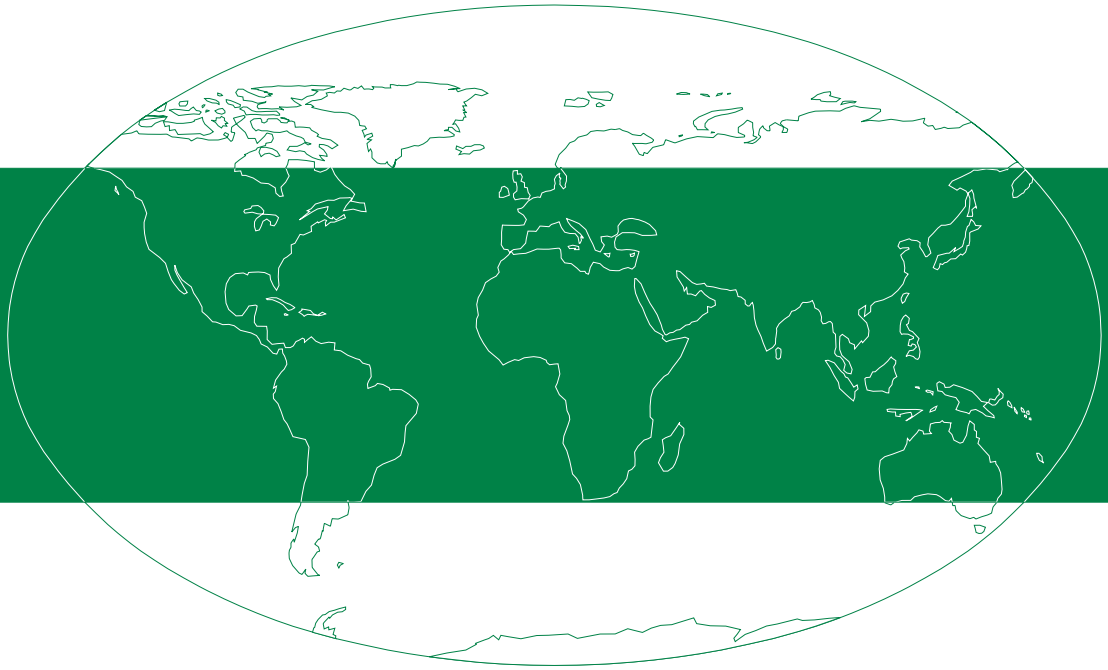
SAILOR

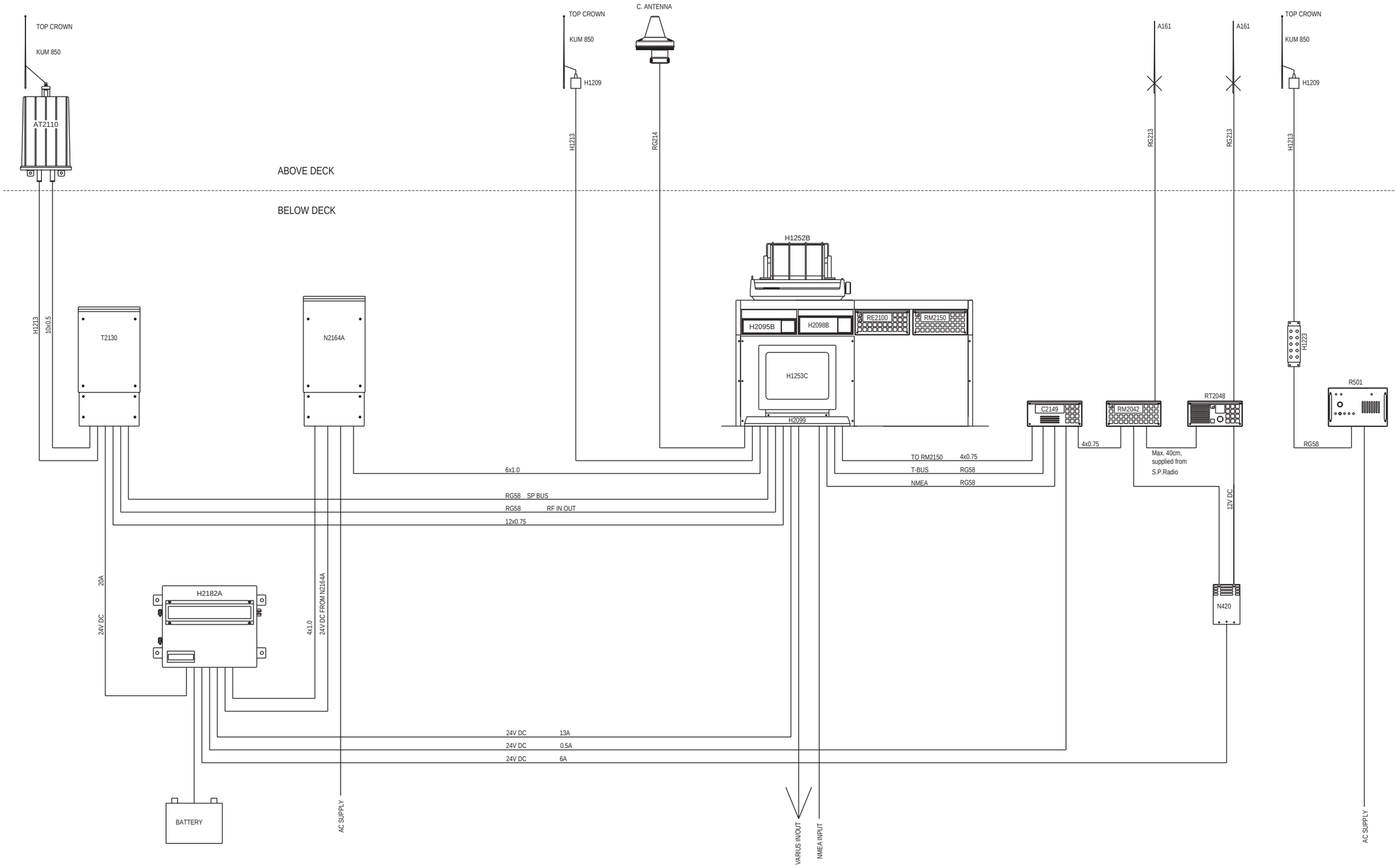


TECHNICAL MANUAL
FOR
H2192 GMDSS Console

S.P. RADIO A/S · AALBORG · DENMARK

1 GENERAL INFORMATION

The console can be configured in several ways to fulfil your requirements. On the following pages is shown some typical configurations:



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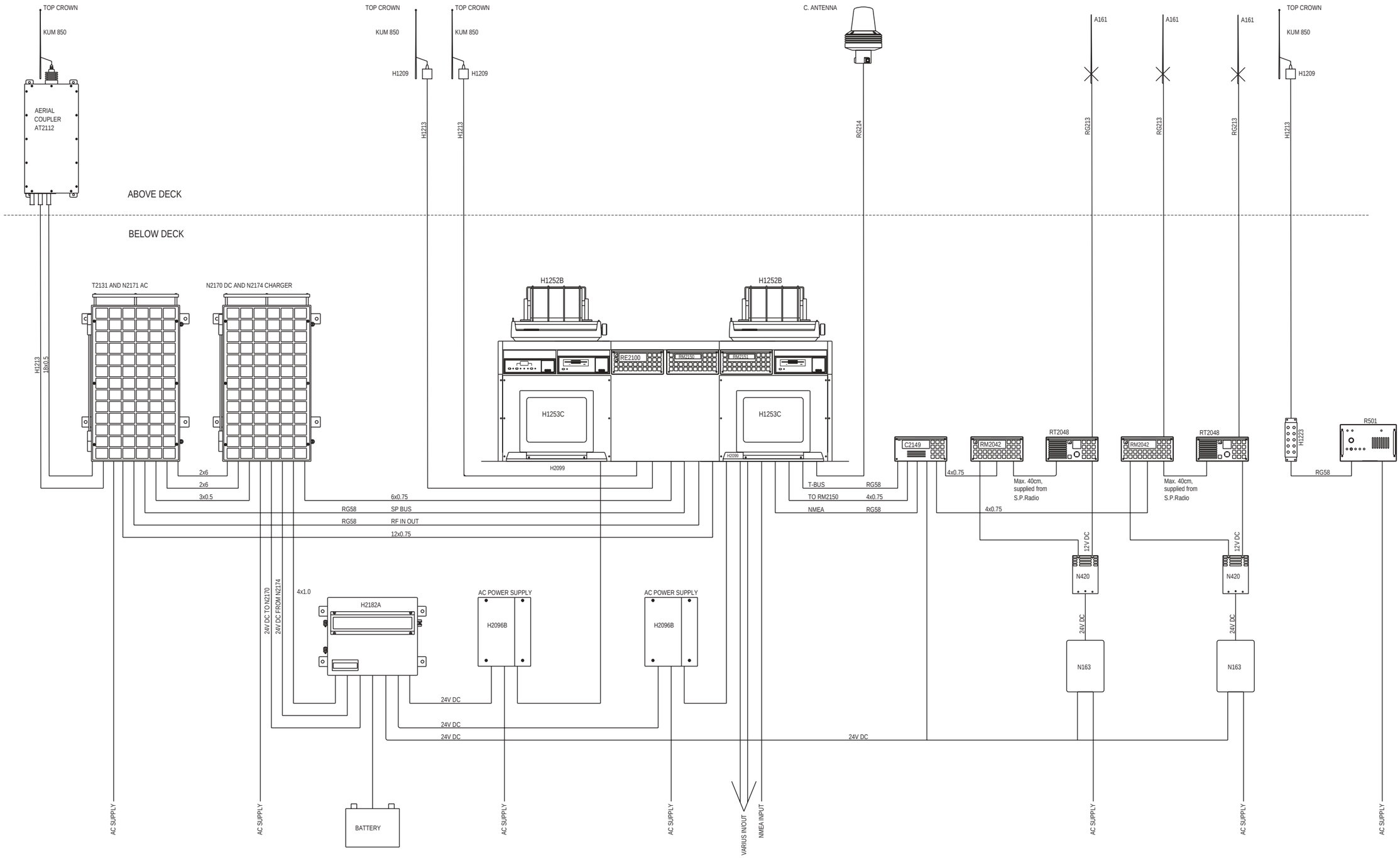
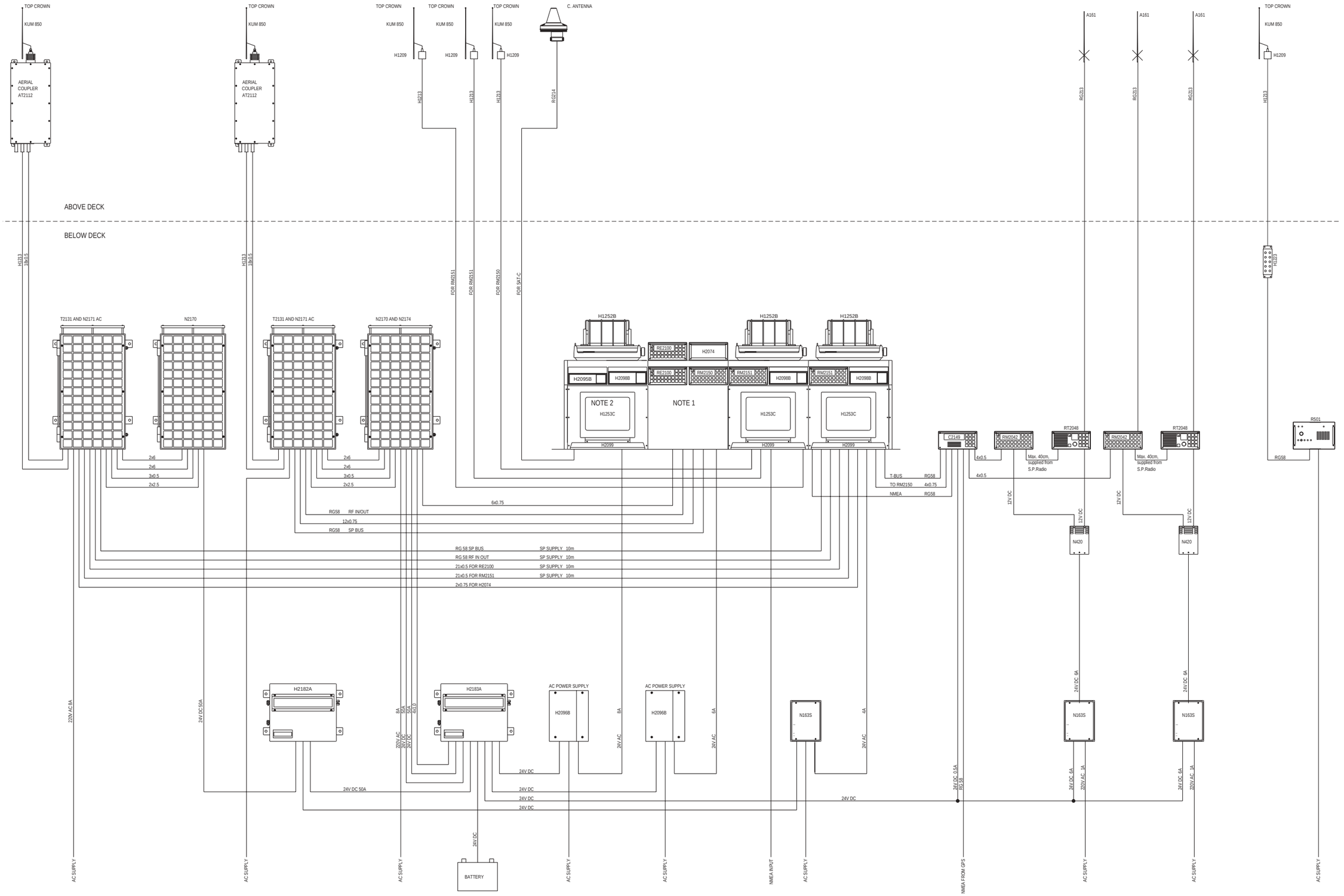

TOP CROWN
KUM 850
AERIAL COUPLER AT2112
ABOVE DECK
BELOW DECK
H1213 18x0.5
T2131 AND N2171 AC
N2170 DC AND N2174 CHARGER
TOP CROWN
KUM 850
H1209
H1213
TOP CROWN
KUM 850
H1209
H1213
C. ANTENNA
RG214
A161
RG213
A161
RG213
A161
RG213
TOP CROWN
KUM 850
H1209
H1213
H1252B
H1252B
RE2100
RM2150
RM2151
H1253C
H1253C
H2099
H2099
H1223
R501
RG58
C2149
RM2042
RT2048
RM2042
RT2048
4x0.75
Max. 40cm, supplied from S.P.Radio
Max. 40cm, supplied from S.P.Radio
4x0.75
2x6
2x6
3x0.5
6x0.75
RG58 SP BUS
RG58 RF IN OUT
12x0.75
T-BUS RG58
TO RM2150 4x0.75
NMEA RG58
12V DC
12V DC
N420
N420
24V DC
24V DC
N163
N163
4x1.0
H2182A
AC POWER SUPPLY
H2096B
AC POWER SUPPLY
H2096B
24V DC TO N2170
24V DC FROM N2174
24V DC
24V DC
24V DC
24V DC
AC SUPPLY
AC SUPPLY
BATTERY
AC SUPPLY
AC SUPPLY
VARUS IN/OUT
NMEA INPUT
AC SUPPLY
AC SUPPLY
AC SUPPLY


TOP CROWN
KUM 850
AERIAL COUPLER AT2112
H1209
H1213
RG214
C. ANTENNA
A161
RG213
ABOVE DECK
BELOW DECK
H1213 18x0.5
T2131 AND N2171 AC
N2170
N2170 AND N2174
FOR RM2151
FOR RM2150
FOR SAT-C
H1252B
RE2100
H2074
RM2150
RM2151
H2095B
H2098B
NOTE 2
NOTE 1
H1253C
H2099
C2149
RM2042
RT2048
Max. 40cm, supplied from S.P.Radio
R501
RG58
T-BUS RG58
TO RM2150 4x0.75
NMEA RG58
4x0.5
12V DC
N420
2x6
3x0.5
2x2.5
6x0.75
12x0.75
RG58 RF IN/OUT
RG58 SP BUS
RG58 SP BUS SP SUPPLY 10m
RG 58 RF IN OUT SP SUPPLY 10m
21x0.5 FOR RE2100 SP SUPPLY 10m
21x0.5 FOR RM2151 SP SUPPLY 10m
2x0.75 FOR H2074
H2182A
H2183A
AC POWER SUPPLY
H2096B
N163S
220V AC 8A
24V DC 50A
8A
50A
24V DC
24V AC
6A
4A
24V DC 6A
24V DC 0.5A
24V DC 1A
220V AC 1A
BATTERY
AC SUPPLY
NMEA IN/OUT
NMEA FROM GPS

29465

1.1 TECHNICAL DATA

Current Drain:

A3 configuration without VHF:

24V DC:	BATT I:	HF SSB	standby	4 Amp
			transmit	4 Amp
	BATT II:	INMARSAT-C	standby	1 Amp
			transmit	3.5 Amp

A3 configuration with VHF:

24V DC:	BATT I:	HF SSB	standby	4 Amp
			transmit	4 Amp
	BATT II:	VHF/INMARSAT-C	standby	2 Amp
			transmit	10 Amp

INPUTS:	NMEA:	high level:	max. 15V
		high level :	min. 2.5V
		low level :	max. 1V
	MUTE IN RM2150:	Relay coil:	max. voltage 35V, 20°C
			min. voltage 9V, 20°C
	MUTE IN RM2151:	Relay coil:	max. voltage 35V, 20°C
			min. voltage 9V, 20°C

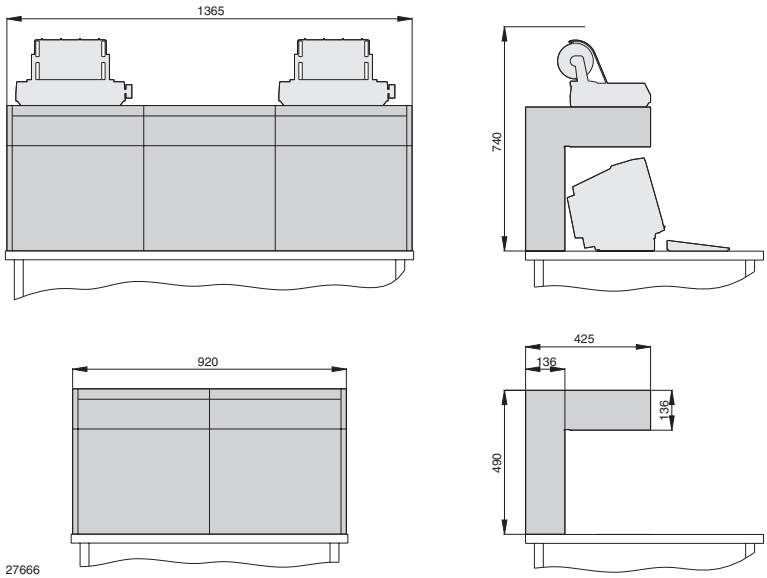
OUTPUTS: FAST MUTE: Relay contact which follows the TX-KEY signal:
max. ratings: 30V/2Amp.

SLOW MUTE: Relay contact which follows the MIC-KEY signal,
with adjustable hang time (R4 or R6 on module (1)):
min. hang time: 0.12 sec.
max. hang time: 3.5 sec.
max. ratings: 30V/2Amp.

EXT. ALARM: Relay contact follows the alarm signal from RM2150
if there is a strap in P19 or the alarm signal from RM2151
if there is a strap in P20:
max. ratings: 30V/2Amp.

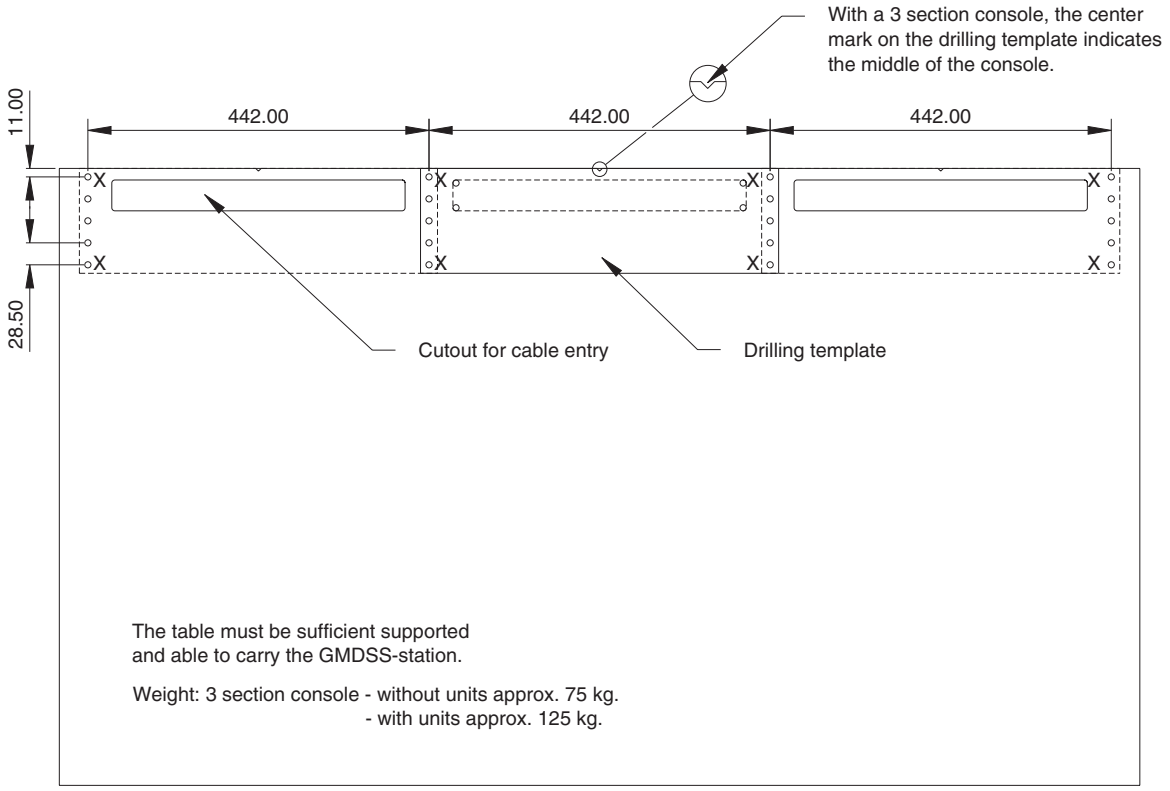
2 INSTALLATION

2.1 DIMENSIONS AND DRILLING PLAN



TABLETOP MOUNTING

The console is mounted table top with minium 4 x 2 pcs. M8 bolts (holes marked with x must always be used). The Ø8mm in the table top is drilled by using the enclosed drilling template, please refer to the drilling plan below.



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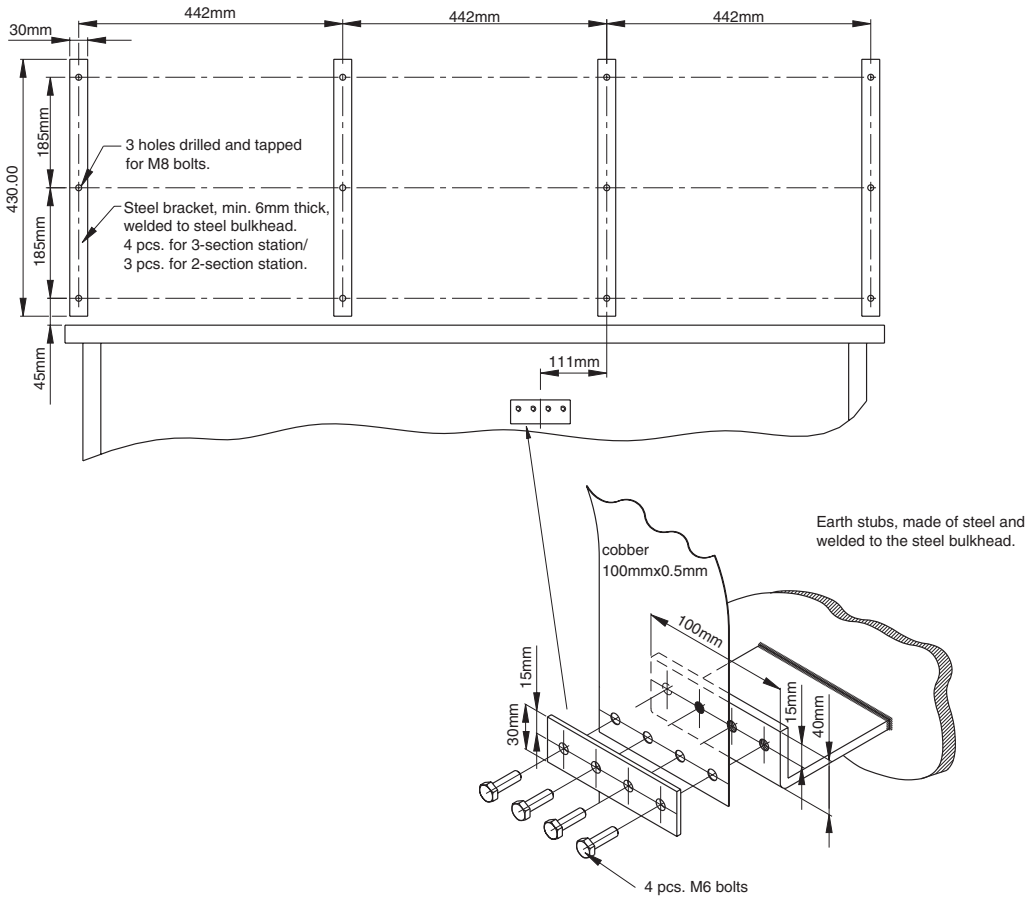
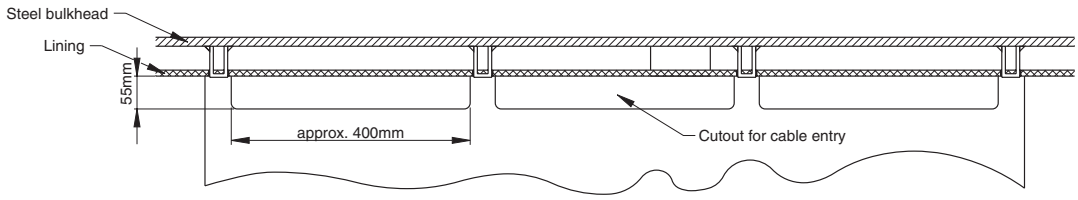
BULKHEAD MOUNTING

The console is mounted on the bulkhead with M8 bolts in the appropriate holes in the base mounting plates. Please refer to the drilling plan below.

FRONT VIEW



TOP VIEW



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2.2 MECHANICAL ASSEMBLING

ASSEMBLY INSTRUCTION
The respective letters A-B-C-D-E-F-G-H-K-L-M refers to the assembly drawings and to the set of screws enclosed.

A: Screws M4 x 10mm and M4 lock washer are mounted in the mounting profiles (marked 1) as shown.

B: The mounting profiles (marked 1) are fastened to the base mounting plates (marked 2 & 3).

C: Tabletop mounting: Drill the ø8mm holes in the table, using the enclosed drilling template, at least 2 holes in each profile must be used, the * marked hole must always be used. Please refer to the drilling plan for table mounting. Next step is to place the previous assembled hardware (B) on the table and fasten it with the enclosed bolts and washers as shown.

Bulkhead mounting: If the console is mounted on bulkhead it must be fastened on the bulkhead with M8 bolts in the appropriate holes in the base mounting plates. Please refer to the drilling plan for bulkhead mounting.

D: The black cable bearers (marked 5) and the ground cables for the single units are mounted on the base mounting plates with M4 x 6mm screws (long) as shown. Note that the screw without ground cable must be M4 x 5mm screw (short).

E: The center Connection Board (module 1, marked 6), the left Connection board (module 2, marked 7) and Power Supply N420 (marked 8) are mounted on the base mounting plates as shown. The 3 receiver protecting units H1223 (marked 9) are mounted in right section, if it is a 2 sections console the receiver protecting units must be placed on the bulkhead or in an other appropriate position.

F: The mounting angles for PS/AF chassis (marked 10 and 11) are mounted on the base mounting profiles as shown. Next step is to mount the PS/AF chassis (marked 12).

G: The earth strip is connected and fastened by the dog (marked 13).

H: The lower mounting plate (marked 14) and upper mounting plate (marked 15) are mounted as shown.

K: The left cover plate (marked 16), the right cover plate (marked 17) and top cover plates (1/1 top cover plate marked 18) and (1/2 top cover plate marked 19) are mounted as shown.

L: Mounting of all units in the GMDSS Station and mounting of cables as shown in the cable plan. The following premounting are necessary on all units before they can be mounted in the console.

Mount the mounting angles (SP Number 227641, stainless steel) on all 1/4 boxes, use the screws M5 x 7mm (marked 1, SP Number 87.284).

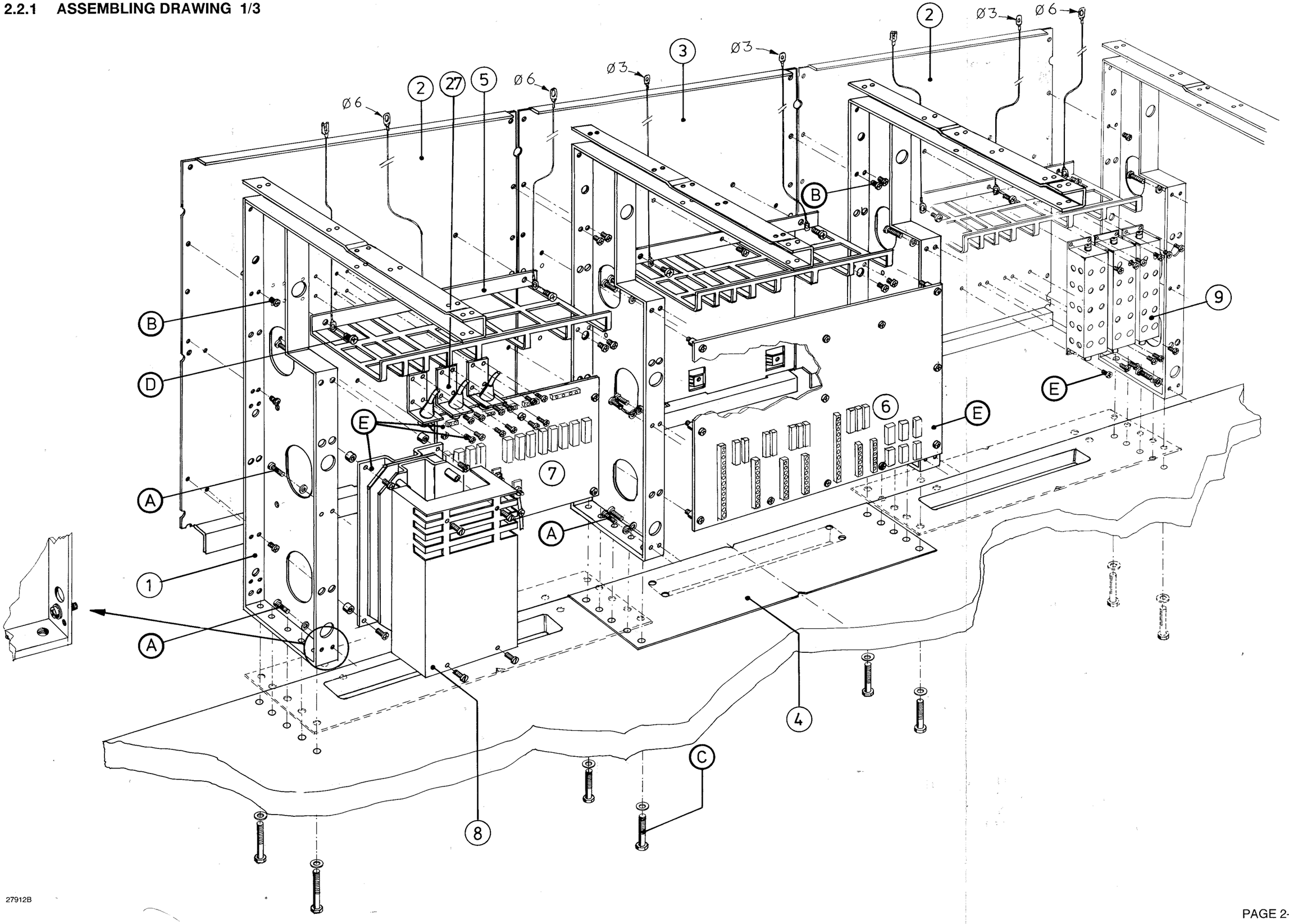
Mount the mounting angles (227641 and 227642 in stainless steel) on the Inmarsat-C Transceiver and the 2 Message terminals, please note that the 5 holes in the mounting angles must be pointing to the front of the units. Next step are to mount the cover plates with the appropiate streamers above the units. Use the screws M4 x 5mm (marked 2, SP Number 87.160).

If you wish to mount units on top of the console, please refer to drawing 2/3. At first you must remove the cover plates (marked 18/19), next step are to mount the 2 angles (SP Number 227654) for each unit, use the screws M4 x 5mm (marked 2, SP Number 87.160). Remember to mount the 2 stop screws M3 x 6mm (marked 3, SP Number 86.962) for each unit.

Mount all units in the console.

M: Mount the top cover plates (marked 20), cover plates (marked 21) and rear cover plates (marked 22). Mount the Center Panel (marked 23) and frontpanels (marked 24). Next step are to mount the frontpanels (marked 25 & 26).

2.2.1 ASSEMBLING DRAWING 1/3



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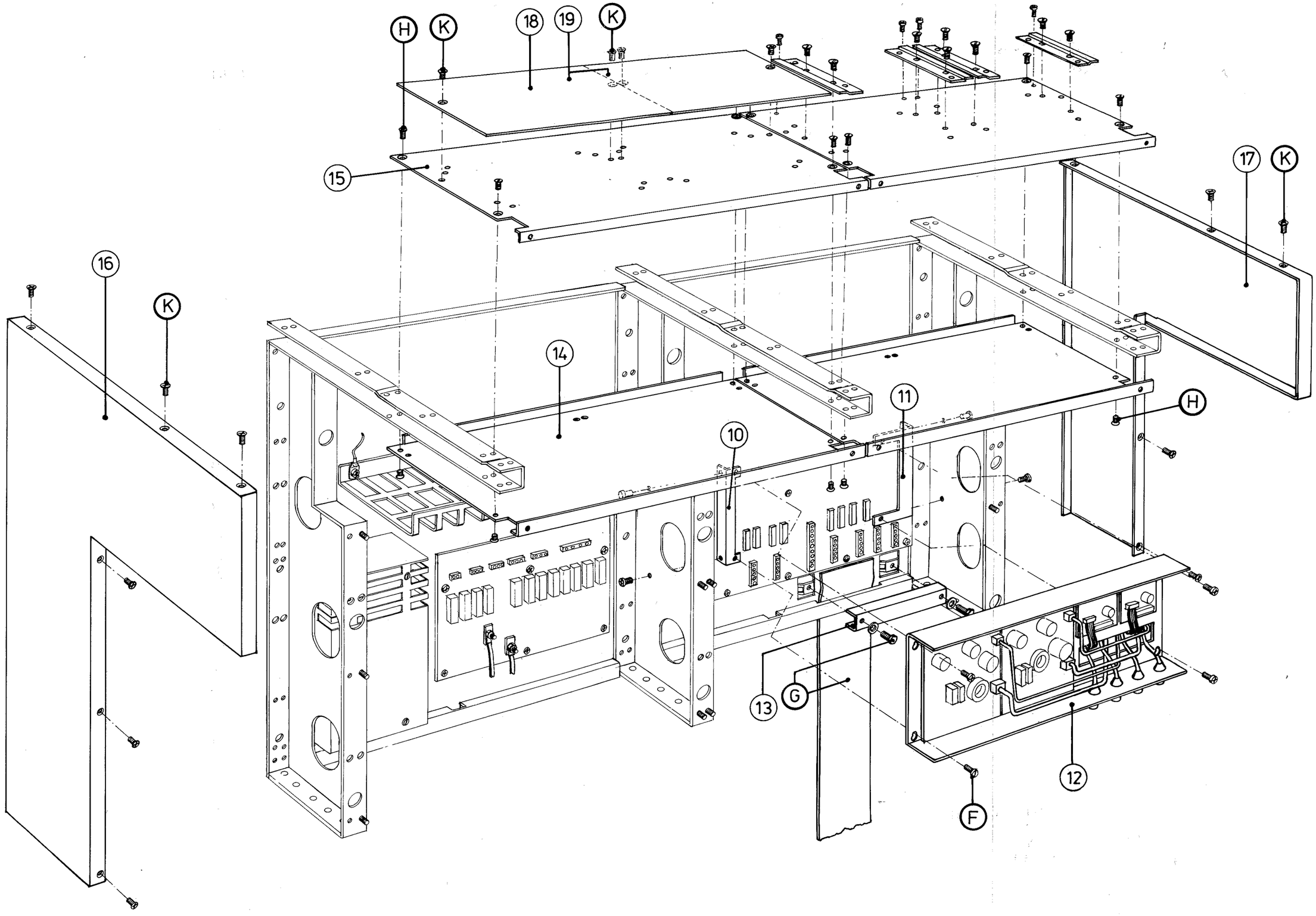
2.2.2 ASSEMBLING DRAWING 2/3



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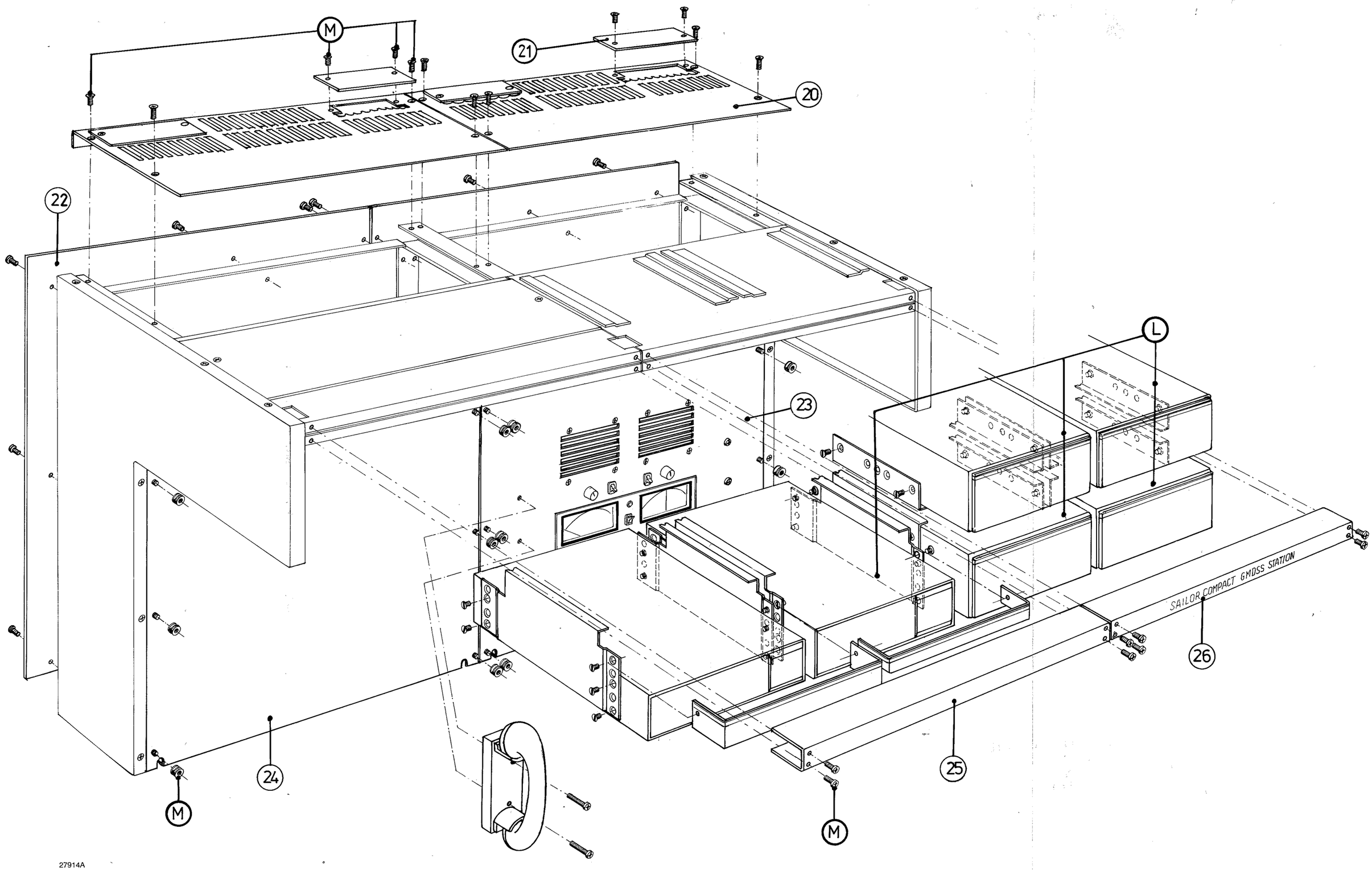
2.2.3 ASSEMBLING DRAWING 3/3



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2.3 INSTALLATION ELECTRICAL

This chapter describe the standard console (3 sections), if you only have 2 sections console, or you don't have the same units as described here, you can use the information here, to make your one configuration.

2.3.1 INSTALLATION ELECTRICAL EXTERNAL

This chapter describes the standard console (3 sections), if you only have a 2 sections console, or you dont have the same units as described here, you can use the information here to make your own configuration.

Before mounting the units in the console, you have connect all external cables to the console.
When this is done mount all internal cables.

2.3.1.1 CONFIGURATION EXAMPLES AND CABLE DIMENSIONS

The following paged show a typical installation example and cable dimensions.

NOTE: There are two inputs for the NMEA signal.

1. If one side of the NMEA signal is on chassis then you can use ether the BNC coax connector PS/AF chassis in the centre section or the terminal ST12 on the connection board 1 in the centre section.

2. If one side of the NMEA signal is connected to negative battery then you must remove the BNC coax connector from P5 on the connection board 1 in the centre section and leave P5 with out connection because it will have negative battery on the outside. Connect your NMEA signal to ST12 on the connection board 1 in the centre section.

For more detailed information about cabling between the units outside H2192, please refer the manual for the unit in question.

CABLE 50 C2149 - H2192

8x0.75mm^2 shielded multicable

H2192	C2149		SIGNAL
ST3	J5	J2 OR J1	
1		3	DATA TO RM2042
2		2	DATA TO C2149
3		5	- BATT
4		9	+ 5V
5	3		ALARM IN
6	2		ALARM OUT
7	5		GROUND
8	9		+ 9V

CABLE 51
H2192 - AUX.

Fast mute out: Two times make and break relay contacts.
Max. ratings: 30V and 2 Amp
Battery outputs: Fused with 1 Amp fuse.

H2192	SIGNAL/RELAY CONTACT
ST6	
1	+ BATT
2	FAST MUTE OUT, NO
3	FAST MUTE OUT, C
4	FAST MUTE OUT, NC
5	FAST MUTE OUT, NO
6	FAST MUTE OUT, C
7	FAST MUTE OUT, NC
8	- BATT

CABLE 52
H2192 TO AUX.

Slow mute out: Four times make and break relay contacts.
Max. ratings: 30V and 2 Amp
Battery outputs: Fused with 1 Amp fuse.

H2192	SIGNAL/RELAY CONTACT
ST4	
1	+ BATT
2	FAST MUTE OUT I, NO
3	FAST MUTE OUT I, C
4	FAST MUTE OUT I, NC
5	FAST MUTE OUT I, NO
6	FAST MUTE OUT I, C
7	FAST MUTE OUT I, NC
8	FAST MUTE OUT II, NO
9	FAST MUTE OUT II, C
10	FAST MUTE OUT II, NC
11	FAST MUTE OUT II, NO
12	FAST MUTE OUT II, C
13	FAST MUTE OUT II, NC
14	- BATT

CABLE 53 H2192 - T213X

11x0.75 mm² shielded multicable, max length 30 meter.

H2192	T2130			T2131 / T2135			SIGNAL
ST5	ST2	ST3	ST7	ST6	ST12	ST8	
1	1			1			MUTE RX
2	2			2			VF/AE CURRENT
3	5			5			SUPPLY ON/OFF
4	9			9			0dBm COMMON
5	10			10			AUX AF TO TX
7	12			12			0dBm
8	13			13			TX-KEY
9	16			16			SP-BUS INTERRUPT
10		1			1		MUTE OUT
11	15			15			- BATT
		2	10		2	10	MUTE OUT/GROUND

CABLE 54 H2192 - TELEX ALARM and MUTE IN.

Telex alarm out: One times make and break relay contact.
Max. ratings: 30V and 2Amp
Battery outputs: Fused with 1Amp fuse.

Mute in to RM2150/51: Relay coil.
Max. voltage: 35V, 20°C.
Min. voltage: 9V, 20°C.
Coil resistance: 2250 ohm +/- 300 ohm.

H2192		H2184		SIGNAL
CONNECTION BOARD (1)	CONNECTION BOARD (2)			
ST7	ST2	ST1	ST2	
1				+ BATT
2			4	EXT. ALARM, NO
3		9		EXT. ALARM, C
4				EXT. ALARM, NC
5				MUTE IN RM2150
6				MUTE IN RM2151
7				- BATT
	1		1	RING INDICATOR / + SES ALARM
	2		2	GROUND / - SES ALARM

For more detailed information,
please see the manual for H2185 chapter 2.2.7

CABLE 56 H2192 - CHARGER I AND CHARGER II (N2174)

Two times shielded multicable 7x0.75mm²

CHARGER I

H2192	N2174 (5-0-26446)	SIGNAL
ST1	ST7	
1	1	- SHUNT
2	2	+ SHUNT
3	3	- VS
4	4	MAN.
5	5	26V
6	6	AUTO
7		NC

CHARGER II

H2192	N2174 (5-0-26446)	SIGNAL
ST2	ST7	
1	1	- SHUNT
2	2	+ SHUNT
3	3	- VS
4	4	MAN.
5	5	26V
6	6	AUTO
7		NC

CABLE 57 BATTERY SUPPLY TO INMARSAT-C AND VHF

Current concuption: 10 Amps
cable dimensions: up to 8 meters 6mm²

H2192	N2161	SIGNAL
P3	P4	+ BATT
P4	P3	- BATT

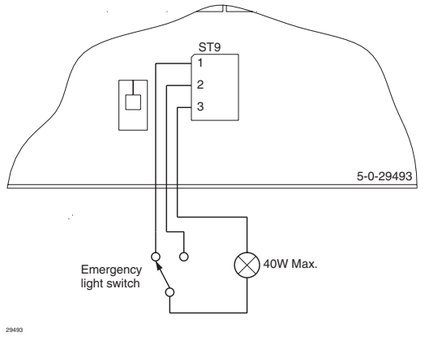
CABLE 58 BATTERY SUPPLY TO HF SSB

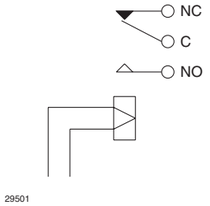
Current concuption: 4 Amps
cable dimensions: up to 30 meters 6mm²

H2192	H2182	SIGNAL
P5	HF +	+ BATT
P4	AUX -	- BATT

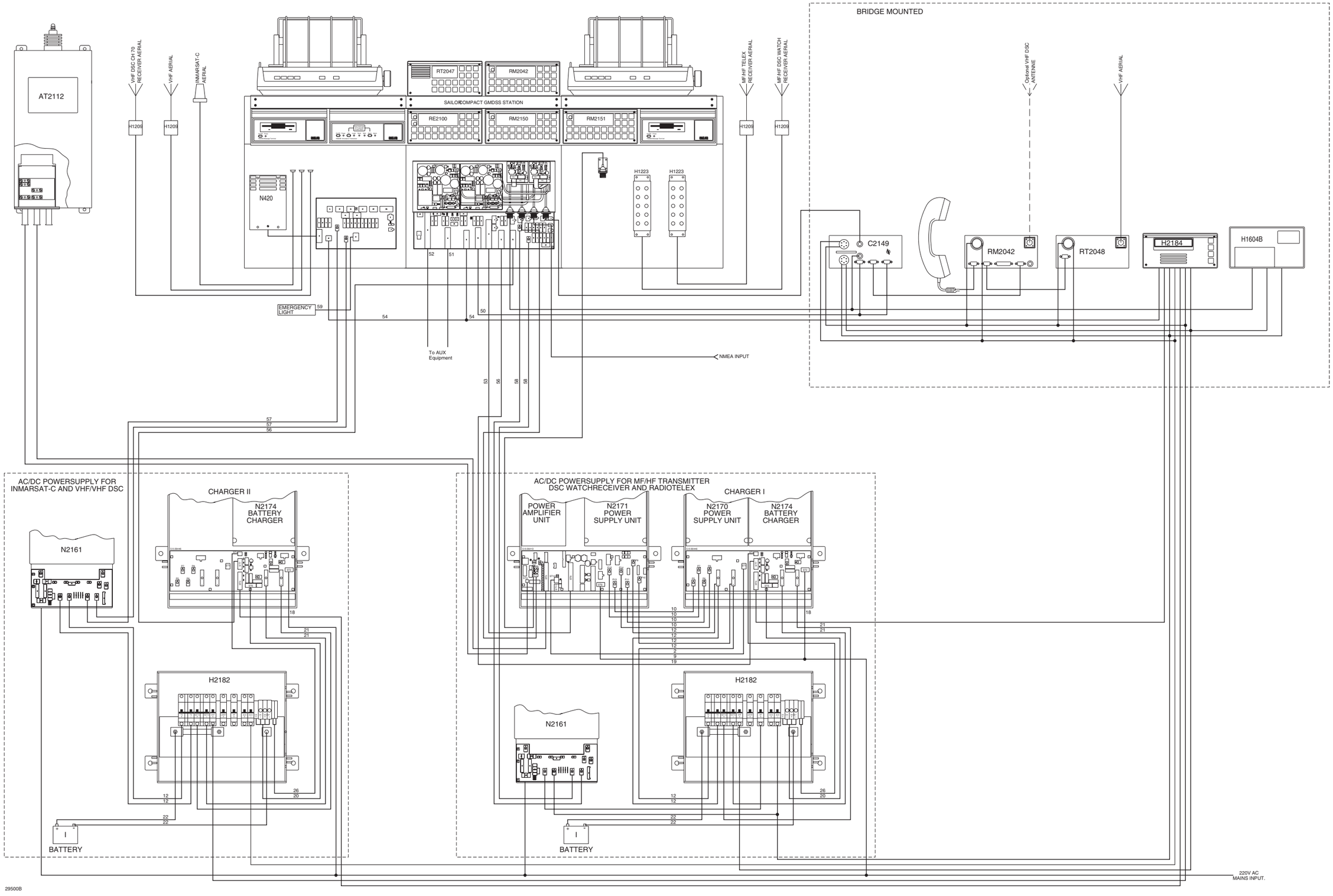
CABLE 59 EMERGENCY LIGHT

Connectionboard module 2





H2192 WITH VHF INTEGRATED IN THE CONSOLE AND C2149 ON THE BRIDGE.



2.3.2 INSTALLATION ELECTRICAL INTERNAL

Before you mount a cable in the console, you must put a number label on the cable in accordance with table 1.
Start with mounting cable no. 1.
If you haven't got a Inmarsat-C in the console, you don't neat cable no. 5, 6, 7, 8, 11, 12, 36, 37.
If you haven't got a VHF mounted in the console, you don't neat to mount cable no. 9, 10, 18, 35, 39, 41.

NOTE 1: The T-bus on Inmarsat-C has to be connected to:

1. Cable 13 if you have a C2149 in your configuration.
2. Cable 38 if you haven't a C2149 in your configuration.
3. Cable 13 if you have a remote alarm unit with EGC printer (H1604B) in your configuration.

The NMEA input on RM2042 has to be connected to:

1. Noting if you have a C2149 in your configuration.
2. Cable 39 if you haven't a C2149 in your configuration.

NOTE 2: There are two inputs for the NMEA signal.

1. If one side of the NMEA signal is on chassis then you can use ether the BNC coax connector PS/AF chassis in the centre section or the terminal ST12 on the connection board 1 in the centre section.

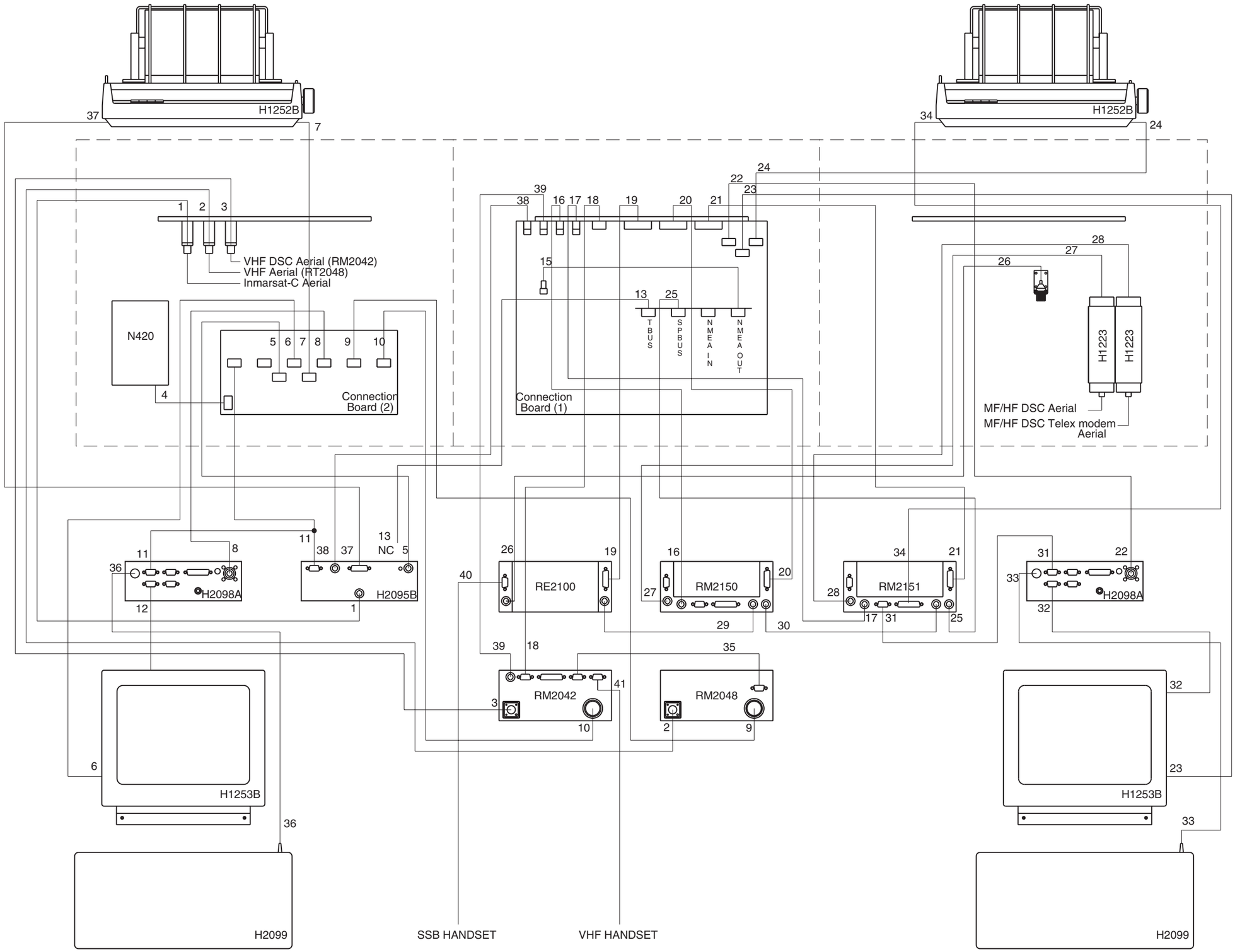
2. If one side of the NMEA signal is connected to negative battery then you must remove the BNC coax connector from P5 on the connection board 1 in the centre section and leave P5 with out connection because it will have negative battery on the outside. Connect your NMEA signal to ST12 on the connection board 1 in the centre section.

INTERNAL CABLES

TABLE 1

Cable	Description	Label	Lenght (cm)	Connection between	PART NO.	Remarks
1	N-male - N-female		120	Inmarsat-C - Antenna	56.064	Mounted on Chassis H2192
2	PL259 - SO239		120	VHF DSC Receiver Aerial	527830	Mounted on Chassis H2192
3	PL259 - SO239		120	VHF Radiotelephone Aerial	527830	Mounted on Chassis H2192
4	Multicable			N420 - ST8-2	527764	Mounted on Connection Board 2
5				Inmarsat-C - ST4-2		Supplied w. Inmarsat-C
6				Monitor - ST5-2		Supplied w. Monitor
7				Printer - ST6-2		Supplied w. Printer
8				Message Terminal - ST7-2		Supplied w. Message Terminal
9	Multicable 6 pole			VHF Radiotelephone - ST10	527765	Mounted on Connection Board 2
10	Multicable 6 pole			VHF DSC Receiver - ST11	527765	Mounted on Connection Board 2
11	9 - 9 pole Sub D			Message Terminal - Inmarsat-C		Supplied w. Message Terminal
12	BNC - 9 pole Sub D			Message Terminal - Monitor		Supplied w. Message Terminal
13	BNC - SO239		120	T-Bus, Inmarsat-C-PS/AF Chassis	527831	Mounted on PS/AF Chassis
15	BNC - SO239		120	NMEA Out, J6-1	527831	Mounted on PS/AF Chassis
16	BNC - BNC		100	J1-1-MF/HF DSC Watch Receiver	527684	NMEA to MF/HF DSC WR
17	BNC - BNC		100	J4-1-MF/HF DSC/Telex Modem	527684	NMEA to MF/HF DSC/Telex M.
18	9 - 9 pole Sub D			P3-1 - VHF DSC Receiver	527832	Interface to GMDSS Alarm Unit
19	25-25 pole Sub D			P6-1 - HF SSB Radiotelephone	56.480	Interface to HF SSB Radiotlph.
20	25-25 pole Sub D			J7-1 - DSC Watch Receiver	56.480	Interface to MF/HF DSC WR
21	25-25 pole Sub D			J8-1 - DSC/Telex Modem	56.480	Interface to MF/HF DSC/Telex
22	Power Cable			ST9-1 - Message Terminal		Supplied w. Message Terminal
23	Power Cable			ST10-1 - Monitor		Supplied w. Message Terminal
24	Power Cable			ST11-1 - Printer		Supplied w. Printer
25	BNC - SO239		120	PS/AF Chassis - DSC/Telex	527831	Mounted on PS/AF Chassis
26	BNC - SO239		120	SO239 HF SSB Radiotelephone	533072	RF In/Out to Transmitter
27	BNC - PL259	Red	100	H1223 DSC Watch Receiver	527755	MF/HF DSC WR aerial
28	BNC - PL259	Red	100	H1223 MF/HF DSC/Telex Modem	527755	MF/HF DSC/Telex aerial
29	BNC - BNC	Blue	100	HF SSB Radiotlph.- DSC WR	527115	SP-Bus
30	BNC - BNC	Blue	100	MF/HF DSC WR - DSC/Tlx	527115	SP-Bus
31	9 - 9 Pole Sub D			MF/HF DSC/Tlx - Message Terminal		Supplied w. Message Terminal
32	9 pole Sub D - BNC			Message Terminal - Monitor		Supplied w. Message Terminal
33				Message Terminal - Keyboard		Supplied w. Keyboard
34	25 pole Sub D - Centronics			Message Terminal - Printer	56.013	Supplied w. Printer
35	9 - 9 Pole Sub D			VHF Radiotlph. - VHF DSC WR	526947	Supplied w. VHF DSC Receiver
36				Message Terminal - Keyboard		Supplied w. Keyboard
37				Inmarsat-C - Printer	56.013	Supplied w. Printer
38	BNC - BNC	Yellow	100	Inmarsat-C - J2-1	527684	NMEA
39	BNC - BNC	Yellow	100	VHF DSC Receiver - J3-1	527684	NMEA
40	9 - 9 Pole Sub D			SSB Handset - RE2100	527832	
41	9 - 9 Pole Sub D			VHF Handset	527832	

INTERNAL CABLE OVERVIEW WITHOUT GMDSS ALARM UNIT C2149



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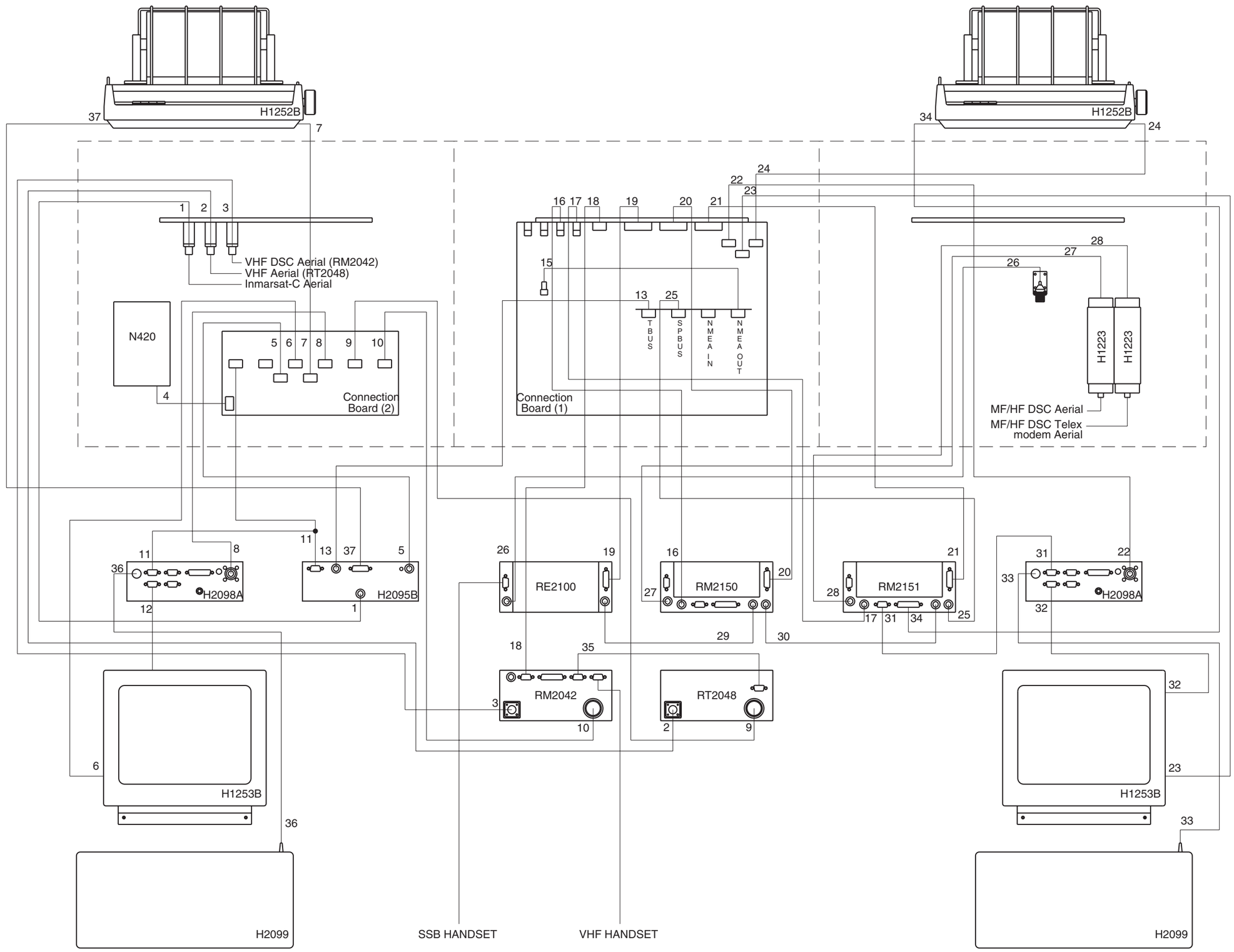
INTERNAL CABLES

TABLE 1

Cable	Description	Label	Lenght (cm)	Connection between	PART NO.	Remarks
1	N-male - N-female		120	Inmarsat-C - Antenna	56.064	Mounted on Chassis H2192
2	PL259 - SO239		120	VHF DSC Receiver Aerial	527830	Mounted on Chassis H2192
3	PL259 - SO239		120	VHF Radiotelephone Aerial	527830	Mounted on Chassis H2192
4	Multicable			N420 - ST8-2	527764	Mounted on Connection Board 2
5				Inmarsat-C - ST4-2		Supplied w. Inmarsat-C
6				Monitor - ST5-2		Supplied w. Monitor
7				Printer - ST6-2		Supplied w. Printer
8				Message Terminal - ST7-2		Supplied w. Message Terminal
9	Multicable 6 pole			VHF Radiotelephone - ST10	527765	Mounted on Connection Board 2
10	Multicable 6 pole			VHF DSC Receiver - ST11	527765	Mounted on Connection Board 2
11	9 - 9 pole Sub D			Message Terminal - Inmarsat-C		Supplied w. Message Terminal
12	BNC - 9 pole Sub D			Message Terminal - Monitor		Supplied w. Message Terminal
13	BNC - SO239		120	T-Bus, Inmarsat-C-PS/AF Chassis	527831	Mounted on PS/AF Chassis
15	BNC - SO239		120	NMEA Out, J6-1	527831	Mounted on PS/AF Chassis
16	BNC - BNC		100	J1-1-MF/HF DSC Watch Receiver	527684	NMEA to MF/HF DSC WR
17	BNC - BNC		100	J4-1-MF/HF DSC/Telex Modem	527684	NMEA to MF/HF DSC/Telex M.
18	9 - 9 pole Sub D			P3-1 - VHF DSC Receiver	527832	Interface to GMDSS Alarm Unit
19	25-25 pole Sub D			P6-1 - HF SSB Radiotelephone	56.480	Interface to HF SSB Radiotlph.
20	25-25 pole Sub D			J7-1 - DSC Watch Receiver	56.480	Interface to MF/HF DSC WR
21	25-25 pole Sub D			J8-1 - DSC/Telex Modem	56.480	Interface to MF/HF DSC/Telex
22	Power Cable			ST9-1 - Message Terminal		Supplied w. Message Terminal
23	Power Cable			ST10-1 - Monitor		Supplied w. Message Terminal
24	Power Cable			ST11-1 - Printer		Supplied w. Printer
25	BNC - SO239		120	PS/AF Chassis - DSC/Telex	527831	Mounted on PS/AF Chassis
26	BNC - SO239		120	SO239 HF SSB Radiotelephone	533072	RF In/Out to Transmitter
27	BNC - PL259	Red	100	H1223 DSC Watch Receiver	527755	MF/HF DSC WR aerial
28	BNC - PL259	Red	100	H1223 MF/HF DSC/Telex Modem	527755	MF/HF DSC/Telex aerial
29	BNC - BNC	Blue	100	HF SSB Radiotlph.- DSC WR	527115	SP-Bus
30	BNC - BNC	Blue	100	MF/HF DSC WR - DSC/Tlx	527115	SP-Bus
31	9 - 9 Pole Sub D			MF/HF DSC/Tlx - Message Terminal		Supplied w. Message Terminal
32	9 pole Sub D - BNC			Message Terminal - Monitor		Supplied w. Message Terminal
33				Message Terminal - Keyboard		Supplied w. Keyboard
34	25 pole Sub D - Centronics			Message Terminal - Printer	56.013	Supplied w. Printer
35	9 - 9 Pole Sub D			VHF Radiotlph. - VHF DSC WR	526947	Supplied w. VHF DSC Receiver
36				Message Terminal - Keyboard		Supplied w. Keyboard
37				Inmarsat-C - Printer	56.013	Supplied w. Printer
38	BNC - BNC	Yellow	100	Inmarsat-C - J2-1	527684	NMEA
39	BNC - BNC	Yellow	100	VHF DSC Receiver - J3-1	527684	NMEA
40	9 - 9 Pole Sub D			SSB Handset - RE2100	527832	
41	9 - 9 Pole Sub D			VHF Handset	527832	

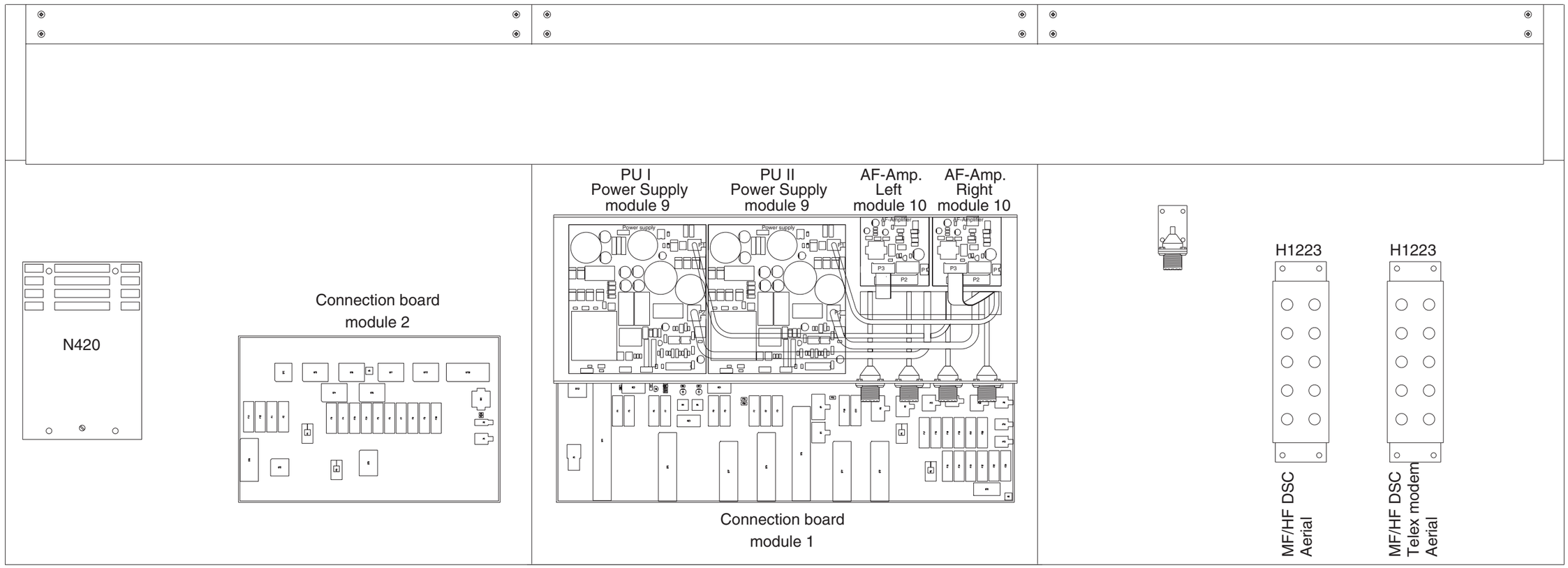
INTERNAL CABLE OVERVIEW WITH GMDSS ALARM UNIT C2149



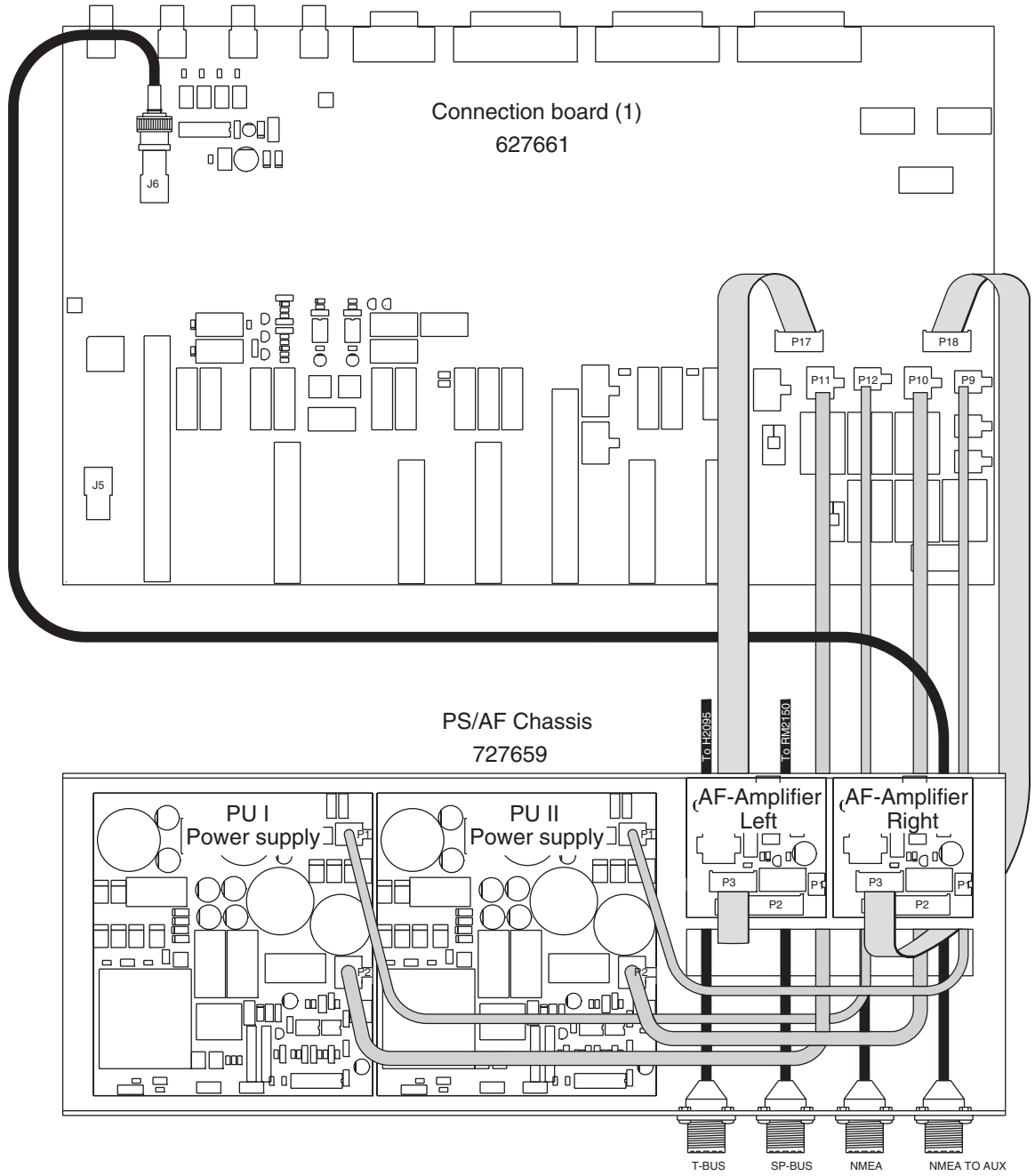
27907D

9728

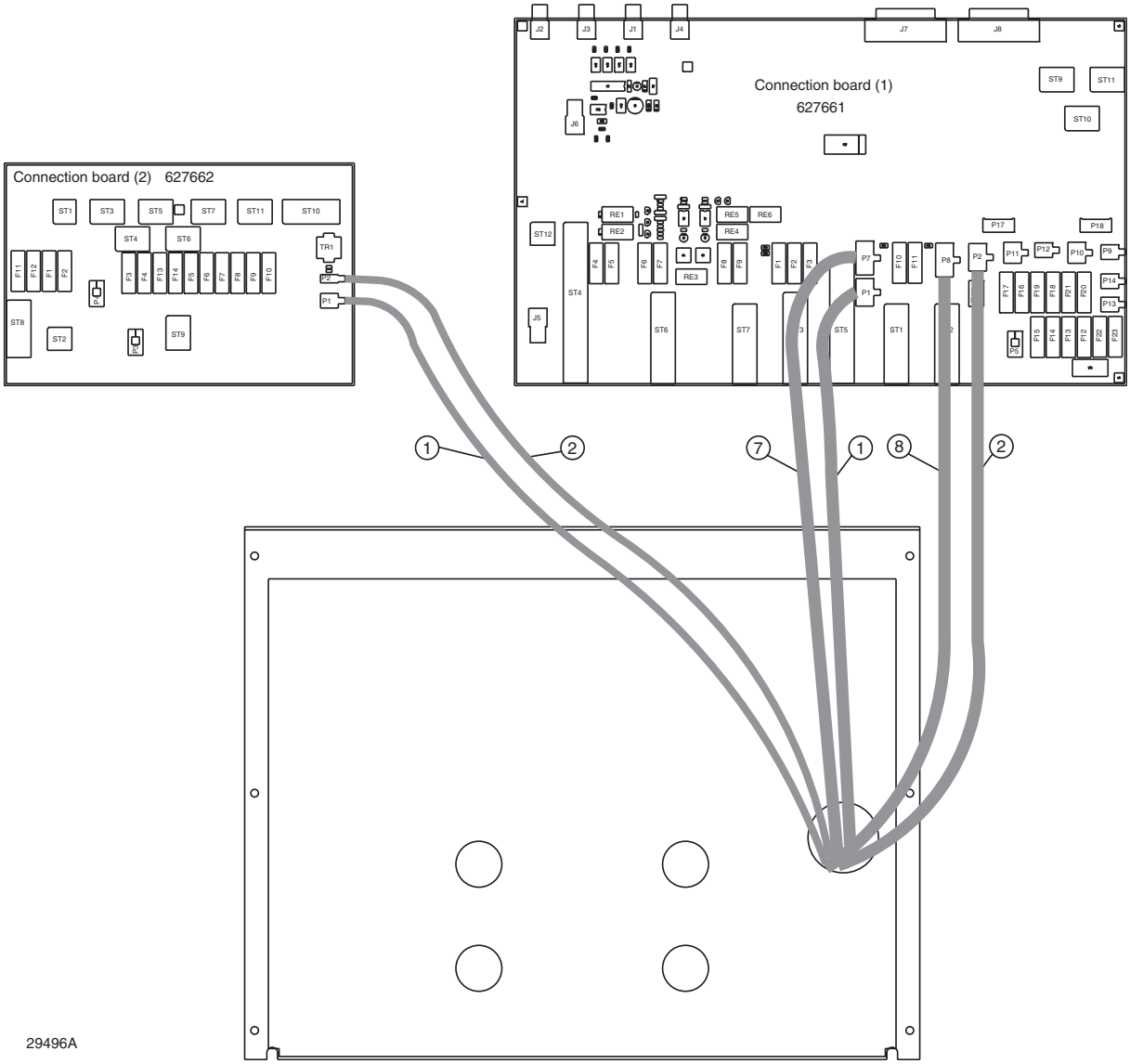
2.4 MODULE LOCATION



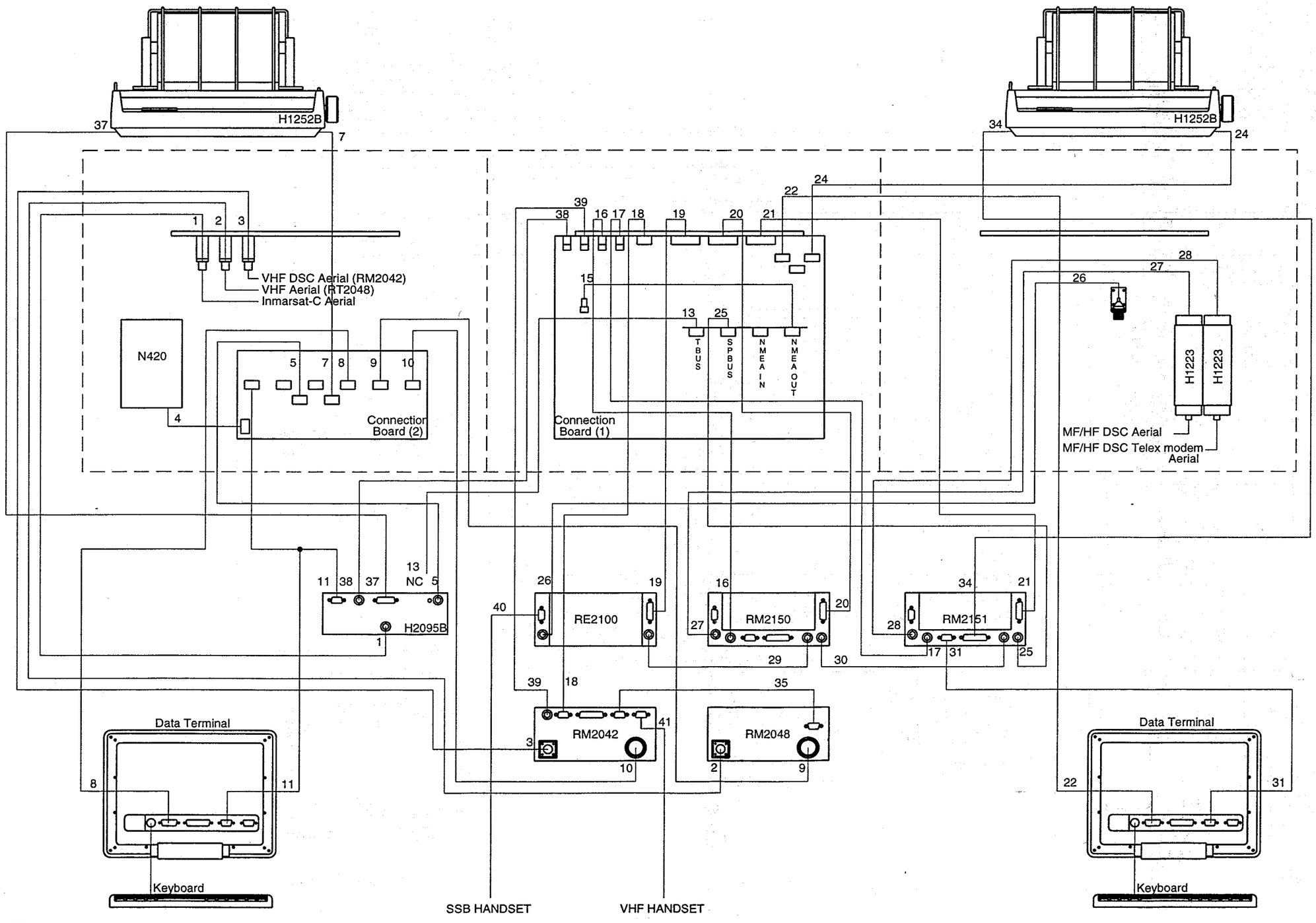
29497B


Connection board (1)
627661
J6
J5
P17
P18
P11
P12
P10
P9
PS/AF Chassis
727659
To H2095
To AM2150
PU I
Power supply
PU II
Power supply
P1
P2
AF-Amplifier
Left
AF-Amplifier
Right
P3
P1
P2
T-BUS
SP-BUS
NMEA
NMEA TO AUX

27947A


Connection board (2) 627662
Connection board (1)
627661
1
2
7
1
8
2
29496A

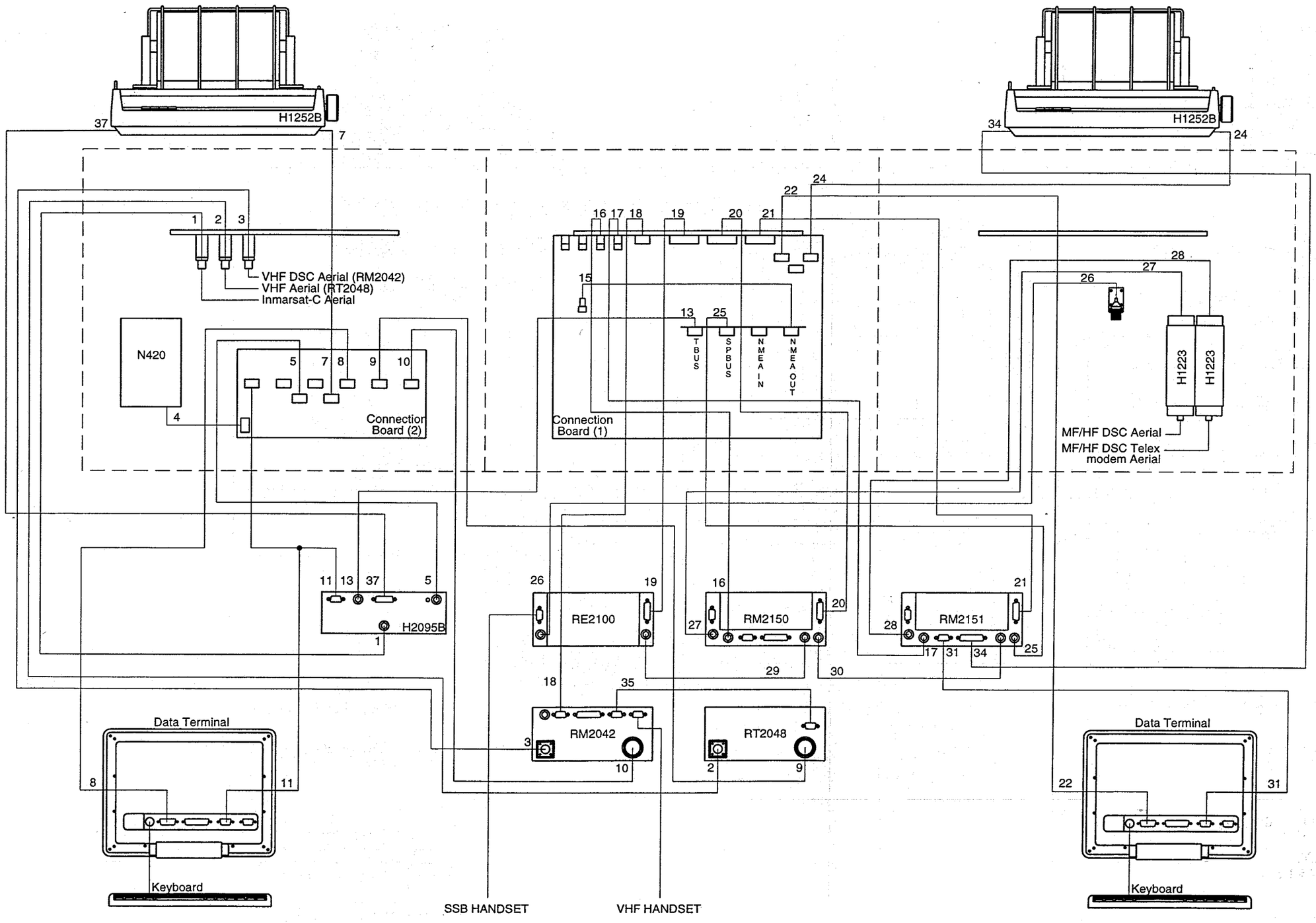
INTERNAL CABLE OVERVIEW WITH DATA TERMINAL AND WITHOUT GMDSS ALARM UNIT C2149



36260

036349

INTERNAL CABLE OVERVIEW WITH DATA TERMINAL AND GMDSS ALARM UNIT C2149

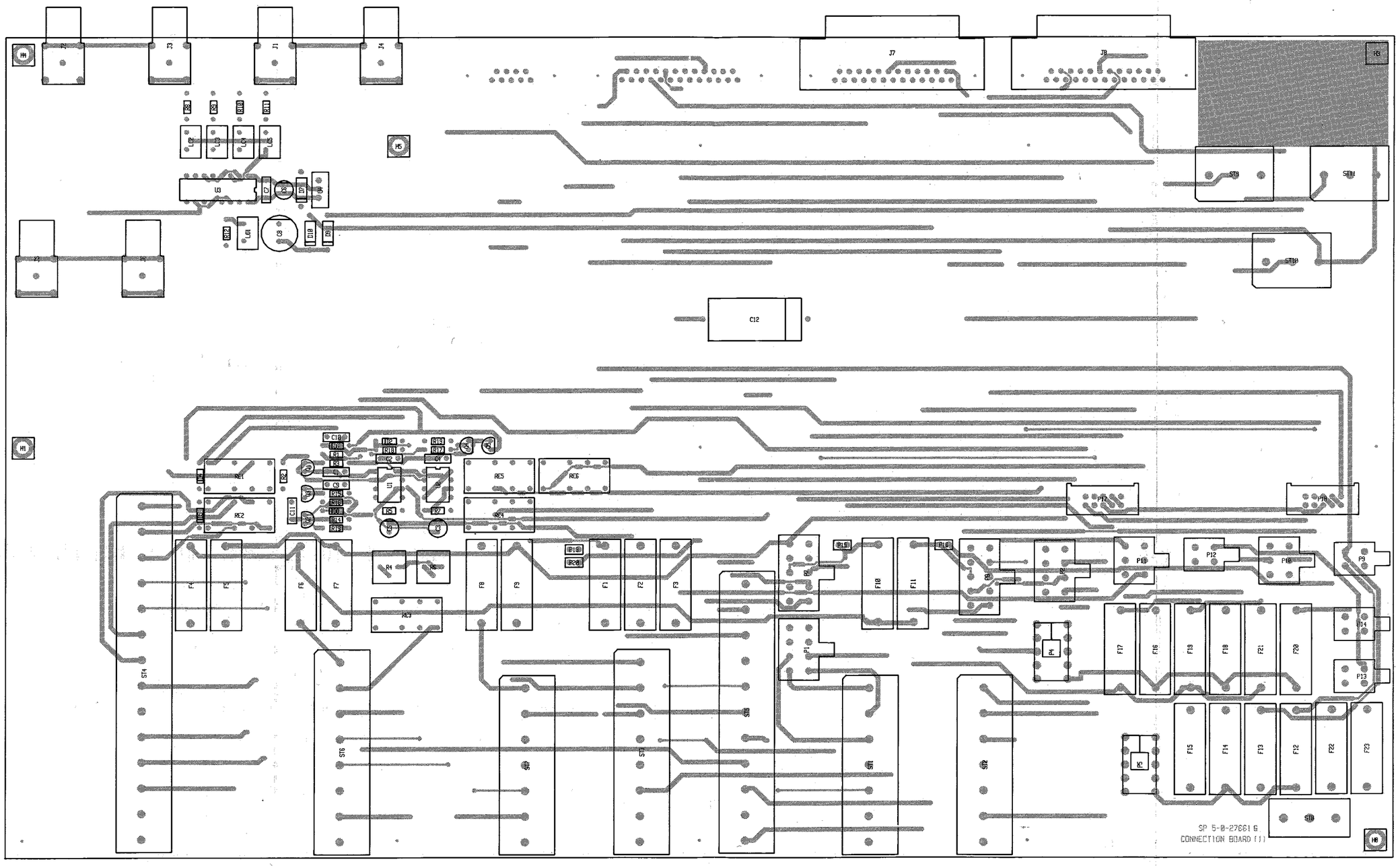


36261

036349

5 CIRCUIT DESCRIPTION AND SCHEMATIC DIAGRAMS

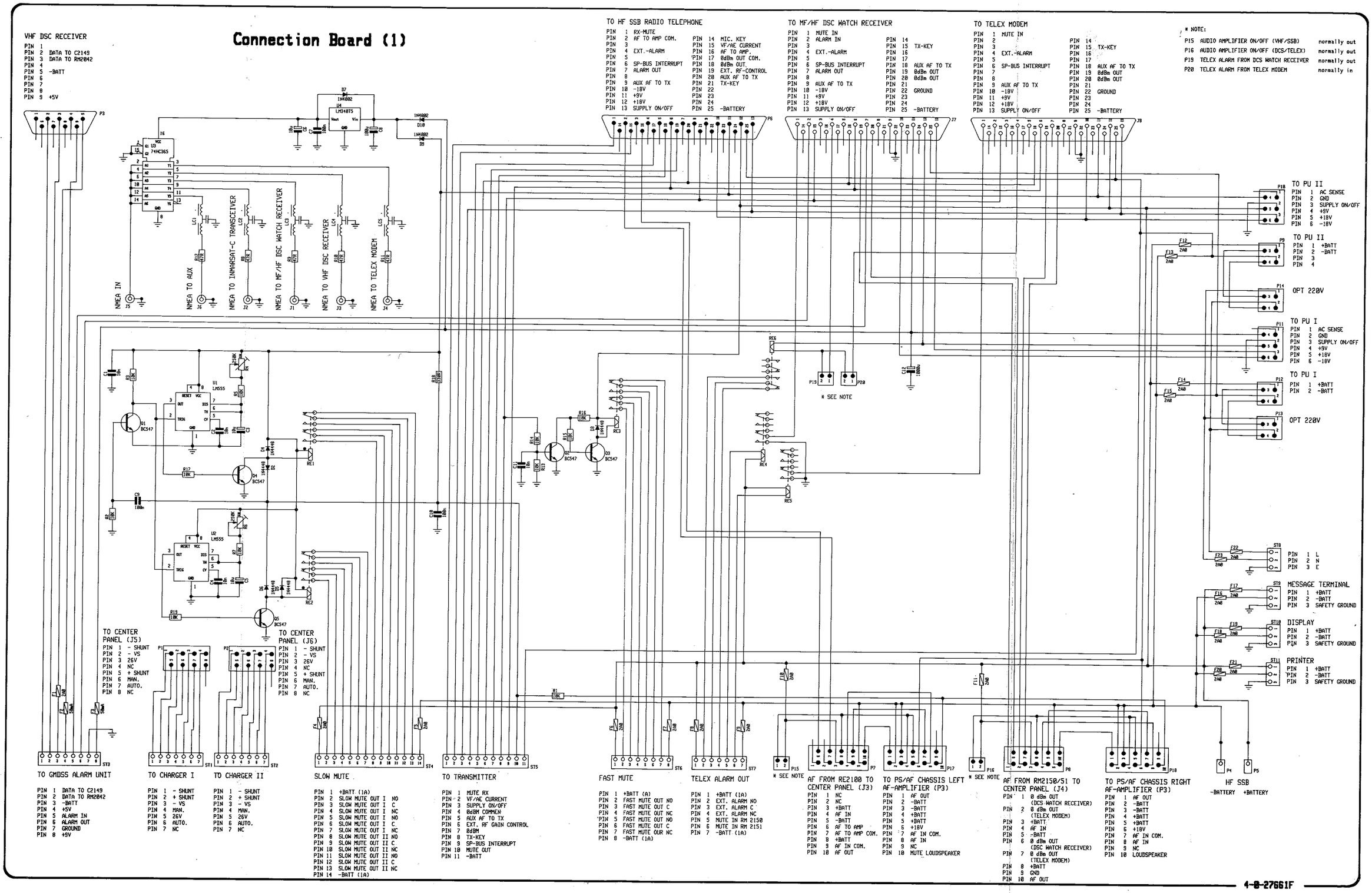
5.1 COMPONENT LOCATION CONNECTION BOARD MODULE 1



Seen from component side with upper side tracks.

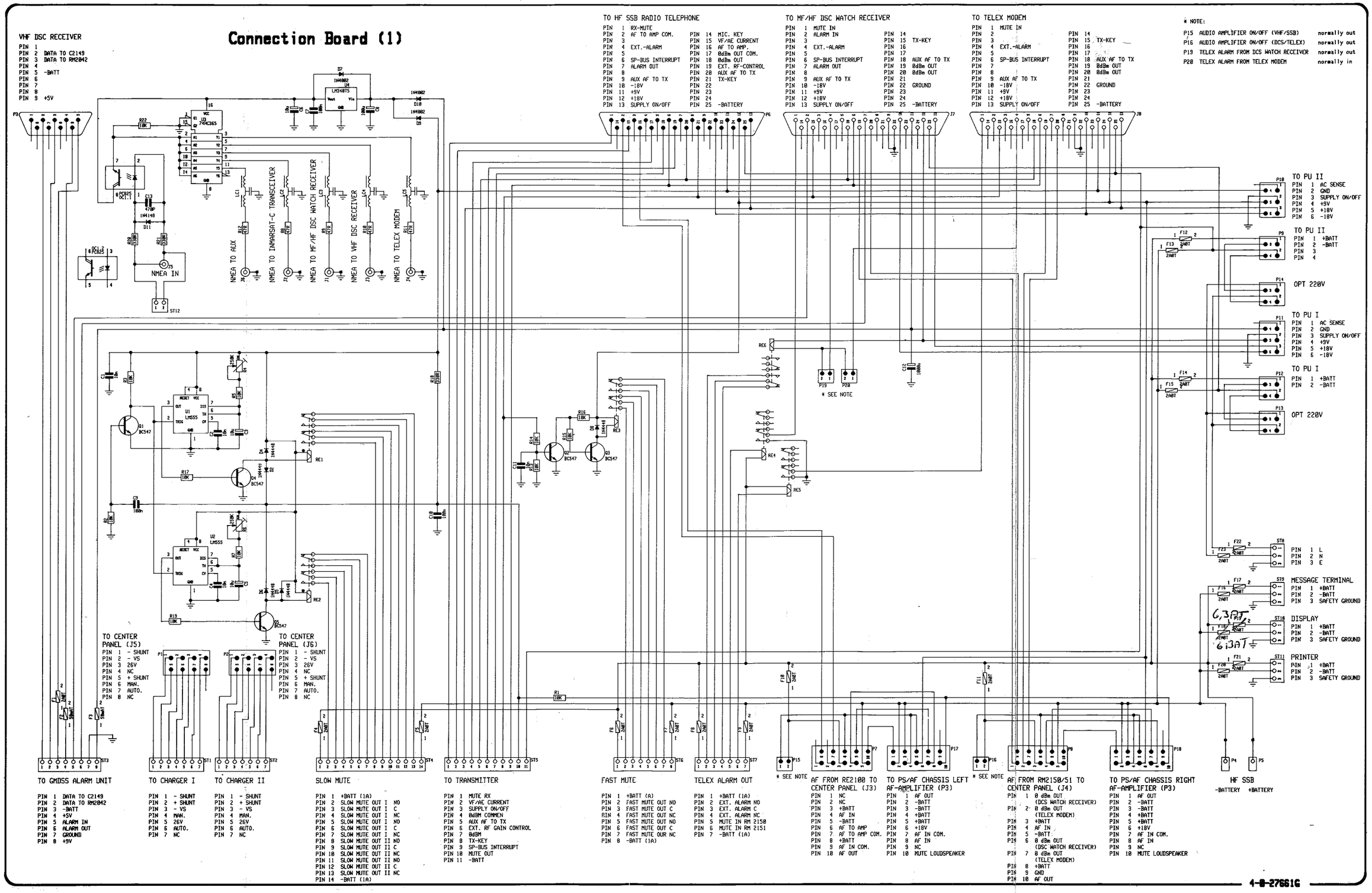
PCB rev. 27661G

CONNECTION BOARD MODULE 1



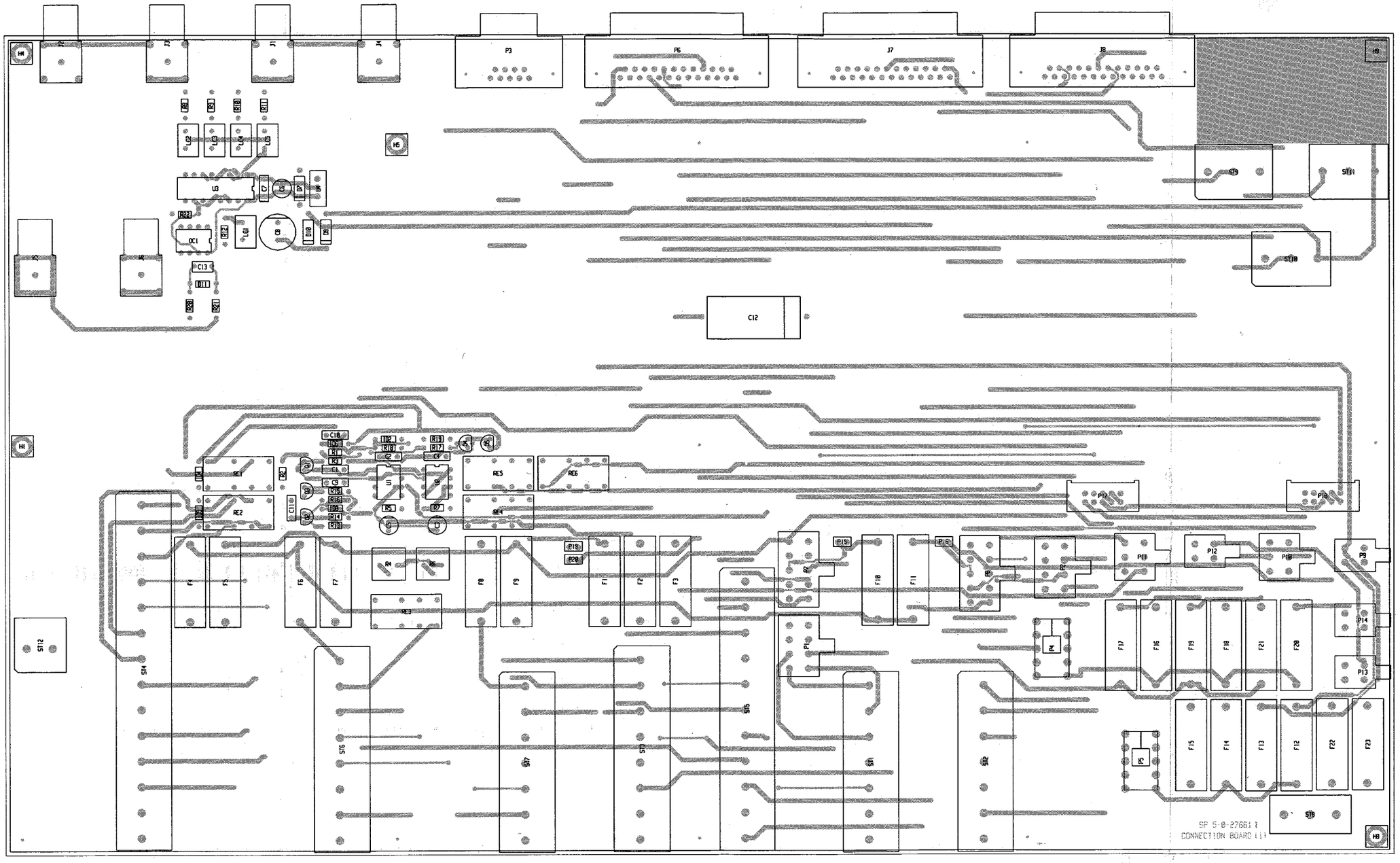
This diagram is valid for PCB rev. 27661F/G/H

CONNECTION BOARD MODULE 1



This diagram is valid for PCB rev. 27661I

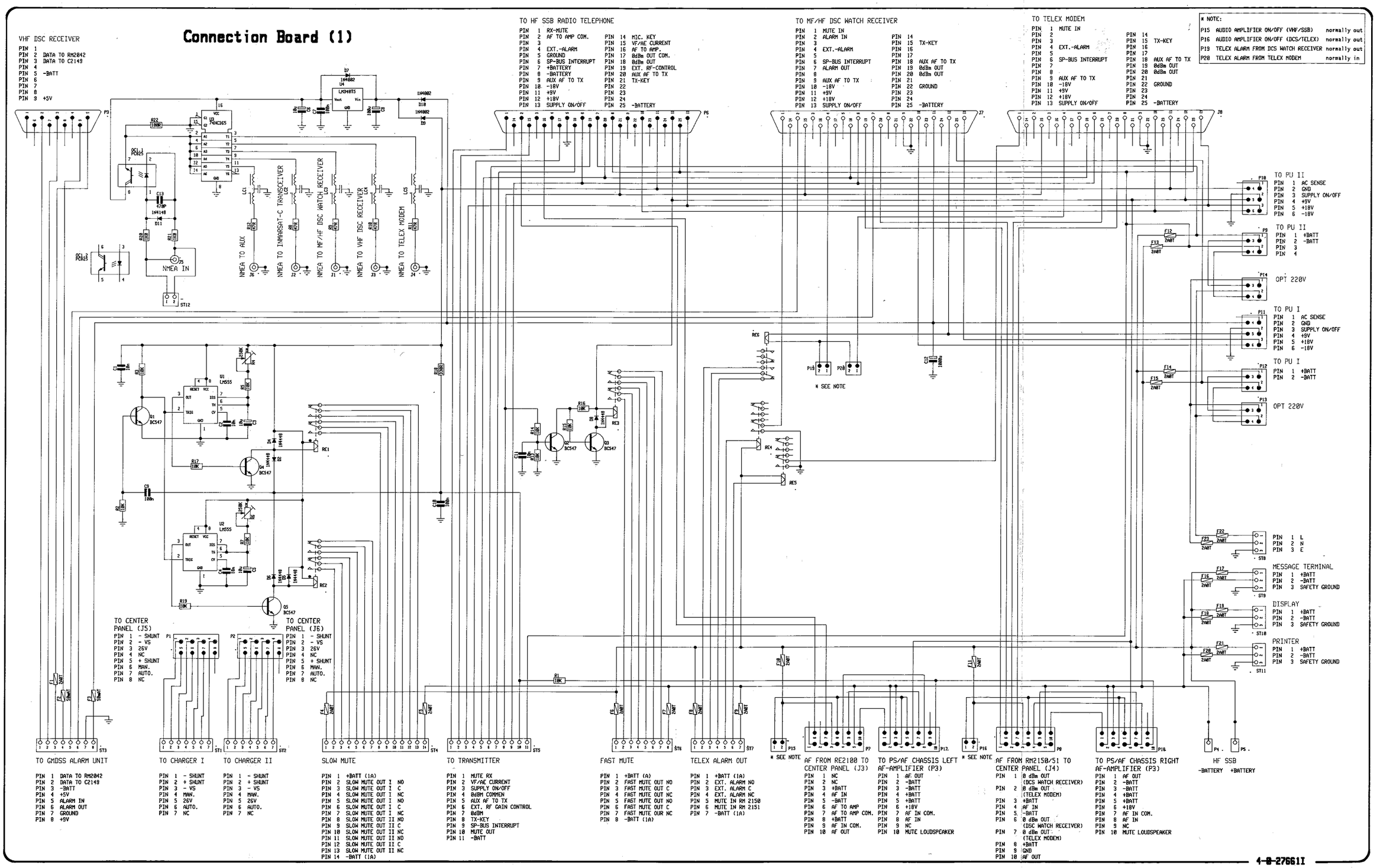
5.1 COMPONENT LOCATION CONNECTION BOARD MODULE 1



Seen from component side with upper side tracks.

PCB rev. 27661I

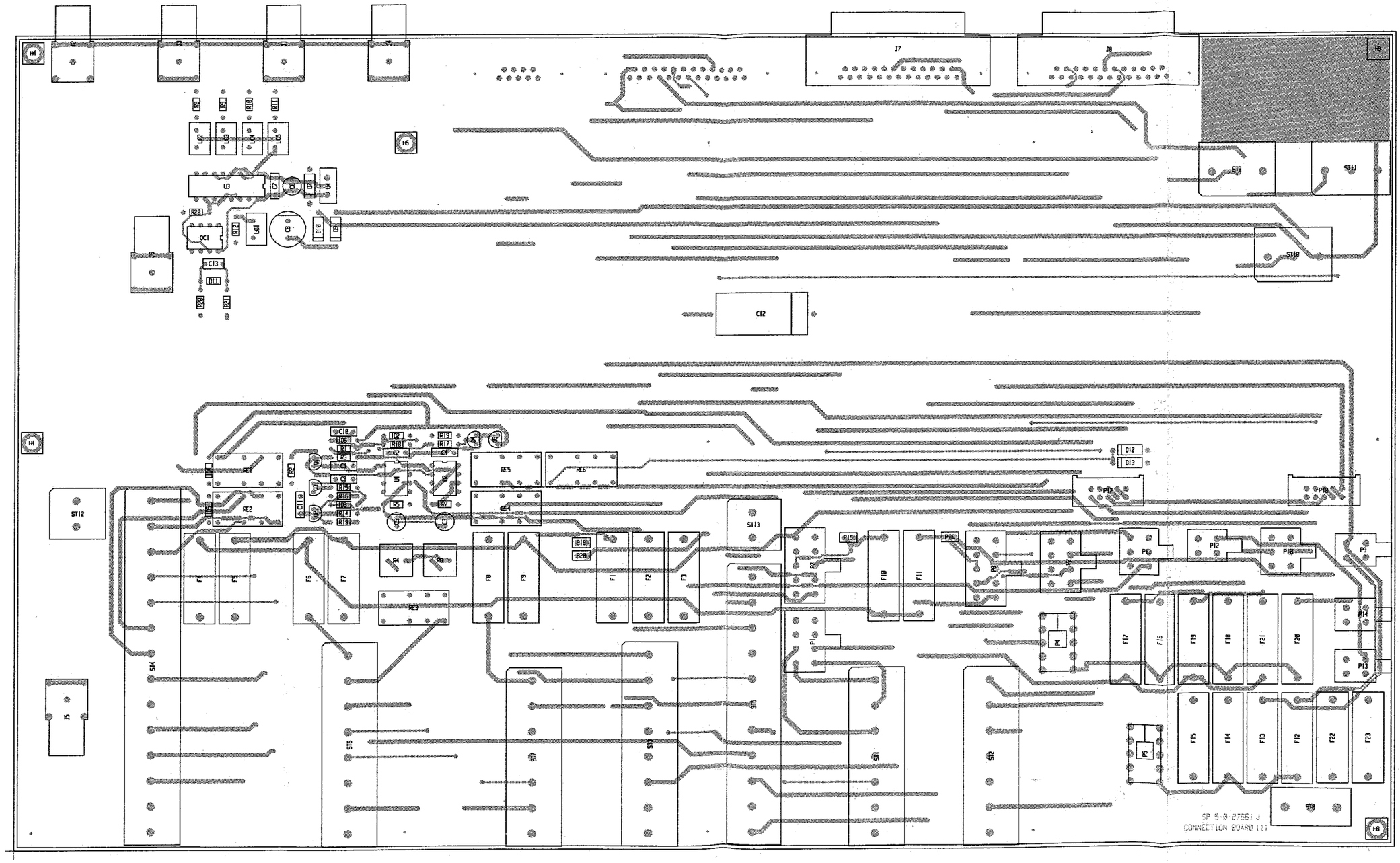
CONNECTION BOARD MODULE 1



This diagram is valid for PCB rev. 27661I

5 CIRCUIT DESCRIPTION AND SCHEMATIC DIAGRAMS

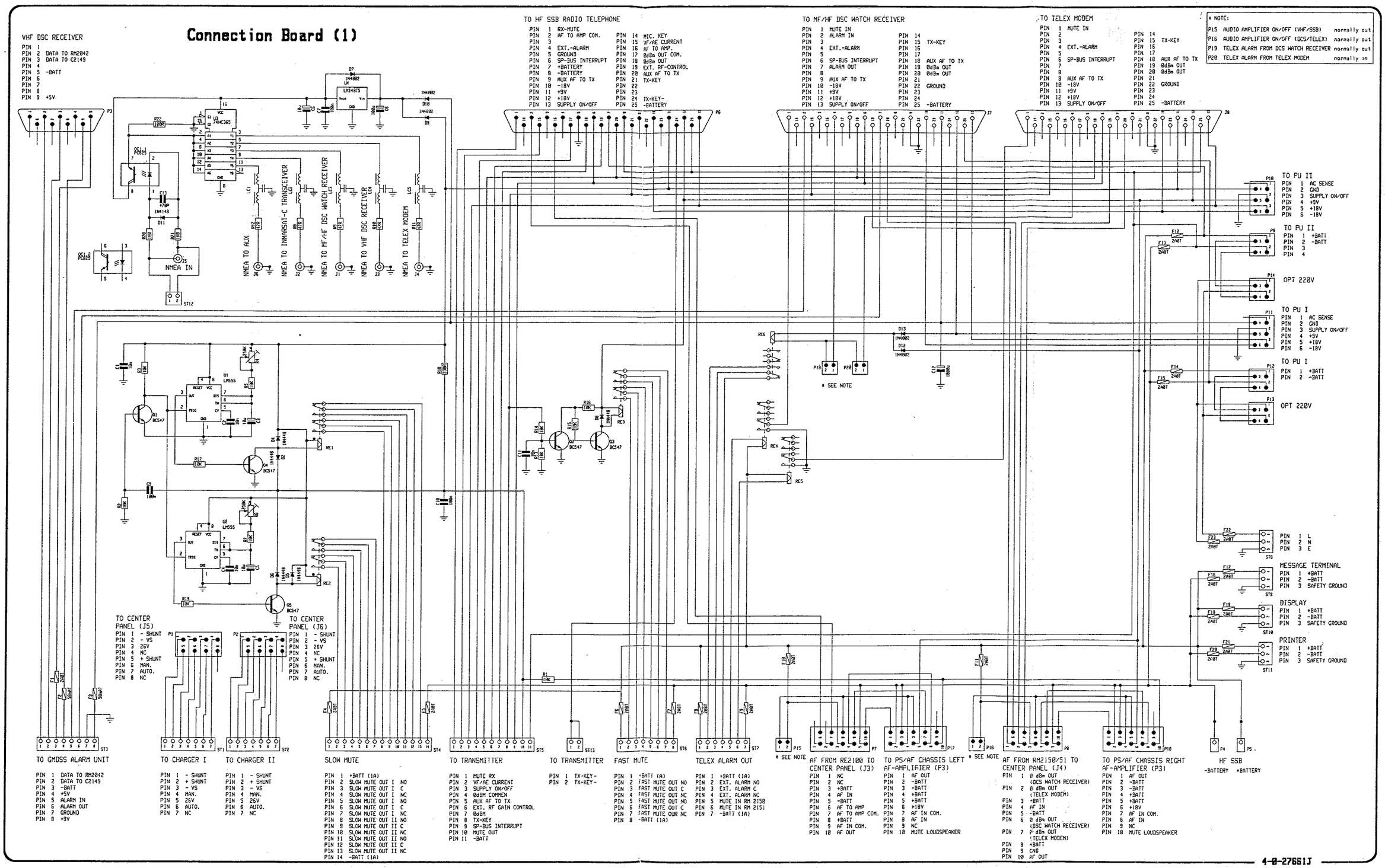
5.1 COMPONENT LOCATION CONNECTION BOARD MODULE 1



Seen from component side with upper side tracks.

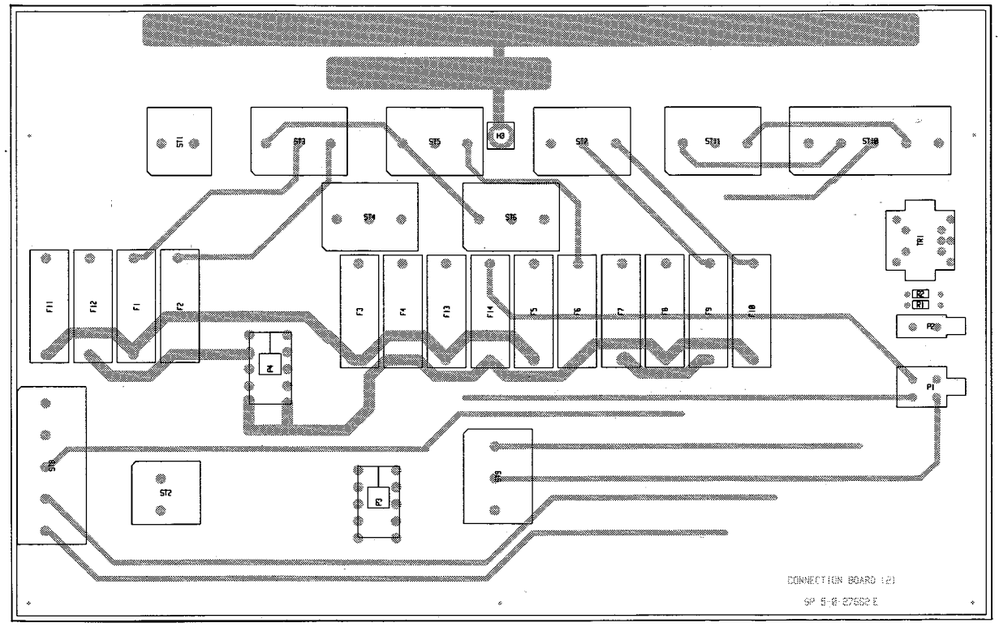
PCB rev. 27661J

CONNECTION BOARD MODULE 1

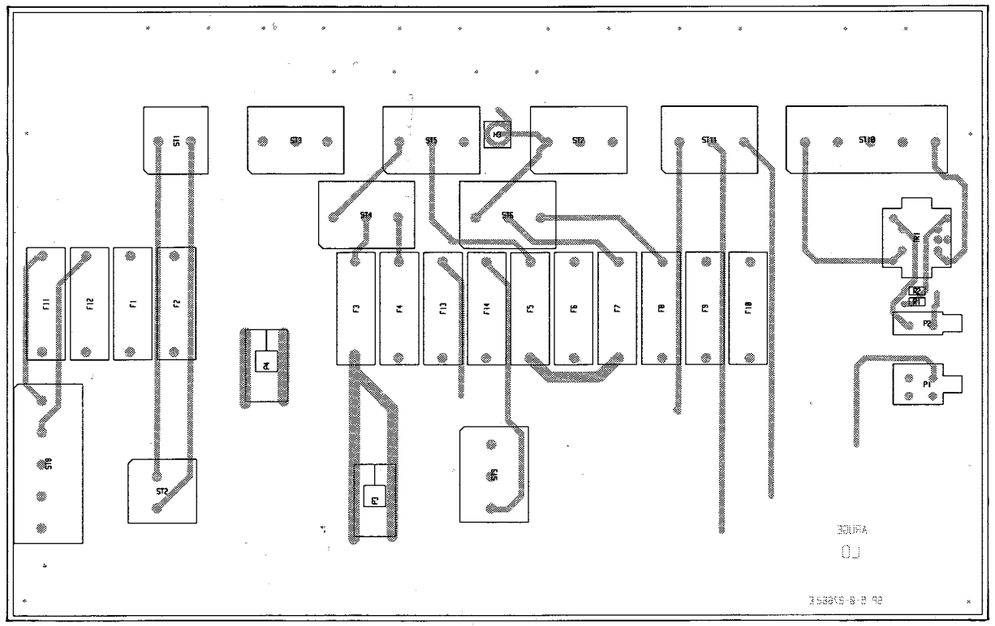


This diagram is valid for PCB rev. 27661J

5.2 COMPONENT LOCATION CONNECTION BOARD MODULE 2



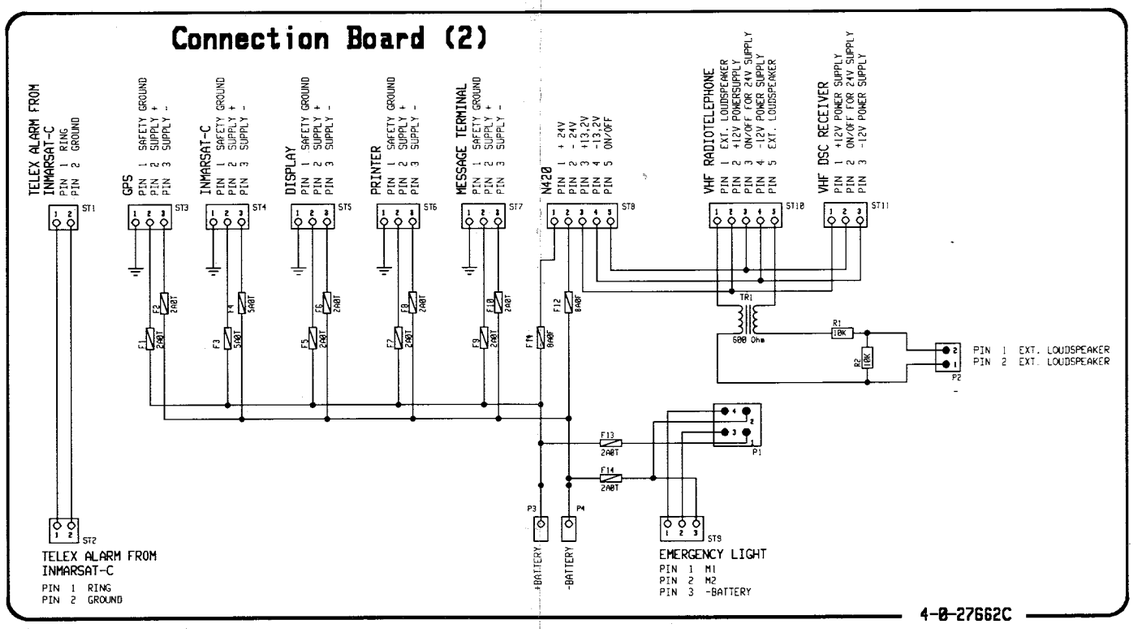
Seen from component side with upper side tracks.



Seen from component side with lower side tracks.

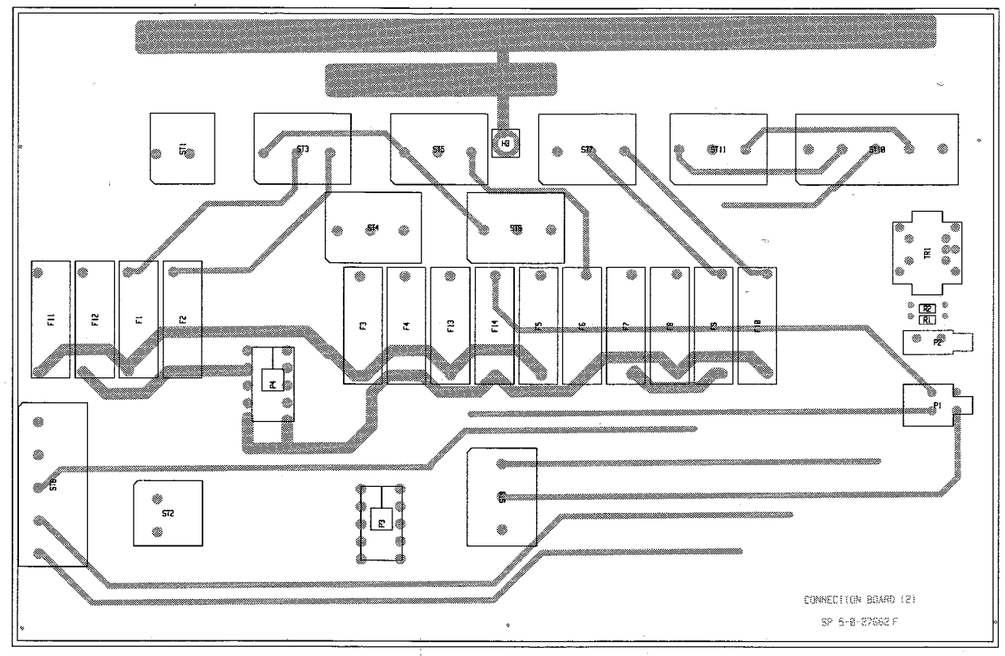
PCB rev. 27662E

CONNECTION BOARD MODULE 2

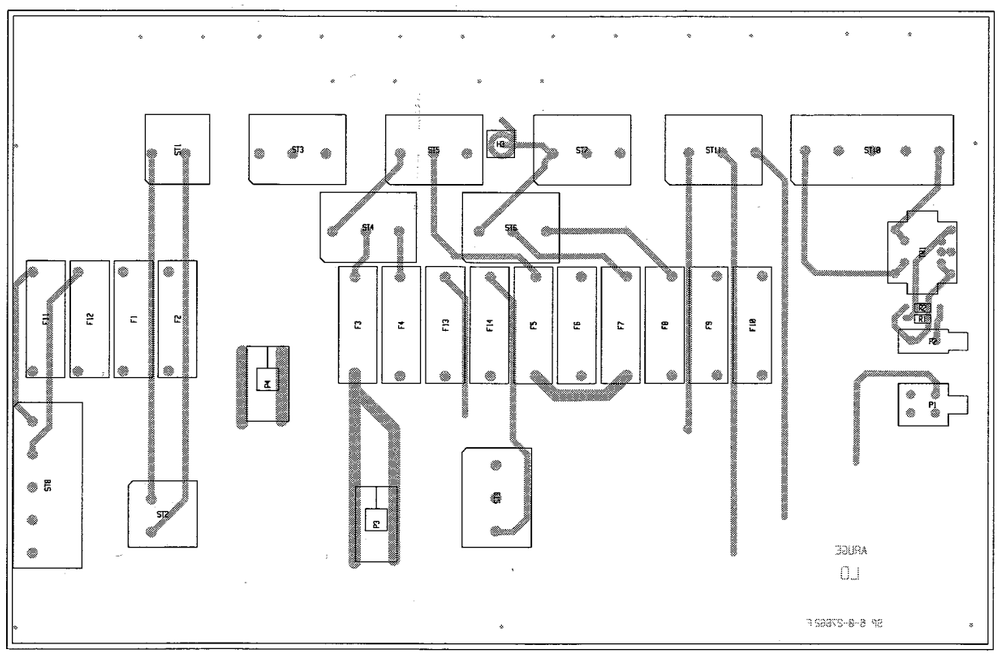


This diagram is valid for PCB rev. 27662D/E

5.2 COMPONENT LOCATION CONNECTION BOARD MODULE 2

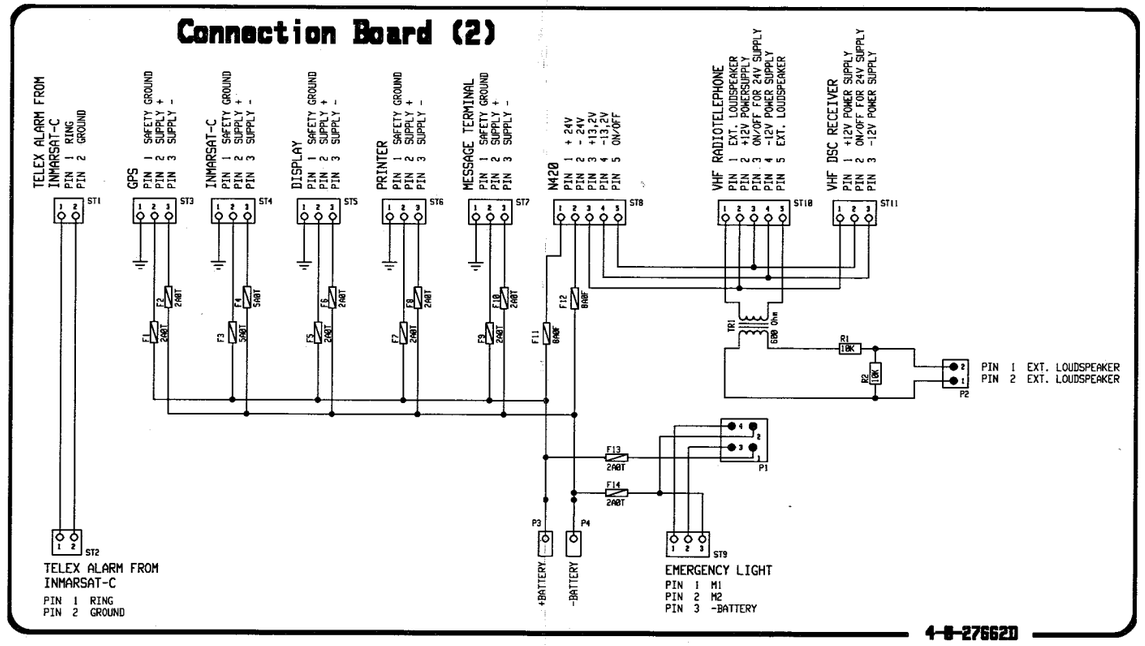


Seen from component side with upper side tracks.



Seen from component side with lower side tracks.

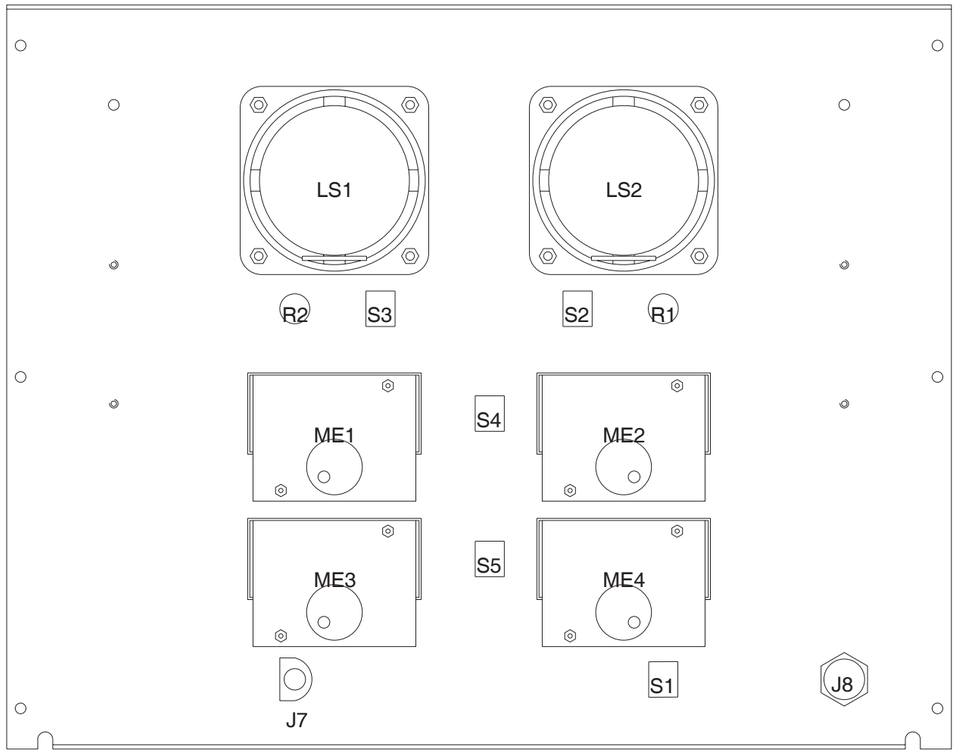
PCB rev. 27662F



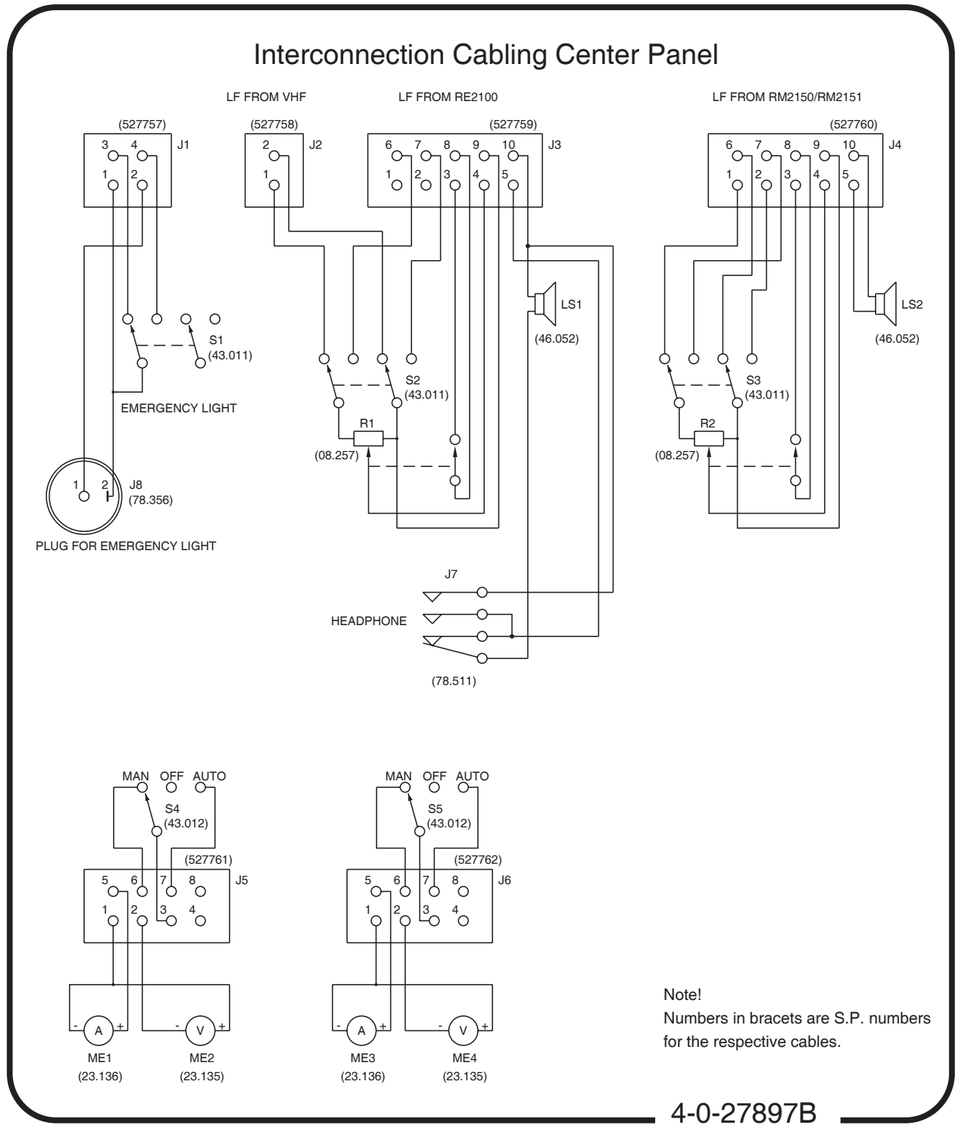
This diagram is valid for PCB rev. 27662F

5.3 CENTER PANEL

LAYOUT CENTER SECTION H2192 GMDSS CONSOLE



29525A



5.4 12V VOLTAGE REGULATOR PART NO. 600416

The output voltage is regulated by the integrated voltage regulator IC1.
The output voltage is 12V DC plus the forward voltage of the diodes D5 and D6 approx. 13.4V DC, if T4 is turned on.
If the output voltage falls, the current through IC1 and R5 increases. An increase in voltage across R5 will result in an increase in T1 and R10-R23, and the output current. T1 delivers most of the output current and IC1 only a small driver current.

If the input voltage is low and the output current is high, the voltage across R10-R23 causes T1 to go into saturation. The voltage across R4 increases, and when the voltage across R4 and VBE of T1 is higher than approx. 1V, T3 starts to conduct base current to T1. This transistor starts to shunt the remaining current to the output, bypassing R10-R23.

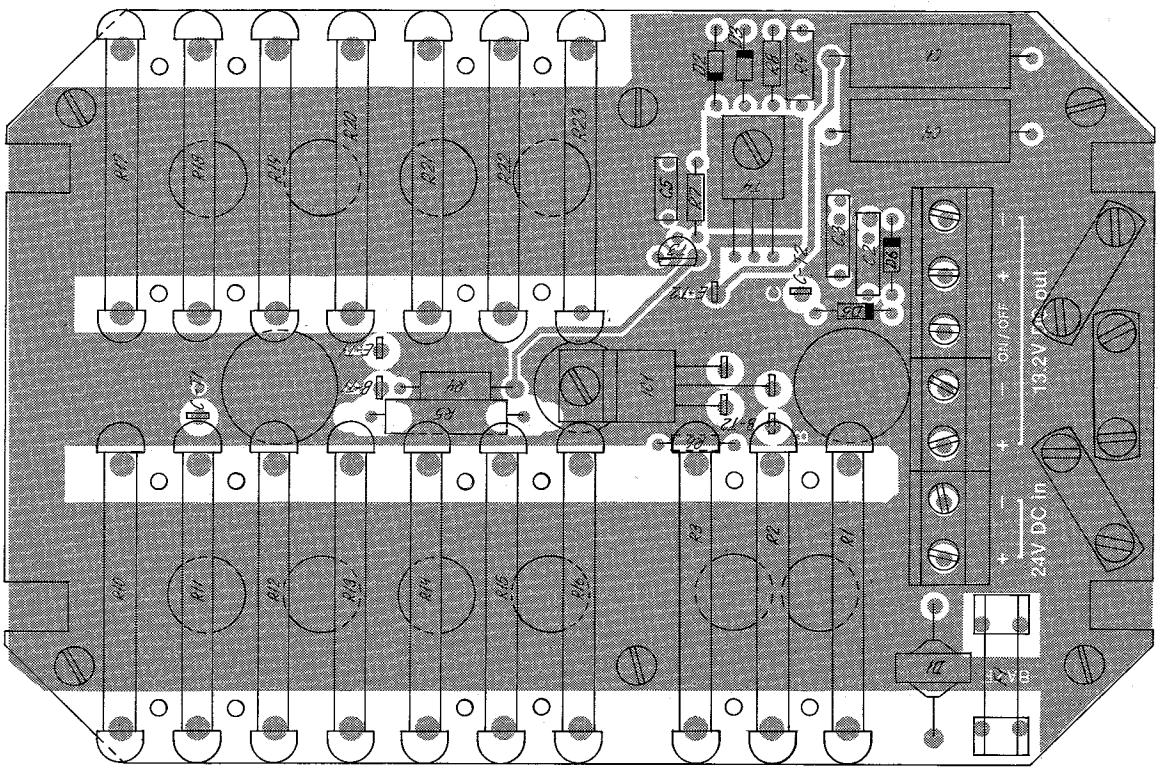
When the input voltage and the output current are high, T1 is nearly saturated. When the input voltage is low and the output current is high, the resistors R1-R3 will result in saturation of both T1 and T2. The combination of T1 in saturation and T2 delivering the remaining output current divides the total loss, so that the most is lost in resistors and gives us lower loss in the semi-conductors and lower junction temperature, which ends up in a higher reliability for the whole regulator.

T4 is used to switch the regulator on/off. If the on/off input is disconnected, T4 is off, and the base currents to T1 and T2 are zero and the current through IC1 is zero too. The standby current consumption is then less than 10 microamp.
If the on/off input is connected to -input, T4 goes into saturation and the regulator starts.

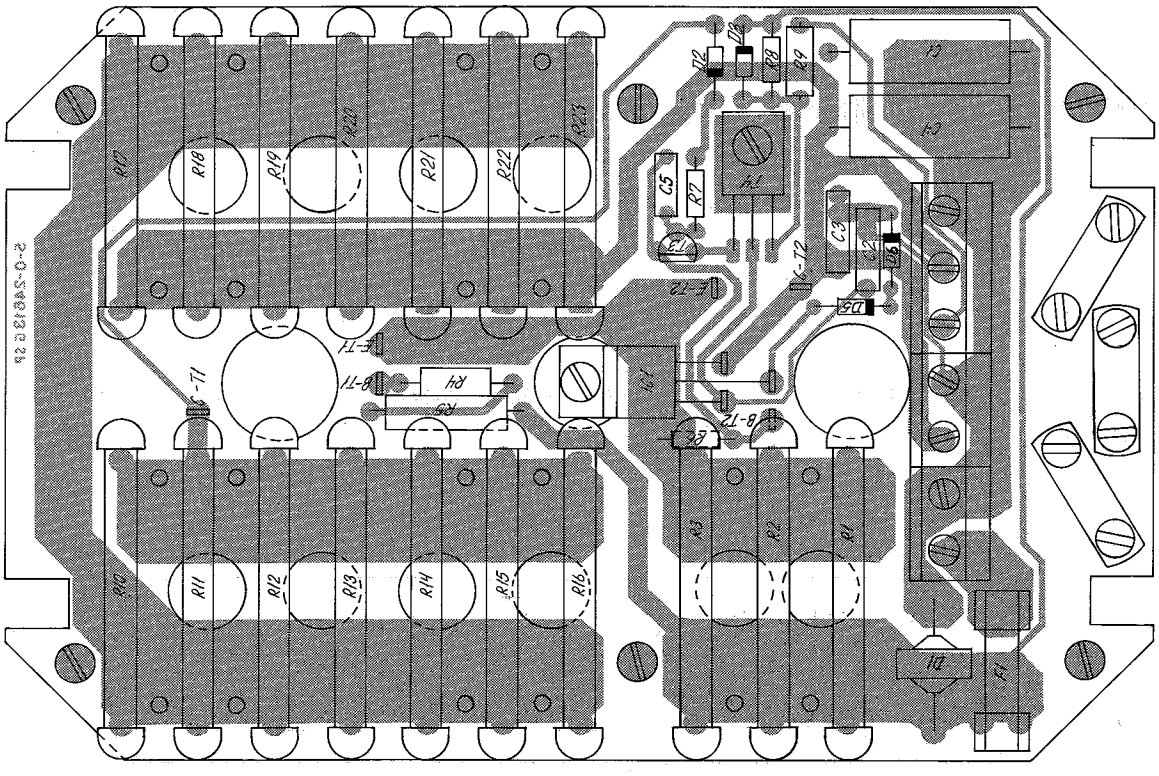
In case of short-circuit of the output, R5 and D3 limit the current through IC1 and T4 to approx. 250 mA, and R1-R3 and D3 limit the current through T1 and T2 to approx. 15 Amp.
The temperature on the heatsink will increase and activate the thermal protection circuit inside IC1 and lower the output voltage, even though a short-circuit of the output should be avoided.

The diode D1 protects against reverse input voltage. It blows the fuse in case of a wrong input connection.

COMPONENT LOCATION 12V VOLTAGE REGULATOR



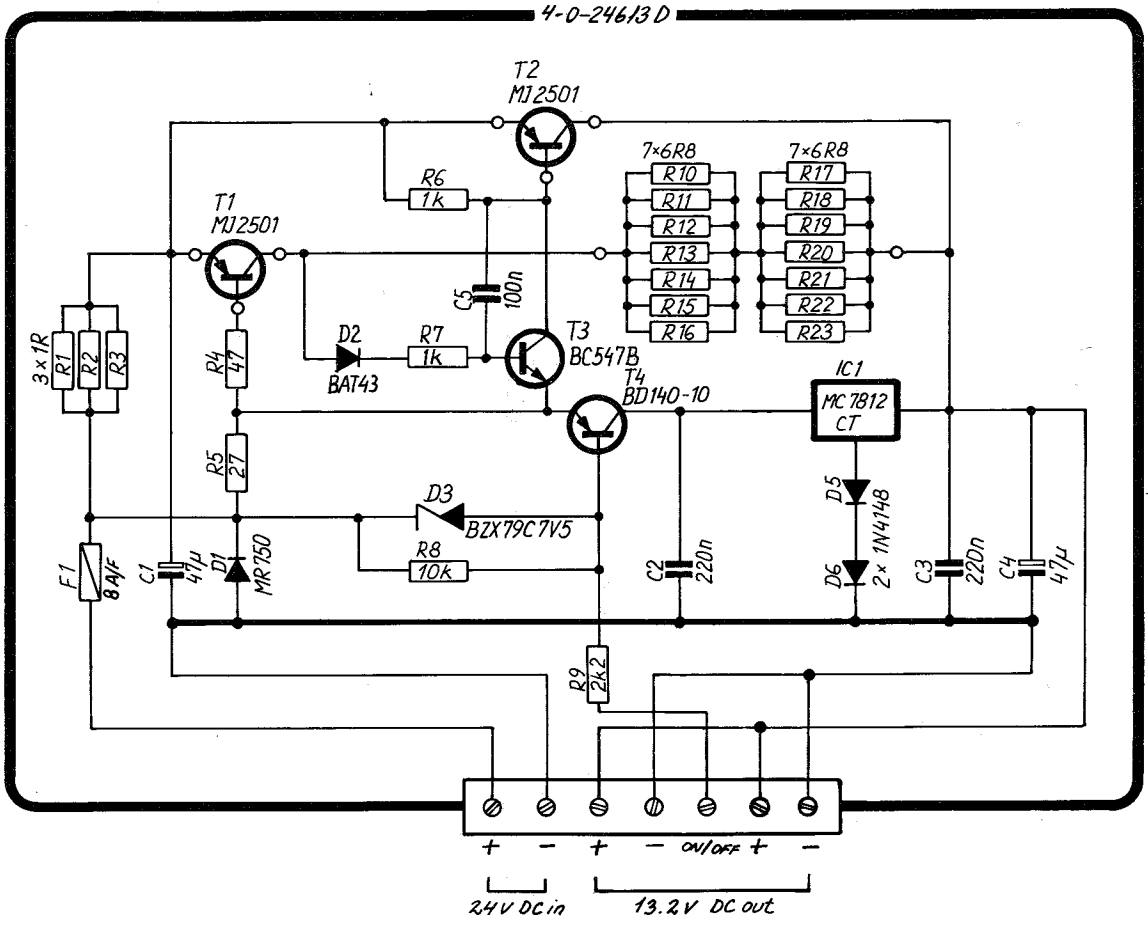
Seen from component side with upper side tracks.



Seen from component side with lower side tracks.

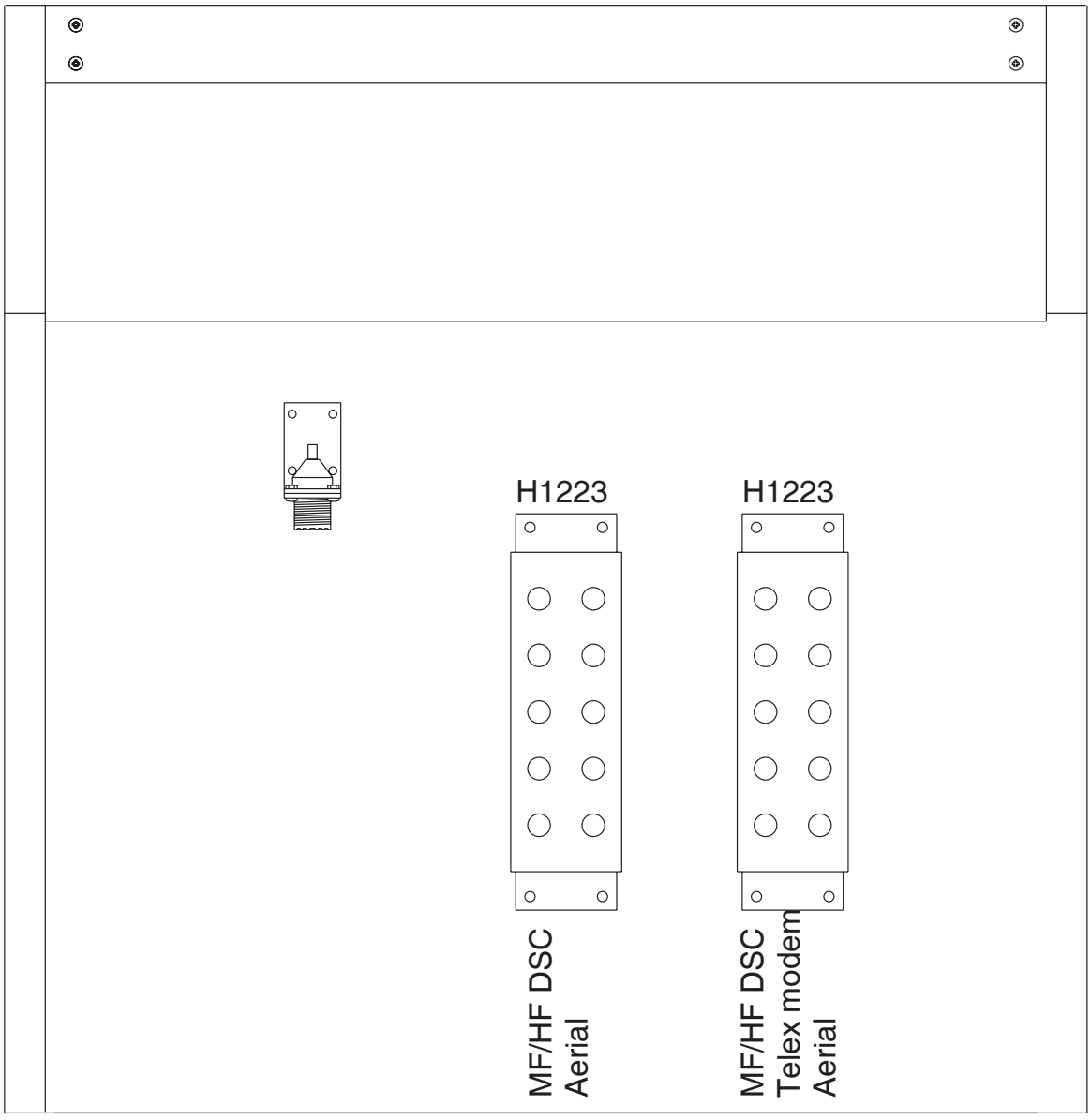
PCB rev. 24613G

12V VOLTAGE REGULATOR



This diagram is valid for PCB rev. 24613G

5.5 RIGHT HAND SECTION

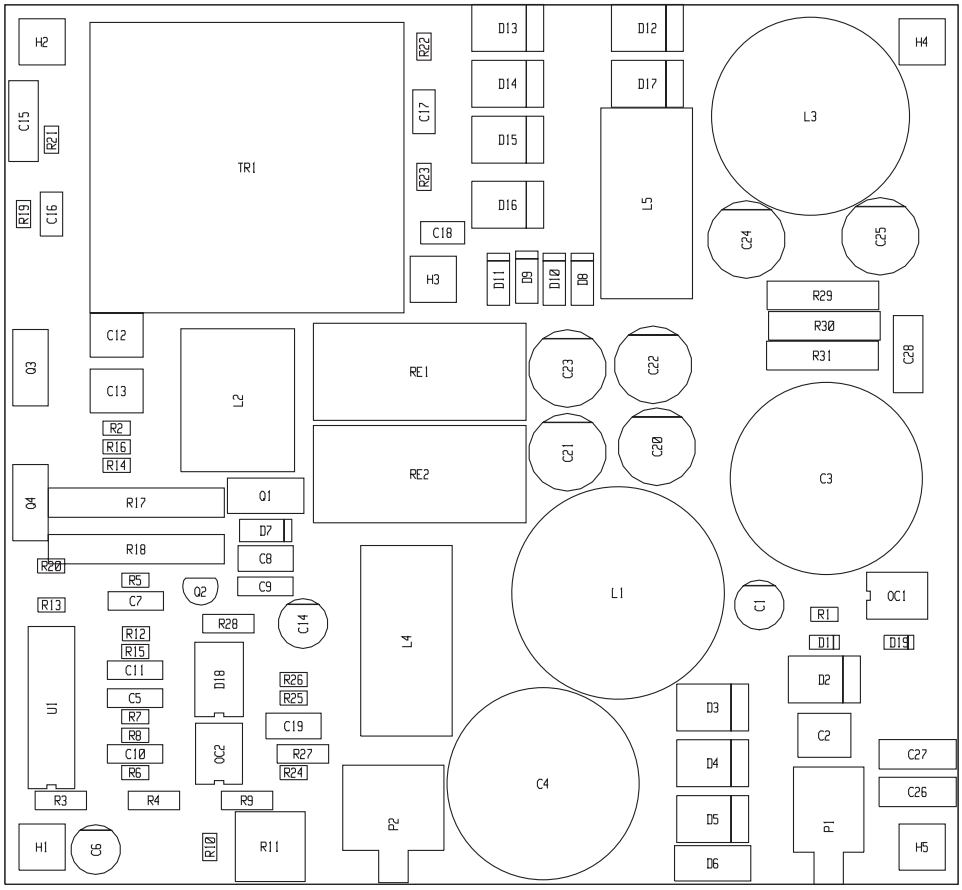


29533A

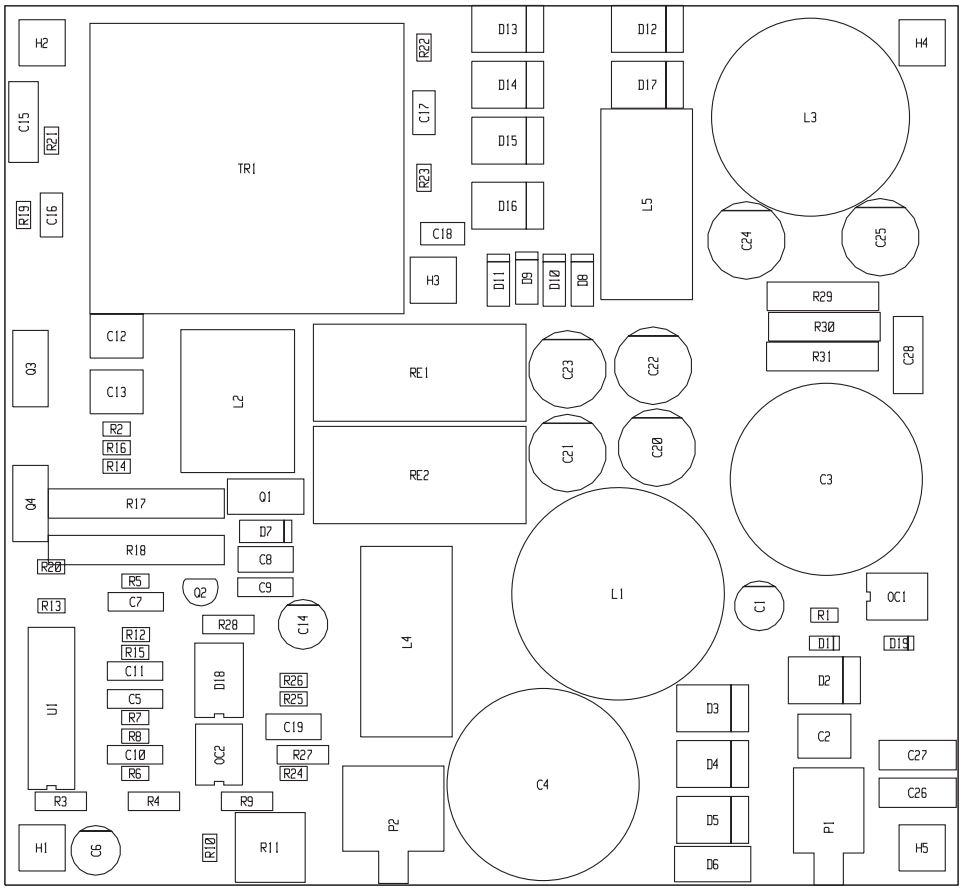
5.9 POWER SUPPLY MODULE 9 PART NO. 626409

The power supply is an isolated forward switch mode converter. It converts a 24V -10% +30% DC voltage to all the necessary voltages for the RE2100 and the control circuits in the transmitter. These voltages are ±19V and +9.5V.
Most of the necessary amplifiers, flip-flops etc. are contained in the ICU1. The only exception from this, is the secondary voltage sense D18.
C2, C26, C27, L1, C3, C4 and C12, C13 are the input filter. The 12V DC supply voltage for U1 is supplied to R2, D7, C8, Q4 and C9 during starting-up. When the converter is in function it is supplied by L2 and D8, D9. This voltage is approx. 15 Volt and forces Q1 to turn off. This configuration reduces the power loss in Q1. R5 and C7 determine the oscillator frequency to approx. 50 kHz.
The +18V DC output voltage is sensed by D18 via the voltage divider R27 and R28. D18 is an integrated shunt regulator. If the voltage on the sense input (R27/R28 common point) is higher than 2.5V, then the D18 starts conducting. In this case, current starts running in the optocoupler diode OC2.
R26 is a DC feed-back and R25/C19 is an AC feed-back.
R24 limits the current in the optocoupler diode.
When current runs in the optocoupler diode, the optocoupler transistor (OC2) starts conducting nearly the same current. This current results in a voltage across R6. This voltage is connected to the non inverting input of the internal error amplifier of U1. The internal error amplifier is fixed to a gain of 2 by R7 and R8.
The output MOS transistor current is sensed by R17 and R18. The current signal is then led to the current sense amplifier input, pin 4. The R15 and C11 is a lowpass filter to remove noise. The emitter of Q2 follows the ramp voltage on the oscillator capacitor C7. R12 adds some of this ramp signal to the current signal. This is necessary to avoid sub-harmonic oscillations when the duty cycle is higher than 50%.
The voltage on pin 1 determines the clamp voltage for the error voltage and thus also the max. current in the output MOS transistors. This voltage is determined by R3 and R4. The capacitor C6 is the soft start capacitor, making the duty cycle and the output voltage rise slowly.
The two pulse width modulated outputs are led to the two output MOS transistors by R13 and R14. These two resistors slow down the rising time of the MOS transistors to prevent spurious oscillations.
R16 and R20 ensure that the transistors always stay off when the IC U1 is off.
R19, C15 and R21, C16 and R22, C17 and R23, C18 are snuppers reducing oscillation due to stray capacitors and stray inductions in the transformer TR1.
D12 to D17 and L3 to L5 and C20 to C25 are the three output rectifiers and filters.
The input voltage is sensed by a 0.35 Volt shut down terminal pin 16 of U1 via R9, R10 and R11.
If the supply voltage is higher than approx. 45V DC, the converter stops.

COMPONENT LOCATION POWER SUPPLY MODULE 9

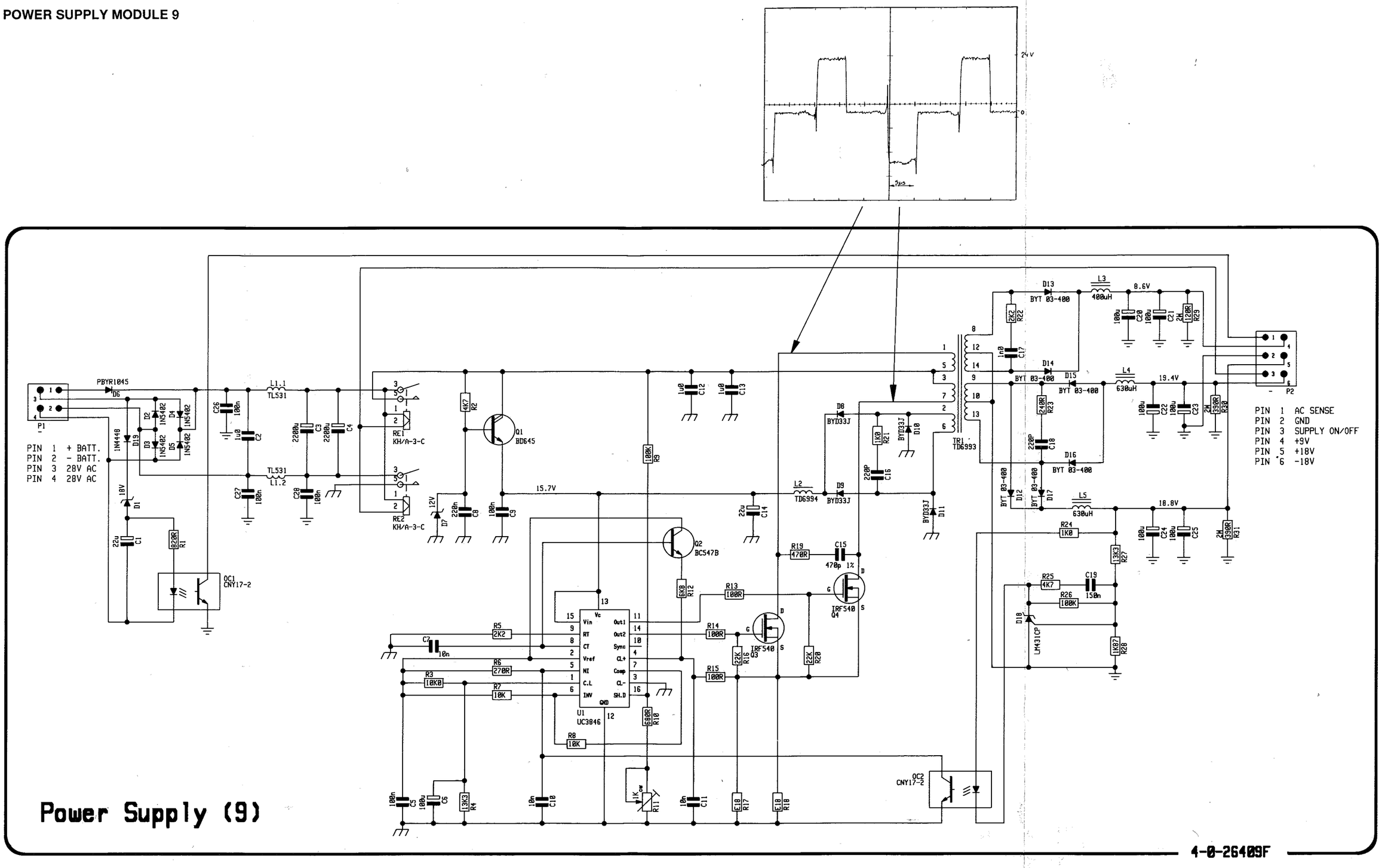


Seen from component side with upper side tracks.



Seen from component side with lower side tracks.
PCB rev. 26409F

POWER SUPPLY MODULE 9

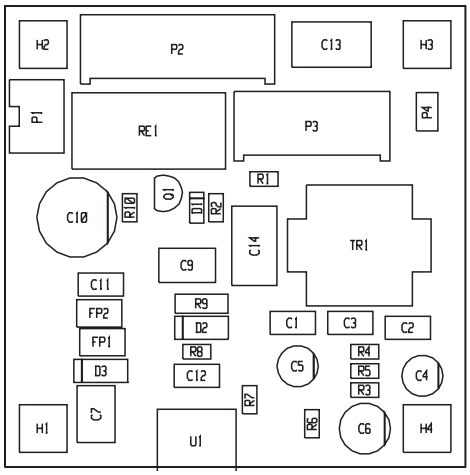


This diagram is valid for PCB rev. 26409F

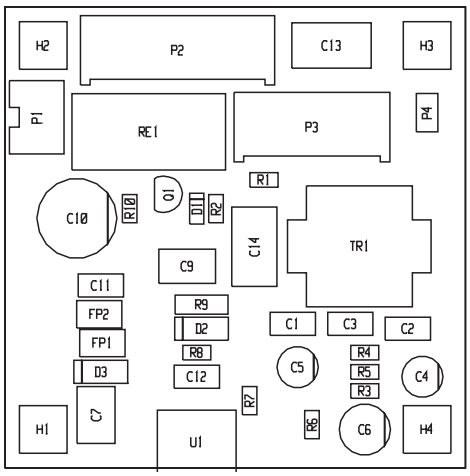
5.10 AF-AMPLIFIER (MODULE 10) PART NO. 626410

The audio amplifier is an integrated circuit TDA2030 U1, and it is supplied from the 28 Volt supply for the PA module. To insulate the battery from ground, there is a transformer TR1 at the input of the amplifier. RE1 and Q1 form a muting circuit for the loudspeaker. This circuit is controlled from the processor.

COMPONENT LOCATION AF-AMPLIFIER MODULE 10



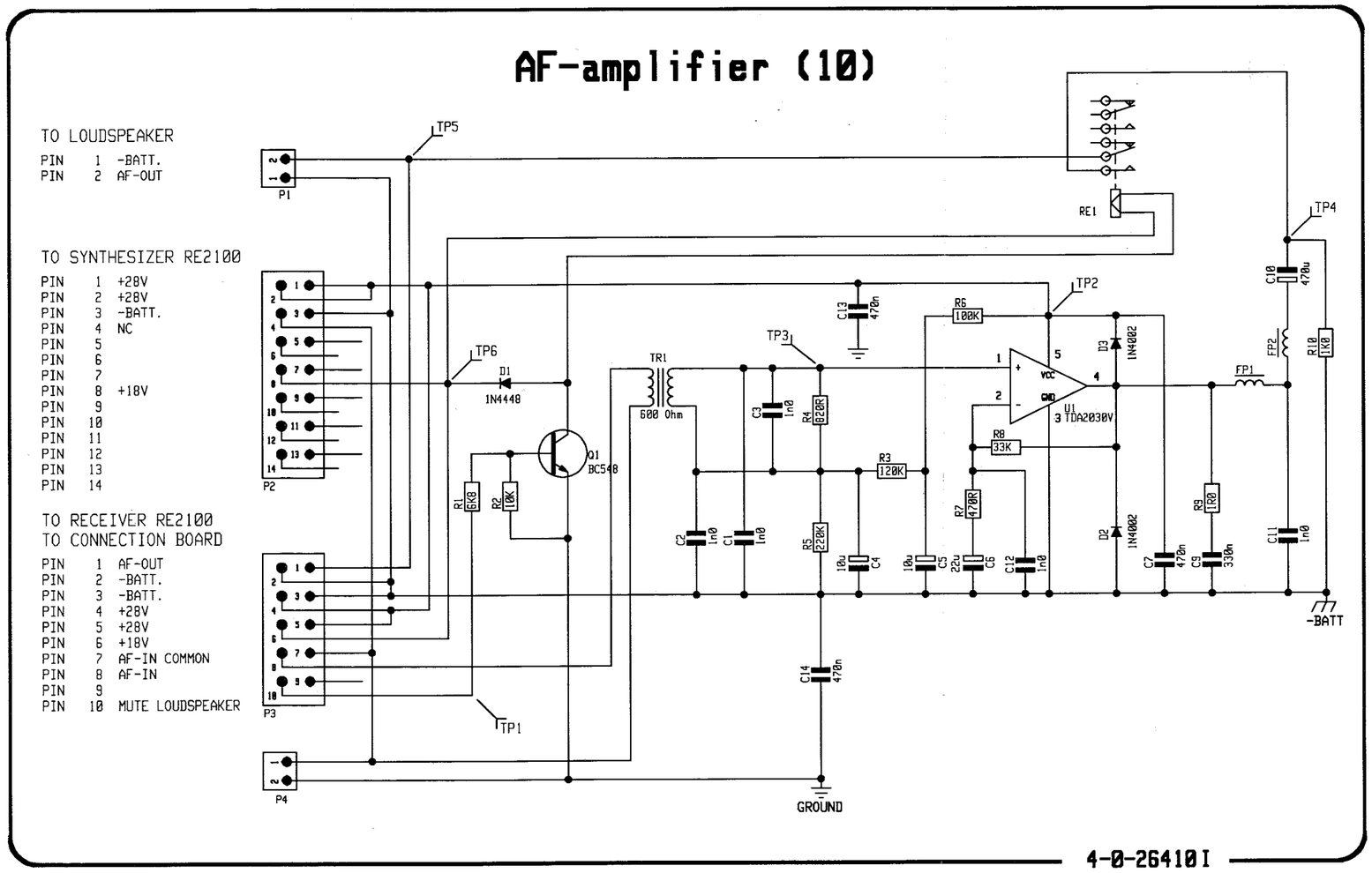
Seen from component side with upper side tracks.



Seen from component side with lower side tracks.

PCB rev. 26410G

AF-AMPLIFIER MODULE 10



This diagram is valid for PCB rev. 26410G

6 PARTS LIST

CONNECTION B. MODULE (1) H2192 GMDSS STATION S.P.RADIO A/S 5-0-27661I 4-0-27661H 627661

POSITION	DESCRIPTION		MANUFACTOR	TYPE	S.P.NUMBER
C1-1	CAPACITOR MKT	10nF 20% 100VDC	PHILIPS	2222 370 38103	11.168
C2-1	CAPACITOR MKT	10nF 20% 100VDC	PHILIPS	2222 370 38103	11.168
C3-1	CAPACITOR ELECTROLYTIC	10uF 20% 35VDC	ELNA	RJ2-35-V-100-M-T34	14.512
C4-1	CAPACITOR MKT	10nF 20% 100VDC	PHILIPS	2222 370 38103	11.168
C5-1	CAPACITOR ELECTROLYTIC	10uF 20% 35VDC	ELNA	RJ2-35-V-100-M-T34	14.512
C6-1	CAPACITOR ELECTROLYTIC	10uF 20% 35VDC	ELNA	RJ2-35-V-100-M-T34	14.512
C7-1	CAPACITOR MKT	0.1uF 10% 63VDC	PHILIPS	2222 370 78104	11.136
C8-1	CAPACITOR ELECTROLYTIC	100uF -10/+50% 25VDC	ERO	EKM 00 CC 310 E G5	14.610
C9-1	CAPACITOR MKT	0.1uF 10% 63VDC	PHILIPS	2222 370 78104	11.136
C10-1	CAPACITOR MKT	0.1uF 10% 63VDC	PHILIPS	2222 370 78104	11.136
C11-1	CAPACITOR MKT	10nF 20% 100VDC	PHILIPS	2222 370 38103	11.168
C12-1	CAPACITOR ELECTROLYTIC	1000uF -10/+50% 16VDC	ERO	EB 00 HD 410 D B5	14.578
C13-1	CAPACITOR CERAMIC	470pF 10% 500VDC	NKE	DT35-0465 758L 471BK 500V	16.095
D2-1	DIODE HIGH SPEED	1N4448	PHILIPS	1N4448	25.147
D4-1	DIODE HIGH SPEED	1N4448	PHILIPS	1N4448	25.147
D5-1	DIODE HIGH SPEED	1N4448	PHILIPS	1N4448	25.147
D6-1	DIODE HIGH SPEED	1N4448	PHILIPS	1N4448	25.147
D7-1	DIODE RECTIFIER	1N4002 100V/1A	THOMSON	1N4002 (03/04/05/06/07)	25.100
D8-1	DIODE HIGH SPEED	1N4448	PHILIPS	1N4448	25.147
D9-1	DIODE RECTIFIER	1N4002 100V/1A	THOMSON	1N4002 (03/04/05/06/07)	25.100
D10-1	DIODE RECTIFIER	1N4002 100V/1A	THOMSON	1N4002 (03/04/05/06/07)	25.100
D11-1	DIODE HIGH SPEED	1N4448	PHILIPS	1N4448	25.147
F1-1	FUSE	2AT 250V 5x20mm	ELU	179 120 2AT	45.508
F2-1	FUSE 50mAT 250V	5x20mm	ELU	179 120 50mAT	45.500
F3-1	FUSE 50mAT 250V	5x20mm	ELU	179 120 50mAT	45.500
F4-1	FUSE	2AT 250V 5x20mm	ELU	179 120 2AT	45.508
F5-1	FUSE	2AT 250V 5x20mm	ELU	179 120 2AT	45.508
F6-1	FUSE	2AT 250V 5x20mm	ELU	179 120 2AT	45.508
F7-1	FUSE	2AT 250V 5x20mm	ELU	179 120 2AT	45.508
F8-1	FUSE	2AT 250V 5x20mm	ELU	179 120 2AT	45.508
F9-1	FUSE	2AT 250V 5x20mm	ELU	179 120 2AT	45.508
F10-1	FUSE	2AT 250V 5x20mm	ELU	179 120 2AT	45.508
F11-1	FUSE	2AT 250V 5x20mm	ELU	179 120 2AT	45.508
F12-1	FUSE	2AT 250V 5x20mm	ELU	179 120 2AT	45.508
F13-1	FUSE	2AT 250V 5x20mm	ELU	179 120 2AT	45.508
F14-1	FUSE	2AT 250V 5x20mm	ELU	179 120 2AT	45.508
F15-1	FUSE	2AT 250V 5x20mm	ELU	179 120 2AT	45.508
F16-1	FUSE	2AT 250V 5x20mm	ELU	179 120 2AT	45.508
F17-1	FUSE	2AT 250V 5x20mm	ELU	179 120 2AT	45.508
F18-1	FUSE	2AT 250V 5x20mm	ELU	179 120 2AT	45.508
F19-1	FUSE	2AT 250V 5x20mm	ELU	179 120 2AT	45.508
F20-1	FUSE	2AT 250V 5x20mm	ELU	179 120 2AT	45.508
F21-1	FUSE	2AT 250V 5x20mm	ELU	179 120 2AT	45.508
F22-1	FUSE	2AT 250V 5x20mm	ELU	179 120 2AT	45.508
F23-1	FUSE	2AT 250V 5x20mm	ELU	179 120 2AT	45.508
J1-1	RECEPTACLE	BNC RIGHT ANGLE	ROSENBERGER	51K-201-400 A4	78.443
J2-1	RECEPTACLE	BNC RIGHT ANGLE	ROSENBERGER	51K-201-400 A4	78.443
J3-1	RECEPTACLE	BNC RIGHT ANGLE	ROSENBERGER	51K-201-400 A4	78.443
J4-1	RECEPTACLE	BNC RIGHT ANGLE	ROSENBERGER	51K-201-400 A4	78.443
J5-1	RECEPTACLE	BNC RIGHT ANGLE	ROSENBERGER	51K-201-400 A4	78.443
J6-1	RECEPTACLE	BNC RIGHT ANGLE	ROSENBERGER	51K-201-400 A4	78.443
J7-1	SOCKET 25 POLES	SUB D RIGHT ANGLE	AMP	343707-2	78.169
J8-1	SOCKET 25 POLES	SUB D RIGHT ANGLE	AMP	343707-2	78.169
LC1-1	EMI SUPPRESSION FILTER	Fo=70MHz	MURATA	DST 310 91 Y5S 222 M	18.550
LC2-1	EMI SUPPRESSION FILTER	Fo=70MHz	MURATA	DST 310 91 Y5S 222 M	18.550
LC3-1	EMI SUPPRESSION FILTER	Fo=70MHz	MURATA	DST 310 91 Y5S 222 M	18.550
LC4-1	EMI SUPPRESSION FILTER	Fo=70MHz	MURATA	DST 310 91 Y5S 222 M	18.550
LC5-1	EMI SUPPRESSION FILTER	Fo=70MHz	MURATA	DST 310 91 Y5S 222 M	18.550
OC1-1	OPTO COUPLER	DUAL DARLINGTON	TOSHIBA	TLP 523-2	32.536
P1-1	MULTIPLUG	2x4 POLES PCB VERSION	MOLEX	39-28-1083	78.218
P2-1	MULTIPLUG	2x4 POLES PCB VERSION	MOLEX	39-28-1083	78.218
P3-1	PLUG SUB D 9 POLES	RIGHT ANGLE, PCB VERSION	AMP	9-167671	78.171
P4-1	CONNECTION ELEMENT	FOR M5 SCREW	ESPERA	1-0-25860	225860
P5-1	CONNECTION ELEMENT	FOR M5 SCREW	ESPERA	1-0-25860	225860
P6-1	PLUG SUB D 25 POLES	RIGHT ANGLE, PCB VERSION	AMP	9-167673	78.173

POSITION	DESCRIPTION		MANUFACTOR	TYPE	S.P.NUMBER
P7-1	MULTIPLUG	2x5 POLES PCB VERSION	MOLEX	39-28-1103	78.220
P8-1	MULTIPLUG	2x5 POLES PCB VERSION	MOLEX	39-28-1103	78.220
P9-1	PLUG 4 POLES		MOLEX	39-28-1043	78.216
P10-1	MULTIPLUG	2x3 POLES PCB VERSION	MOLEX	39-28-1063	78.217
P11-1	MULTIPLUG	2x3 POLES PCB VERSION	MOLEX	39-28-1063	78.217
P12-1	PLUG 4 POLES		MOLEX	39-28-1043	78.216
P15-1	PLUG	1/10" SIL SQ.PINS 2 POLES	AMP	0-826629-2 (0-826647-2)	78.322
P16-1	PLUG	1/10" SIL SQ.PINS 2 POLES	AMP	0-826629-2 (0-826647-2)	78.322
P17-1	PLUG	2x5 POLES	3M	3654-6002 / 7610-6002 JL	78.251
P18-1	PLUG	2x5 POLES	3M	3654-6002 / 7610-6002 JL	78.251
P19-1	PLUG	1/10" SIL SQ.PINS 2 POLES	AMP	0-826629-2 (0-826647-2)	78.322
P20-1	PLUG	1/10" SIL SQ.PINS 2 POLES	AMP	0-826629-2 (0-826647-2)	78.322
Q1-1	TRANSISTOR	BC547	PHILIPS*	BC547	28.062
Q2-1	TRANSISTOR	BC547	PHILIPS*	BC547	28.062
Q3-1	TRANSISTOR	BC547	PHILIPS*	BC547	28.062
Q4-1	TRANSISTOR	BC547	PHILIPS*	BC547	28.062
Q5-1	TRANSISTOR	BC547	PHILIPS*	BC547	28.062
R1-1	RESISTOR MF	10k OHM 5% 0.33W	PHILIPS	2322 180 73103	02.496
R2-1	RESISTOR MF	10k OHM 5% 0.33W	PHILIPS	2322 180 73103	02.496
R3-1	RESISTOR MF	10k OHM 5% 0.33W	PHILIPS	2322 180 73103	02.496
R4-1	PRESET CERMET	250k OHM 10% 0.5W	* BOURNS	3386P-1-254	07.895
R5-1	RESISTOR MF	10k OHM 5% 0.33W	PHILIPS	2322 180 73103	02.496
R6-1	PRESET CERMET	250k OHM 10% 0.5W	* BOURNS	3386P-1-254	07.895
R7-1	RESISTOR MF	10k OHM 5% 0.33W	PHILIPS	2322 180 73103	02.496
R8-1	RESISTOR MF	47 OHM 5% 0.33W	PHILIPS	2322 180 73479	02.440
R9-1	RESISTOR MF	47 OHM 5% 0.33W	PHILIPS	2322 180 73479	02.440
R10-1	RESISTOR MF	47 OHM 5% 0.33W	PHILIPS	2322 180 73479	02.440
R11-1	RESISTOR MF	47 OHM 5% 0.33W	PHILIPS	2322 180 73479	02.440
R12-1	RESISTOR MF	47 OHM 5% 0.33W	PHILIPS	2322 180 73479	02.440
R13-1	RESISTOR MF	10k OHM 5% 0.33W	PHILIPS	2322 180 73103	02.496
R14-1	RESISTOR MF	10k OHM 5% 0.33W	PHILIPS	2322 180 73103	02.496
R15-1	RESISTOR MF	10k OHM 5% 0.33W	PHILIPS	2322 180 73103	02.496
R16-1	RESISTOR MF	10k OHM 5% 0.33W	PHILIPS	2322 180 73103	02.496
R17-1	RESISTOR MF	10k OHM 5% 0.33W	PHILIPS	2322 180 73103	02.496
R18-1	RESISTOR MF	330 OHM 5% 0.33W	PHILIPS	2322 180 73331	02.460
R19-1	RESISTOR MF	10k OHM 5% 0.33W	PHILIPS	2322 180 73103	02.496
R20-1	RESISTOR MF	1k0 OHM 5% 0.33W	PHILIPS	2322 180 73102	02.472
R21-1	RESISTOR MF	1k0 OHM 5% 0.33W	PHILIPS	2322 180 73102	02.472
R22-1	RESISTOR MF	100 OHM 5% 0.33W	PHILIPS	2322 180 73101	02.448
RE1-1	RELAY 12VDC DPDT 1.25A	M1B-12-H/AZ 820-2C212DE	MEISEI	M1B-12-H	21.295
RE2-1	RELAY 12VDC DPDT 1.25A	M1B-12-H/AZ 820-2C212DE	MEISEI	M1B-12-H	21.295
RE3-1	RELAY	24VDC 2SH. 2A	OMRON	G5V-2-24 VDC	21.327
RE4-1	RELAY	24VDC 2SH. 2A	OMRON	G5V-2-24 VDC	21.327
RE5-1	RELAY	24VDC 2SH. 2A	OMRON	G5V-2-24 VDC	21.327
RE6-1	RELAY	24VDC 2SH. 2A	OMRON	G5V-2-24 VDC	21.327
ST1-1	TERMINAL BLOCK	7 POLES PCB VERSION	PHOENIX	GSMKDS 3/7	81.087
ST2-1	TERMINAL BLOCK	7 POLES PCB VERSION	PHOENIX	GSMKDS 3/7	81.087
ST3-1	TERMINAL BLOCK	8 POLES PCB VERSION	PHOENIX	GSMKDS 3/8	81.088
ST4-1	TERMINAL BLOCK	14 POLES PCB VERSION	PHOENIX	GSMKDS 3/14	81.094
ST5-1	TERMINAL BLOCK	11 POLES PCB VERSION	PHOENIX	GSMKDS 3/11	81.091
ST6-1	TERMINAL BLOCK	8 POLES PCB VERSION	PHOENIX	GSMKDS 3/8	81.088
ST7-1	TERMINAL BLOCK	7 POLES PCB VERSION	PHOENIX	GSMKDS 3/7	81.087
ST9-1	TERMINAL BLOCK	3 POLES PCB VERSION	PHOENIX	GSMKDS 3/3 Art.Nr: 17 33 03 3	81.083
ST10-1	TERMINAL BLOCK	3 POLES PCB VERSION	PHOENIX	GSMKDS 3/3 Art.Nr: 17 33 03 3	81.083
ST11-1	TERMINAL BLOCK	3 POLES PCB VERSION	PHOENIX	GSMKDS 3/3 Art.Nr: 17 33 03 3	81.083
ST12-1	TERMINAL BLOCK	2 POLES PCB VERSION	PHOENIX	GSMKDS 3/2 Art.Nr: 17 33 02 0	81.082
U1-1	TIMER	"555" DIL 8	TEXAS	NE 555 P	31.205
U2-1	TIMER	"555" DIL 8	TEXAS	NE 555 P	31.205
U3-1	74 HC 365	HEX 3-STATE BUFFER	TEXAS	SN74HC365N	34.551
U4-1	POS. VOLTAGE REG. FIXED	5V/1A 7805CT/LM340T-5.0	MOTOROLA	MC7805CT	31.250

POSITION	DESCRIPTION		MANUFACTOR	TYPE	S.P.NUMBER
CONNECTION B. MODULE (2)		**H2192 GMDSS STATION**	**S.P.RADIO A/S**	**5-0-27662F / 4-0-27662D**	**627662**
F1-2	FUSE	2AT 250V 5x20mm	ELU	179 120 2AT	45.508
F2-2	FUSE	2AT 250V 5x20mm	ELU	179 120 2AT	45.508
F3-2	FUSE	5AT 250V 5x20mm	ELU	179 120 5AT	45.575
F4-2	FUSE	5AT 250V 5x20mm	ELU	179 120 5AT	45.575
F5-2	FUSE	2AT 250V 5x20mm	ELU	179 120 2AT	45.508
F6-2	FUSE	2AT 250V 5x20mm	ELU	179 120 2AT	45.508
F7-2	FUSE	2AT 250V 5x20mm	ELU	179 120 2AT	45.508
F8-2	FUSE	2AT 250V 5x20mm	ELU	179 120 2AT	45.508
F9-2	FUSE	2AT 250V 5x20mm	ELU	179 120 2AT	45.508
F10-2	FUSE	2AT 250V 5x20mm	ELU	179 120 2AT	45.508
F11-2	FUSE	8AF 250V Ø5x20mm	ELU	171 100 8AF (DIN 41571/1)	45.561
F12-2	FUSE	8AF 250V Ø5x20mm	ELU	171 100 8AF (DIN 41571/1)	45.561
F13-2	FUSE	2AT 250V 5x20mm	ELU	179 120 2AT	45.508
F14-2	FUSE	2AT 250V 5x20mm	ELU	179 120 2AT	45.508
P1-2	PLUG 4 POLES		MOLEX	39-28-1043	78.216
P2-2	PLUG 2POLES		MOLEX	39-28-1023	78.215
P3-2	CONNECTION ELEMENT	FOR M5 SCREW	ESPERA	1-0-25860	225860
P4-2	CONNECTION ELEMENT	FOR M5 SCREW	ESPERA	1-0-25860	225860
R1-2	RESISTOR MF	10k OHM 5% 0.33W	PHILIPS	2322 180 73103	02.496
R2-2	RESISTOR MF	10k OHM 5% 0.33W	PHILIPS	2322 180 73103	02.496
ST1-2	TERMINAL BLOCK	2 POLES PCB VERSION	PHOENIX	GSMKDS 3/2 Art.Nr: 17 33 02 0	81.082
ST2-2	TERMINAL BLOCK	2 POLES PCB VERSION	PHOENIX	GSMKDS 3/2 Art.Nr: 17 33 02 0	81.082
ST3-2	TERMINAL BLOCK	3 POLES PCB VERSION	PHOENIX	GSMKDS 3/3 Art.Nr: 17 33 03 3	81.083
ST4-2	TERMINAL BLOCK	3 POLES PCB VERSION	PHOENIX	GSMKDS 3/3 Art.Nr: 17 33 03 3	81.083
ST5-2	TERMINAL BLOCK	3 POLES PCB VERSION	PHOENIX	GSMKDS 3/3 Art.Nr: 17 33 03 3	81.083
ST6-2	TERMINAL BLOCK	3 POLES PCB VERSION	PHOENIX	GSMKDS 3/3 Art.Nr: 17 33 03 3	81.083
ST7-2	TERMINAL BLOCK	3 POLES PCB VERSION	PHOENIX	GSMKDS 3/3 Art.Nr: 17 33 03 3	81.083
ST8-2	TERMINAL BLOCK	5 POLES PCB VERSION	PHOENIX	GSMKDS 3/5	81.085
ST9-2	TERMINAL BLOCK	3 POLES PCB VERSION	PHOENIX	GSMKDS 3/3 Art.Nr: 17 33 03 3	81.083
ST10-2	TERMINAL BLOCK	5 POLES PCB VERSION	PHOENIX	GSMKDS 3/5	81.085
ST11-2	TERMINAL BLOCK	3 POLES PCB VERSION	PHOENIX	GSMKDS 3/3 Art.Nr: 17 33 03 3	81.083
TR1-2	TRAFO AF	1:1 600 OHMS	TDK	L04EE13-C10153	22.500
CONTROL PANEL CONS.& ACCE		**H2192 GMDSS CONSOLE**	**S.P.RADIO A/S**	**0-0-27658**	**727658**
J7	JACK SOCKET	1/4" STEREO W.SWITCH	CLIFF	S2-BSS-BLACK	78.511
J8	SOCKET	1 POLE	BOSCH	0 352 322 006	78.356
LS1	LOUDSPEAKER	4 OHMS 15W 88x88mm	RIGHT ELEC.	S-881252-035P TERMINALER BAGUDRETTEDE	46.052
LS2	LOUDSPEAKER	4 OHMS 15W 88x88mm	RIGHT ELEC.	S-881252-035P TERMINALER BAGUDRETTEDE	46.052
ME1	PANEL METER	SCALED 80-0-80 AMP.	SIFAM	29WF/75-0-75mV SCALED 80/0/80A	23.136
ME2	PANEL METER	SCALED 0-40V	SIFAM	29WF/0-40V, SCALED 0-40V	23.135
ME3	PANEL METER	SCALED 80-0-80 AMP.	SIFAM	29WF/75-0-75mV SCALED 80/0/80A	23.136
ME4	PANEL METER	SCALED 0-40V	SIFAM	29WF/0-40V, SCALED 0-40V	23.135
R1	POTENTIOMETER	10k OHM 10% 0.1W LOG	NOBLE	V90-10155-D	08.257
R2	POTENTIOMETER	10k OHM 10% 0.1W LOG	NOBLE	V90-10155-D	08.257
S1	ROCKER SWITCH	DPDT ON-NONE-ON 4A/250VAC	CARLINGSWITCH	6 10 1 2 4 2 1-0-0	43.011

POSITION	DESCRIPTION		MANUFACTOR	TYPE	S.P.NUMBER
S2	ROCKER SWITCH	DPDT ON-NONE-ON 4A/250VAC	CARLINGSWITCH	6 10 1 2 4 2 1-0-0	43.011
S3	ROCKER SWITCH	DPDT ON-NONE-ON 4A/250VAC	CARLINGSWITCH	6 10 1 2 4 2 1-0-0	43.011
S4	ROCKER SWITCH	DPTT ON-OFF-ON 4A/250VAC	CARLINGSWITCH	6 10 1 2 4 6 1-0-0	43.012
S5	ROCKER SWITCH	DPTT ON-OFF-ON 4A/250VAC	CARLINGSWITCH	6 10 1 2 4 6 1-0-0	43.012

VOLTAGE REGULATOR N420 ESPERA 5-0-24613G / 4-0-24613D 600416

POSITION	DESCRIPTION		MANUFACTOR	TYPE	S.P.NUMBER
C1	CAPACITOR ELECTROLYTIC	47uF -10/+50% 63V	ERO	EB 00 FL 247 J	14.552
C2	CAPACITOR MKT	0.22uF 10% 63V	ERO*	MKT1818	11.090
C3	CAPACITOR MKT	0.22uF 10% 63V	ERO*	MKT1818	11.090
C4	CAPACITOR ELECTROLYTIC	47uF -10/+50% 63V	ERO	EB 00 FL 247 J	14.552
C5	CAPACITOR MKT	100nF 10% 100VDC	PHILIPS	2222 371 28104	11.180
D1	DIODE	MR750	MOTOROLA	MR750	25.219
D2	DIODE SCHOTTKY	BAT 43	THOMSON-CSF	BAT43	27.600
D3	DIODE ZENER	7.5V 5% 0.4W BZX79C7V5	PHILIPS	BZX79C7V5	26.539
D5	DIODE	1N4148 HIGH SPEED	PHILIPS	1N4148-143	25.131
D6	DIODE	1N4148 HIGH SPEED	PHILIPS	1N4148-143	25.131
F1	FUSE	8AF 250V Ø5x20mm	ELU	171 100 8AF (DIN 41571/1)	45.561
IC1	VOLTAGE REGULATOR	+12V	MOTOROLA*	MC7812CT	31.260
R1	RESISTOR POWER	1R0 OHM 10% 6.5W	VITROHM	1R0 10% TYPE 296-0	05.725
R2	RESISTOR POWER	1R0 OHM 10% 6.5W	VITROHM	1R0 10% TYPE 296-0	05.725
R3	RESISTOR POWER	1R0 OHM 10% 6.5W	VITROHM	1R0 10% TYPE 296-0	05.725
R4	RESISTOR	47 OHM 5% 0.6W	BEYSCHLAG	MBB 0207-00-BX-47R 5%	03.167
R5	RESISTOR PMF	27 OHM 5% 3W	PHILIPS	2322 195 13279	04.660
R6	RESISTOR MF	1k0 OHM 5% 0.4W	PHILIPS	2322 181 53102	01.200
R7	RESISTOR MF	1k0 OHM 5% 0.4W	PHILIPS	2322 181 53102	01.200
R8	RESISTOR MF	10k OHM 5% 0.4W	PHILIPS	2322 181 53103	01.225
R9	RESISTOR	2.2 KOHM 5% 0.6W	DRALORIC	SMA 0207 S TK100-2K2 5%	03.208
R10	RESISTOR POWER	6R8 OHM 10% 6.5W	VITROHM	6R8 10% TYPE 296-0	05.730
R11	RESISTOR POWER	6R8 OHM 10% 6.5W	VITROHM	6R8 10% TYPE 296-0	05.730
R12	RESISTOR POWER	6R8 OHM 10% 6.5W	VITROHM	6R8 10% TYPE 296-0	05.730
R13	RESISTOR POWER	6R8 OHM 10% 6.5W	VITROHM	6R8 10% TYPE 296-0	05.730
R14	RESISTOR POWER	6R8 OHM 10% 6.5W	VITROHM	6R8 10% TYPE 296-0	05.730
R15	RESISTOR POWER	6R8 OHM 10% 6.5W	VITROHM	6R8 10% TYPE 296-0	05.730
R16	RESISTOR POWER	6R8 OHM 10% 6.5W	VITROHM	6R8 10% TYPE 296-0	05.730
R17	RESISTOR POWER	6R8 OHM 10% 6.5W	VITROHM	6R8 10% TYPE 296-0	05.730
R18	RESISTOR POWER	6R8 OHM 10% 6.5W	VITROHM	6R8 10% TYPE 296-0	05.730
R19	RESISTOR POWER	6R8 OHM 10% 6.5W	VITROHM	6R8 10% TYPE 296-0	05.730
R20	RESISTOR POWER	6R8 OHM 10% 6.5W	VITROHM	6R8 10% TYPE 296-0	05.730
R21	RESISTOR POWER	6R8 OHM 10% 6.5W	VITROHM	6R8 10% TYPE 296-0	05.730
R22	RESISTOR POWER	6R8 OHM 10% 6.5W	VITROHM	6R8 10% TYPE 296-0	05.730
R23	RESISTOR POWER	6R8 OHM 10% 6.5W	VITROHM	6R8 10% TYPE 296-0	05.730
T1	TRANSISTOR DARLINGTON	MJ2501	MOTOROLA*	MJ2501	29.235
T2	TRANSISTOR DARLINGTON	MJ2501	MOTOROLA*	MJ2501	29.235
T3	TRANSISTOR AF	BC547B NPN TO-92	PHILIPS	BC547B	28.067
T4	TRANSISTOR	BD140-10	AEG*	BD140-10	29.066

POWER SUPPLY MODULE 9 N2165 ESPERA 5-0-26409F / 4-0-26409F 626409

POSITION	DESCRIPTION		MANUFACTOR	TYPE	S.P.NUMBER
C1-9	CAPACITOR ELECTROLYTIC	22uF 20% 35VDC	ELNA	RJ2-35-V-220-M-F1	14.516
C2-9	CAPACITOR MKT	1uF 10% 63VDC	PHILIPS	2222 370 78105	11.137
C3-9	CAPACITOR ELECTROLYTIC	2200uF -20/+50% 63VDC	PHILIPS	2222 021 48222	14.733
C4-9	CAPACITOR ELECTROLYTIC	2200uF -20/+50% 63VDC	PHILIPS	2222 021 48222	14.733
C5-9	CAPACITOR MKT	100nF 5% 63VDC	PHILIPS	2222 370 79104	11.135
C6-9	CAPACITOR ELECTROLYTIC	100uF 20% 10VDC	ELNA	RJ3-10-V-101-M-T34	14.607
C7-9	CAPACITOR MKT	10nF 20% 100VDC	PHILIPS	2222 370 38103	11.168
C8-9	CAPACITOR MKT	220nF 10% 63VDC	PHILIPS	2222 370 78224	11.095
C9-9	CAPACITOR MKT	100nF 5% 63VDC	PHILIPS	2222 370 79104	11.135
C10-9	CAPACITOR MKT	10nF 20% 100VDC	PHILIPS	2222 370 38103	11.168
C11-9	CAPACITOR MKT	10nF 20% 100VDC	PHILIPS	2222 370 38103	11.168
C12-9	CAPACITOR MKT	1uF 10% 63VDC	PHILIPS	2222 370 78105	11.137
C13-9	CAPACITOR MKT	1uF 10% 63VDC	PHILIPS	2222 370 78105	11.137

POSITION	DESCRIPTION		MANUFACTOR	TYPE	S.P.NUMBER
C14-9	CAPACITOR ELECTROLYTIC	22uF 20% 35VDC	ELNA	RJ2-35-V-220-M-F1	14.516
C15-9	CAPACITOR POLYSTYRENE	470pF 1% 630VDC	PHILIPS	2222 431 84701	10.429
C16-9	CAPACITOR CERAMIC	220pF 10% 500VDC CL2	NKE	DT35-0465 758S B 221K500V	16.090
C17-9	CAPACITOR CERAMIC	1nOF 10% CL2 500VDC	NKE	DT 360 758L B 102 K 500V	15.160
C18-9	CAPACITOR CERAMIC	220pF 10% 500VDC CL2	NKE	DT35-0465 758S B 221K500V	16.090
C19-9	CAPACITOR MKT	150nF 5% 50VDC	ERO	MKT 1826-415/06 4-G	11.181
C20-9	CAPACITOR ELECTROLYTIC	100uF -10/+50% 25VDC	ERO	EKM 00 CC 310 E G5	14.610
C21-9	CAPACITOR ELECTROLYTIC	100uF -10/+50% 25VDC	ERO	EKM 00 CC 310 E G5	14.610
C22-9	CAPACITOR ELECTROLYTIC	100uF -10/+50% 25VDC	ERO	EKM 00 CC 310 E G5	14.610
C23-9	CAPACITOR ELECTROLYTIC	100uF -10/+50% 25VDC	ERO	EKM 00 CC 310 E G5	14.610
C24-9	CAPACITOR ELECTROLYTIC	100uF -10/+50% 25VDC	ERO	EKM 00 CC 310 E G5	14.610
C25-9	CAPACITOR ELECTROLYTIC	100uF -10/+50% 25VDC	ERO	EKM 00 CC 310 E G5	14.610
C26-9	CAPACITOR MKT	100nF 10% 100VDC	PHILIPS	2222 371 28104	11.180
C27-9	CAPACITOR MKT	100nF 10% 100VDC	PHILIPS	2222 371 28104	11.180
C28-9	CAPACITOR MKT	100nF 10% 100VDC	PHILIPS	2222 371 28104	11.180
D1-9	DIODE ZENER	18V 5% 0.4W BZX79C18	PHILIPS	BZX79C18	26.564
D2-9	DIODE RECTIFIER	1N5402 200V/3A	PROMAX	1N5402	25.116
D3-9	DIODE RECTIFIER	1N5402 200V/3A	PROMAX	1N5402	25.116
D4-9	DIODE RECTIFIER	1N5402 200V/3A	PROMAX	1N5402	25.116
D5-9	DIODE RECTIFIER	1N5402 200V/3A	PROMAX	1N5402	25.116
D6-9	DIODE POWER	SCHOTTKY 45VDC/10A	PHILIPS	PBYR 1045	27.617
D7-9	ZENER DIODE 12V 5%	1.3W BZV85C12/BZX85C12	PHILIPS	BZV85C12	26.638
D8-9	DIODE FAST RECOVERY	600VDC/1A	PHILIPS	BYD 33 J	27.150
D9-9	DIODE FAST RECOVERY	600VDC/1A	PHILIPS	BYD 33 J	27.150
D10-9	DIODE FAST RECOVERY	600VDC/1A	PHILIPS	BYD 33 J	27.150
D11-9	DIODE FAST RECOVERY	600VDC/1A	PHILIPS	BYD 33 J	27.150
D12-9	DIODE FAST RECOVERY	400V/3A BYT03-400/MUR440	THOMSON	BYT 03-400 TAPED	25.212
D13-9	DIODE FAST RECOVERY	400V/3A BYT03-400/MUR440	THOMSON	BYT 03-400 TAPED	25.212
D14-9	DIODE FAST RECOVERY	400V/3A BYT03-400/MUR440	THOMSON	BYT 03-400 TAPED	25.212
D15-9	DIODE FAST RECOVERY	400V/3A BYT03-400/MUR440	THOMSON	BYT 03-400 TAPED	25.212
D16-9	DIODE FAST RECOVERY	400V/3A BYT03-400/MUR440	THOMSON	BYT 03-400 TAPED	25.212
D17-9	DIODE FAST RECOVERY	400V/3A BYT03-400/MUR440	THOMSON	BYT 03-400 TAPED	25.212
D18-9	DIODE SHUNT REGULATOR	PROGRAMMABLE TL431C	MOTOROLA	TL431CP	26.997
D19-9	DIODE HIGH SPEED	1N4448	PHILIPS	1N4448	25.147
L1-9	CHOKE	TL531	TRANS-ELECTRO	6-0-26309A	400531
L2-9	CHOKE FIXED	10mH/100mADC	TRADANIA	6-0-26623	20.254
L3-9	CHOKE FIXED TOROIDAL	400uH/2A +20/-12%	ULVECO	Art.Nr: TD 6994.0 2-2.0-400-2-R (DK11752) UDT.IFLG.SP Tg:0-0-26192	20.245
L4-9	CHOKE FIXED TOROIDAL	630uH/1A6 +20/-12.5%	ULVECO	Art.Nr: DK11-542 (2-1.6-630-1/SP Tg:26271)	20.244
L5-9	CHOKE FIXED TOROIDAL	630uH/1A6 +20/-12.5%	ULVECO	Art.Nr: DK11-542 (2-1.6-630-1/SP Tg:26271)	20.244
OC1-9	OPTO COUPLER	CNY17-2	TOSHIBA	CNY 17-2	32.530
OC2-9	OPTO COUPLER	CNY17-2	TOSHIBA	CNY 17-2	32.530
P1-9	PLUG 4 POLES		MOLEX	39-28-1043	78.216
P2-9	MULTIPLUG	2x3 POLES PCB VERSION	MOLEX	39-28-1063	78.217
Q1-9	TRANSISTOR AF POWER NPN	DARLINGTON BD645/BDX53	PHILIPS	BD645	29.122
Q2-9	TRANSISTOR AF	BC547B NPN TO-92	PHILIPS	BC547B	28.067
Q3-9	TRANS.POW.MOSFET N-CHANN.	100V/27A/85mOHM IRF540	MOTOROLA	IRF540	29.402
Q4-9	TRANS.POW.MOSFET N-CHANN.	100V/27A/85mOHM IRF540	MOTOROLA	IRF540	29.402
R1-9	RESISTOR MF	820 OHM 5% 0.33W	PHILIPS	2322 180 73821	02.470
R2-9	RESISTOR MF	4k7 OHM 5% 0.33W	PHILIPS	2322 180 73472	02.488
R3-9	RESISTOR MF	10k0 OHM 1% 0.6W	* PHILIPS	2322 156 11003	03.427
R4-9	RESISTOR MF	13k3 OHM 1% 0.6W	PHILIPS	2322 156 11333	03.473
R5-9	RESISTOR MF	2k2 OHM 5% 0.33W	PHILIPS	2322 180 73222	02.480
R6-9	RESISTOR MF	270 OHM 5% 0.33W	PHILIPS	2322 180 73271	02.458
R7-9	RESISTOR MF	10k OHM 5% 0.33W	PHILIPS	2322 180 73103	02.496
R8-9	RESISTOR MF	10k OHM 5% 0.33W	PHILIPS	2322 180 73103	02.496
R9-9	RESISTOR MF	100k OHM 1% 0.6W	* PHILIPS	2322 156 11004	03.477
R10-9	RESISTOR MF	680 OHM 5% 0.33W	PHILIPS	2322 180 73681	02.468
R11-9	PRESET CERMET	1k0 OHM 10% 0.5W	BOURNS	3386P-1-102	07.886
R12-9	RESISTOR MF	6k8 OHM 5% 0.33W	PHILIPS	2322 180 73682	02.492
R13-9	RESISTOR MF	100 OHM 5% 0.33W	PHILIPS	2322 180 73101	02.448
R14-9	RESISTOR MF	100 OHM 5% 0.33W	PHILIPS	2322 180 73101	02.448
R15-9	RESISTOR MF	100 OHM 5% 0.33W	PHILIPS	2322 180 73101	02.448
R16-9	RESISTOR MF	22k OHM 5% 0.33W	PHILIPS	2322 180 73223	02.504
R17-9	RESISTOR WW	R180 OHM 5% 2W	MODULOHM	R18-J-2W-E-1	06.220
R18-9	RESISTOR WW	R180 OHM 5% 2W	MODULOHM	R18-J-2W-E-1	06.220
R19-9	RESISTOR MF	470 OHM 5% 0.33W	PHILIPS	2322 180 73471	02.464
R20-9	RESISTOR MF	22k OHM 5% 0.33W	PHILIPS	2322 180 73223	02.504

POSITION	DESCRIPTION		MANUFACTOR	TYPE	S.P.NUMBER
R21-9	RESISTOR MF	1k0 OHM 5% 0.33W	PHILIPS	2322 180 73102	02.472
R22-9	RESISTOR MF	2k2 OHM 5% 0.33W	PHILIPS	2322 180 73222	02.480
R23-9	RESISTOR MF	240 OHM 5% 0.33W	PHILIPS	2322 180 73241	02.457
R24-9	RESISTOR MF	1k0 OHM 5% 0.33W	PHILIPS	2322 180 73102	02.472
R25-9	RESISTOR MF	4k7 OHM 5% 0.33W	PHILIPS	2322 180 73472	02.488
R26-9	RESISTOR MF	100k OHM 5% 0.33W	PHILIPS	2322 180 73104	02.520
R27-9	RESISTOR MF	13k3 OHM 1% 0.6W	PHILIPS	2322 156 11333	03.473
R28-9	RESISTOR MF	1k87 OHM 1% 0.6W	PHILIPS	2322 156 11872	03.474
R29-9	RESISTOR PMF	120 OHM 5% 2W	PHILIPS	2322 191 31201	04.178
R30-9	RESISTOR PMF	390 OHM 5% 2W	PHILIPS	2322 194 13391	04.189
R31-9	RESISTOR PMF	390 OHM 5% 2W	PHILIPS	2322 194 13391	04.189
RE1-9	RELAY	24VDC 1MAKE 16A.	PASI	KH/A-3-C	21.027
RE2-9	RELAY	24VDC 1MAKE 16A.	PASI	KH/A-3-C	21.027
TR1-9	TRANSFORMER SMPS	35x40x43mm	K&J ELEKTRONIK	6-0-26620A Art.Nr: ETD34-0003	22.173
U1-9	CURRENT MODE PWM CONTROL.	UC3846	UNITRODE	UC3846	31.486

AF AMPLIFIER MODULE (10) — ESPERA — 5-0-26410G / 4-0-26410H — 626410

POSITION	DESCRIPTION		MANUFACTOR	TYPE	S.P.NUMBER
C1-10	CAPACITOR CERAMIC	1nOF 10% CL2 500VDC	NKE	DT 360 758L B 102 K 500V	15.160
C2-10	CAPACITOR CERAMIC	1nOF 10% CL2 500VDC	NKE	DT 360 758L B 102 K 500V	15.160
C3-10	CAPACITOR CERAMIC	1nOF 10% CL2 500VDC	NKE	DT 360 758L B 102 K 500V	15.160
C4-10	CAPACITOR ELECTROLYTIC	10uF 20% 35VDC	ELNA	RJ2-35-V-100-M-T34	14.512
C5-10	CAPACITOR ELECTROLYTIC	10uF 20% 35VDC	ELNA	RJ2-35-V-100-M-T34	14.512
C6-10	CAPACITOR ELECTROLYTIC	22uF 20% 35VDC	ELNA	RJ2-35-V-220-M-F1	14.516
C7-10	CAPACITOR MKT	470nF 5% 63VDC	PHILIPS	2222 370 79474	11.187
C9-10	CAPACITOR MKT	330nF 10% 63VDC	PHILIPS	2222 370 78334	11.189
C10-10	CAPACITOR ELECTROLYTIC	470uF -20/+50% 40VDC	ELNA	RJ3-50-471-M-F	14.649
C11-10	CAPACITOR CERAMIC	1nOF 10% CL2 500VDC	NKE	DT 360 758L B 102 K 500V	15.160
C12-10	CAPACITOR CERAMIC	1nOF 10% CL2 500VDC	NKE	DT 360 758L B 102 K 500V	15.160
C13-10	CAPACITOR MKT	470nF 10% 100VDC	PHILIPS	2222 371 28474	11.049
C14-10	CAPACITOR MKT	470nF 10% 100VDC	PHILIPS	2222 371 28474	11.049
D1-10	DIODE HIGH SPEED	1N4448	PHILIPS	1N4448	25.147
D2-10	DIODE RECTIFIER	1N4002 100V/1A	THOMSON	1N4002 (03/04/05/06/07)	25.100
D3-10	DIODE RECTIFIER	1N4002 100V/1A	THOMSON	1N4002 (03/04/05/06/07)	25.100
FP1-10	FERRITE BEAD INDUCTOR		MURATA	BLO1RN1-A62T5	35.188
FP2-10	FERRITE BEAD INDUCTOR		MURATA	BLO1RN1-A62T5	35.188
P1-10	PLUG	2 POLES	AMP	0-826375-2	78.102
P2-10	PLUG	2x7 POLES	3M	3598-6002 / 7614-6002 JL	78.254
P3-10	PLUG	2x5 POLES	3M	3654-6002 / 7610-6002 JL	78.251
Q1-10	TRANSISTOR AF	BC548 NPN TO-92	PHILIPS	BC548 (-A/-B/-C)	28.070
R1-10	RESISTOR MF	6k8 OHM 5% 0.33W	PHILIPS	2322 180 73682	02.492
R2-10	RESISTOR MF	10k OHM 5% 0.33W	PHILIPS	2322 180 73103	02.496
R3-10	RESISTOR MF	120k OHM 5% 0.33W	PHILIPS	2322 180 73124	02.522
R4-10	RESISTOR MF	820 OHM 5% 0.33W	PHILIPS	2322 180 73821	02.470
R5-10	RESISTOR MF	220k OHM 5% 0.33W	PHILIPS	2322 180 73224	02.528
R6-10	RESISTOR MF	100k OHM 5% 0.33W	PHILIPS	2322 180 73104	02.520
R7-10	RESISTOR MF	470 OHM 5% 0.33W	PHILIPS	2322 180 73471	02.464
R8-10	RESISTOR MF	33k OHM 5% 0.33W	PHILIPS	2322 180 73333	02.508
R9-10	RESISTOR MF	1 OHM 5% 0.4W	PHILIPS	2322 181 53108	01.125
R10-10	RESISTOR MF	1k0 OHM 5% 0.33W	PHILIPS	2322 180 73102	02.472
RE1-10	RELAY	24VDC 2SH. 2A	OMRON	G5V-2-24 VDC	21.327
TR1-10	TRAFO AF	1:1 600 OHMS	TDK	L04EE13-C10153	22.500
U1-10	AF POWER AMPLIFIER	TDA 2030 VERT.	THOMSON	TDA 2030 V	31.483