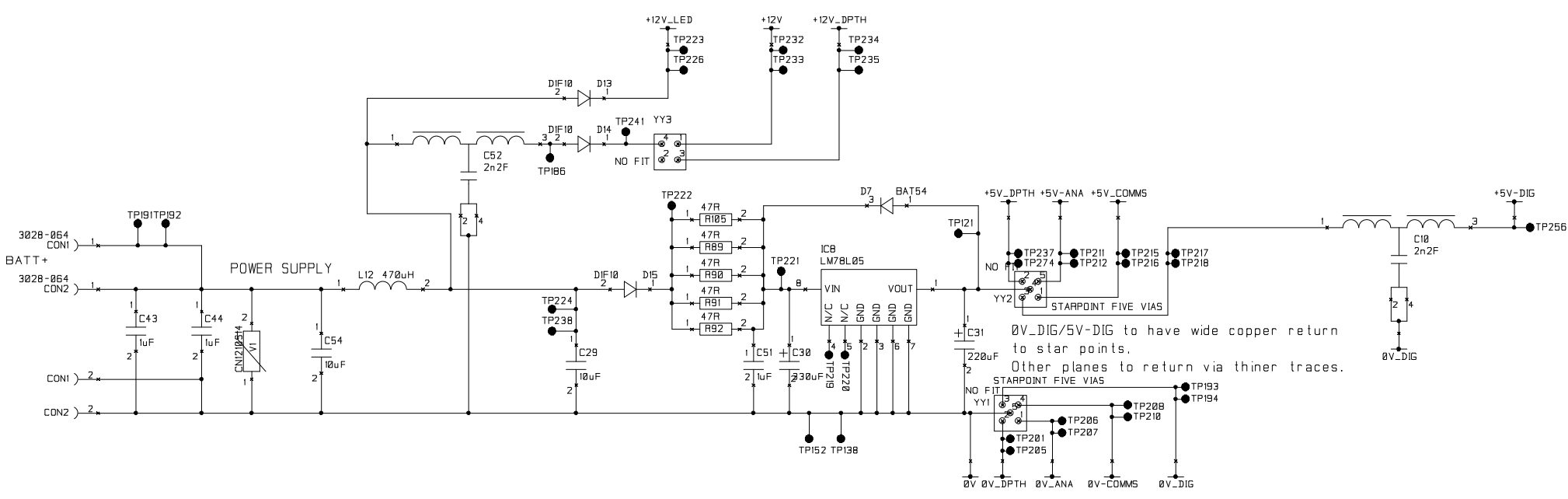
ISS	DATE	COMMENTS
A	21.07.05	New issue.
B	19.08.07	See PPP 4624-026..001
C	19.10.05	Up issued to be in line with sheet 1. PPP 4624-026..002



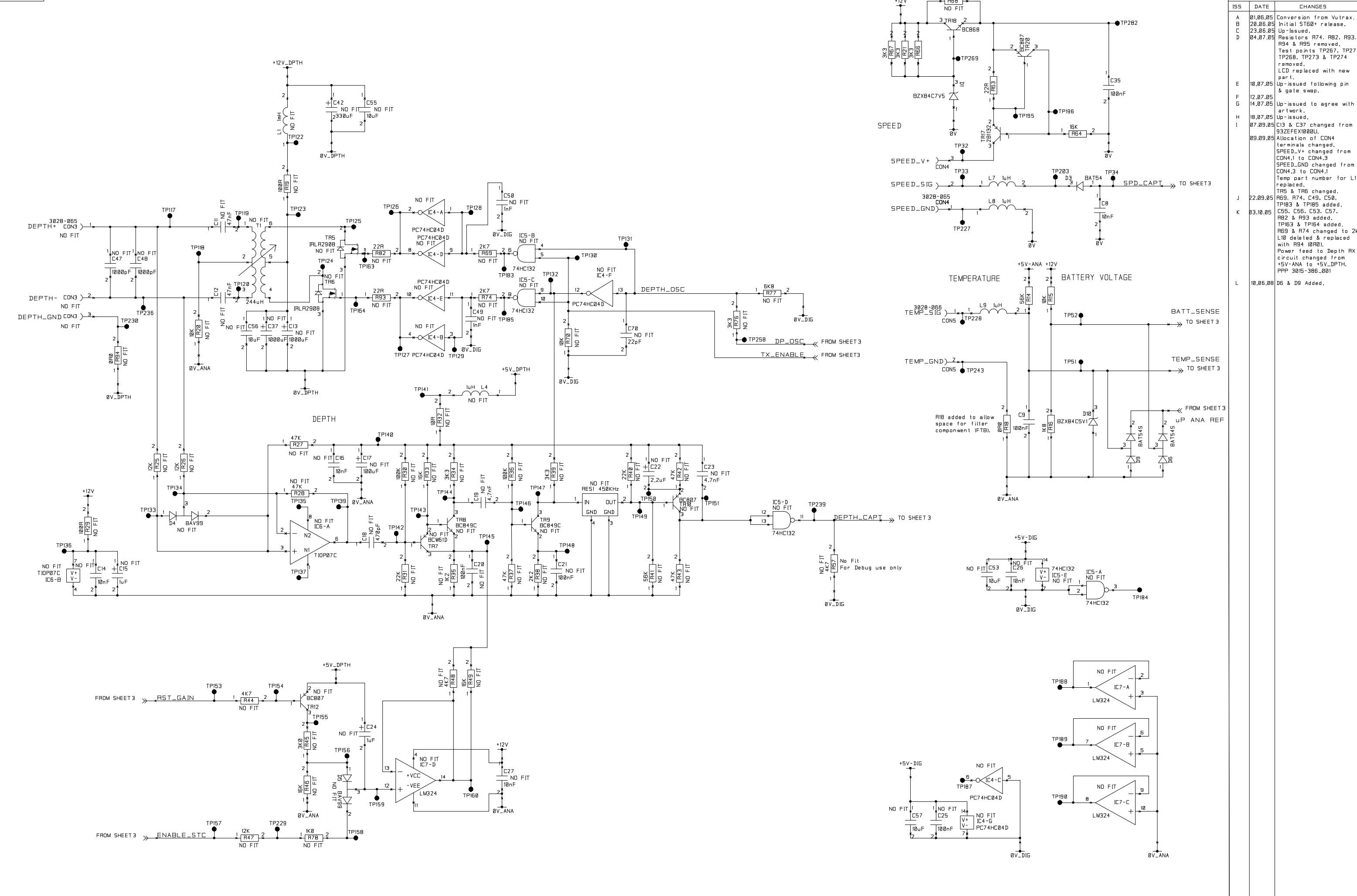
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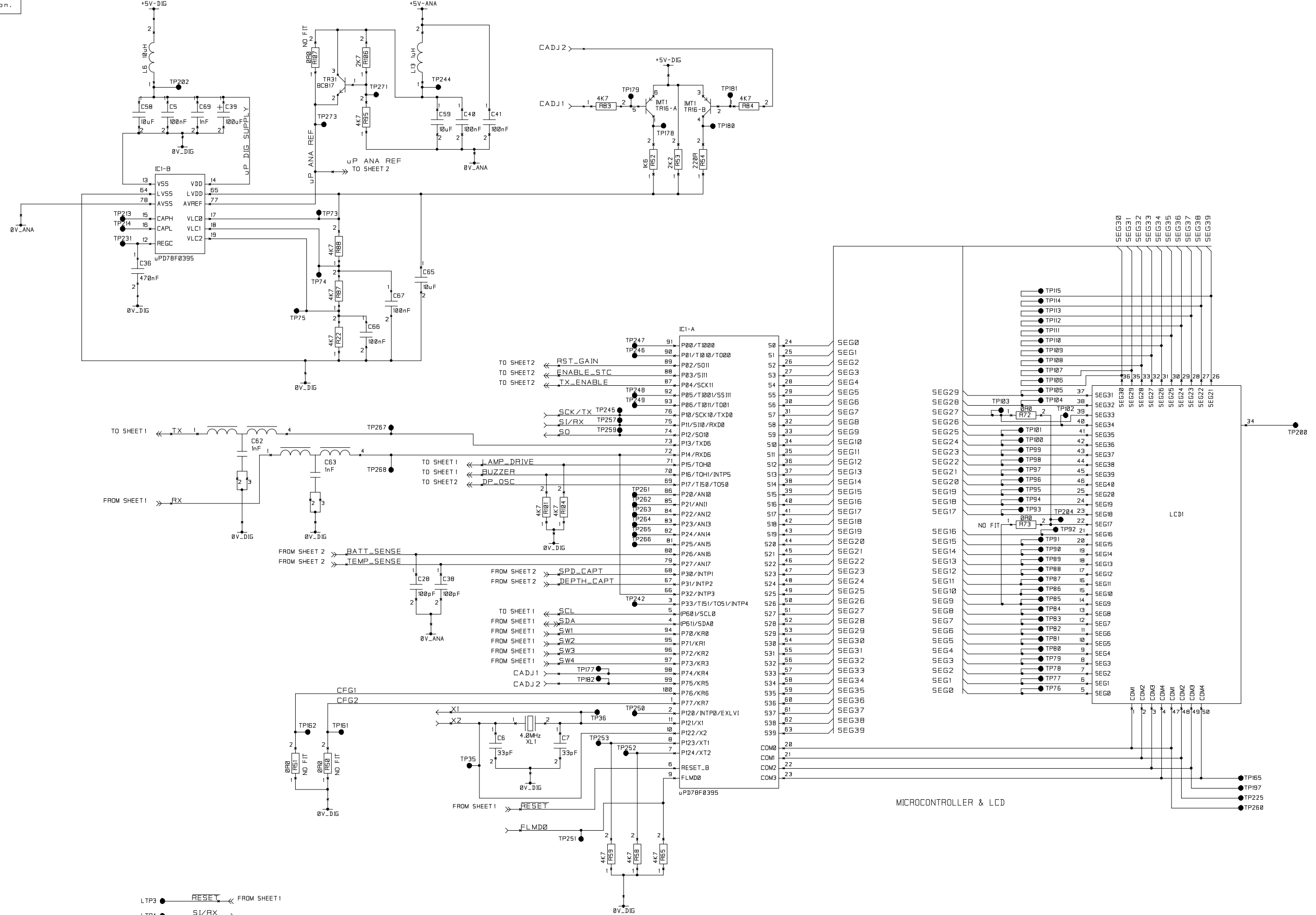
DO NOT SCALE	REMOVE ALL BURRS AND SHARP EDGES UNLESS OTHERWISE STATED	DRAWN I.T.	CHKD I.W.	DATE 21.07.05
PROJ	TITLE . ST8002 AUTOPILOT HEAD.	SCALE 1:1	DRWG No :- 4624-011	sht 2 of 2



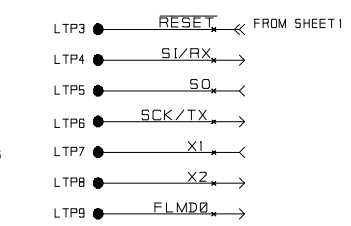
CIRCUIT DIAGRAM REFERS TO PCB 3015-306



ISS	DATE	CHANGES
A	01.06.05	Conversion from Vutrax.
B	20.06.05	Initial ST60+ release.
C	23.06.05	Up-issued.
D	04.07.05	Resistors R74, R82, R93, R94 & R95 removed. Test points TP267, TP271, TP268, TP273 & TP274 removed. LCD replaced with new part.
E	10.07.05	Up-issued following pin & gate swap.
F	12.07.05	Up-issued to agree with artwork.
G	14.07.05	Up-issued.
H	18.07.05	Up-issued.
I	07.09.05	C13 & C37 changed from 932FEF1000U.
J	09.09.05	Allocation of CON4 terminals changed. SPEED_V+ changed from CON4.1 to CON4.3. SPEED_GND changed from CON4.3 to CON4.1. Temp part number for L1 replaced.
K	22.09.05	TR5 & TR6 changed. R69, R74, C49, C50, TPI13 & TPI15 added. C55, C56, C53, C57, R92 & R93 added. TPI13 & TPI14 added. R69 & R74 changed to 2k. L10 deleted & replaced with R94 (0R0). Power feed to Depth RX circuit changed from +5V_ANA to +5V_DPTH. PPP 3015-306.001
L	03.10.05	D6 & D9 Added.

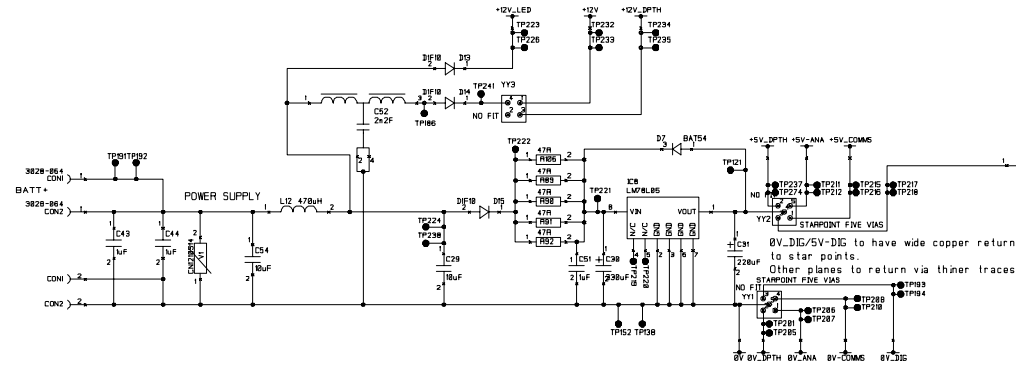


ISS	DATE	CHANGES
A	01.06.05	Conversion from Vutrax.
B	20.06.05	Initial ST60+ release.
C	23.06.05	Up-issued.
D	04.07.05	Resistors R74, R82, R93, R94 & R95 removed. Test points TP267, TP271, TP268, TP273 & TP274 removed. LCD replaced with new part.
E	10.07.05	Up-issued following pin & gate swap.
F	12.07.05	Up-issued to agree with artwork.
G	14.07.05	Up-issued.
H	18.07.05	Up-issued.
I	09.09.05	LVDD pin connected to VLCD pin on micro. TP103 deleted.
J	22.09.05	Up-issued.
K	03.10.05	C58 & C59 added. L6 changed from 1uH to 10uH. Route codes changed on 'uP ANA REF' & 'uP DIG SUPPLY'. C52 & C53 feed through caps added. TP257, TP268, TP271, TP273 added. R95, R106, R107 & TR31 added. SKT1 deleted. R96 - R100, R102 & R103 deleted. TP270, TP272, TP275 - TP281 deleted. LTP1 to LTP9 added. C65, C66 & C67 added. PPP 3015-306_001
L	10.06.08	Signal/supply uP ANA REF referenced off page (see sheet 2).

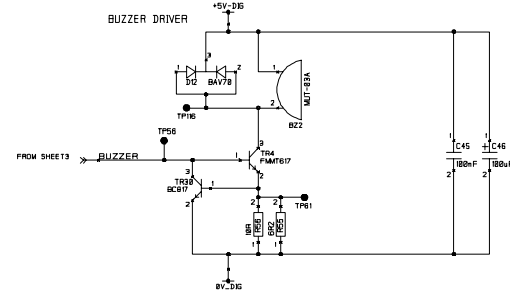
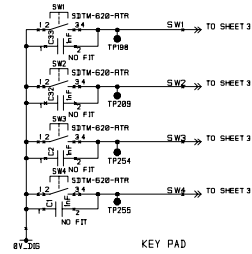
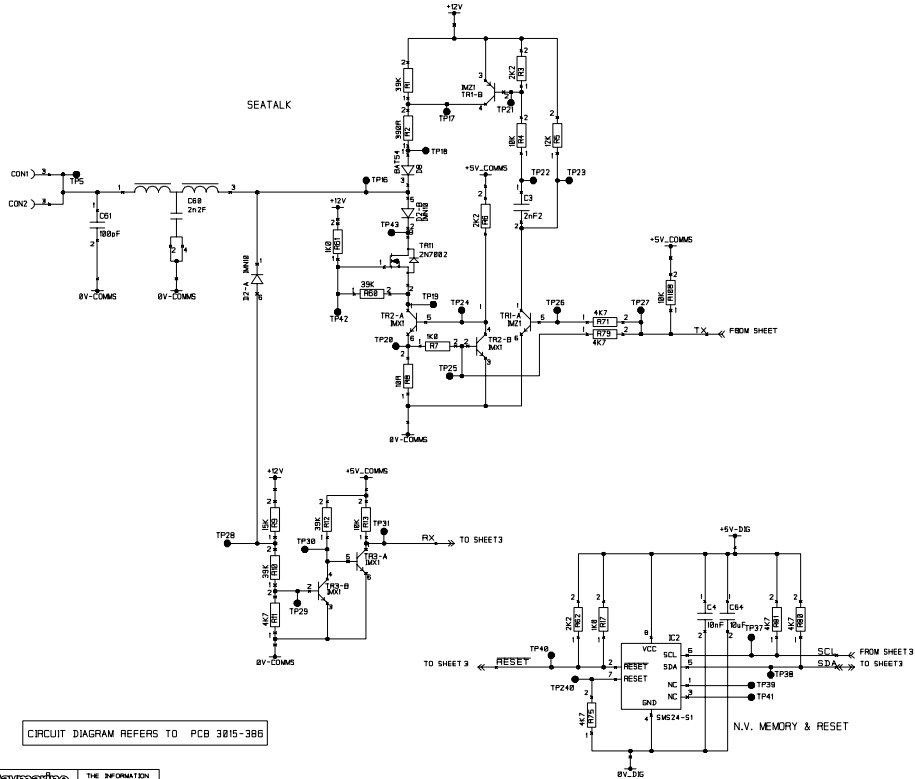
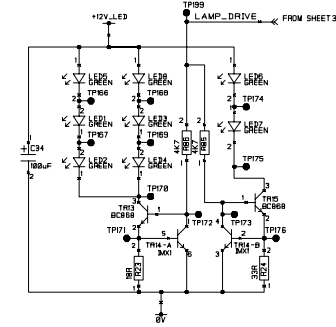


Large Test points LTP1 to LTP9 to be situated on component side of the PCB.

Used on.



KEY & LCD ILLUMINATION



CIRCUIT DIAGRAM REFERS TO PCB 3015-386

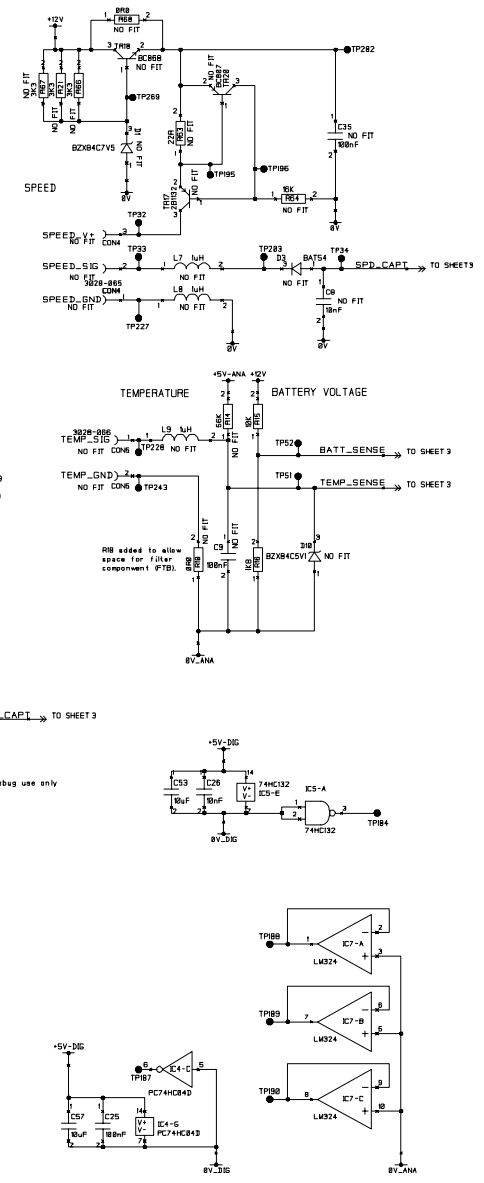
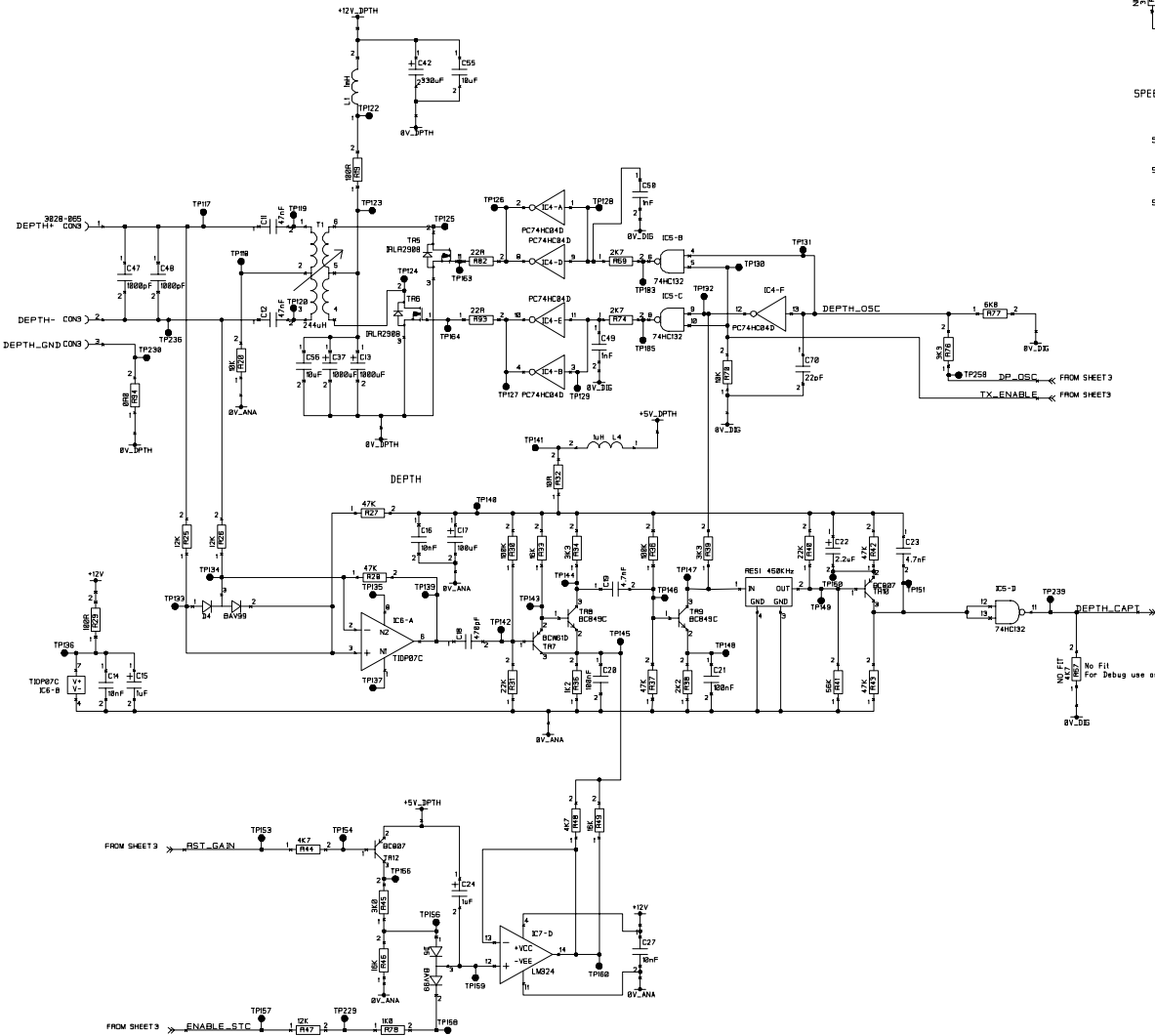
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MODIFICATION/AMENDMENT

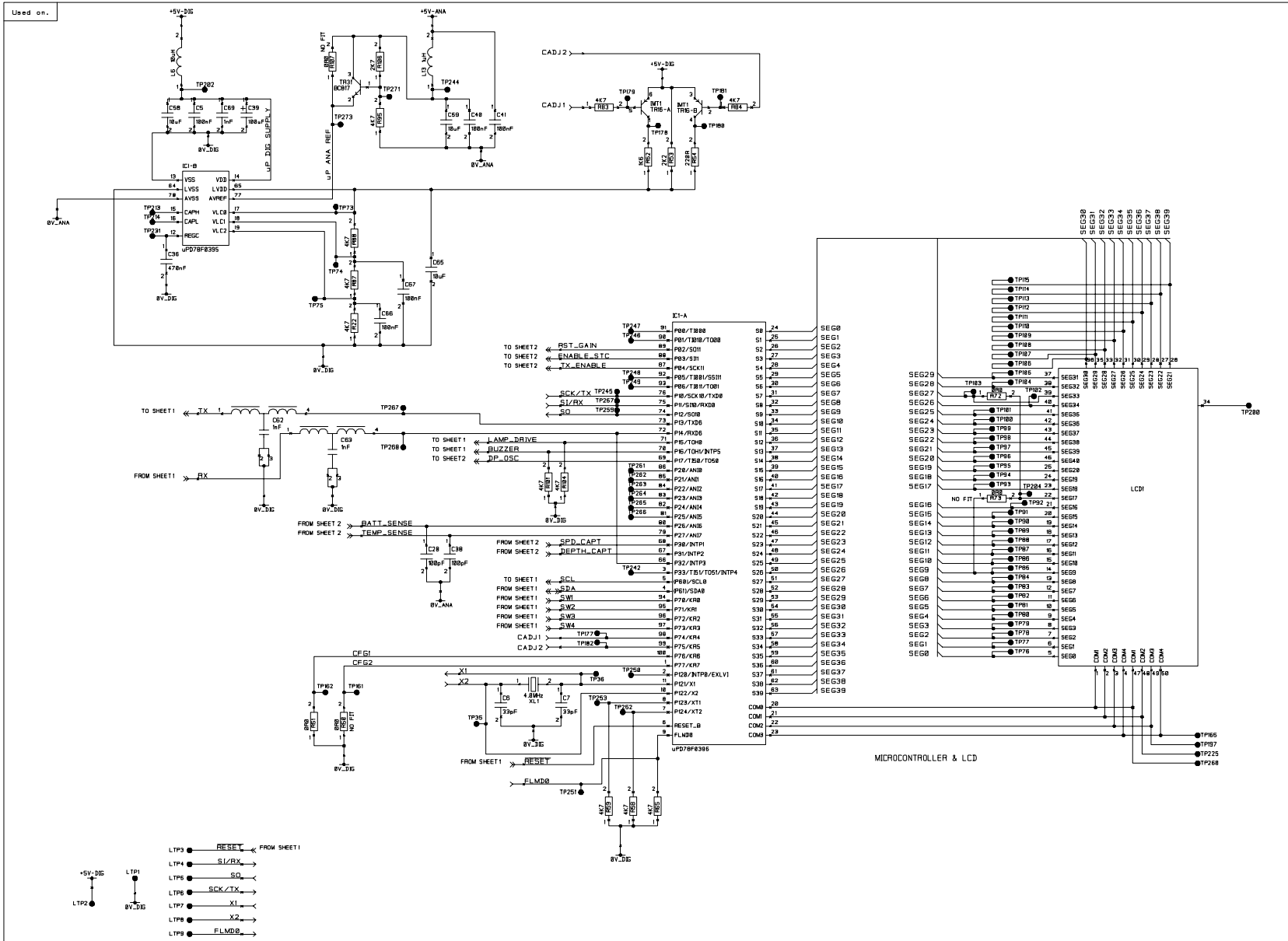
REV	DATE	CHANGES
A	01.08.05	Conversion from Votrax.
B	20.06.05	Initial ST08+ release.
C	23.06.05	Up-issued.
D	04.07.05	Resistor R74, R82, R83, R84 & R85 removed. Test points TP207, TP221, TP268, TP273 & TP274 removed. LCD replaced with new part.
E	08.07.05	Up-issued following pin & gate swap.
F	2.07.05	
G	4.07.05	Up-issued to agree with network.
H	08.07.05	Up-issued. Resistor R74 & TP98 added. Feed thru cap C10 added. C55 replaced with variable 01.
I	20.07.05	Update 32-C & TP98 added. Feed thru cap C10 added. C55 replaced with variable 01.
J	22.09.05	Up-issued.
K	02.10.05	L2 changed to differential. C52, C50 feed through filters added. C3 & C4 caps added. TP86 added. TP95, TP84 & TP237 deleted. L2 & L1 deleted. Star point VY2 changed from 4 to 5 mv. +5V_DIG supply added. R88 pull-up to +5V_COMM added. D2-C replaced with B8 Schottky diode. Alternative buzzer BZ1 added. PFP 3015-986-081

DO NOT SCALE	REMOVE ALL BURRS AND SHARP EDGES UNLESS OTHERWISE STATED	DRAWN DW	CHKD	DATE 1.08.05
PROJ 2024	TITLE: ST08 PLUS DEPTH - SHEET 1 OF 3	SCALE 1:1	DRWG No: 4524-0W	

Used on:



MODIFICATION/AMENDMENT		
ISS	DATE	CHANGES
A	01.05.85	Conversion from Matrix.
B	28.05.85	Initial ST68+ release.
C	23.05.85	Up-issued
D	04.07.85	Resistors R74, R82, R93, R94 & R95 removed. Test points TP227, TP271, TP288, TP273 & TP274 removed. LCD replaced with new part.
E	03.07.85	Up-issued following pin & gate swap.
F	14.07.85	Up-issued to agree with artwork.
G	14.07.85	Up-issued.
H	07.09.85	Allocation of CDN4 terminals changed. SPEED_V+ changed from CDN1 to CDN3. SPEED_GND changed from CDN3 to CDN1.
I	09.09.85	Temp part number for L1 replaced. TR5 & TR6 changed. R63, R74, C49, C58, TP103 & TP105 added. C25, C26, C33, C57, R62 & R63 added. TP103 & TP104 added. R63 & R74 changed to 2k. L8 deleted & replaced with R94 (R92). Power lead to Depth RX circuit changed from +5V-ANA to +5V-DPTH. PNP 3015-306_001
J	22.09.85	TR5 & TR6 changed. R63, R74, C49, C58, TP103 & TP105 added. C25, C26, C33, C57, R62 & R63 added. TP103 & TP104 added. R63 & R74 changed to 2k. L8 deleted & replaced with R94 (R92). Power lead to Depth RX circuit changed from +5V-ANA to +5V-DPTH. PNP 3015-306_001
K	03.10.85	



MODIFICATION/AMENDMENT

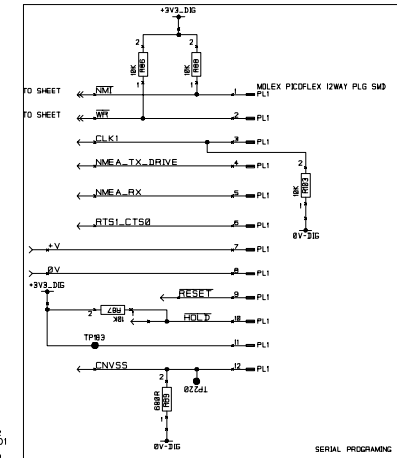
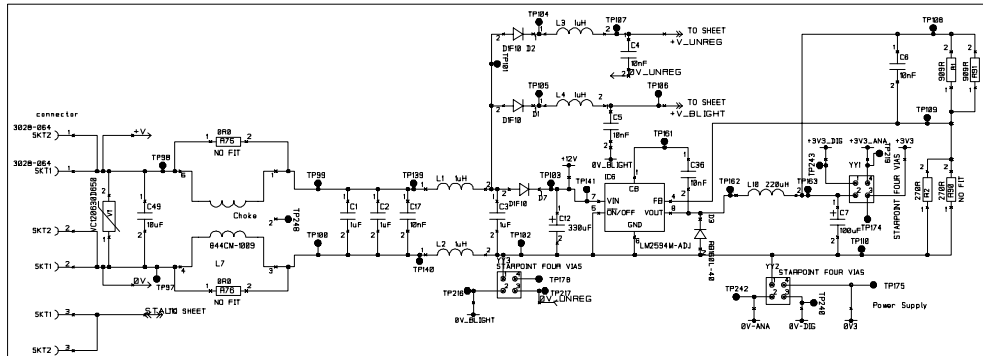
REV	DATE	CHANGES
A	01.06.05	Conversion from Ultrav.
B	28.06.05	Initial ST68+ release.
C	23.06.05	Up-issued
D	04.07.05	Resistors R74, R82, R83, R84 & R85 removed. Test points TP207, TP271, TP280, TP273 & TP274 removed. LCD replaced with new part.
E	03.07.05	Up-issued following pin & gate swap.
F	02.07.05	Up-issued to agree with artwork.
G	04.07.05	Up-issued.
H	09.07.05	Up-issued.
I	09.09.05	LVDD pin connected to VCC pin on micro. TP80 deleted.
J	22.09.05	Up-issued.
K	03.10.05	C58 & C59 added. LE changed from L41 to L41H. Resistor codes changed on L41 ANA REF & L41 D5 SUPPLY. C52 & C53 lead through code added. TP207, TP208, TP271, TP273 added. R85, R86, R87 & TR31 added. SK11 deleted. R86 - R88, R102 & R103 deleted. TP226, TP272, TP275 - TP281 deleted. L41 to L41H added. C55, C56 & C57 added. PMP 385-585.001

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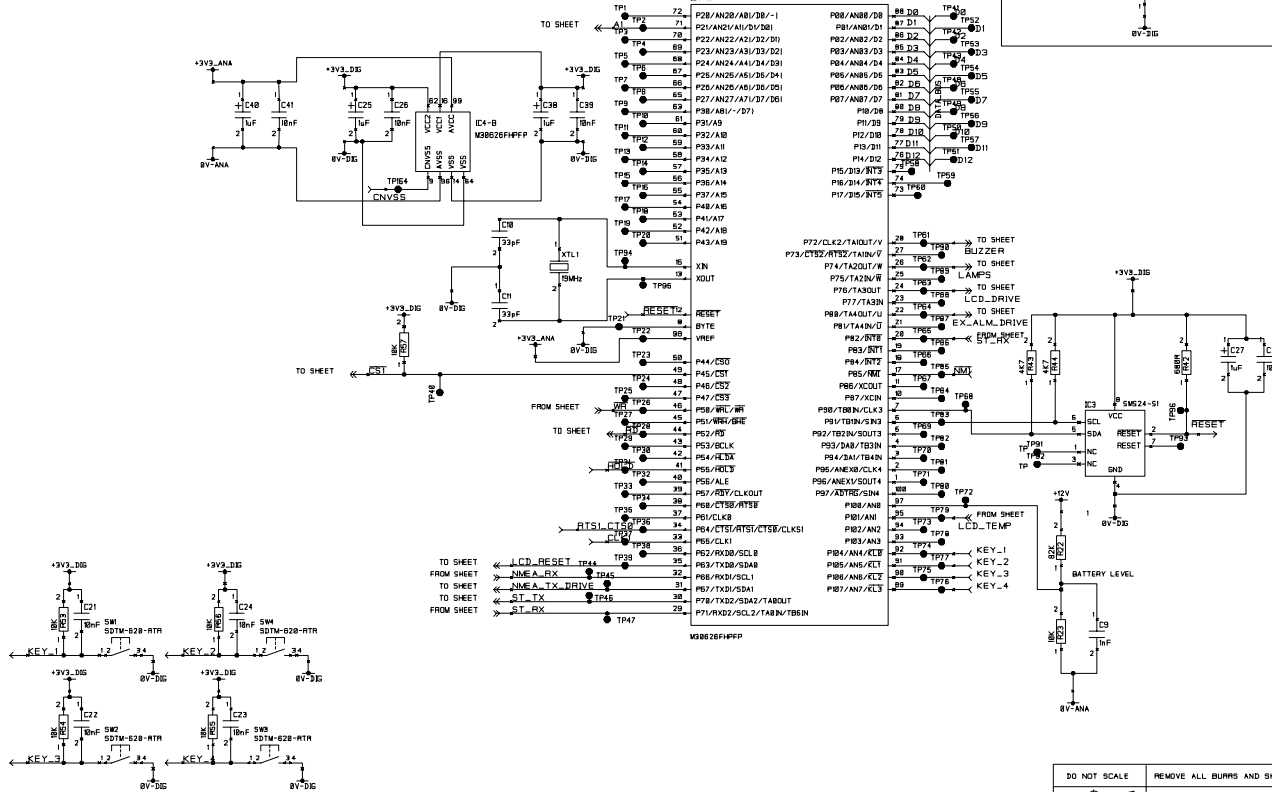
Large Test points LTP1 to LTP9 to be situated on component side of the PCB.

DO NOT SCALE	REMOVE ALL BURRS AND SHARP EDGES UNLESS OTHERWISE STATED	DRAWN DW	CHKD	DATE
PROJ D624	TITLE: ST68 PLUS DEPTH - SHEET 3	SCALE 1:1	DRWG No: -	4624-014

Used on.



IC4 to be place close to LCD connection.

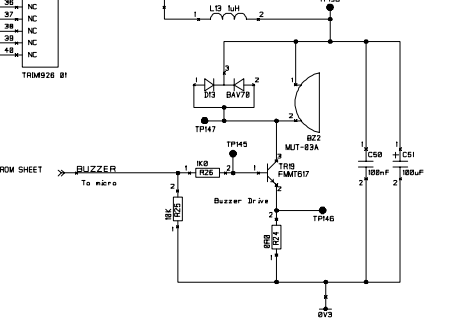
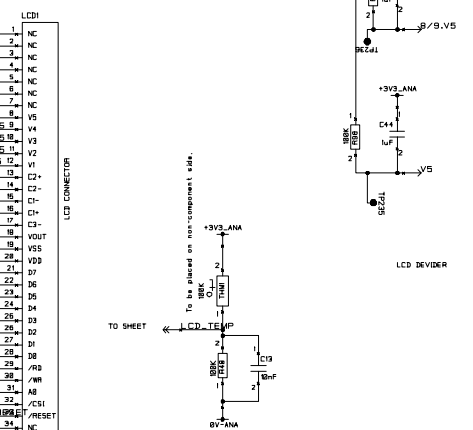
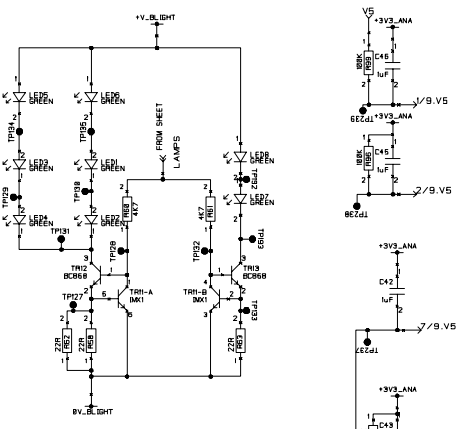
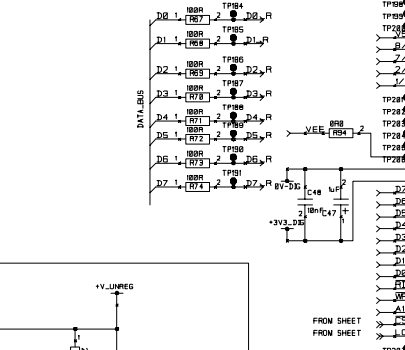
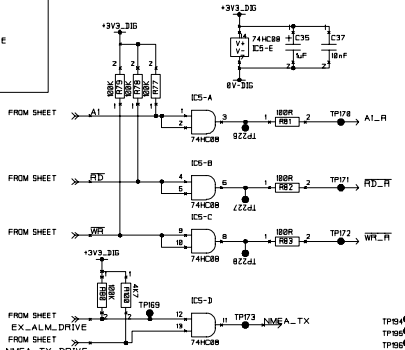
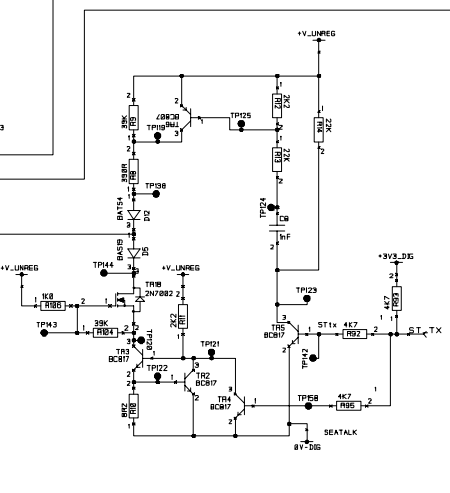
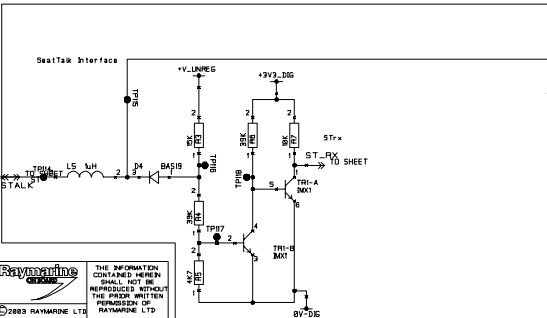
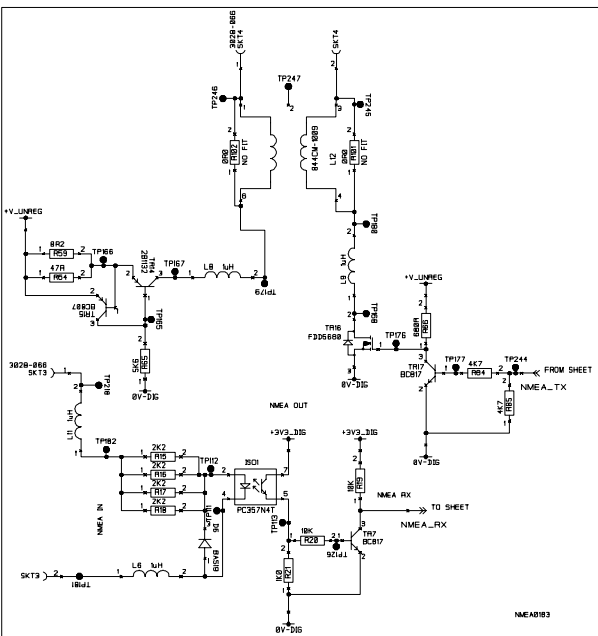
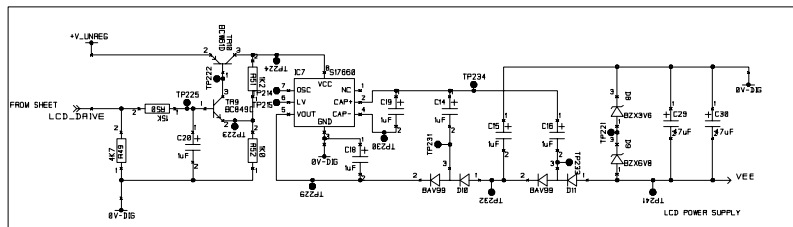


MODIFICATION/AMENDMENT

REV	DATE	CHANGES
A	26.07.05	New issue taken from 4595-882-G
B	28.10.05	IC3 was 94024822 IC4 was 9408M8024 See sheet 2 PPP 3815-386_881
C	31.01.06	IC1 CHANGED BACK TO IC4 M-85-881

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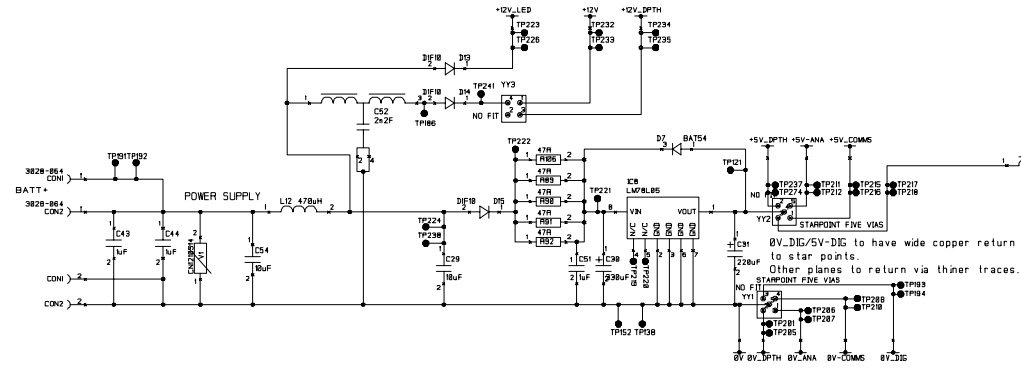
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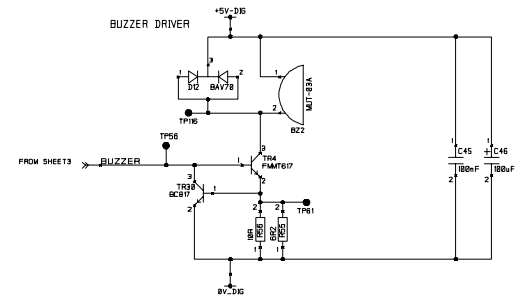
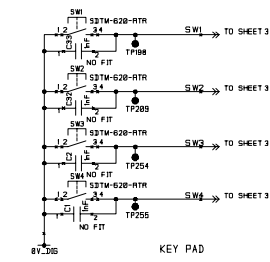
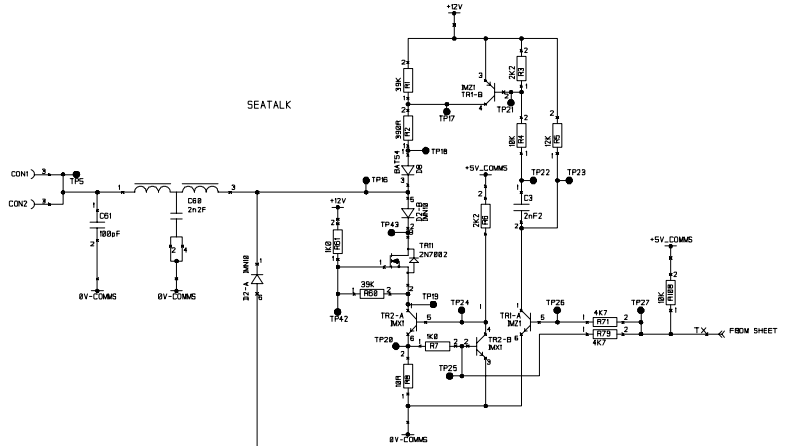
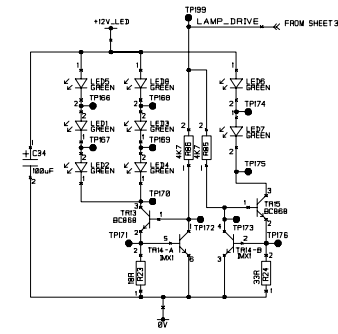
MODIFICATION/AMENDMENT

ISS	DATE	CHANGES
A	28.07.05	New Issue taken from 4536-082-G
B	28.10.05	R80 use 4K7 See sheet 1 PWB: 385-388_B01
C	31.01.06	X1 CHANGED BACK TO IC4 M95-981

Used on:



KEY & LCD ILLUMINATION



CIRCUIT DIAGRAM REFERS TO PCB 3015-386

MODIFICATION/AMENDMENT

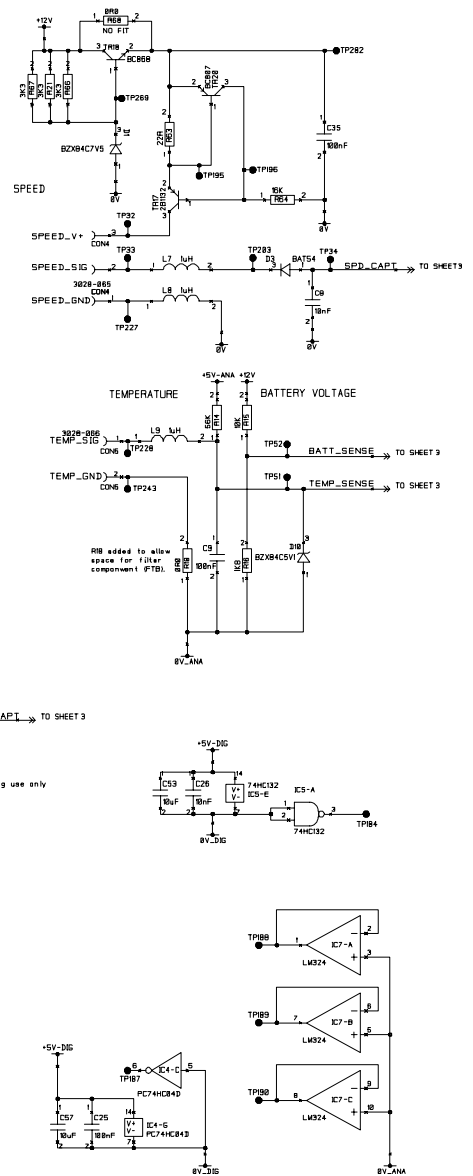
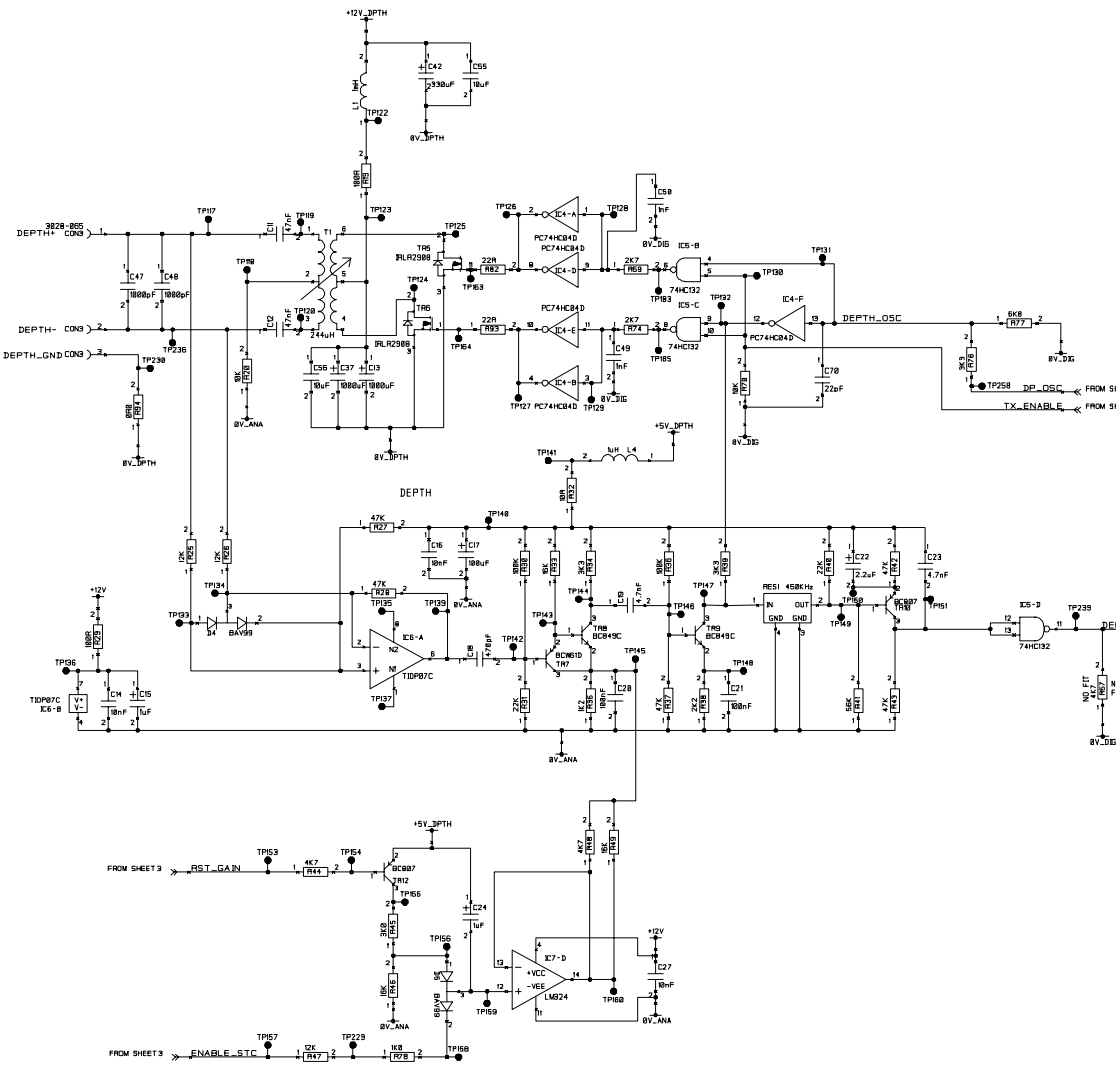
REV	DATE	CHANGES
A	01.08.05	Conversion from Vutrax.
B	20.06.05	Initial ST08+ release.
C	23.06.05	Up-issued.
D	04.07.05	Resistor R74, R82, R93, R94 & R95 removed. Test points TP207, TP221, TP268, TP273 & TP274 removed. LCD replaced with new part.
E	08.07.05	Up-issued following pin & gate swap.
F	2.07.05	
G	4.07.05	Up-issued to agree with network.
H	08.07.05	Up-issued. C29, C30, C31 & TP89 added. Feed thru cap C10 added. C55 replaced with variable 01.
I	20.07.05	Update 32-C & TP89 added. Feed thru cap C10 added. C55 replaced with variable 01.
J	22.09.05	Up-issued.
K	02.10.05	L2 changed to differential. C52, C53 feed through filters added. C31 & C54 caps added. TP86 added. TP95, TP84 & TP237 deleted. L2 & L1 deleted. Star point VY2 changed from 4 to 5 mV. +5V-DIG supply added. R88 pull-up to +5V-DIG added. D2-C replaced with B8 Schottky diode. Alternative buzzer B21 added. PFP 3015-986-081



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DO NOT SCALE	REMOVE ALL BURRS AND SHARP EDGES UNLESS OTHERWISE STATED	DRAWN DW	CHKD	DATE
PROJ 2024	TITLE: ST08 PLUS TRDATA - SHEET 1 OF 3	SCALE 1:1	DRWG No: 1	4024-006

Used on:

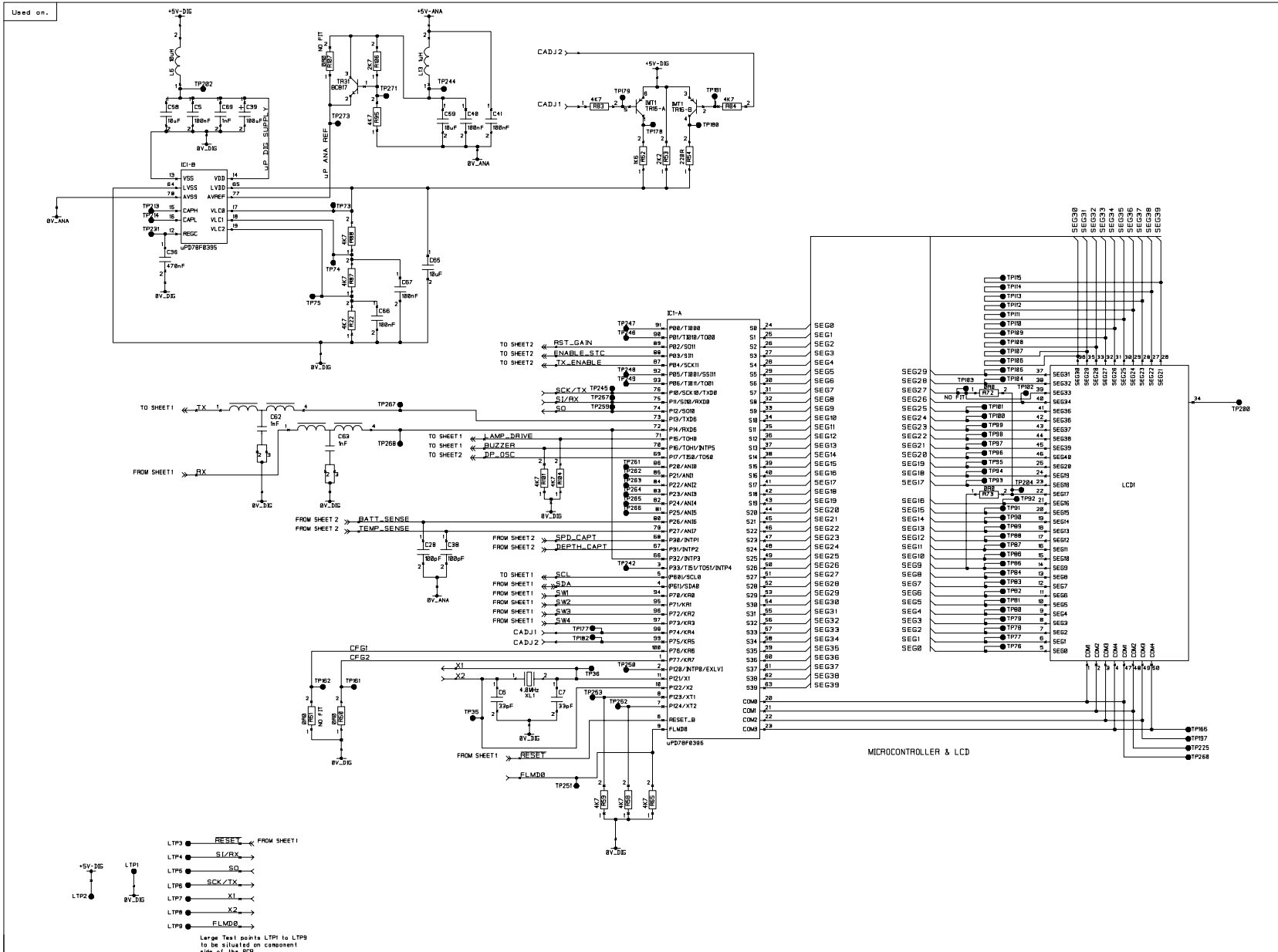


MODIFICATION/AMENDMENT

ISS	DATE	CHANGES
A	01.05.05	Conversion from Matrix.
B	28.05.05	Initial ST68+ release.
C	23.05.05	Up-issued.
D	04.07.05	Resistor R74, R82, R93, R94 & R95 removed. Test points TP227, TP271, TP268, TP273 & TP274 removed. LCD replaced with new part.
E	03.07.05	Up-issued following pin & gate swap.
F	12.07.05	Up-issued to agree with artwork.
G	14.07.05	Up-issued.
H	07.09.05	Up-issued.
I	07.09.05	Allocation of CDN4 terminals changed. SPEED_V+ changed from CDN1 to CDN3. SPEED_GND changed from CDN3 to CDN1. Temp part number for L1 replaced.
J	22.09.05	TRS & TR6 changed. R93, R74, C49, C58, TP303 & TP305 added. C25, C26, C33, C57, R82 & R93 added. R69 & R74 changed to 2k. L8 deleted & replaced with R94 (R92). Power feed to Depth RX circuit changed from +5V_ANA to +5V_DEPTH. PNP 3015-306_001
K	03.10.06	

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DO NOT SCALE	REMOVE ALL BURRS AND SHARP EDGES UNLESS OTHERWISE STATED	DRAWN DW	CHK'D	DATE
PROJ 3024	TITLE: ST68 PLUS TRDATA - SHEET 2	SCALE 1:1	DRWG No: 4824-05	1.05.05



MODIFICATION/AMENDMENT

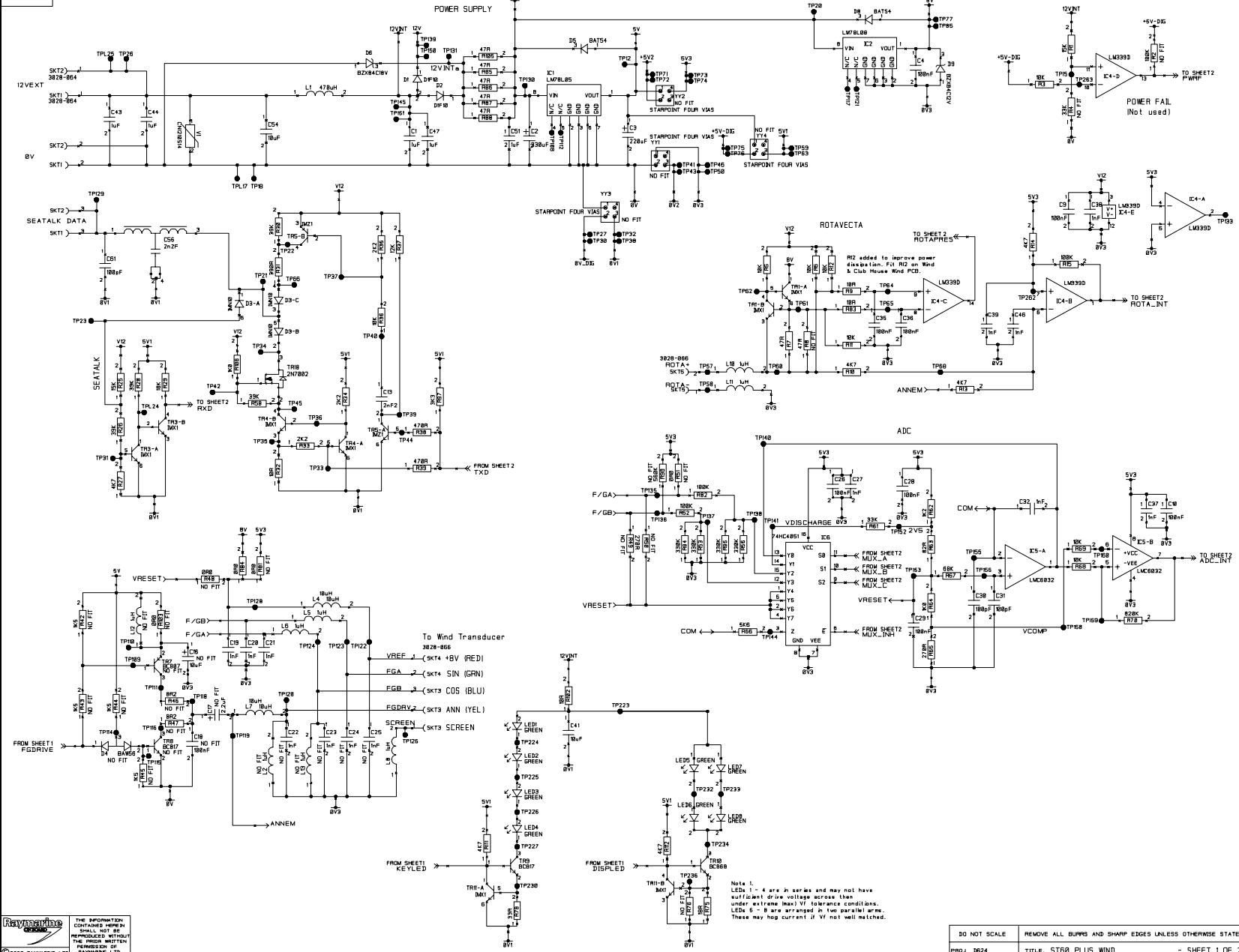
REV	DATE	CHANGES
A	01.06.05	Conversion from Ultrav.
B	28.06.05	Initial ST68+ release.
C	23.06.05	Up-issued
D	04.07.05	Resistors R74, R82, R93, R94 & R95 removed. Test points TP207, TP271, TP268, TP273 & TP274 removed. LCD replaced with new part.
E	03.07.05	Up-issued following pin & gate swap.
F	02.07.05	Up-issued to agree with artwork.
G	14.07.05	Up-issued.
H	09.07.05	Up-issued.
I	09.09.05	LVDD pin connected to VCC8 pin on micro. TP80 deleted.
J	22.09.05	Up-issued.
K	03.10.05	C58 & C59 added. LE changed from L41 to L41H. Resistor codes changed on UPD78F8386. S11 deleted. R95 - R98, R102 & R103 deleted. TP226, TP272, TP275 - TP281 deleted. LTP1 to LTP9 added. C65, C66 & C67 added. PFP 385-585.001



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DO NOT SCALE	REMOVE ALL BURRS AND SHARP EDGES UNLESS OTHERWISE STATED	DRAWN DW	CHKD	DATE
PROJ 0624	TITLE: ST68 PLUS TRDATA - SHEET 3	SCALE 1:1	DRWG No:--	4624-016

Used on:

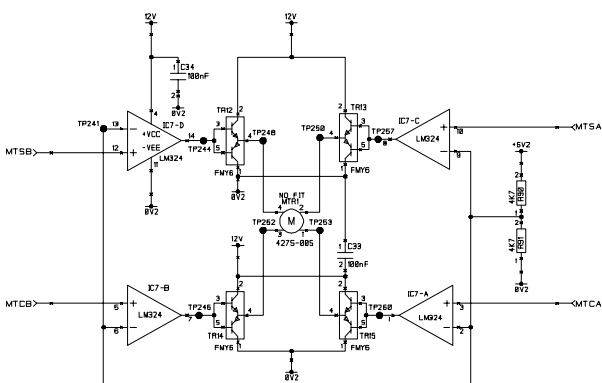
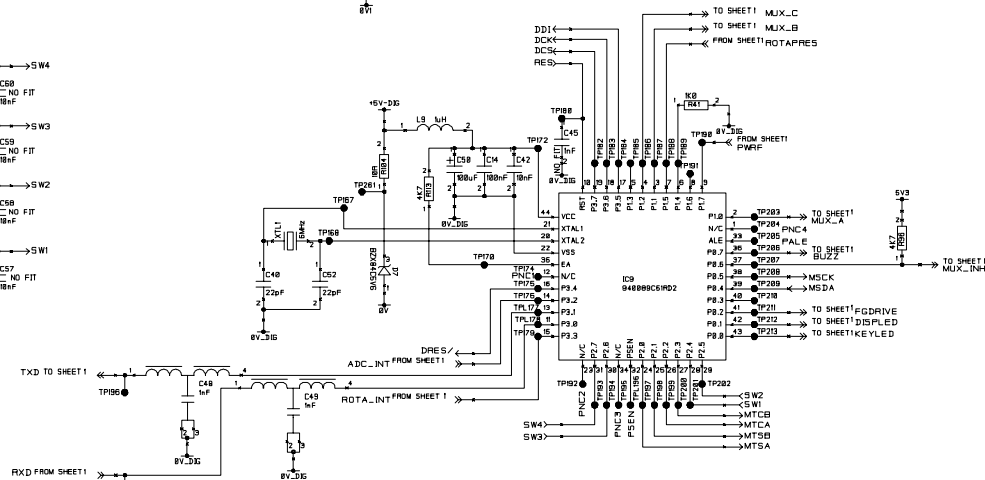
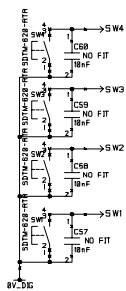
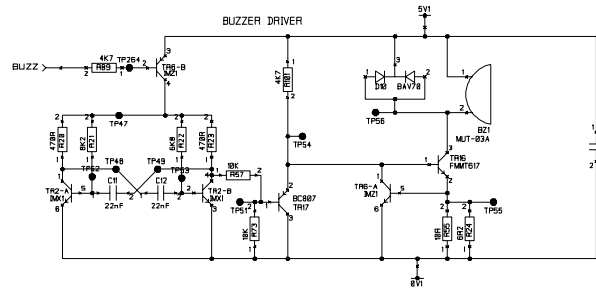


MODIFICATION/AMENDMENT

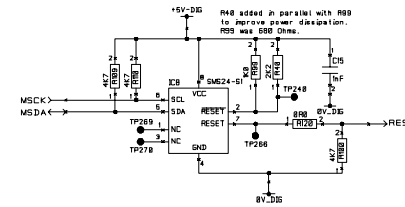
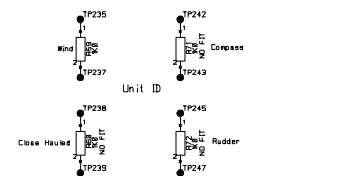
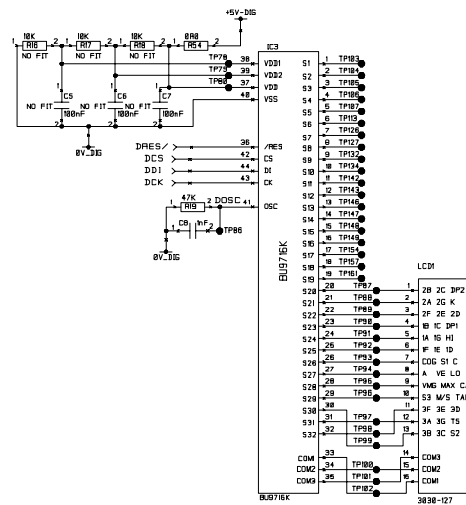
ISS	DATE	CHANGES
A	17.05.05	Initial conversion from Vultrex 4314-802.
B	25.05.05	Final Layout
B3	25.05.05	Pinout of SKT3 & SKT1 re-allocated.
B4	26.05.05	IC4 marked as 'No Fit'. L4 & L7 changed to 1200 foot print.
C	21.06.05	R92 changed to ferrite L2. R93 changed to ferrite L2. R93 changed to ferrite L2. R93 changed to ferrite L2.
D	08.07.05	L4 & L7 changed to match schematic.
E	19.07.05	R92 changed to ferrite L2. R93 changed to ferrite L2. R93 changed to ferrite L2. R93 changed to ferrite L2.
F	20.07.05	Up-merged. Route codes for VREF & FGA changed from 12/8 to 40/20.
G	28.07.05	PPW 3015-387_001. D5-C added. TP96 added. C61 changed from 052400 to 9565XXXX00.
H	15.08.05	Test points 12/24 & 25 changed to large pads. C39, C40 & C47 added. C1 changed from 100pF to 1uF.
I	18.08.05	L3 changed to feed through capacitor C56. C1 changed to diff chock TP8 & TP4 added.
J	08.09.05	Route codes for track 'SEATALK_DATA' changed from 12/8 to 20/5.
K	01.11.05	Route codes for signal 'SEATALK_DATA' changed. C39, C40 were 100pF. L12 now no fit. R93 value 100 removed. See sheet 2.

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Used on:



Sine - Cosine Motor Drive

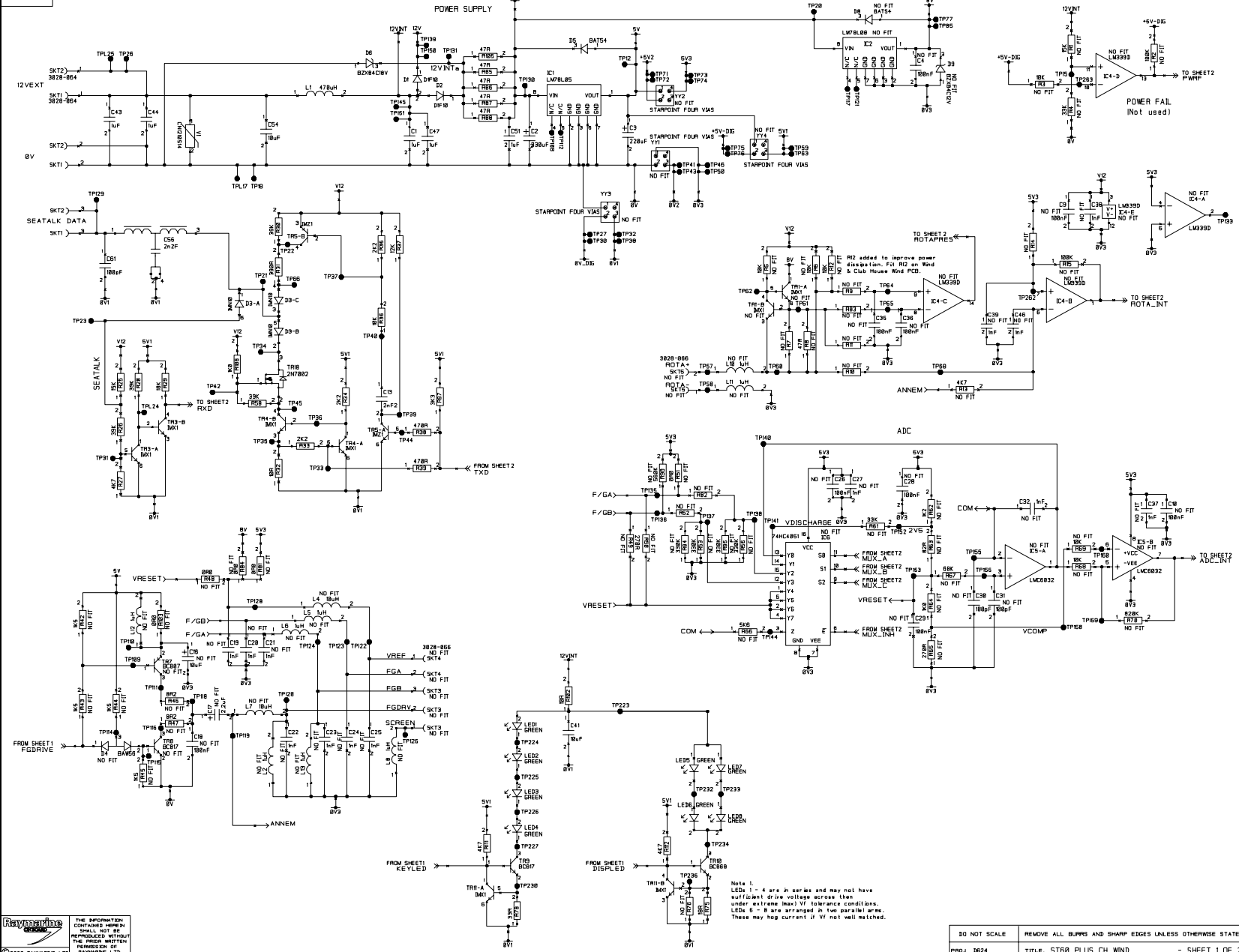


MODIFICATION/AMENDMENT		
ISS	DATE	CHANGES
A	17.05.05	Initial conversion from Vultrax 434-082.
B	25.05.05	Final Layout.
B3	25.05.05	Route code changed for net connected to pin 44 of IC1.
B4	26.05.05	R16-B, C5-7 & C45 marked as 'NO FIT'.
C	21.06.05	C46 - C49 replaced with R10, R09, R01 & R12 with Test points either side. C56 deleted.
D	08.07.05	Up issued to bring in line with sheet 1.
E	09.07.05	R16 Deleted. R13 Added.
F	08.07.05	Up-issued.
G	15.08.05	C49 & C48 added. R10, R11, R12 & R15 changed to large pads. C56 & TP214 added.
H	15.08.05	Up-issued.
J	08.05.05	Up-issued. R22 was BK. R21 was BK. See Sheet 1.
K	01.11.05	IC3 assigned Raymarine part no. See Sheet 1.

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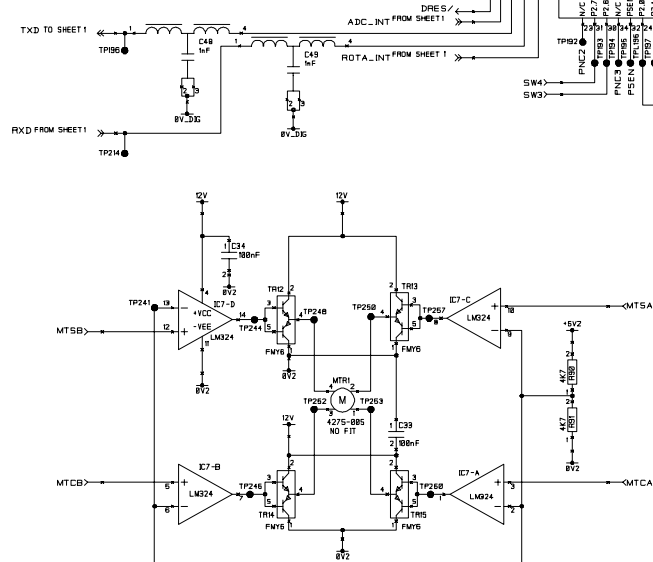
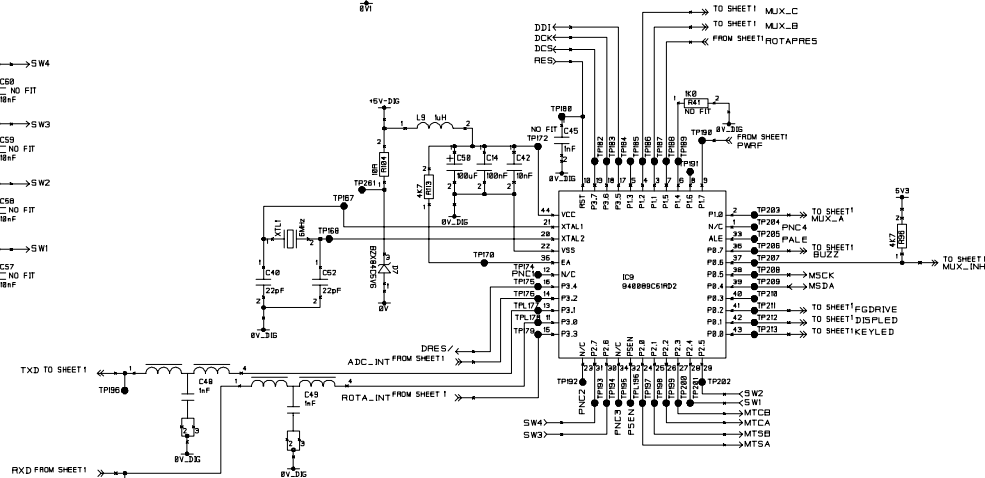
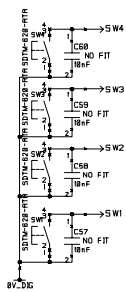
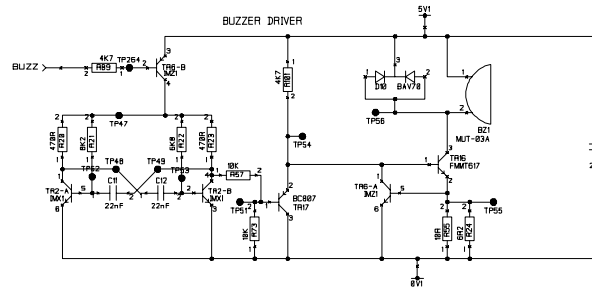
MODIFICATION/AMENDMENT

ISS	DATE	CHANGES
A	17.05.95	Initial conversion from Vultrex 4314-882.
B	25.05.95	Final Layout
B3	25.05.95	Pinout of SK3 & SK11 re-located.
B4	26.05.95	LM393 marked as 'No Fit'. L4 & L7 changed to 1200 foot print.
C	21.06.95	R92 changed to ferrite L2. R93 changed to ferrite L3. R94 & L7 changed back to 9608L1 to match schematic.
D	09.07.95	R92 changed to ferrite L2. R93 changed to ferrite L3. R94 & L7 changed to 9608L1 to match schematic.
E	19.07.95	Up-merged
F	20.07.95	Route codes for VREF & FGA changed from 12/B to 4B/20.
G	28.07.95	PPW 3815-387_081
H	15.08.95	D5-C added. TP66 added. C61 changed from 05248U to 956FFKX8U. Test points 12/24 & 25 changed to large pads.
I	18.08.95	C39, C40 & C47 added. C1 changed from 100F to 1uF.
J	08.09.95	L3 changed to feed through capacitor C56. L1 changed to diff chock TP6 & TP4 deleted. Route codes for track SEATALK_DATA changed from 12/B to 20/B5.
K	01.11.95	Route codes for signal SEATALK_DATA changed. C39, C40 were 1000F. L12 now no fit. R93 value 100 removed. See sheet 2.
K	01.11.95	L1 was 220u. See Sheet 2.

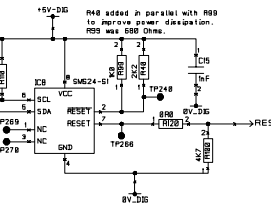
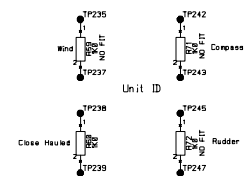
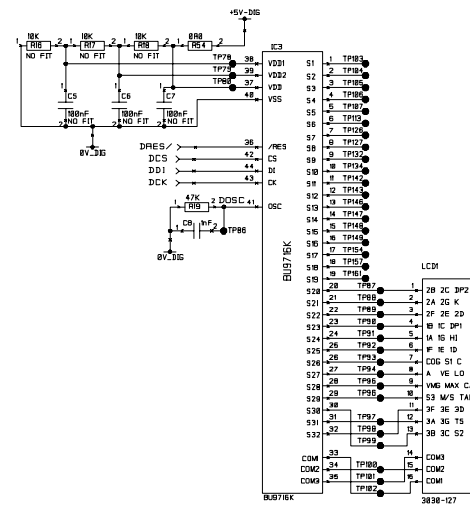
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3000 Highway Ltd
2000 Marine Drive
Raymarine Ltd

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Used on:



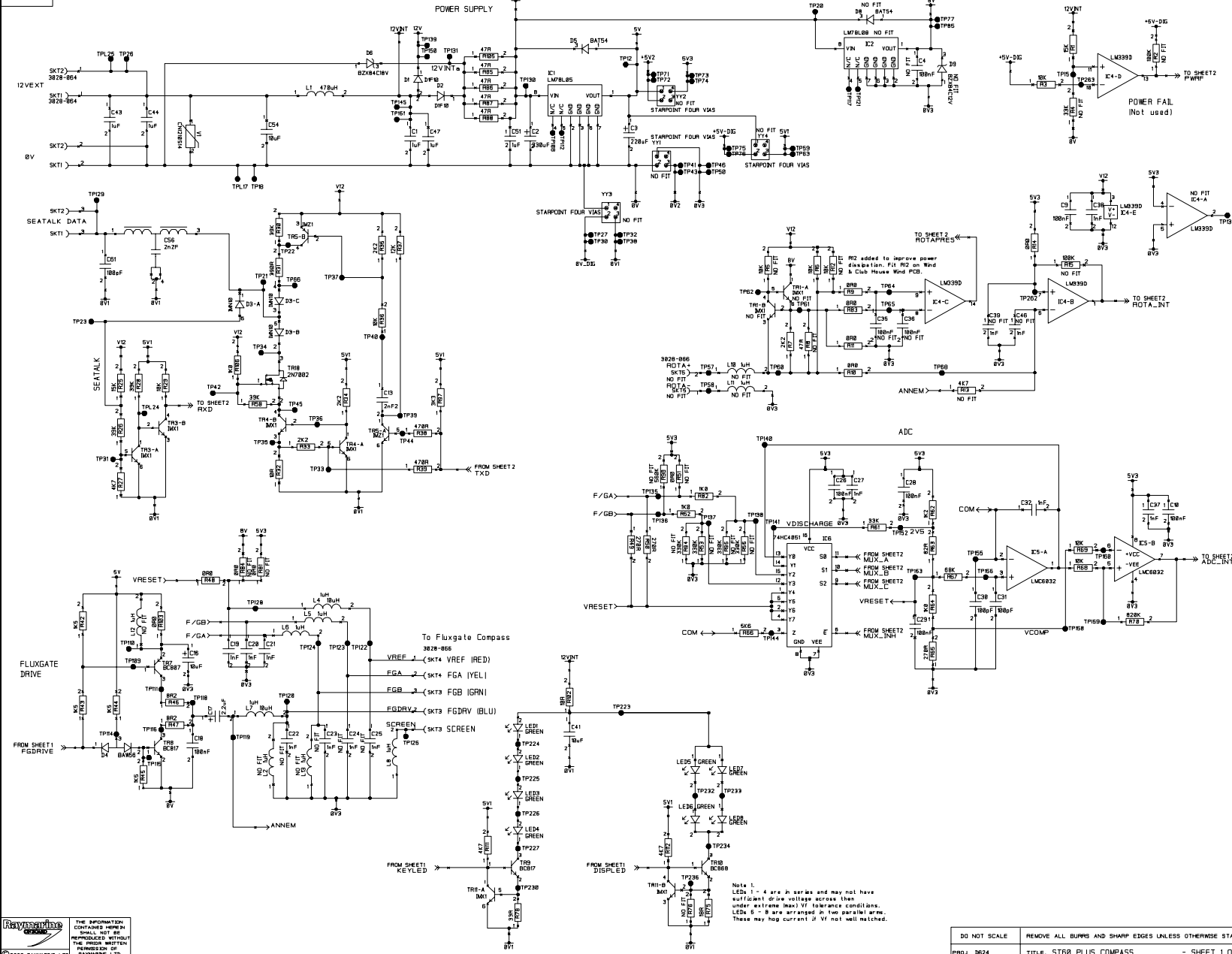
Sine - Cosine Motor Drive



MODIFICATION/AMENDMENT

ISS	DATE	CHANGES
A	17.05.05	Initial conversion from Vultrax 434-082.
B	25.05.05	Final Layout.
B3	25.05.05	Route code changed for net connected to pin 44 of IC1.
B4	26.05.05	R16-B, C5-7 & C45 marked as 'NO FIT'.
C	21.06.05	C46 - C49 replaced with R10, R08, R01 & R72 with Test points either side. C56 deleted.
D	08.07.05	Up issued to bring in line with sheet 1.
E	09.07.05	R16 Deleted. R73 Added.
F	08.07.05	Up-issued.
G	15.08.05	C49 & C48 added. R10 & R55 changed to large pads. TP106 & TP214 added.
H	15.08.05	Up-issued.
J	08.05.05	Up-issued. R22 was 10K. R21 was 10K. See Sheet 1.
K	01.11.05	IC3 assigned Raymarine part no. See Sheet 1.

Used on:



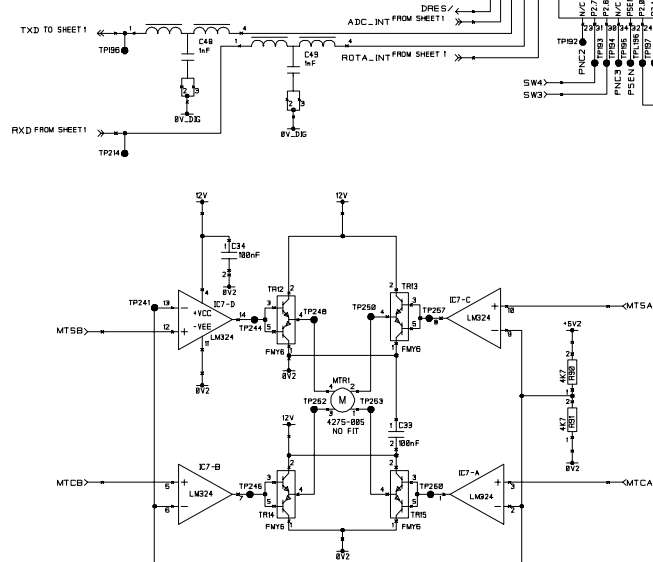
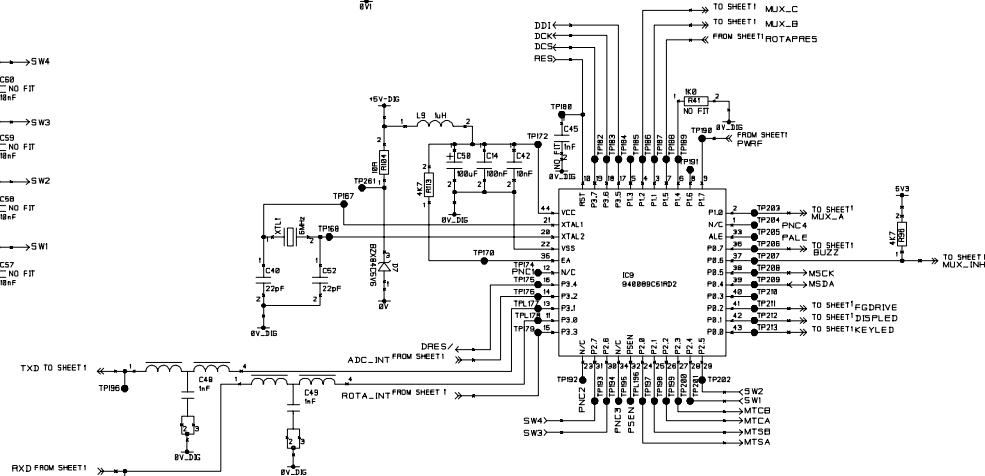
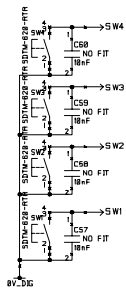
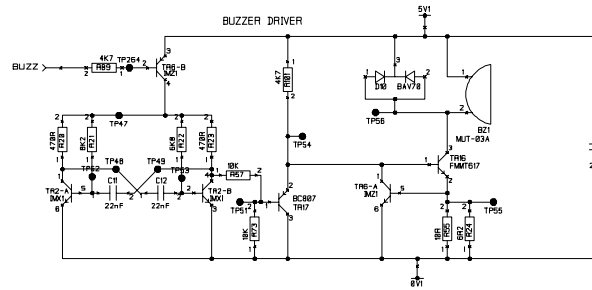
MODIFICATION/AMENDMENT

ISS	DATE	CHANGES
A	17.05.05	Initial conversion from Vultrex 4314-002.
B	25.05.05	Final Layout
B3	25.05.05	Pinout of SK73 & SK11 re-located.
B4	26.05.05	LM339 marked as 'No Fit'. L4 & L7 changed to 1200 foot print.
C	21.06.05	R92 changed to ferrite L2. R93 changed to ferrite L3. R94 changed to ferrite L4. L7 changed to 960BL1 to match schematic.
D	08.07.05	R92 changed to ferrite L2. R93 changed to ferrite L3. R94 changed to ferrite L4. All star points changed from 5 to 4 way.
E	19.07.05	Up-merged
F	20.07.05	Route codes for VREF & FGA changed from 12/8 to 40/20.
G	28.07.05	PPW 3015-387_001
H	15.08.05	DS-C added. TP66 added. C61 changed from 100nF to 100pF. Test points 1224 & 25 changed to large pads. C39, C40 & C47 added. C1 changed from 100pF to 10nF.
I	18.08.05	L3 changed to feed through capacitor C56. L1 changed to diff chock TP6 & TP4 added. Route codes for track SEATALK_DATA changed from 12/8 to 20/5.
J	08.09.05	Route codes for signal SEATALK_DATA changed. C39, 40 were 100nF. L12 now no fit. R93 value 100 removed. See sheet 2
K	01.11.05	L1 was 220k. See Sheet 2

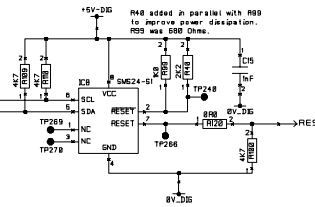
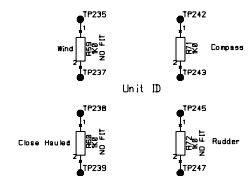
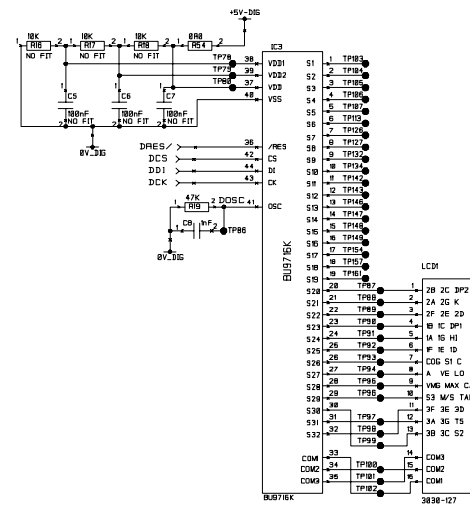
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 1000 Marine Drive

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Used on:



Sine - Cosine Motor Drive



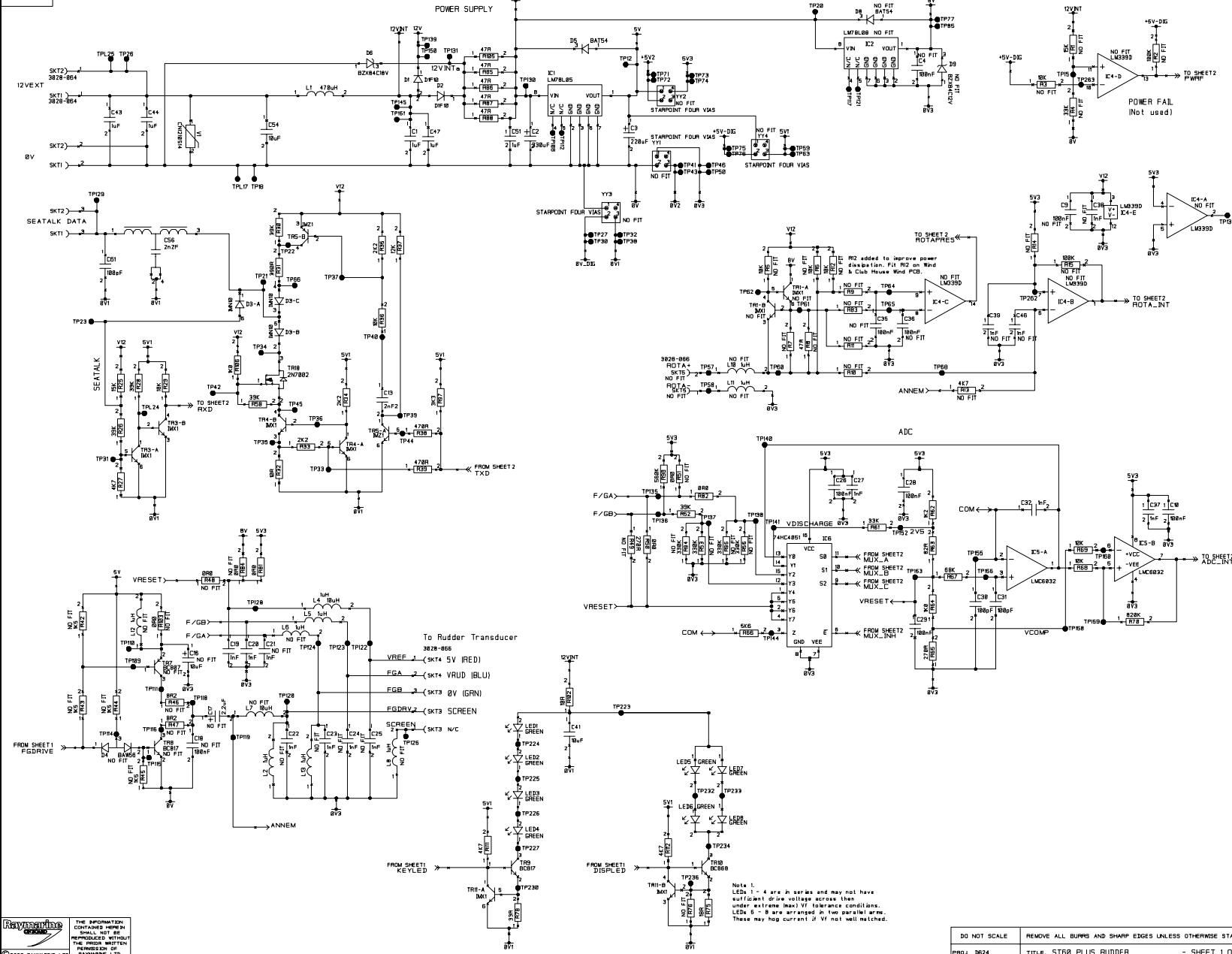
MODIFICATION/AMENDMENT

ISS	DATE	CHANGES
A	17.05.05	Initial conversion from Vultrax 434-082.
B	25.05.05	Final Layout.
B3	25.05.05	Route code changed for net connected to pin 44 of IC1.
B4	26.05.05	R16-B, C5-7 & C45 marked as 'NO FIT'.
C	21.06.05	C46 - C49 replaced with R10, R09, R01 & R72 with Test points either side. C56 deleted.
D	08.07.05	Up issued to bring in line with sheet 1.
E	09.07.05	R16 Deleted. R73 Added.
F	08.07.05	Up-issued.
G	15.08.05	C49 & C48 added. TP177, TP78 & R55 changed to large pads. TP186 & TP214 added.
I	19.08.05	Up-issued.
J	09.05.06	Up-issued. R22 was HK. R21 was HK. See Sheet 1.
K	01.11.05	IC3 assigned Raymarine part no. See Sheet 1.



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Used on:



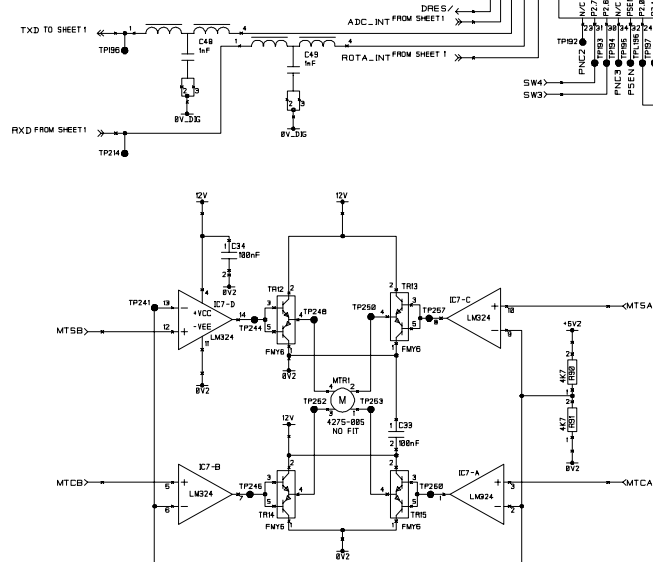
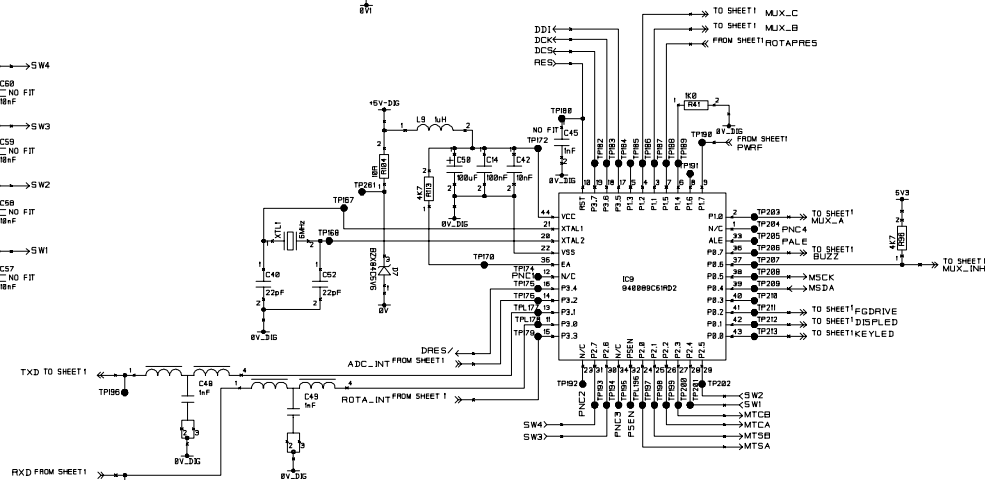
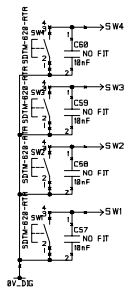
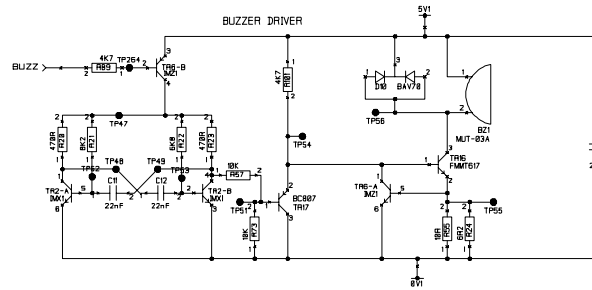
MODIFICATION/AMENDMENT

ISS	DATE	CHANGES
A	17.05.05	Initial conversion from Vultrex 4314-802.
B	25.05.05	Final Layout
B3	25.05.05	Pinout of SK3 & SK11 re-located. L4 & L7 changed to 120Ω foot print.
B4	26.05.05	R6 marked as 'No Fit'. L4 & L7 changed to 960ΩL20 R62 changed to ferrite L2. R93 changed to ferrite L2. R93 changed to ferrite L20.
C	21.06.05	Star Point Y73 added. L2 & L13 changed back to R92. R93 & L4 & L7 changed back to 960ΩL1 to match schematic.
D	09.07.05	L4 & L7 changed to 960ΩL20. R92 changed to ferrite L2. R93 changed to ferrite L20 (960ΩL1). All star points changed from S to 4 way.
E	19.07.05	Up-merged
F	20.07.05	Route codes for VREF & FGA changed from 12/8 to 40/20. PMP 3015-307_001
G	28.07.05	D5-C added. TP66 added. C61 changed from 0524RU to 956FFXX100. Test points 1224 & 25 changed to large pads.
H	15.08.05	C39, C40 & C47 added. C1 changed from 100pF to 1µF. L3 changed to feed through capacitor C56. L1 changed to diff chock TP6 & TP4 added. Route codes for track SEATALK_DATA changed from 12/8 to 20/5.
I	18.08.05	C61 added.
J	08.09.05	Route codes for signal SEATALK_DATA changed. C39, 40 were 100pF. L12 now no fit. R93 value 10Ω removed. See sheet 2
K	01.11.05	L1 was 220Ω. See Sheet 2

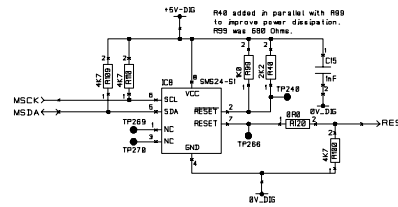
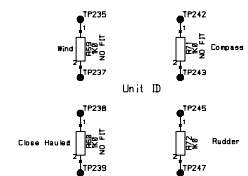
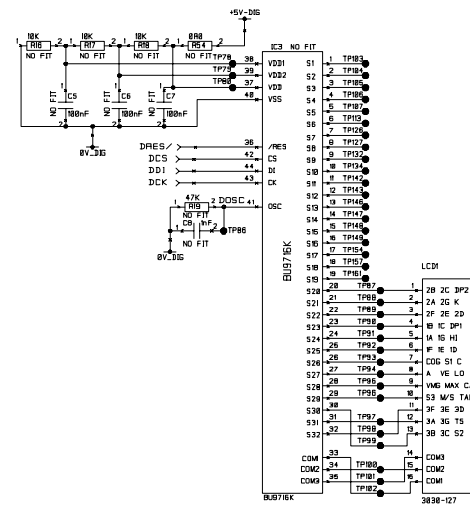
Raymarine
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Note 1:
LEDs 1 - 4 are in series and may not have sufficient drive voltage across them under extreme (max) V_f tolerance conditions. LEDs 5 - 8 are arranged in two parallel arms. These may hog current if V_f not well matched.

Used on:



Sine - Cosine Motor Drive

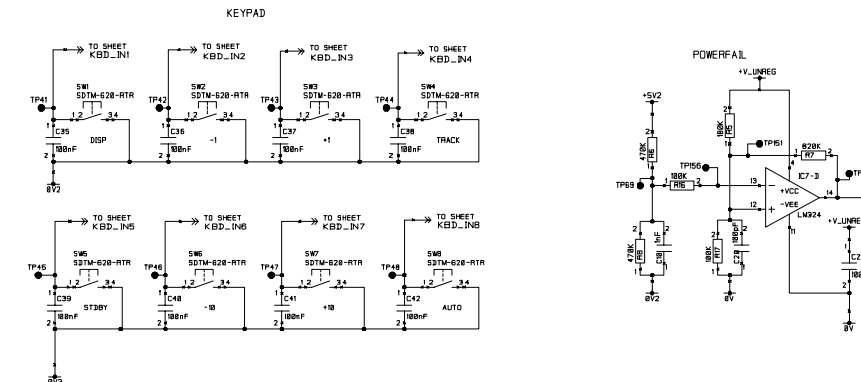
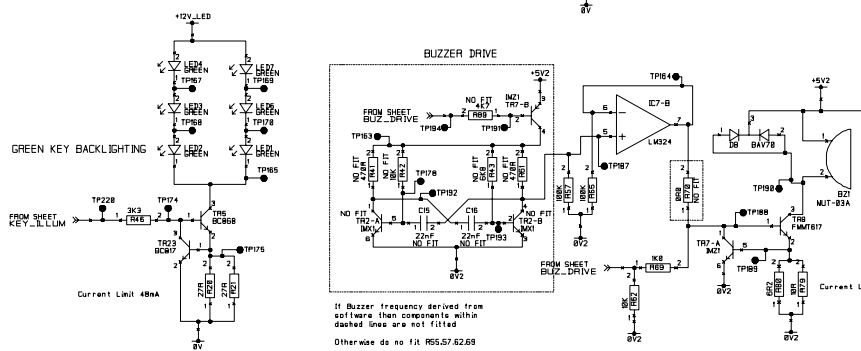
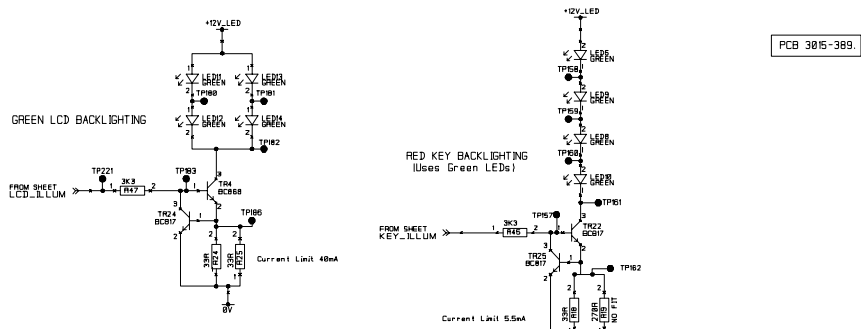


MODIFICATION/AMENDMENT		
ISS	DATE	CHANGES
A	17.05.05	Initial conversion from Vultrax 434-082.
B	25.05.05	Final Layout.
B3	25.05.05	Route code changed for net connected to pin 44 of IC1.
B4	26.05.05	R16-B, C5-7 & C45 marked as 'NO FIT'.
C	21.06.05	C46 - C49 replaced with R10, R08, R01 & R12 with Test points either side. C56 deleted.
D	08.07.05	Up issued to bring in line with sheet 1.
E	09.07.05	R16 Deleted. R173 Added.
F	08.07.05	Up-issued.
G	08.07.05	Test points, TP177, 178 & 185 changed to large pads. C56 deleted.
H	15.08.05	C49 & C48 added. TP86 & TP214 added.
I	19.08.05	Up-issued.
J	09.09.05	Up-issued. R22 was 8K. R21 was 8K. See Sheet 1.
K	01.11.05	IC3 assigned Raymar part no. See Sheet 1.

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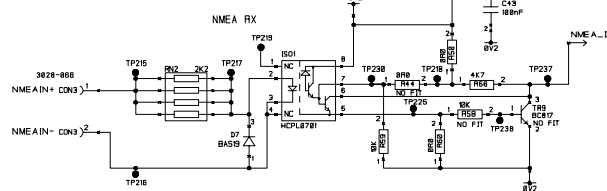
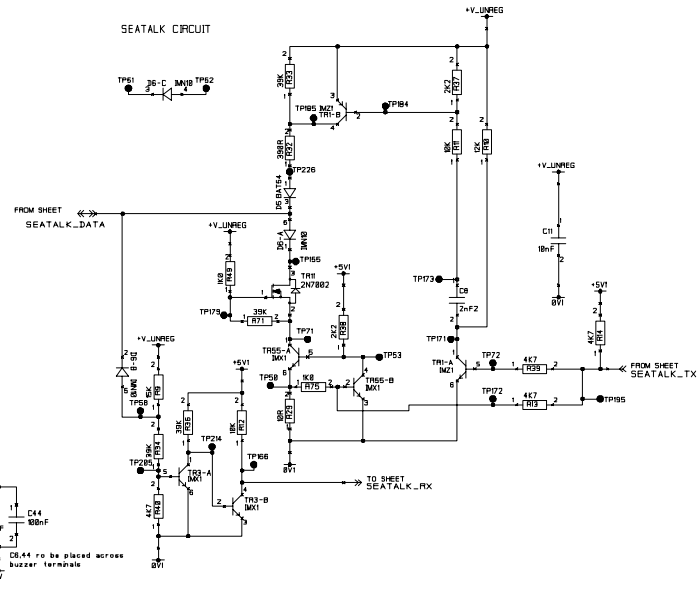
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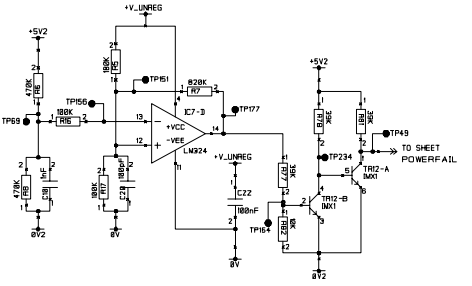


PCB 3815-389.

SEATALK CIRCUIT



POWERFAIL



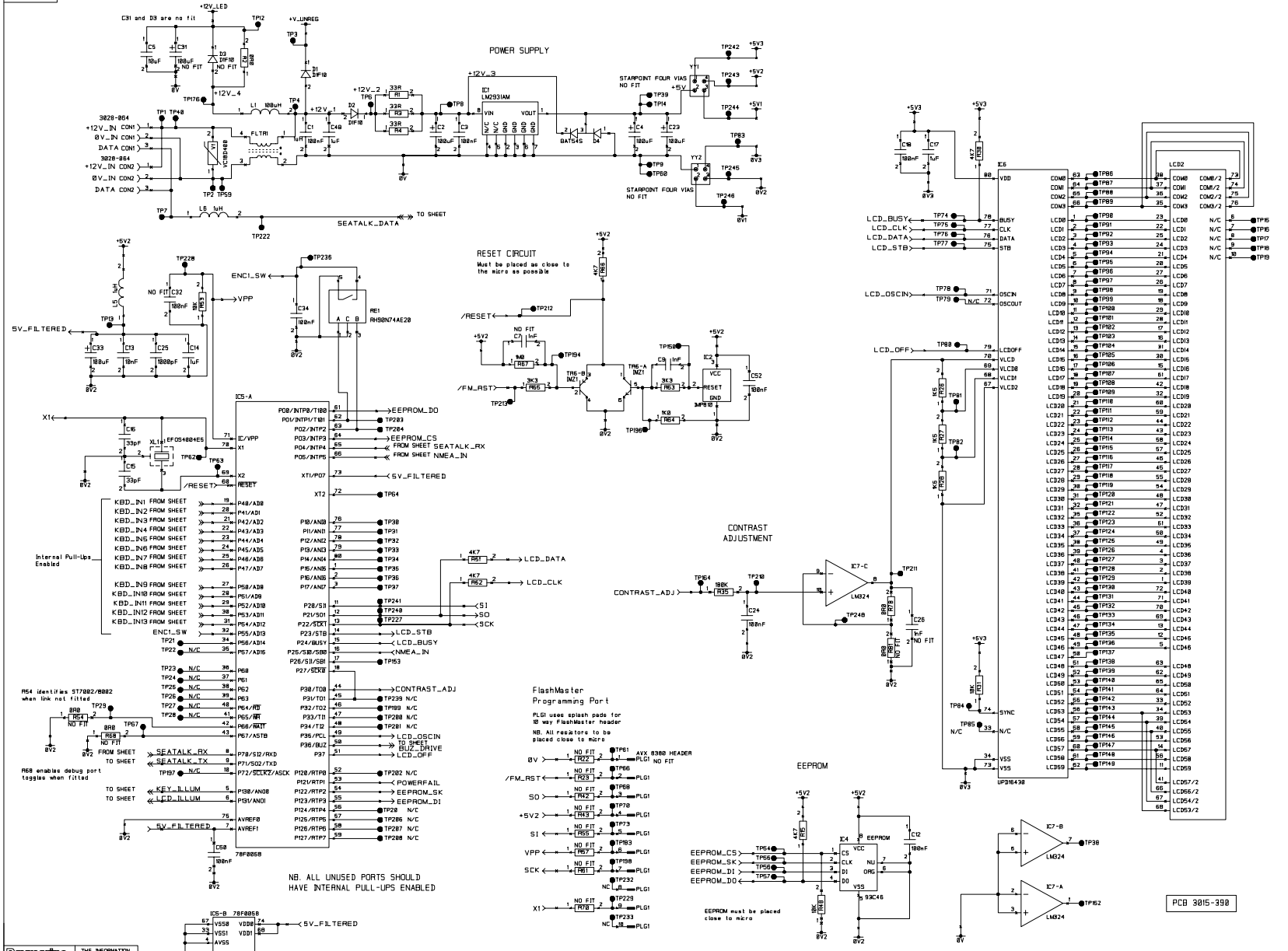
IS03 OPTIONS:		R08	R58	R56	TR9	R44	R50	R59
HCLP-8781 S0B		8R8	-	4K7	-	-	8R8	8K
HCLP-8781/PSB701 S0S Mount on pins 2-7 of S0B1		8R8	-	4K7	-	-	8R8	8R8
PC3574AT S0S Mount on pins 2,4,5,7 of S0B1		8K	8K	8K	8C817	8R8	8R8	-

MODIFICATION/AMENDMENT		
ISS	DATE	CHANGES
A	18.05.85	Schema L2 Peer Review
B	28.06.85	TR11, R49,71 added
C	07.09.85	See PPP 4624-825_001
D	18.08.85	Revision value changes See PPP 4624-825_001
E	11.10.85	R19 use spread No F.It Value R58 was 8R8 R58 was 8R8 See sheet 1 PPP 4624-825_002



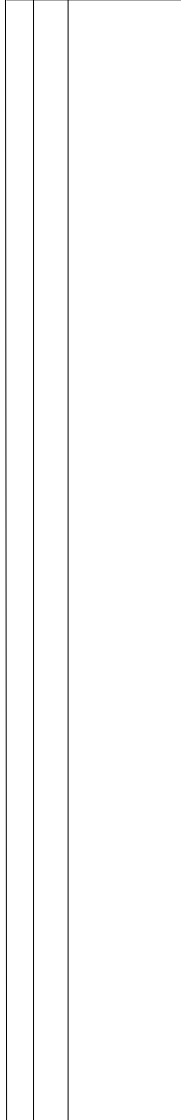
DO NOT SCALE	REMOVE ALL BURRS AND SHARP EDGES UNLESS OTHERWISE STATED	DRAWN IN	CHKD	DATE
PROJ 2824	TITLE: 578881* Control Head - Sheet 2 of 2	SCALE 1:1	DRWG No: 4624-825	18.05.85

Used on:



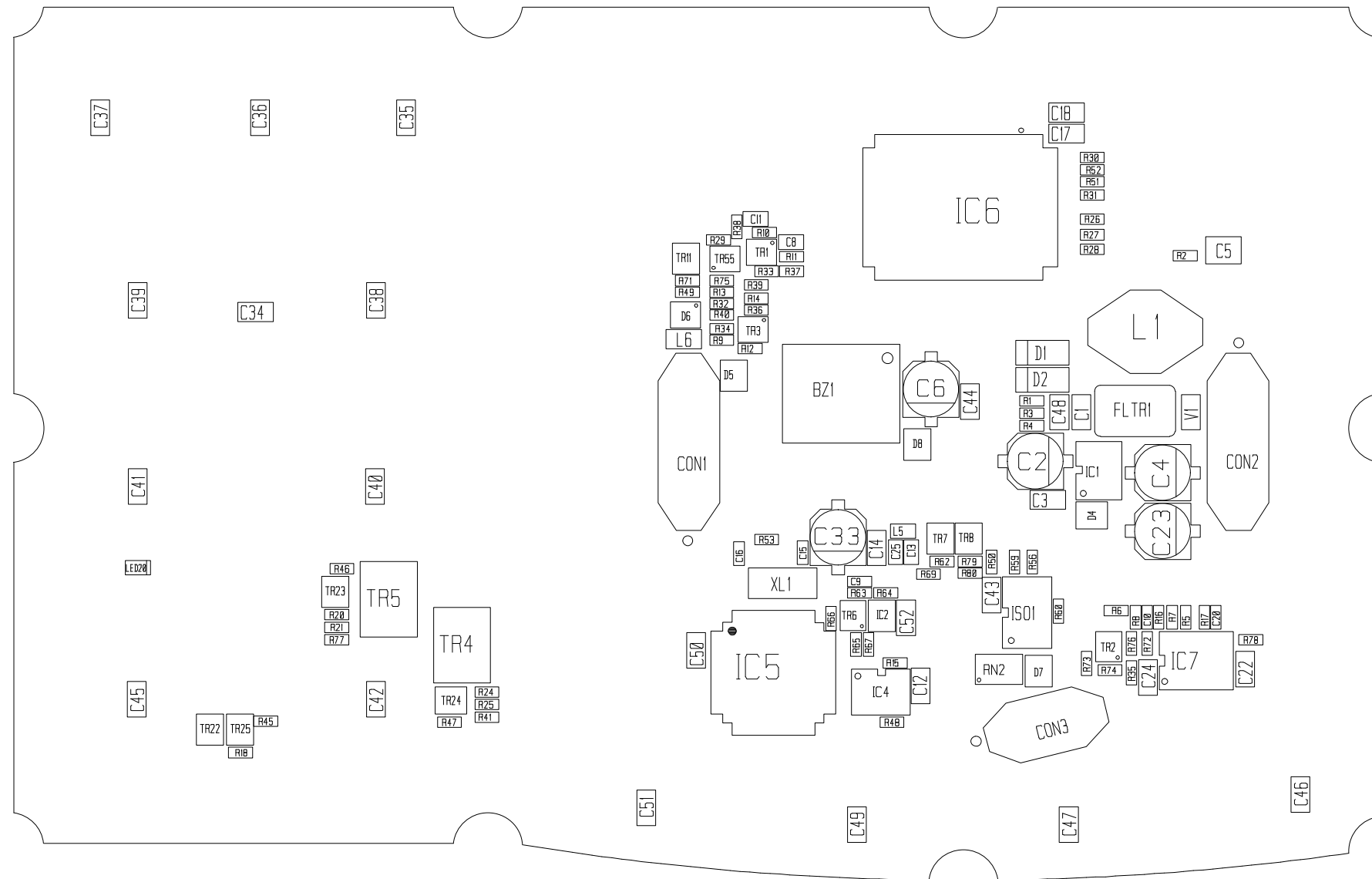
MODIFICATION/AMENDMENT

ID	DATE	CHANGES
A	22.05.05	Initial Release
B	19.08.05	See PPP 4624-826_001
C	11.10.05	CS2 new no fit See sheet 2 PPP 4624-826_002



PCB 3015-390

SURFACE MOUNT COMPONENT SIDE

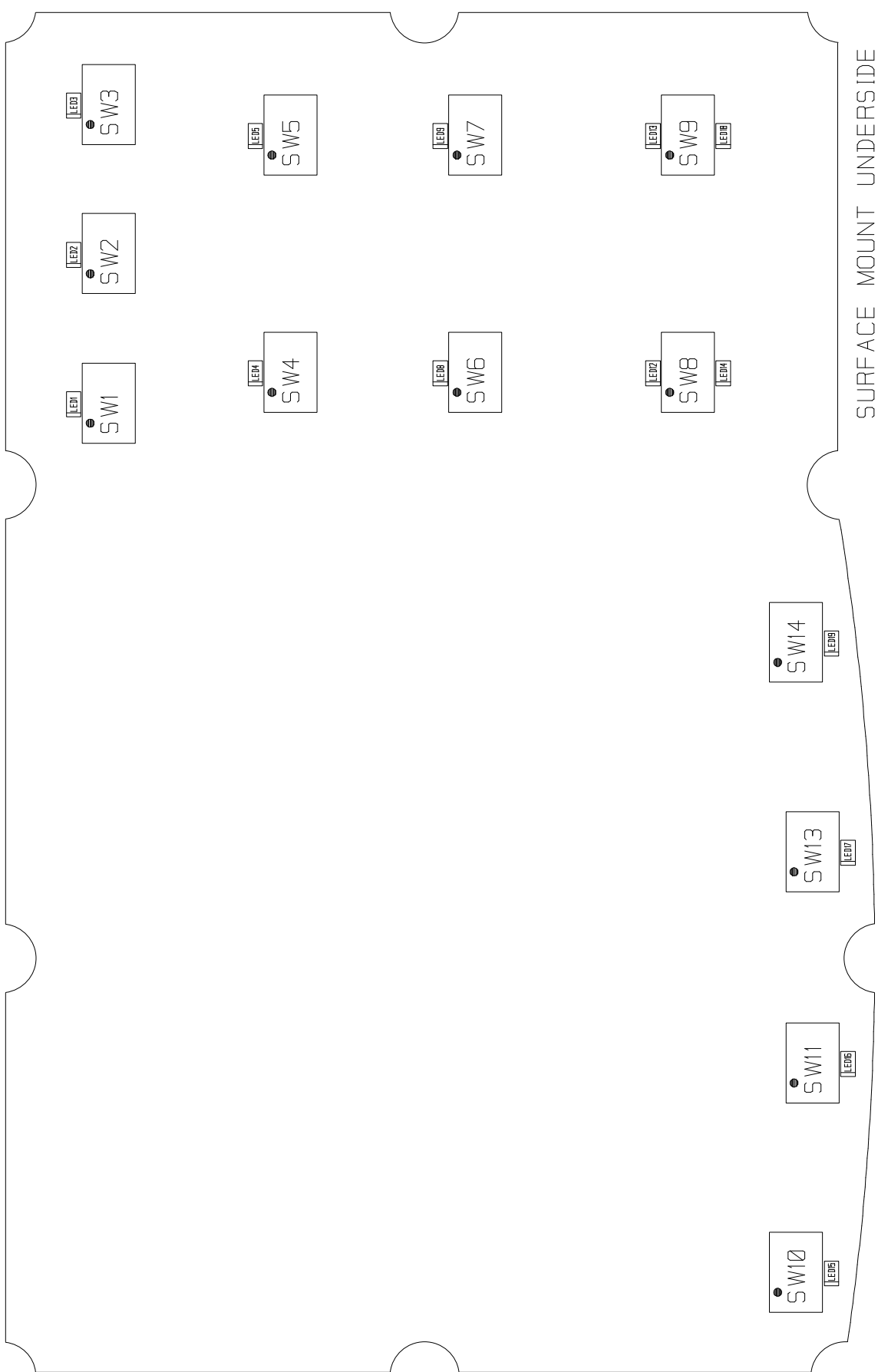


ISS	DATE	COMMENTS
A	21.07.05	New issue.
B	19.08.07	See PPP 4624-026_001
C	13.10.05	C32 deleted. PPP 4624-026_002

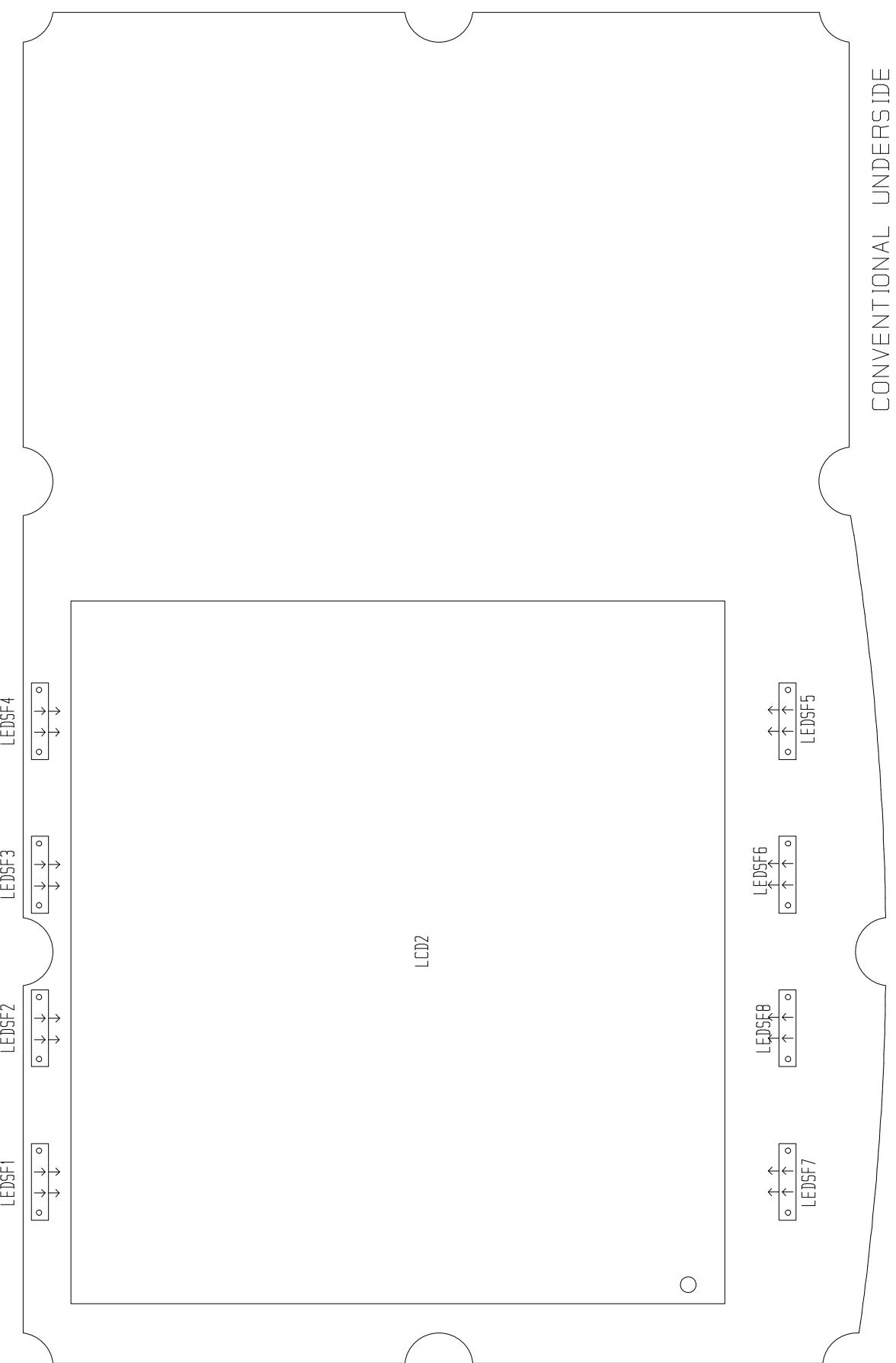


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DO NOT SCALE	REMOVE ALL BURRS AND SHARP EDGES UNLESS OTHERWISE STATED	DRAWN I.T.	CHKD I.W.	DATE 21.07.05
PROJ	TITLE . ST7002 AUTOPILOT HEAD.	SCALE 1:1	DRWG No :- 4624-028	sh1 of 2



SURFACE MOUNT UNDERSIDE



CONVENTIONAL UNDERSIDE

ISS	DATE	COMMENTS
A	21.07.05	New issue.
B	19.08.07	See PPP 4624-026_001
C	13.10.05	Up issued to be in line with sheet 1. PPP 4624-026_002



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DO NOT SCALE	REMOVE ALL BURRS AND SHARP EDGES UNLESS OTHERWISE STATED	DRAWN I.T.	CHKD I.W.	DATE 21.07.05
PROJ	TITLE . ST7002 AUTOPILOT HEAD.	SCALE 1:1	DRWG No :- 4624-028	sht 2 of 2