



Raymarine Limited

RAY 240 VHF Radio

Circuit Diagrams

FCC ID PJ5RAY240

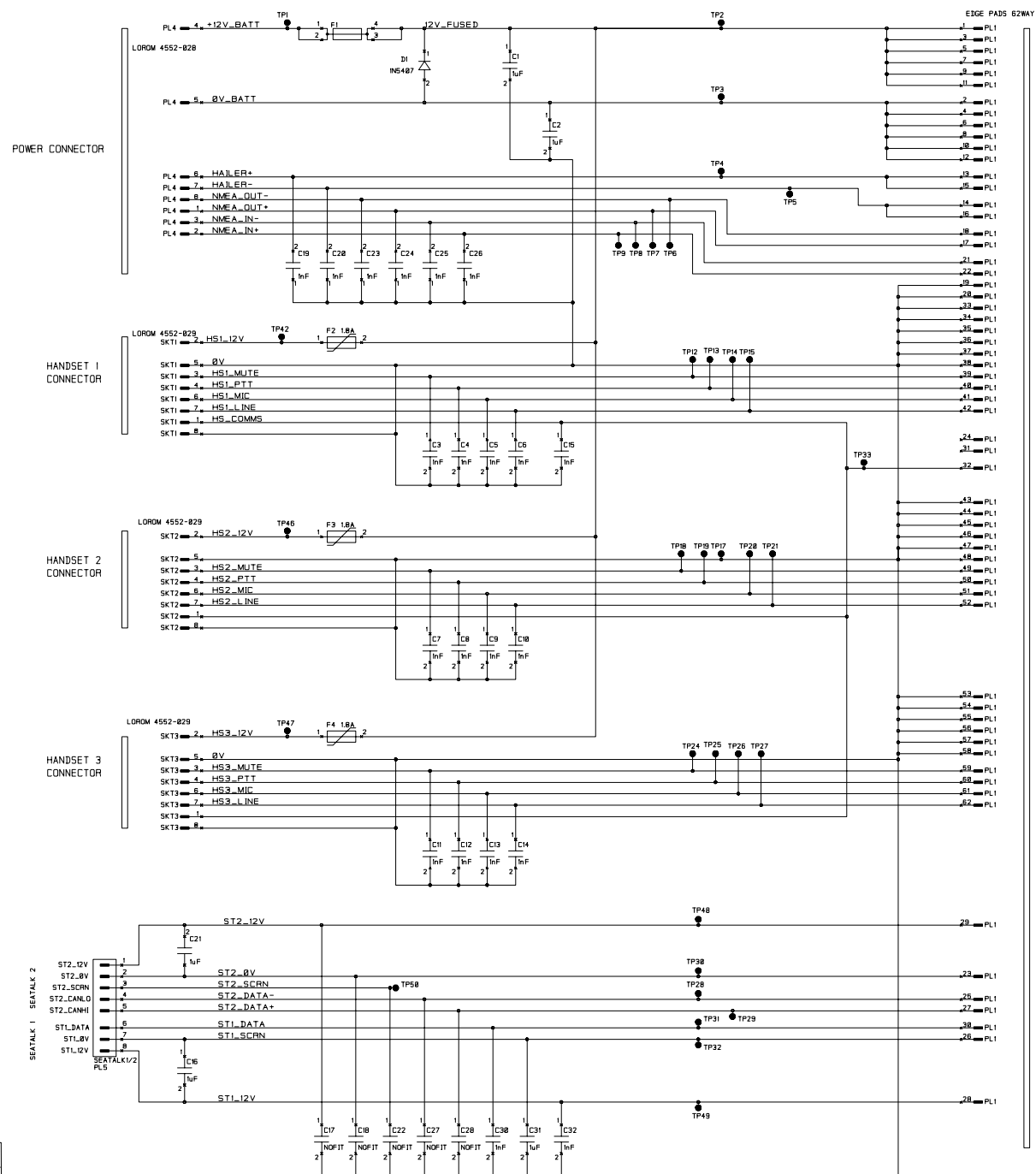
IC: 4069B-RAY240

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Used on,

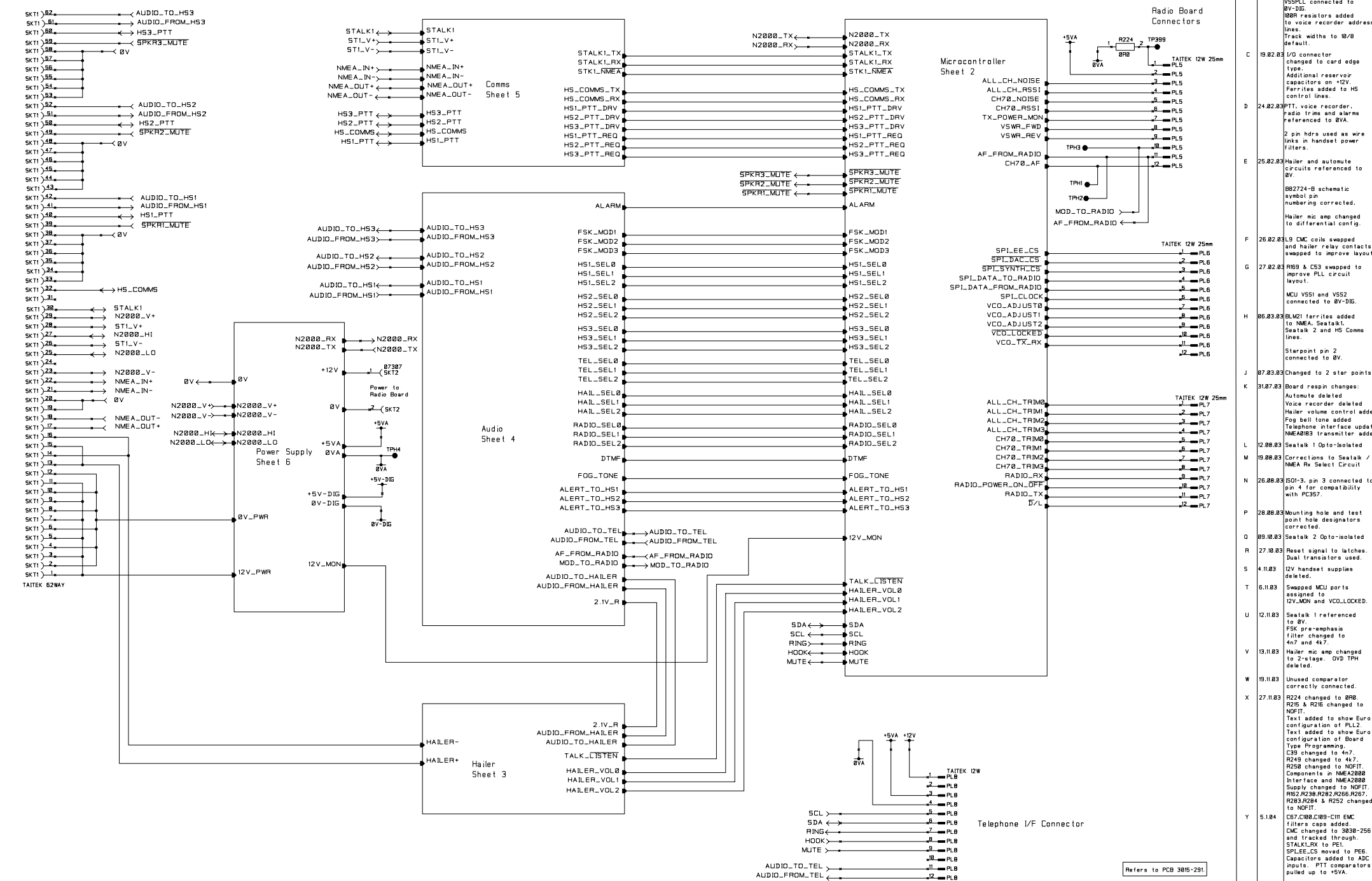
Odd numbered pads on component side
Even numbered pads on solder side



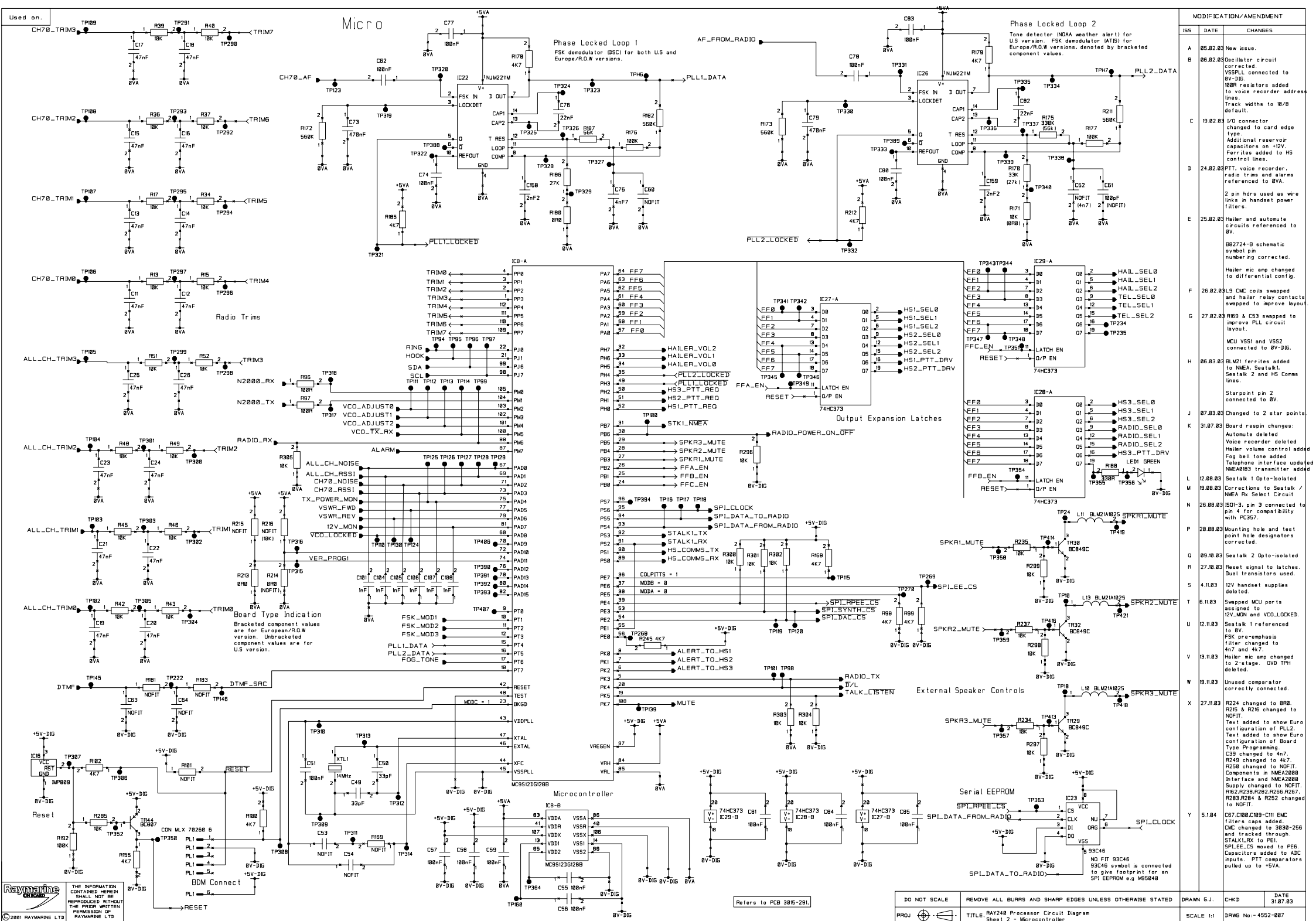
EDGE CONNECTOR

MODIFICATION/AMENDMENT			
ISS	DATE	CHANGES	
A	25.02.83	New issue.	
B	05.08.83	PCB Respin. Polyswitches added. Change to Loren connectors.	
C	16.08.83	Edge connector pin-out changed to match Issue 2 Processor Board	
D	17.11.83	Combined ST1/ST2 connector. Decoupling capacitors on all signal lines to BV.	
E	19.11.83	F2, F3, F4 changed to surface mount 8680MFSMB5.	
F	20.11.83	C17 and C22 changed to 1uF 9326U. C17 changed to 8683 no11. C31 changed to 1uF. C22 changed to 1286 no11.	
D	DRAWN G.J.	CHKD	DATE 05.08.83
	SCALE 1:1	DRAWN No: 9552-022	

I/O Connector

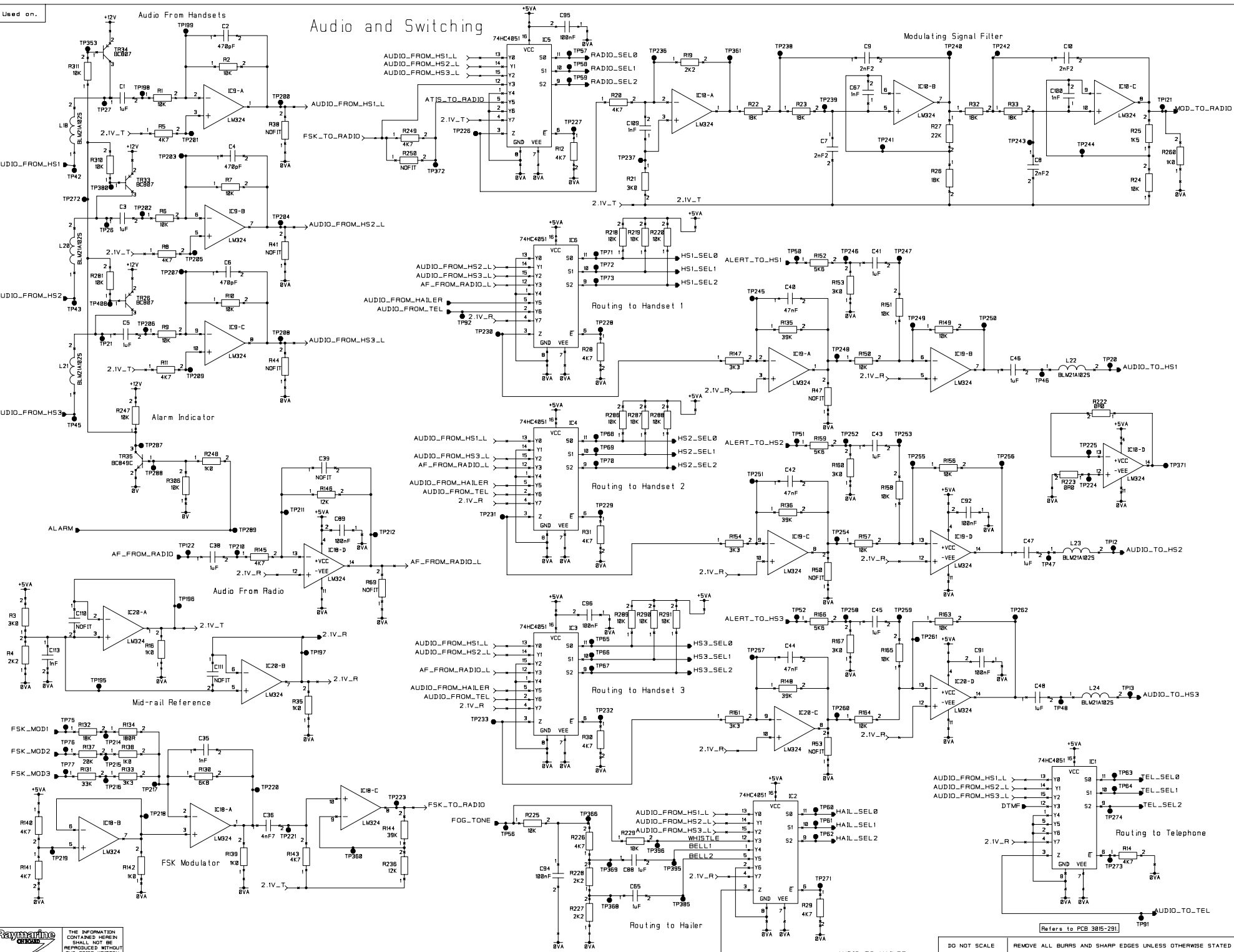


Refers to PCB 3015-291.

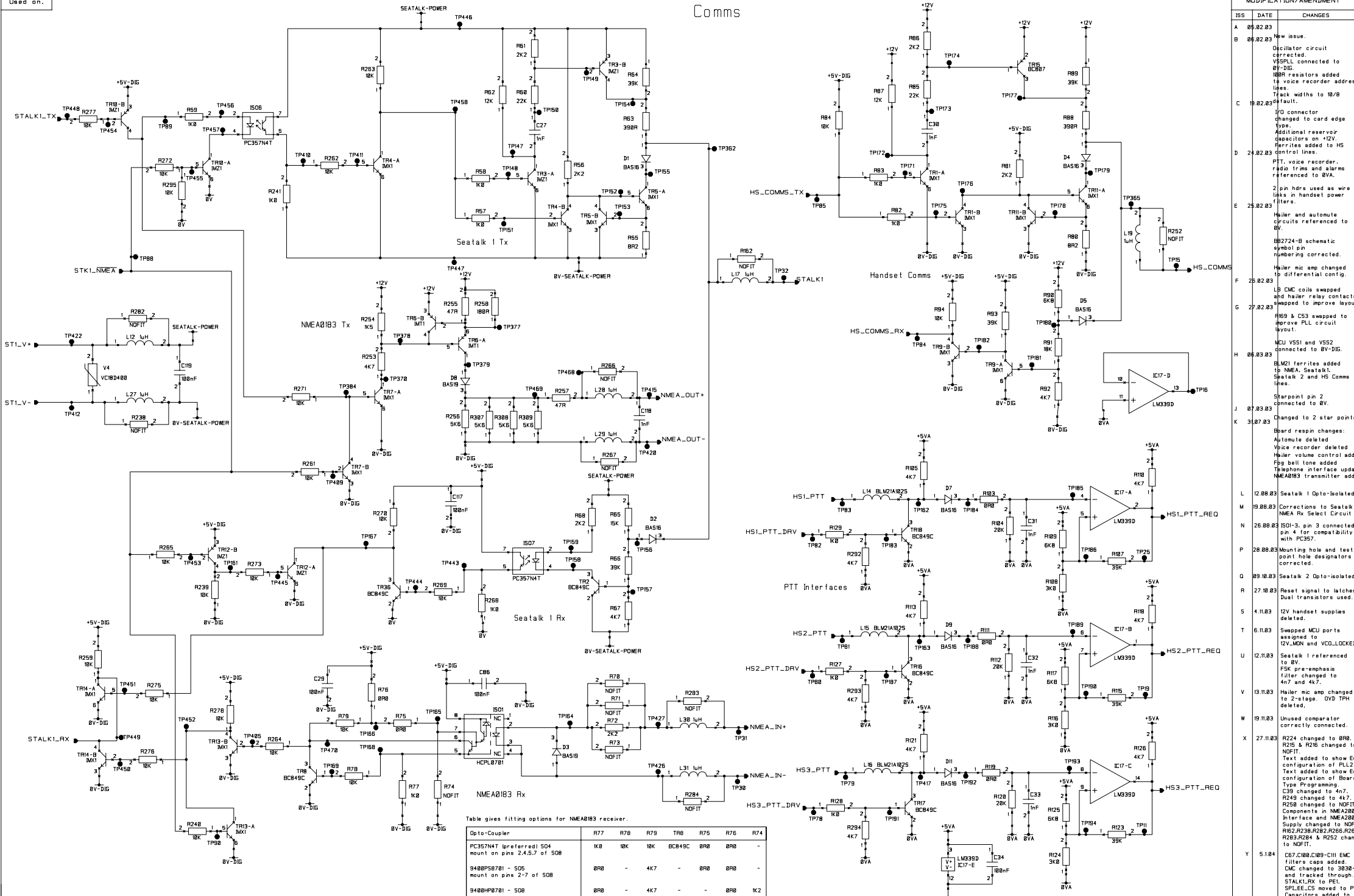


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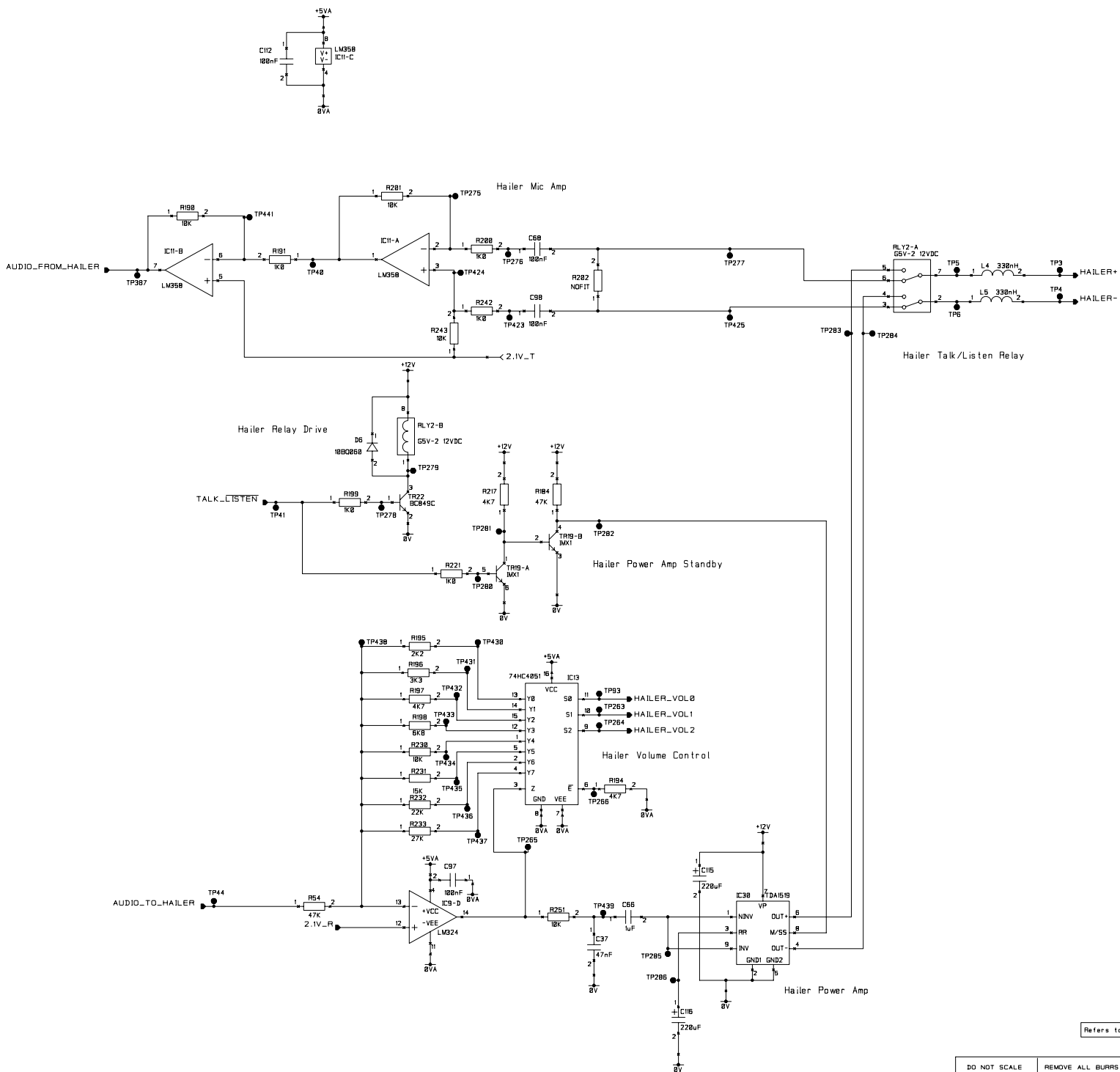
Audio and Switching



MODIFICATION/AMENDMENT		
ISS	DATE	CHANGES
A	05.02.03	New issue.
B	06.02.03	Oscillator circuit corrected. V55P1L connected to 0V-DIG. 100R resistors added to voice recorder address lines. Track widths to 10/8 default.
C	19.02.03	I/O connector changed to card edge type. Additional reservoir capacitors on +12V. Ferrites added to HS control lines.
D	24.02.03	PTT, voice recorder, radio trims and alarms referenced to 0V.
E	25.02.03	Hailer and automate circuits referenced to 0V. BB2724-B schematic symbol pin numbering corrected. Hailer mic amp changed to differential config.
F	26.02.03	L9 CMC coils swapped and hailer relay contacts swapped to improve layout.
G	27.02.03	R169 & C53 swapped to improve PLL circuit layout.
H	06.03.03	MCU V551 and V552 connected to 0V-DIG. BLM21A1025 ferrites added to NMEA, Seatalk, Seatalk 2 and HS Comm lines. Starpoint pin 2 connected to 0V.
J	07.03.03	Changed to 2 star points.
K	31.07.03	Board respin changes: Automate deleted Voice recorder control added Hailer volume control added Pog bell tone added Telephone interface updated NMEA0183 transmitter added
L	12.08.03	Seatalk 1 Opto-Isolated
M	19.08.03	Corrections to Seatalk / NMEA Rx Select Circuit
N	26.08.03	ISO1-3, pin 3 connected to pin 4 for compatibility with PC357.
P	28.08.03	Mounting hole and test point hole designators corrected.
Q	09.10.03	Seatalk 2 Opto-isolated
R	27.10.03	Reset signal to latches. Dual transistors used.
S	4.11.03	12V handset supplies deleted.
T	6.11.03	Swapped MCU ports assigned to 12V_MCN and VCD_LOCKED.
U	12.11.03	Seatalk 1 referenced to 0V. FSK pre-emphasis filter changed to 4n7 and 4k7.
V	13.11.03	Hailer mic amp changed to 2-stage. OVD TPH deleted.
W	19.11.03	Unused comparator correctly connected.
X	27.11.03	R224 changed to 0R0. R215 & R216 changed to NDFIT. Text added to show Euro configuration of PLL2. Text added to show Euro configuration of Board Type Programming. C38 changed to 4n7. R249 changed to 4k7. R250 changed to NDFIT. Components in NMEA2000 interface and NMEA2000 Supply changed to NDFIT. R162, R238, R239, R248, R257, R283, R284 & R252 changed to NDFIT.
Y	5.104	C57, C100, C103, C104 CMC filters cap added. CMC changed to 3030-256 and tracked through STAKL_RX to PE1. SPLEE_CS moved to PE6. Capacitors added to ADC inputs. PTT comparators pulled up to +5V.



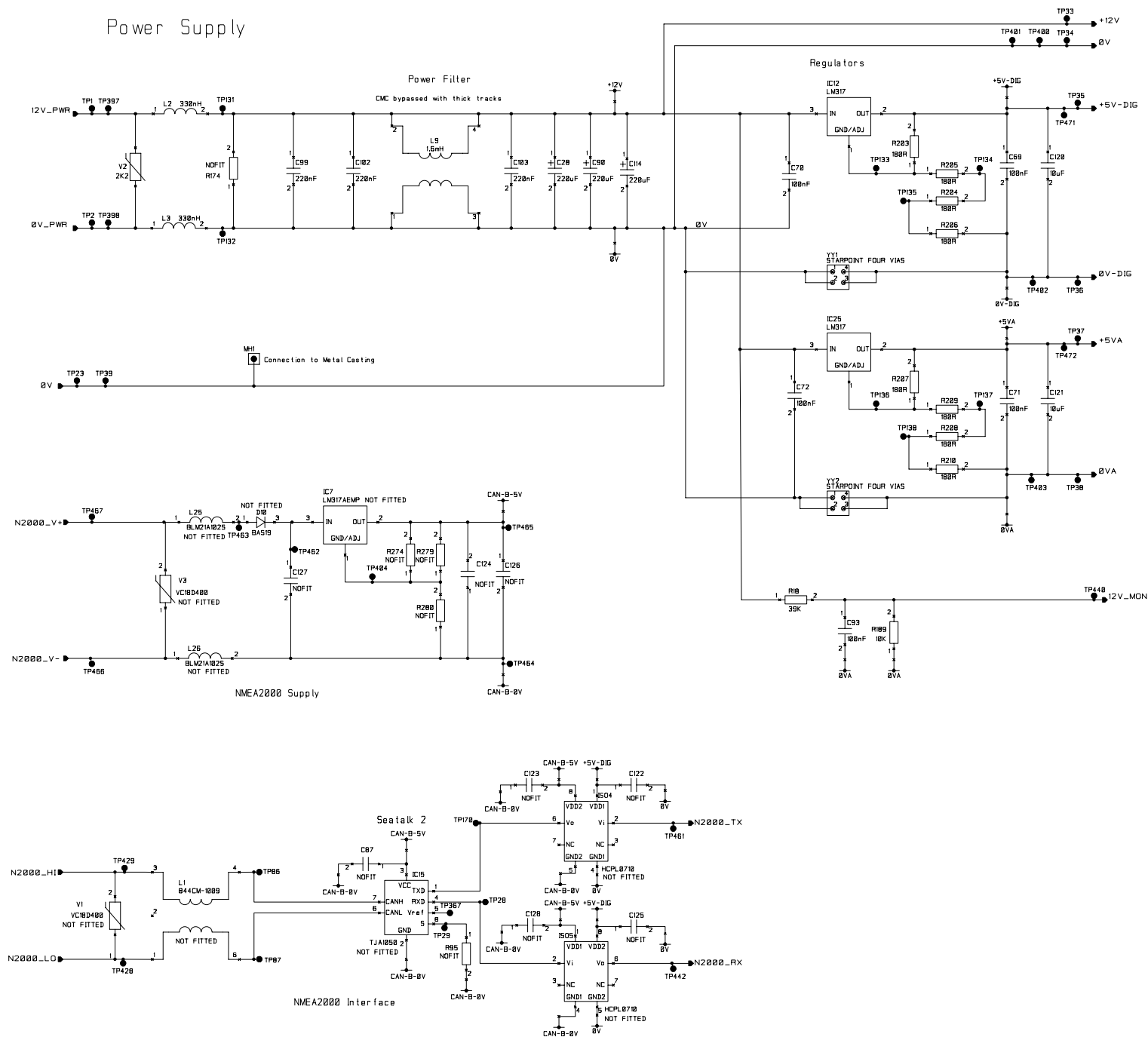
Hailer



Refers to PCB 351-291.

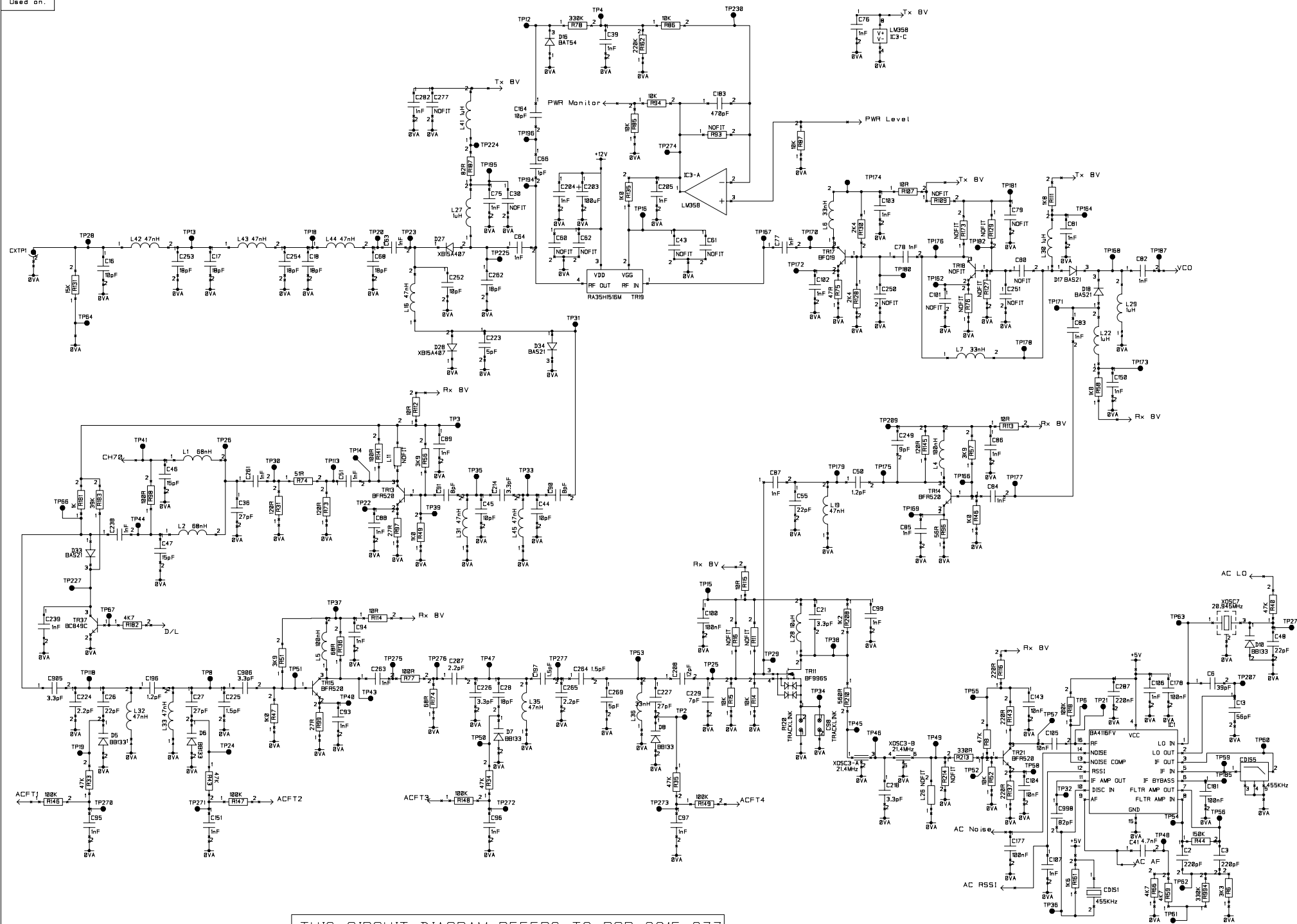
MODIFICATION / AMENDMENT		
ISS	DATE	CHANGES
A	05.02.03	New issue.
B	06.02.03	Oscillator circuit corrected. VSSPLL connected to 0V-DIG. 100R resistors added to voice recorder address lines. Track widths to 10/8 default.
C	19.02.03	I/O connector changed to card edge type. Additional reservoir capacitors on +12V. Ferrites added to HS control lines.
D	24.02.03	PTT, voice recorder, radio trms and alarms referenced to 0VA. 2 pin hdrs used as wire links in handset power filters.
E	25.02.03	Hailer and automate circuits referenced to 0V. BB2724-B schematic symbol pin numbering corrected. Hailer mic amp changed to differential config.
F	26.02.03	CMC coils swapped and hailer relay contacts swapped to improve layout.
G	27.02.03	R169 & C33 swapped to improve PLL circuit layout. MCU VSS1 and VSS2 connected to 0V-DIG.
H	06.03.03	BLM21 ferrites added to NMEA: Seatalk1, Seatalk 2 and HS Comms lines. Starpoint pin 2 connected to 0V.
J	07.03.03	Changed to 2 star points
K	31.07.03	Board respin changes: Automute deleted Voice recorder deleted Fog bell tone added Telephone interface updated NMEA183 transmitter added
L	12.08.03	Seatalk 1 Opto-Isolated
M	19.08.03	Corrections to Seatalk / NMEA Rx Select Circuit
N	26.08.03	ISO-3, pin 3 connected to pin 4 for compability with PC357.
P	28.08.03	Mounting hole and test point hole designators corrected.
Q	09.10.03	Seatalk 2 Opto-isolated
R	27.10.03	Reset signal to latches. Dual transistors used.
S	4.11.03	12V handset supplies deleted.
T	6.11.03	Swapped MCU ports assigned to 12V_MON and VCO_LOCKED.
U	12.11.03	Seatalk 1 referenced to 0V. FSK pre-emphasis filter changed to 4n7 and 4k7.
V	13.11.03	Hailer mic amp changed to 2-stage. OVD TPH deleted.
W	19.11.03	Unused comparator correctly connected.
X	27.11.03	R224 changed to 0R0. R215 & R216 changed to NOFIT.
Y	5.1.04	Text added to show Euro configuration of RL2. Text added to show Euro configuration of Board Type Programming. C39 changed to 4n7. R249 changed to 4k7. R258 changed to NOFIT. Components in NMEA2000 Interface and NMEA2000 Supply changed to NOFIT. R162,R238,R282,R266,R267, R283,R284 & R252 changed to NOFIT. C67,C88,C89-C111 EMC filters caps added. CMC changed to 3038-256 and tracked through. STALKLBY to PEL. SPLLEE_CS moved to PE6. Capacitors added to ADC inputs. PTT comparators pulled up to +5VA.

Power Supply



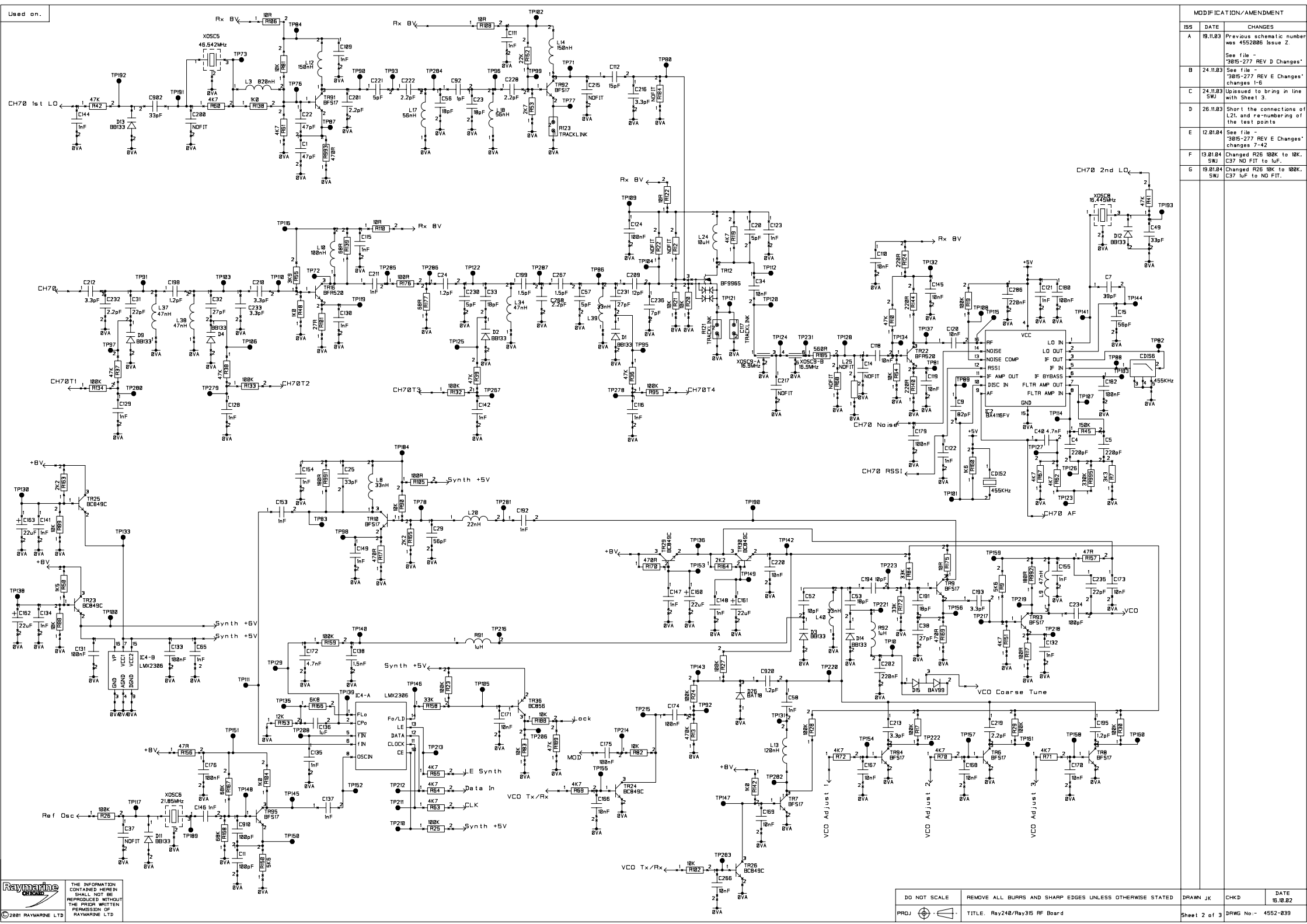
Refers to PCB 3015-291.

MODIFICATION/AMENDMENT		
ISS	DATE	CHANGES
A	25.02.03	New issue.
B	26.02.03	Oscillator circuit corrected. VSSPLL connected to BV-DIG. 100R resistors added to voice recorder address lines. Track widths to 10/8 default.
C	19.02.03	I/O connector changed to card edge type. Additional reservoir capacitors on +12V. Ferrites added to HS control lines.
D	24.02.03	PTT, voice recorder, radio trims and alarms referenced to 0V. 2 pin hdrs used as wire links in handset power filters.
E	25.02.03	Hailer and automate circuits referenced to 0V. BB2724-B schematic symbol pin numbering corrected. Hailer mic amp changed to differential config.
F	26.02.03	CMC coils swapped and hailer relay contacts swapped to improve layout.
G	27.02.03	R169 & C53 swapped to improve PLL circuit layout. MCU VSSI and VSS2 connected to BV-DIG.
H	26.03.03	BLM21 ferrites added to NMEA, Seastalk, Seastalk 2 and HS Comms lines. Starpoint pin 2 connected to 0V.
J	27.03.03	Changed to 2 star points.
K	31.07.03	Board respin changes: Automate deleted. Voice recorder deleted. Hailer volume control added. Fog bell tone added. Telephone interface updated. NMEAB103 transmitter added.
L	12.08.03	Seastalk 1 Opto-Isolated
M	19.08.03	Connections to Seastalk / NMEA Rx Select Circuit
N	26.08.03	ISO-B, pin 3 connected to pin 4 for compatibility with PC357.
P	28.08.03	Mounting hole and test point hole designators corrected.
Q	09.10.03	Seastalk 2 Opto-Isolated
R	27.10.03	Reset signal to latches. Dual transistors used.
S	4.11.03	12V handset supplies deleted.
T	6.11.03	Swapped MCU ports assigned to 12V-MON and VLOCLOCKED.
U	12.11.03	Seastalk referenced to 0V. FSK pre-emphasis filter changed to 4n7 and 4k7.
V	13.11.03	Hailer mic amp changed to 2-stage. OVD TPH deleted.
W	19.11.03	Unused comparator correctly connected.
X	27.11.03	R224 changed to 00R. R205 & R206 changed to NOFIT. Text added to show Euro configuration of RL2. Text added to show Euro configuration of Board Type Programming. C39 changed to 4n7. R249 changed to 4k7. R250 changed to NOFIT. Components in NMEA2000 Interface and NMEA2000 Supply changed to NOFIT. R162, R238, R282, R266, R267, R283, R284 & R252 changed to NOFIT.
Y	5.10.04	CB7, CB8, CB9 - C11 EMC filters case added. R249 changed to 3038-256 and tracked through. STALK-BOX to PE6. SPFLEECS moved to PE6. Capacitors added to ADC inputs. PTT comparators pulled up to +5VA.
D	DRAWN GJ	CHKD
		DATE 31/07/03
	SCALE 1:1	DWG No - 4552-007

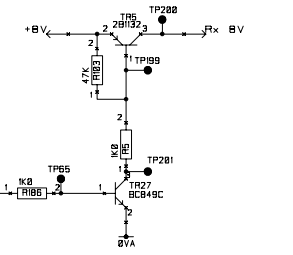
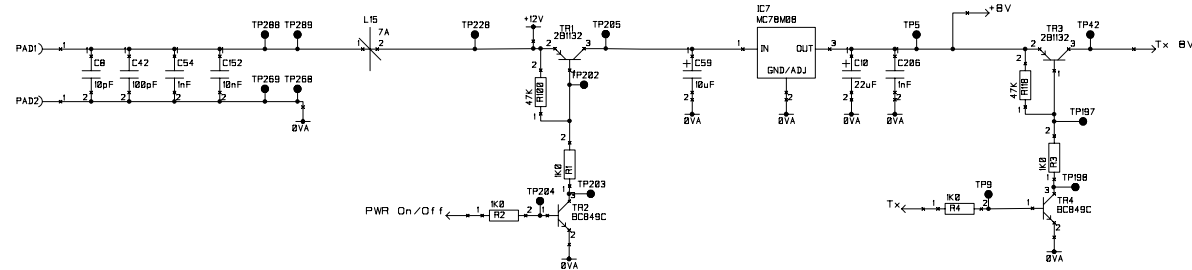
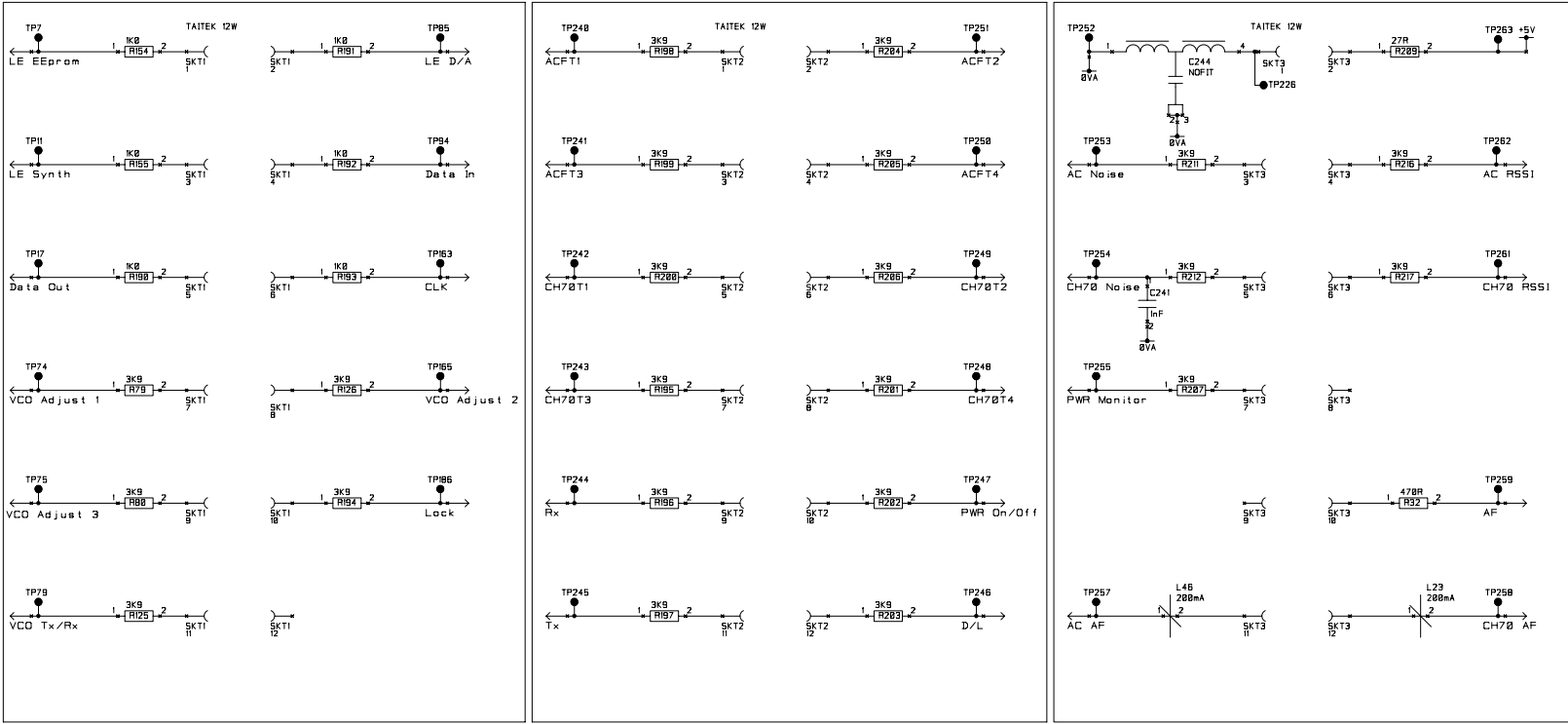
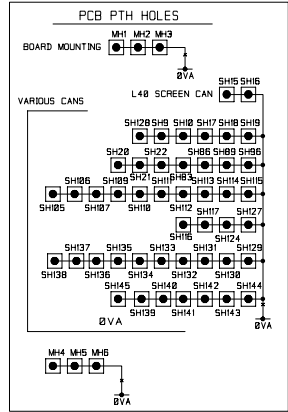
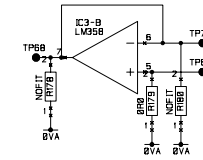
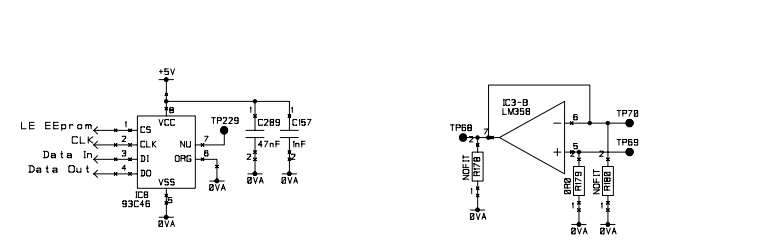
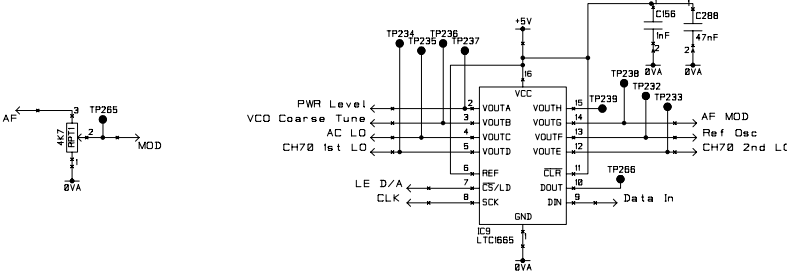


THIS CIRCUIT DIAGRAM REFERS TO PCB 3015-277

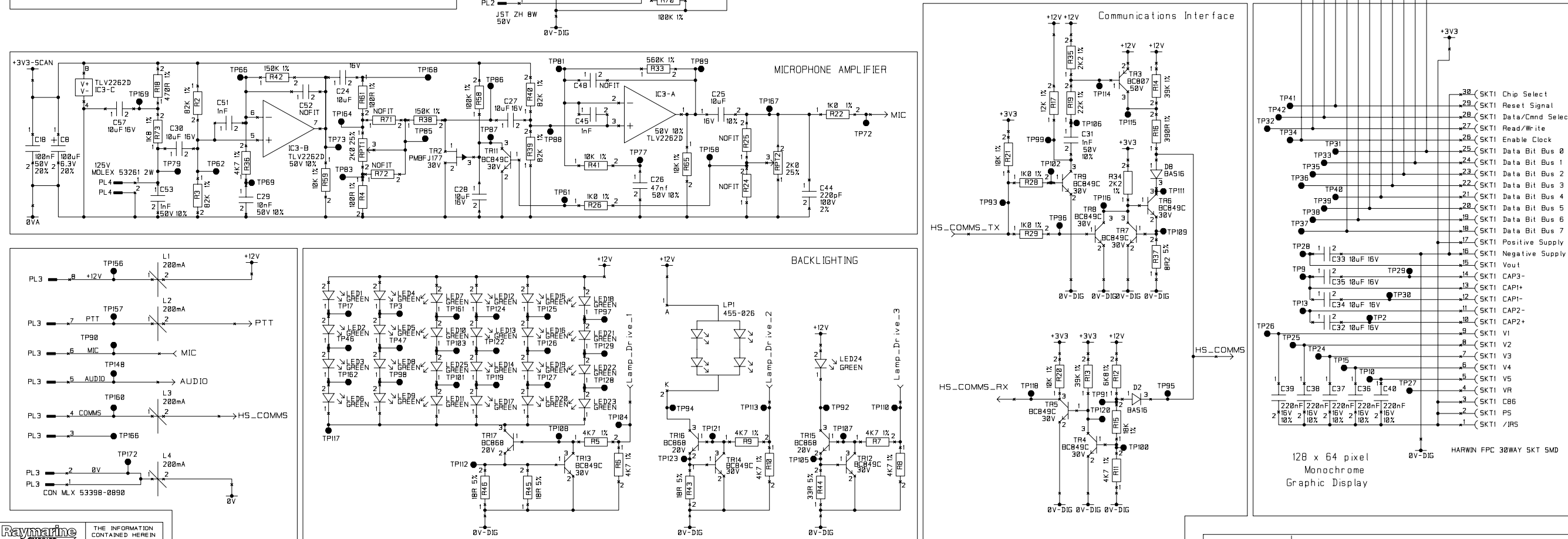
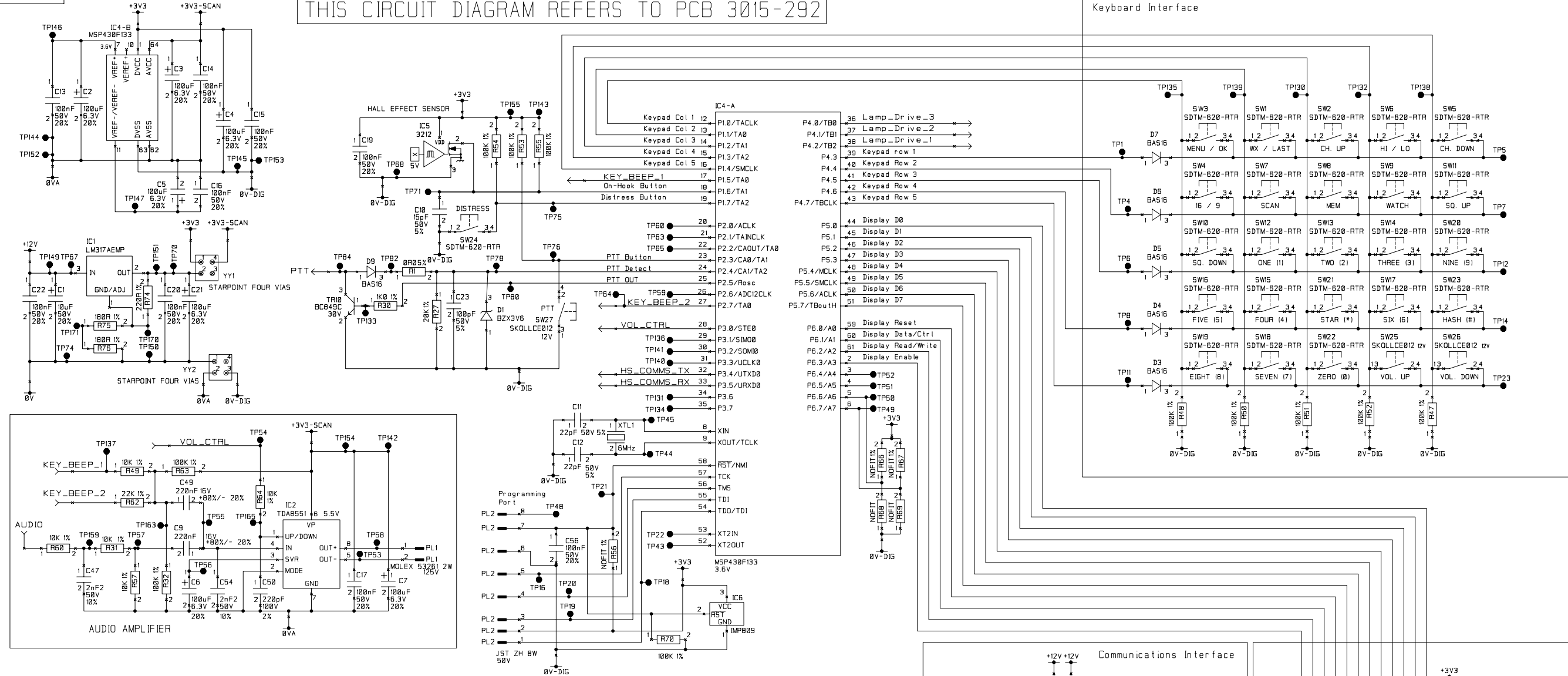
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MODIFICATION / AMENDMENT		
ISS	DATE	CHANGES
A	19.11.83	Previous schematic number was 4552086 Issue Z. See file - '3015-277 REV D Changes'
B	24.11.83	See file - '3015-277 REV E Changes' changes 1-6
C	24.11.83	Added Shield Mounting Hole SH145. Connected C244 pin 1 & 4 together.
D	26.11.83	Short the connections of L21 and re-numbering of the test points
E	12.01.84	See file - '3015-277 REV E Changes' changes 7-42
F	13.01.84 SWJ	Added L23, L46. Change MH1-6 from CHASSIS to 0VA. C244 to NOFIT. Deleted L21, C198, 237, 240, wire link across C244, TP264. Move R32
G	16.01.84 SWJ	Change L15, L23, L46, to their Raymarine numbers.



THIS CIRCUIT DIAGRAM REFERS TO PCB 3015-292

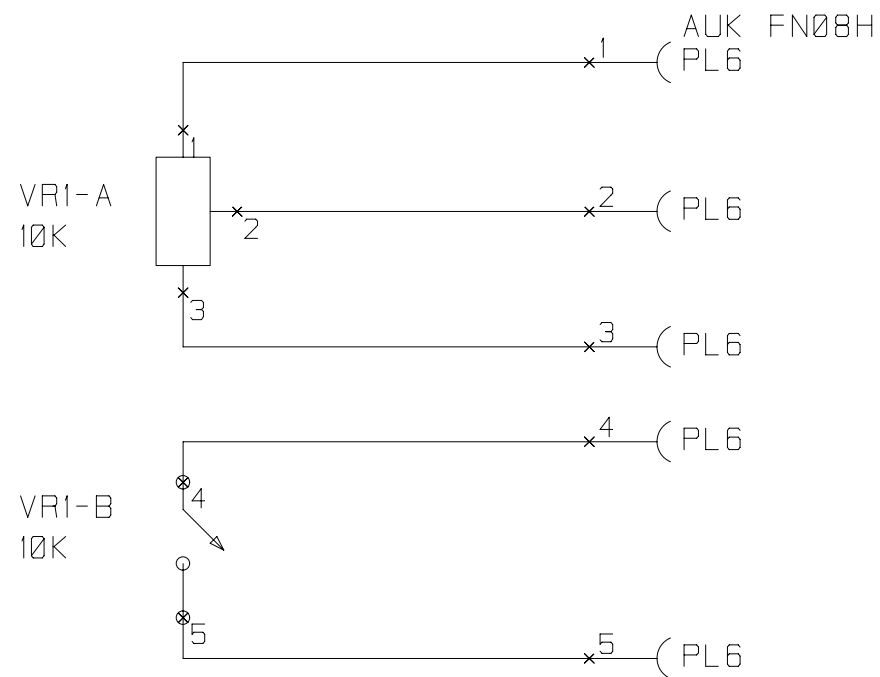
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DO NOT SCALE	REMOVE ALL BURRS AND SHARP EDGES UNLESS OTHERWISE STATED
PROJ. D552	TITLE. RAY240 ACTIVE SPEAKER

MODIFICATION/AMENDMENT		
ISS	DATE	COMMENTS
A	28.08.03	First Issue
B	26 Sep 03	Change Direction of Pot Operation



THIS CIRCUIT DIAGRAM REFERS TO PCB 3015-293



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DRAWN J.R.L.

CHKD

DATE
26.09.03

PROJ	D552
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TITLE .	VOLUME CONTROL
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SCALE 1:1

DRWG No :-

4552-036