

Sailor

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**MOUNTING INSTRUCTIONS FOR
SAILOR TANDEM STATION
&
INSTRUCTION BOOK FOR
CENTER PANEL H1222**



A/S S. P. RADIO · AALBORG · DENMARK

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PART LISTS

TECHNICAL DATA H1222

PHONE PATCH

AF output to telephone line 100 mV +-2 dB/600 ohm.
AF output from telephone line 150 mV +-15 dB/600 ohm.

TELEX

AF output from Receiver 700 mV +-2 dB/600 ohm
AF input to Transmitter 350 mV +-10 dB/600 ohm
TT from TELEX 24 V 50 mA
Teleprinter start (High tension ON) 24 V 13 mA

LINE OUTPUT

AF output from Receiver 400 mV +-3 dB/4,7 kohm

TAPE RECORDER

AF output from Receiver 20 mV +-3 dB/4,7 kohm

TIME SIGNAL

AF output from Receiver 4 Watt/8 ohm

MUTE (Supply Terminal Block)

For muting of auxiliary receivers and central aerial systems.

When main or reserve station is transmitting, the contact between ST 5 and ST 6 will close.

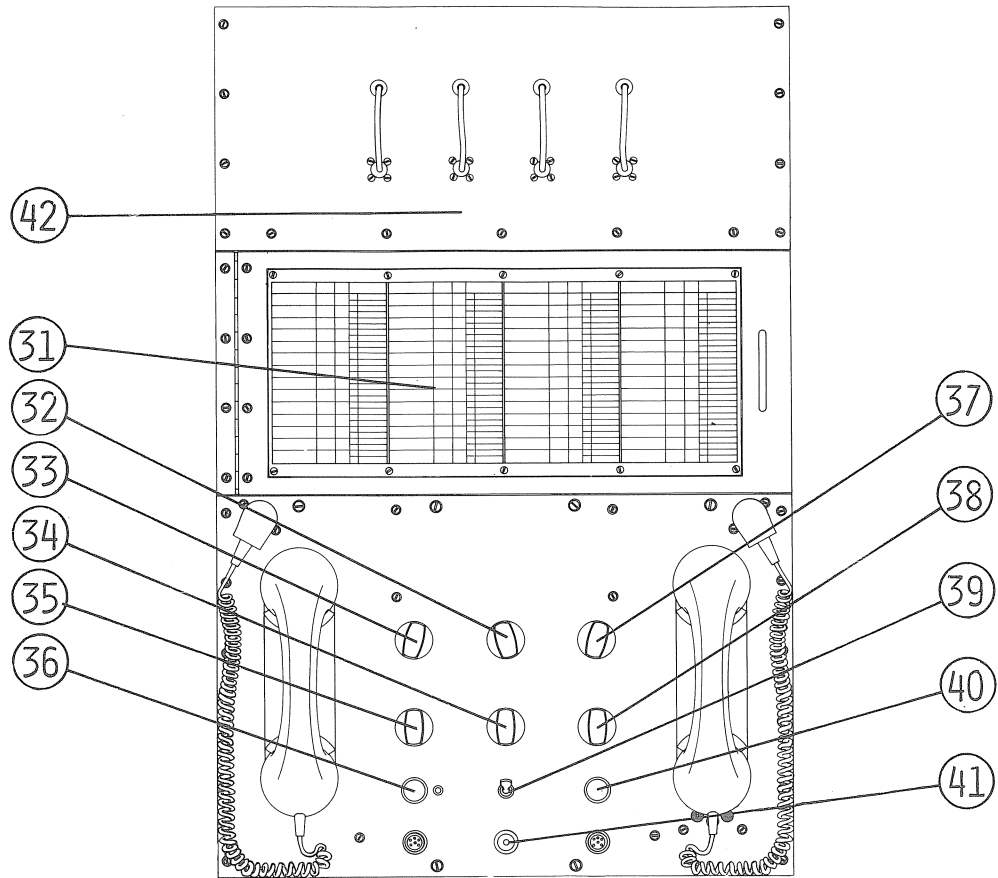
The contact between ST 3 and ST 4 can be strapped for opened or closed contact when transmitting.

D.F. RECEIVER SWITCH

Contact Max. 1 Amp - 24 Volt

The contact between ST 7 and ST 8 can be strapped for opened or closed contact when Transmitter Aerial Switch is in pos. D.F.

CONTROLS FOR CENTER SECTION



- 31 FREQUENCY TABLE
Hatch for inspection of fuses and supply cables.
- 32 MUTE
ON: Both the Main and the Reserve Receivers are muted from the transmitter in operation (with full break-in).
OFF: The Main Receiver only is muted of the Main Transmitter and the Reserve Receiver only is muted from the Reserve Transmitter.
- 33 TELEX
The Simplex TOR equipment can be switched from the Main Transmitter and Receiver to the Reserve Transmitter and Receiver.
- 34 TIME SIGNAL
An extra loudspeaker in the chart room can be connected to the Main or Reserve Receiver.
- 35 PHONE PATCH
MAIN: The ship's interphone network is connected to the Main Transmitter and Receiver for duplex telephone connections ashore. The transmitter is automatically keyed.
RESERVE: The ship's interphone network is connected to the Reserve Transmitter and Receiver for duplex telephone connections ashore. The transmitter is automatically keyed.
OFF: The ship's interphone network is disconnected.

- 36 PHONE PATCH LEVEL
The level from the interphone network has to be adjusted so that the lamp is just flashing.
- 37 TAPE RECORDER
For tape recording of information from the Main or Reserve Receiver.
- 38 LINE OUTPUT
Output from the Main or the Reserve Receiver for auxiliary amplifier equipment.
- 39 EMERGENCY LIGHT
The emergency light in the radioroom can be switched on here or at the door.
- 40 SIDE TONE LEVEL
Level of side tone when key down or TUNE on.
- 41 LEAD LIGHT
For connection of lead light or a small solder iron (25 Watt).
- 42 RECEIVER AERIAL SELECTOR PANEL
Possibility for selecting of four aerials to the receivers.

GENERAL

It is the object of the present manual to give the information necessary to prepare and carry out a correct installation of a SAILOR short wave station.

Therefore in this manual further to the information about the mechanical dimensions, the dimensions of bolts etc., information will also be given about the choice and installation of cables, aerials and earthbands.

When the station has been installed as described in this manual, it must be run-in and tuned up. The procedures to follow will appear in the technical manuals for transmitter, receiver and operation instructions.

TRANSMITTER AERIAL

The transmitter T1127L with the TUNER H1201 is constructed for the type of aerial which will give the best radiation diagram, namely a vertical aerial with an electrical length of 15 to 22 metres.

Out of consideration for the range covered on the high short wave bands a short aerial should be selected. However, it must also be considered that as large a part of the aerial as possible be able to radiate the around for better results. To obtain this it may be necessary to use a rather long aerial. For the 405 - 535 kHz MF-band the long aerial will give the best result, but it is the tuning in the frequency range from 1.6 - 4 MHz which determines the max. length of the aerial. In other words, if the transmitter can be tuned to the highest frequency in the range 1.6 - 4 MHz, the aerial is not too long.

When choosing type of aerial and insulators all these considerations have to be taken into account, including that the antenna voltage at the foot point is very high (25 k Volt) in the band from 405 - 535 kHz.

The aerial can be a self supporting whip aerial or a wire aerial with a suitable top capacity.

Recommended aerials:

Self supporting whip aerial from DUK Antennen STA 150 C - MF/HF.

Self supporting whip aerial from TJØSTHEIM Antennas AS 9 STX.

Wire aerial with suitable top capacity: Electrical length 15 - 22 m.

From the deckhead insulator to the insulator on top of H1201 or H1202 the signal is led through a feeder, which can be made either of 8 - 12 mm copper tube or of aerial wire. The feeder is placed on stand-off insulators in such manner that there is a distance of at least 100 mm between the feeder and the deckhouse roof, the deck or the bulkhead. The feeder must be as short as possible, and it should be no longer than 10% of the total length of the aerial.

RECEIVER AERIAL

For receiver aerial use either a whip aerial 6 - 9 metres or a wire aerial of at least 6 metres. The whip aerial will normally give the best result owing to its radiation characteristics.

For the lead-in from aerial to receiver use 50 ohm coaxial cable.

If 50 ohm coaxial cable RG213U is used, cable has to run in steel tube (conduit).

If 50 ohm triaxial cable H1213 (S.P.RADIO) is used outer screen has to be earthed to console end only.

At the footpoint of aerial mount a junction box e.g. SAILOR H1209 for the connection of aerial and coaxial cable. The box must be designed for outside mounting in maritime environments.

IMPORTANT! The aerial must be connected directly to the cable. No transformer or protection diode must be used. Only SAILOR Receiver Protecting Unit H1223 must be used in the console end.

The screen of the coaxial cable (innerscreen) and the connection box must be effectively earthed (RF earth) to mast or the like, on which the aerial is mounted.

The aerial must be placed as high and as clear as possible, and for duplex reasons as far from the transmitter aerial as possible.

If a wire aerial is used it will for duplex reasons be preferable that the angle, which the down lead of the receiver aerial forms with the transmitter aerial, be as large as possible.

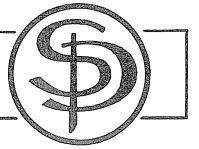
EARTHING

The earthbands of the station (100 mm x min. 0.5 mm copper) are connected to the mounting plates as shown on PHOTO 1. The four earth bands are led to the deck and the deckhouse roof in the shortest possible way. Earth stubs as shown on drawing DRILLING PLAN FOR SAILOR TANDEM STATION can be used.

For ships where the mounting plates are directly bolted to the steel bulkhead or outer metal wall, the earthbands can under certain circumstances be omitted if the following points are observed:

- a. The steel bulkhead must be fully welded to the ship's superstructure so that there are good electrical connections to both roof and deck.
- b. The bolts securing the mounting plate must be welded to bulkhead or outer wall.

Generally speaking an effective earth connection is just as important as a good aerial.



PACKING LIST

CENTER PANEL FOR SAILOR TANDEM STATION

- 1 Transmitter aerial switch H1202
- 1 Cabinet for H1202
- 4 Aerial stand off for H1202
- 1 Receiver aerial selector panel
- 1 Hatch with frequency table and cover plate
- 1 Center panel H1222
- 1 Center mounting plate with dual-rear, contact board and supply terminal block
- 2 Iron-bars for mounting plates
- 2 Copper tubes for interconnection H1201/H1202
- 2 Meter flexible air tube
- 2 Clamps for air tube
- 2 Wall flanges for air outlet
- 4 Receiver protecting units H1223 with mounting plate
- 1 Spacer rail marked G
- 2 Wood spacers marked Z
- 1 Set of screws for assembling of Tandem station marked A-F-H-I-K
- 1 Bag M Spare screws etc.
- 1 Bag N Stickers for Main and Reserve station
- 1 Bag O Stickers for Main and Reserve Key
- 1 Bag P Sticker for H1202 special version
- 6 Spadebolts H1220
- 2 Headphones
- 2 Keys AMPLIDAN
- 1 Loudspeaker L167 special
- 2 Bells for auto alarm 500 kHz
- 1 Aerial transformer for auto alarm 500 kHz (Only with Redifon AA1 Auto alarm)
- 1 Operation instructions for SAILOR Tandem station
- 1 Set mounting instruction and manuals for SAILOR Tandem station
- If the Main and Reserve station are pre-mounted for Tandem station the following parts are mounted by S.P.Radio
- 3 Coaxial aerial cables PL259/BNC
- 1 Multicable for H1218 P104/J301
- 1 AC mains cable N1401 long type for Tandem station
- 2 Microtelephone cables with plug MEZ60BZ
- 2 Grommets for mic. cables
- Cable clips and screws from bag B
- Labels from bag C
- 1 H1218 automatic keying device and REDIFON AA1 Auto alarm/ITT AA734 Auto alarm
- 1 Cabinet for H1218
- 2 Coupling flanges for air outlet H1221
- 2 Mounting hardware for center panel
- Screws from bag D/screws from bag E/Cable clips from bag L

MOUNTING INSTRUCTIONS

Main station consisting of H1201-T1127L-S1301L-R1120-H1218-N1401.

Reserve station consisting of H1201-T1127L-S1301L-R1120-N1400-N1404.

Center Section consisting of H1202-H1220-H1221-H1222-H1223.

PHOTO 1

- 1.1 Drill the holes in the bulkhead and the table-top as shown under the DRILLING PLAN for SAILOR TANDEM STATION.
- 1.2 Remove the units from the main and reserve cabinets.
- 1.3 Remove the mounting plates from the main and reserve cabinets.
- 1.4 Assemble, on a table, the two mounting plate and the center mounting plate together on the two flat iron-bars. Use the screws from Bag.A.
- 1.5 Fix the combined mounting plate to the bulkhead by means of 8 pcs. 3/8" or 8 mm bolts (not delivered by manufacturer). If needed the bulkhead and table must be strengthened. The weight of the complete tandem station is 400 kg.
- 1.6 Earthing of the tandem station as described in the paragraph EARTHING.

PHOTO 2

- 2.1 Supply and signal cable from the ship's installation to Supply Terminal Block (S.T.). See drawing for WIRING to SAILOR TANDEM STATION.

PHOTO 3

- 3.1 Check the cabling on the stations and make it ready for a tandem installation. Use cable clips from Bag.B.
- Arrow A Receiver aerial cable for R1120.
- 3.2 Mount coaxial aerial cable for Auto Alarm Receiver through the hole "G" (left cabinet).
 - 3.3 Mount multicable for H1218, through the hole "G" (left cabinet).
 - 3.4 Mount the new long AC Mains cable through the hole "I" (left cabinet).
- Arrow B Microtelephone cable through hole on front of the cabinet (photo 3 and 5).
- Arrow C Fix the labels from Bag.C. on the rear contact cables J101.

PHOTO 4

- Arrow D Assembling of Coupling Flange for Air Outlet H1221.
- Arrow E Assembling of mounting hardware for Center Panel. Use screws from Bag.D.
- Arrow F With the screws from Bag.E. make mechanical adjustment of the rack so it fits tightly against the mounting hardware.

PHOTO 5

- 5.1 Mounting of the Transmitter Aerial Switch H1202 between the main and reserve transmitter cabinets. Use the screws from Bag.F.
- Arrow G IMPORTANT: The grounding straps from H1202 have to be mounted together with the grounding straps from H1201. See photo 3.
- 5.2 Before pushing the tandem cabinet against the mounting plates the spacer rail marked "G" has to be mounted.
- 5.3 Push the tandem cabinet into place on the mounting plates.

PHOTO 6

- Arrow H Chassis for Dual Rear Contact Board has to be removed as shown.
- Arrow J Insert the 12 bolts without tightening them.
- Arrow K Place the 6 spade bolts as shown and tighten the nuts slightly under the table.
- 6.1 Drill 6 pcs. $\varnothing 9$ holes in the cabinets through the hole of the spade bolts and mount 6 pcs. MG 8 x 16. (H1220).
- 6.2 Tighten the bolts (Arrow J) and the 6 nuts under the table.
- 6.3 Remove the spacer rail marked "G" and assemble the chassis for Dual Contact Board (Arrow H). Tighten the screws carefully.

PHOTO 7

- Arrow L Connect the cables marked Main J101 and Reserve J101 to Main P101 and Reserve P101.
- Arrow M Mount the 10 pole Hirschmann plug through the hole to H1202 as shown. Use cable clips and screws from Bag.H.
- Arrow N Mount the 4 Receiver Protection Units H1223 as shown. Use the screws from Bag.I.
- 7.1 Mount the aerial coaxial cable to the Receiver Protection Unit H1223. The outer shielding braid from the triaxial cable H1213 have to be grounded at the strain relief clamps.
- Arrow O Mount the corresponding coaxial cables from the Receiver Aerial Selector Panel.
- Arrow P Mount the air tube to the air outlet with the clamps delivered.

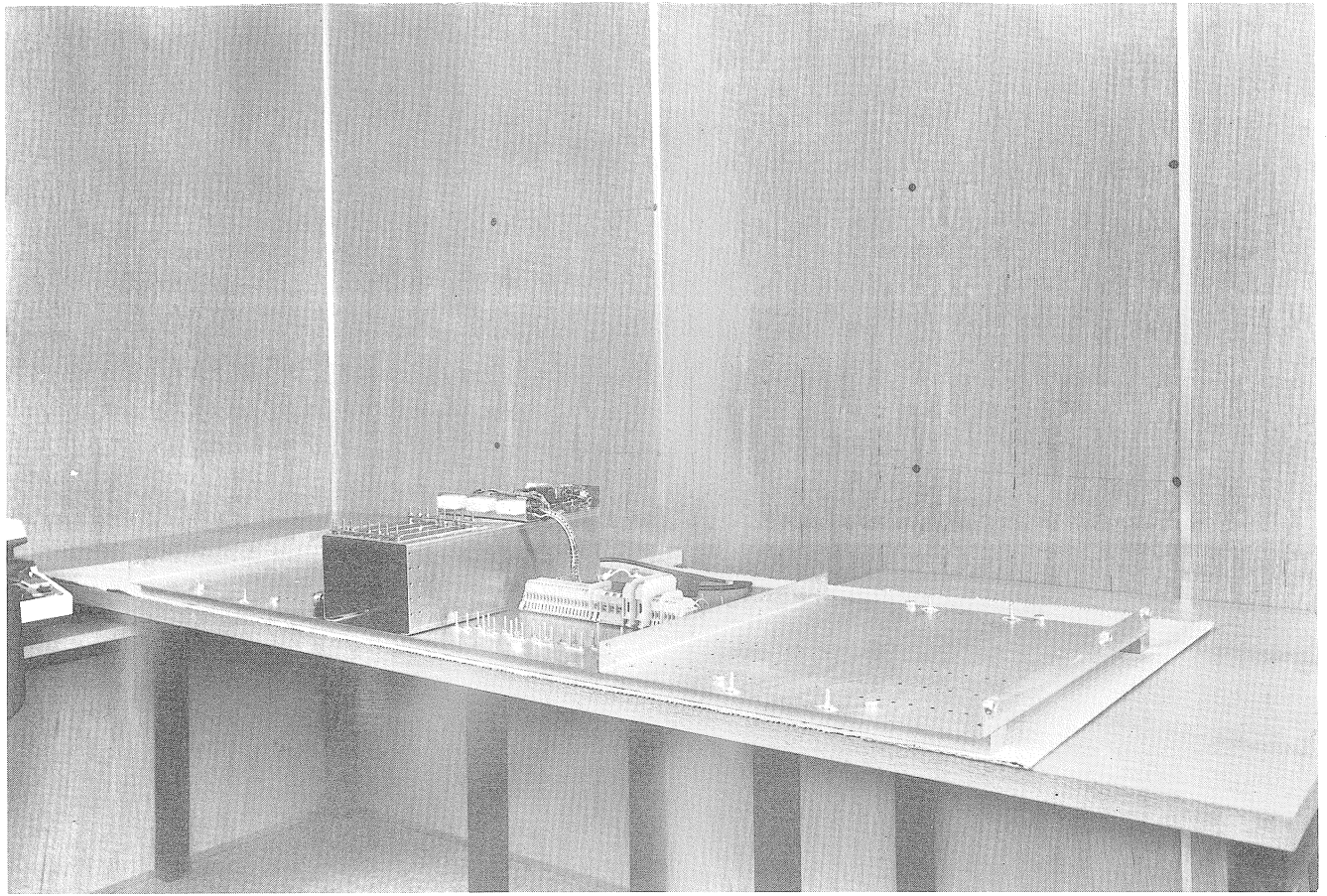
PHOTO 8

- Arrow R Mount the Receiver Aerial Selector Panel. Use the screws from Bag.K. Connect the corresponding receiver coaxial cables to the Receiver Aerial Selector Panel.
- Arrow S Mount the corresponding microtelephone cables from main and reserve transmitter to the Phone Patch Unit.
- Arrow T Mount the plugs P102-P103-P104 to J102-J103-J104.
- 8.1 Mount the cables from the power supply N1401, the battery charger N1404 and the emergency light to the Supply Terminal Block. (S.T.) See drawing Interconnection Diagram for Dual Rear Contactboard and Supply Terminal Block.
- Arrow U Fasten the multicable from H1218 and the two cables from the Center Panel H1222 as shown. Use the cable clips from Bag.L.

PHOTO 9

- Arrow V Mount the cover plate.
- Arrow X Adjustment hole for Phone Patch ballance.
- Arrow Y Mount the hatch with the frequency table. Use the screws from Bag.K.
- 9.1 Mount the Center Panel H1222. Use the screws from Bag.K.
- 9.2 Mount all the units in the cabinets.

PHOTO 0



Mounting instructions for
Sailor Tandem station A

PHOTO 1

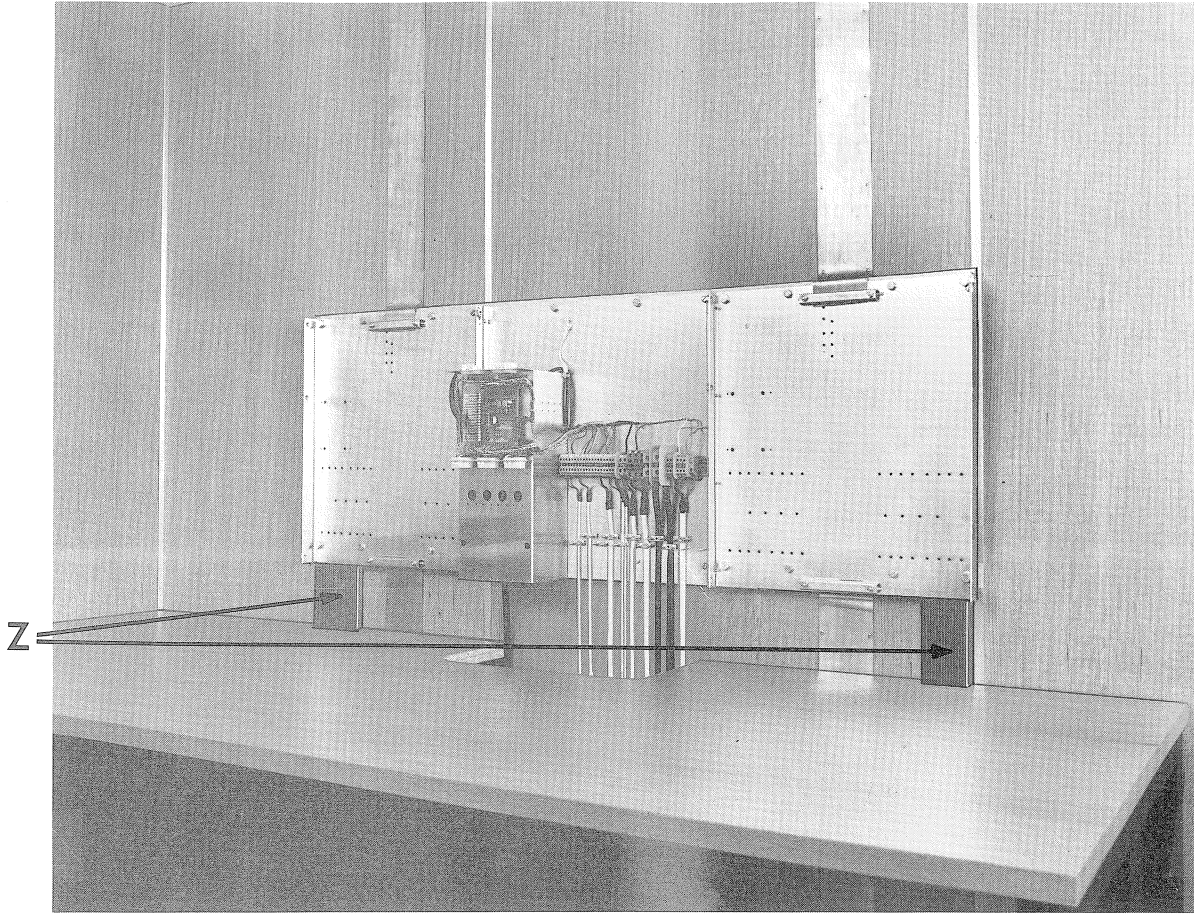


PHOTO 2

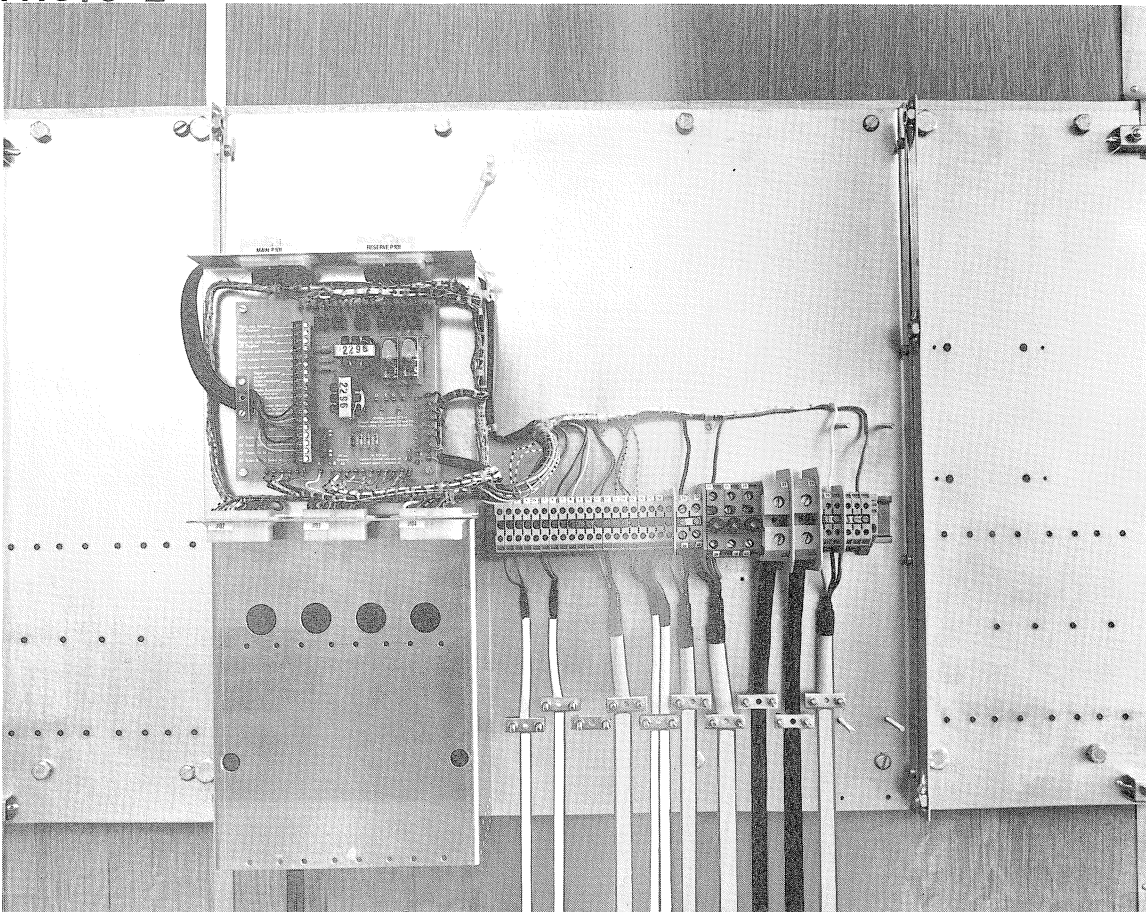


PHOTO 3

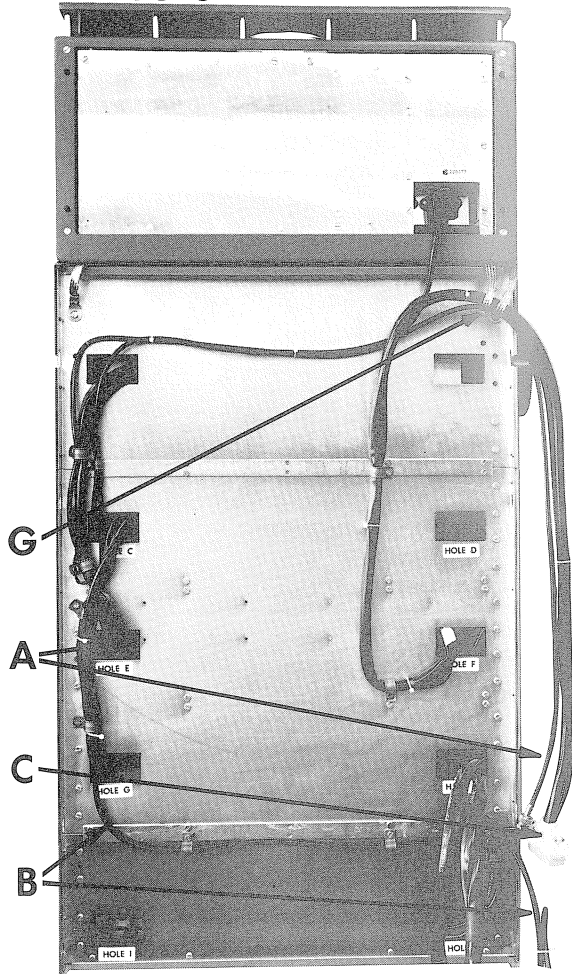


PHOTO 4

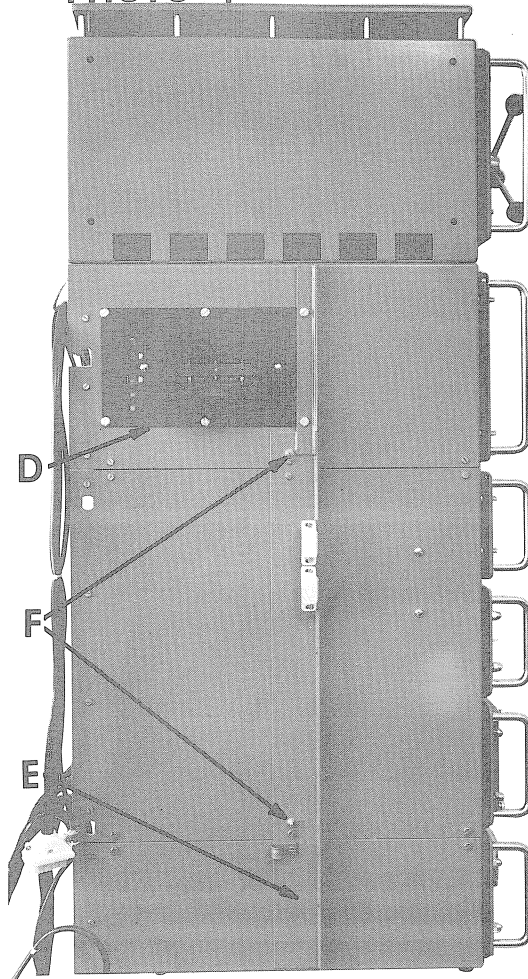


PHOTO 5

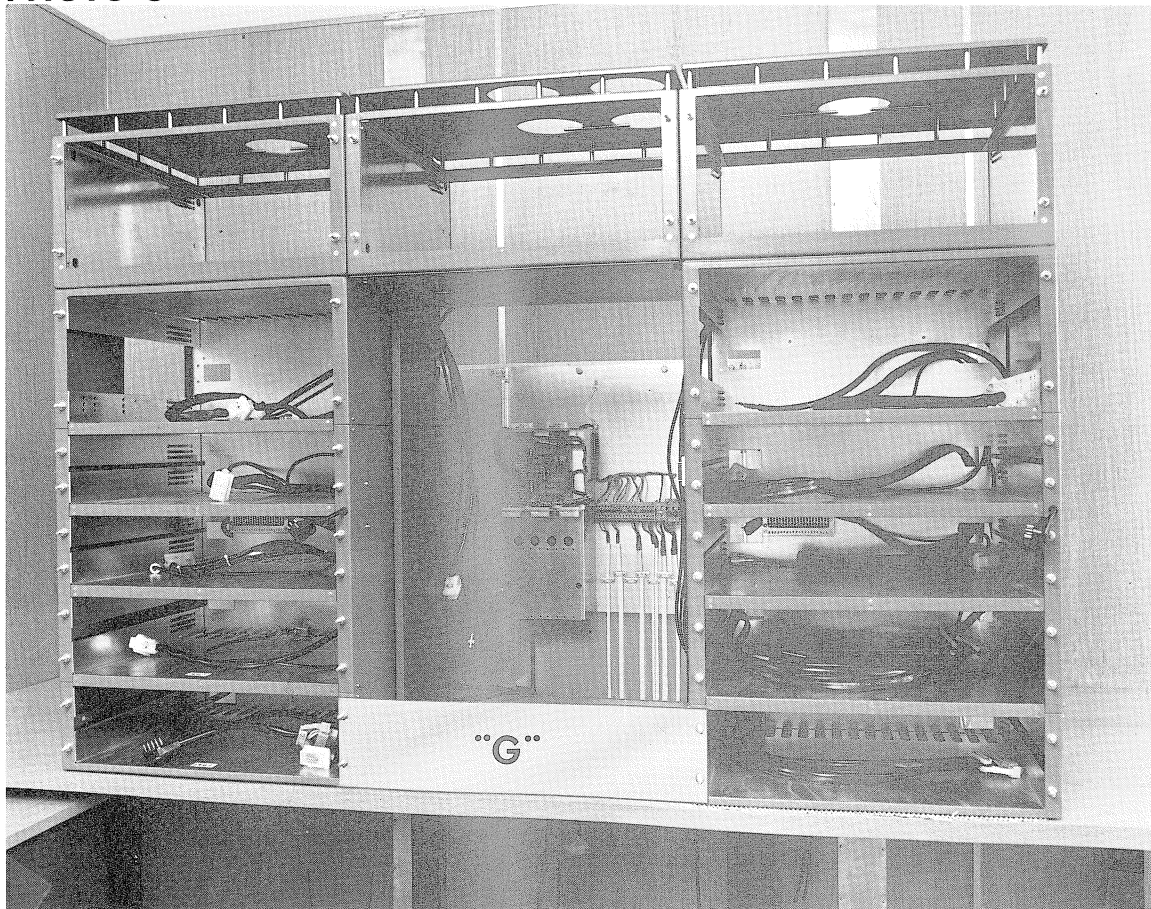


PHOTO 6

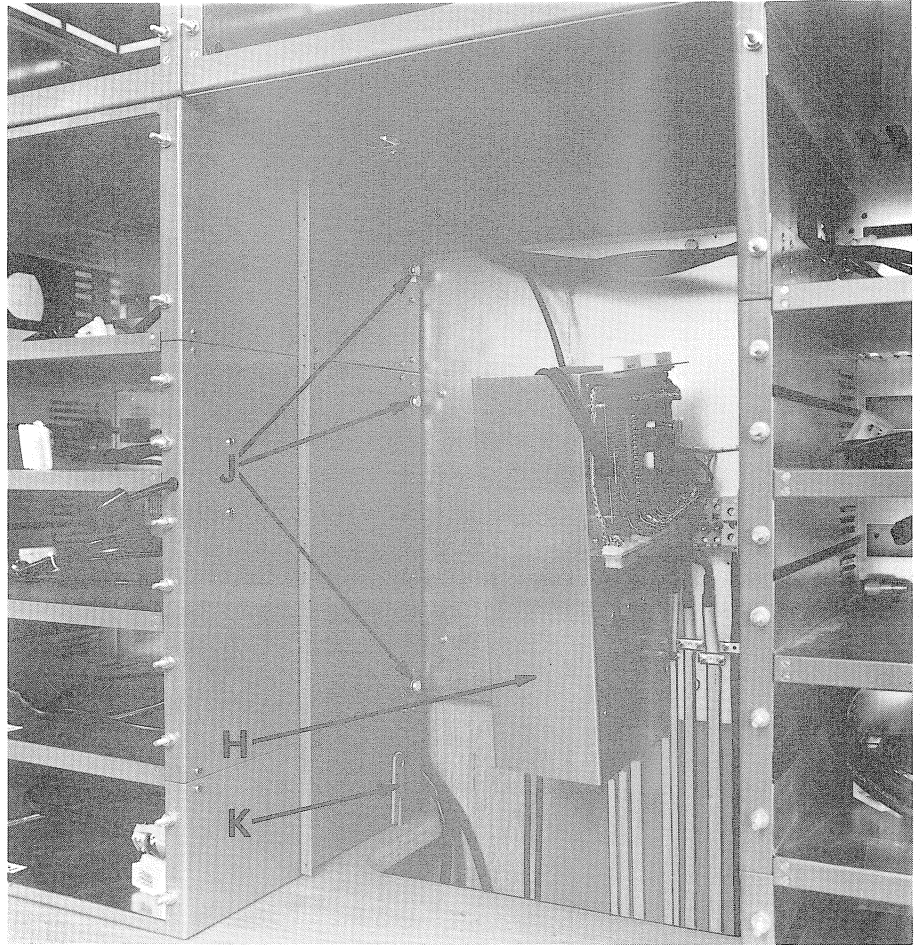


PHOTO 7

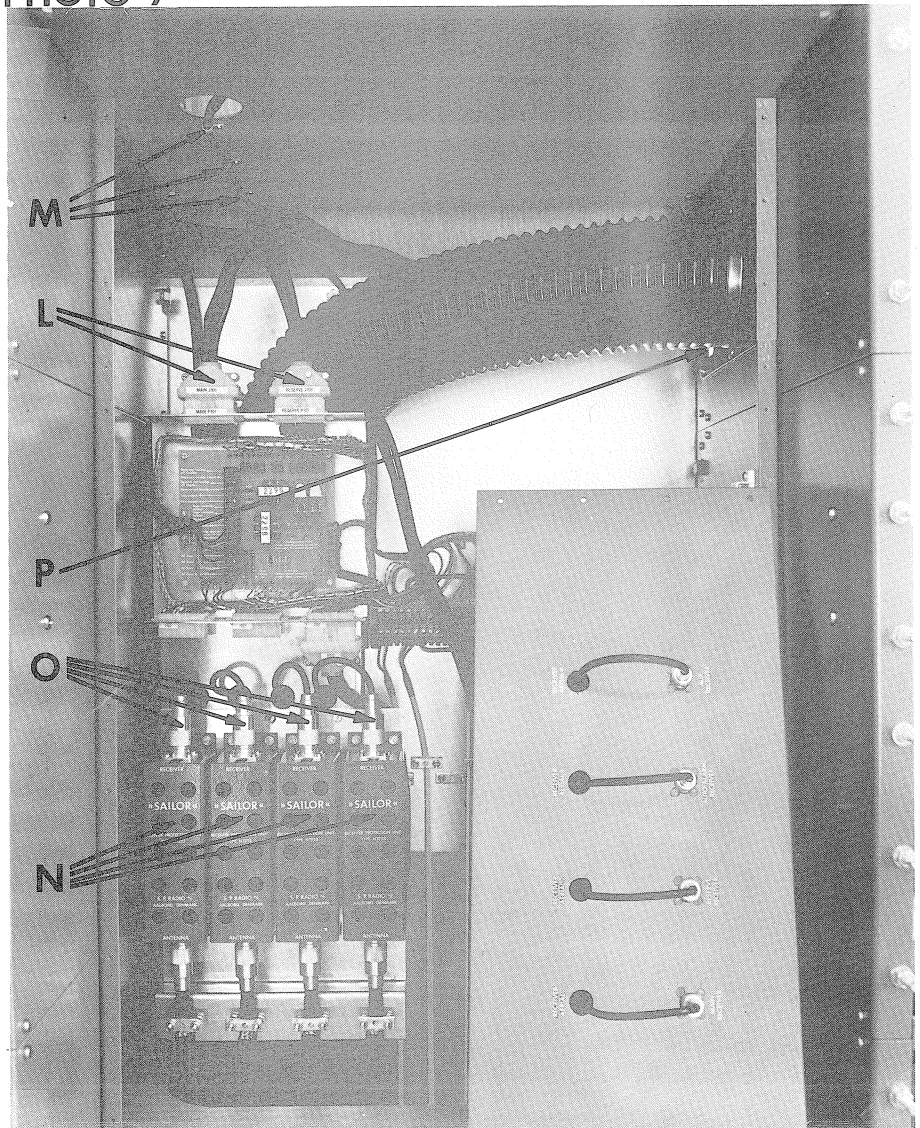


PHOTO 9

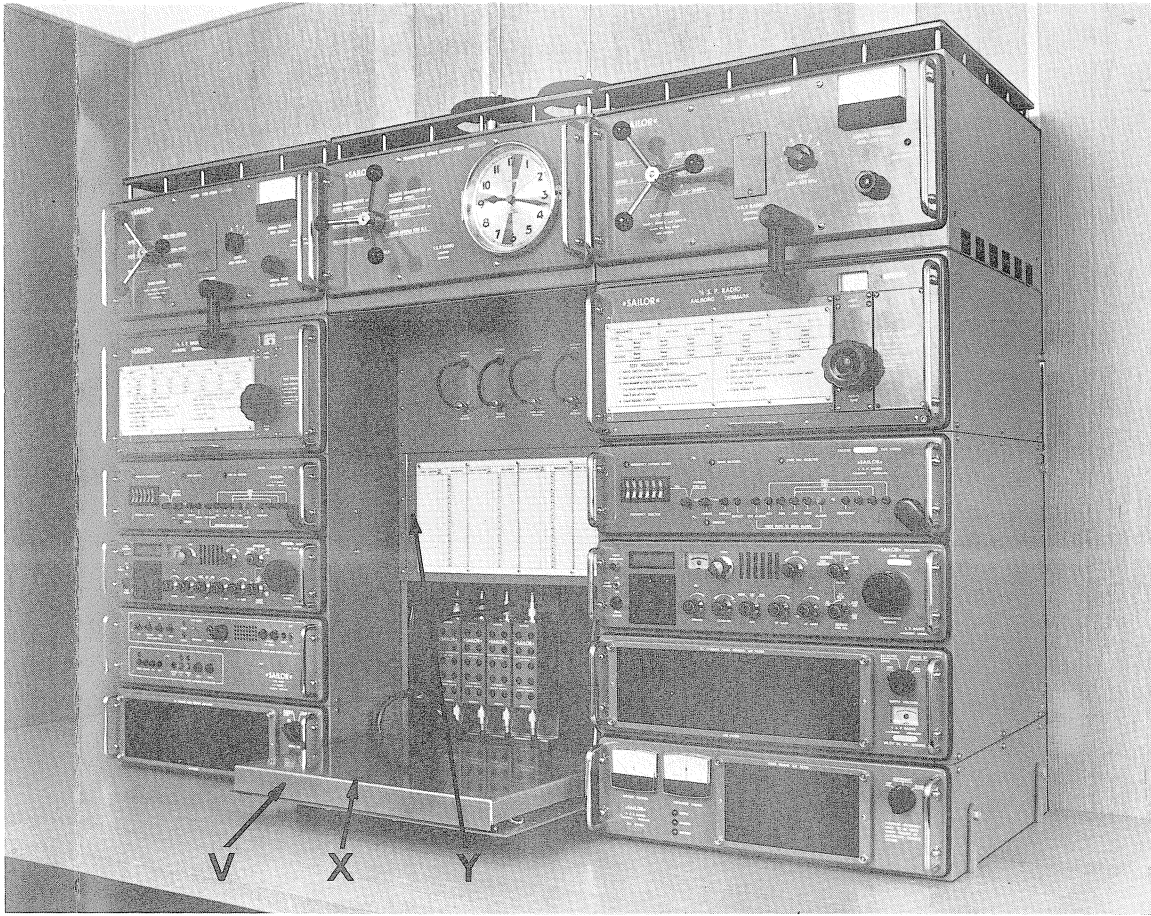
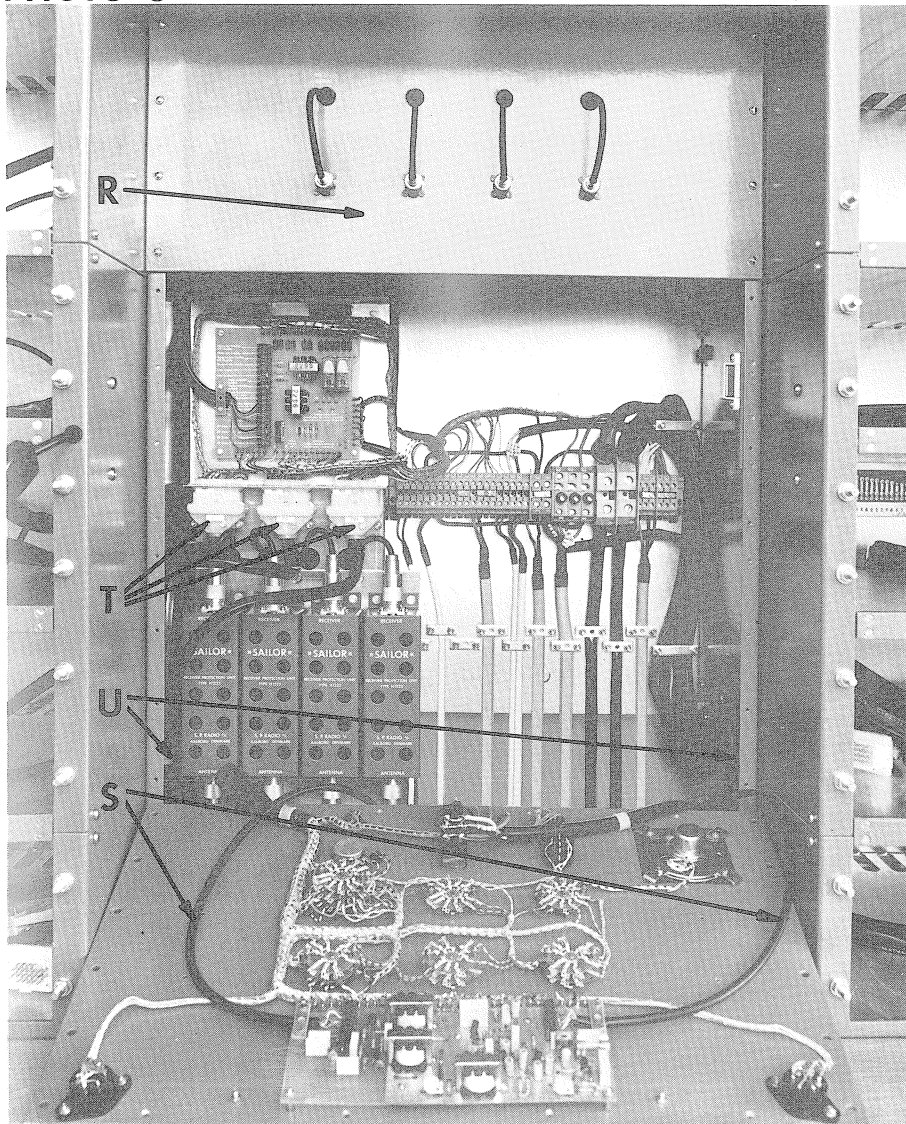
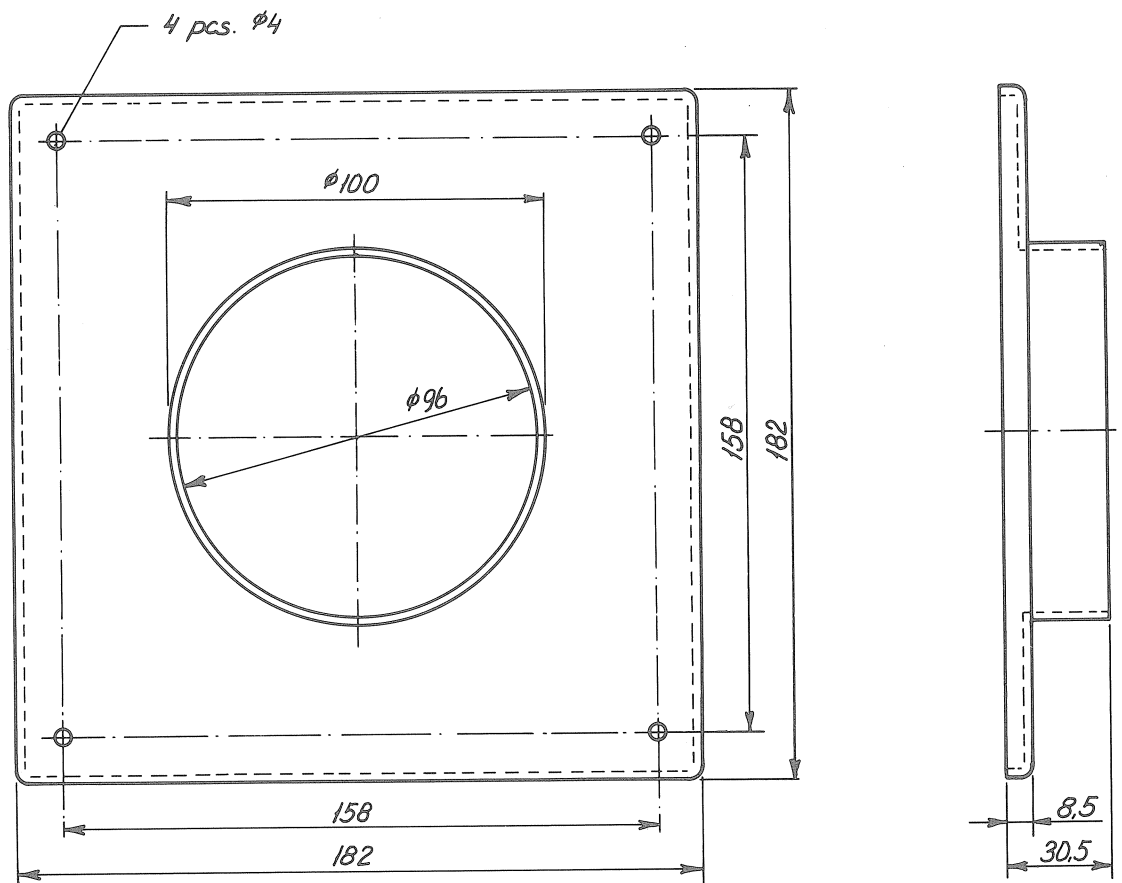


PHOTO 8





Wall flange. Tandem Station

Note 1.

All shipyard supply cables have to be Butyl P.C.P. Screened and earthed at each end.

Note 2.

Minimum bending radius of cable 100 mm.

Note 3.

Requires 2x16 Amp. Supplies.

Recommended supply cables:

110-117V AC conductor - diameter = 2.5 mm²
 220-240V AC conductor - diameter = 1.5 mm²

Note 4.

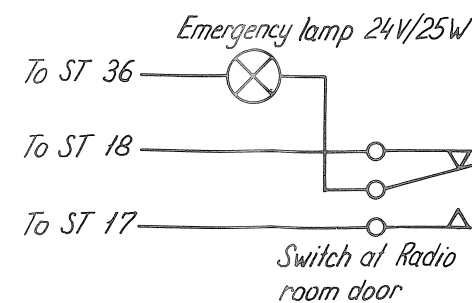
24V DC SUPPLY CABLES

Max. voltage drop allowed between the batteries and short wave set is 0,66V at max. 70 Amp. power consumption, on basis of which the adjoining table for 24V DC supply cables has been set up.

Distance between battery and short wave set	Min. cable diameter in mm ² : □
1,5 m	6 mm ²
2,4 m	10 mm ²
3,8 m	16 mm ²
6 m	25 mm ²
8,3 m	35 mm ²
12 m	50 mm ²
16,5 m	70 mm ²

Note 5.

Emergency light installation in radio room.



Note 6.

DF receiver switch: Max. 1 Amp. 24V DC
 Contact closed in DF pos.: Connect J to K on Dual Rear Contact Board.
 Contact open in DF pos.: Connect J to L on Dual Rear Contact Board.

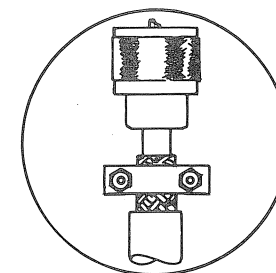
Note 7.

Mute: Supply Terminal Block S.T. 3-4
 Contact closed when transmitting: Connect C to E and F to H on Dual Rear Contact Board.

Contact open when transmitting: Connect C to D and F to G on Dual Rear Contact Board.

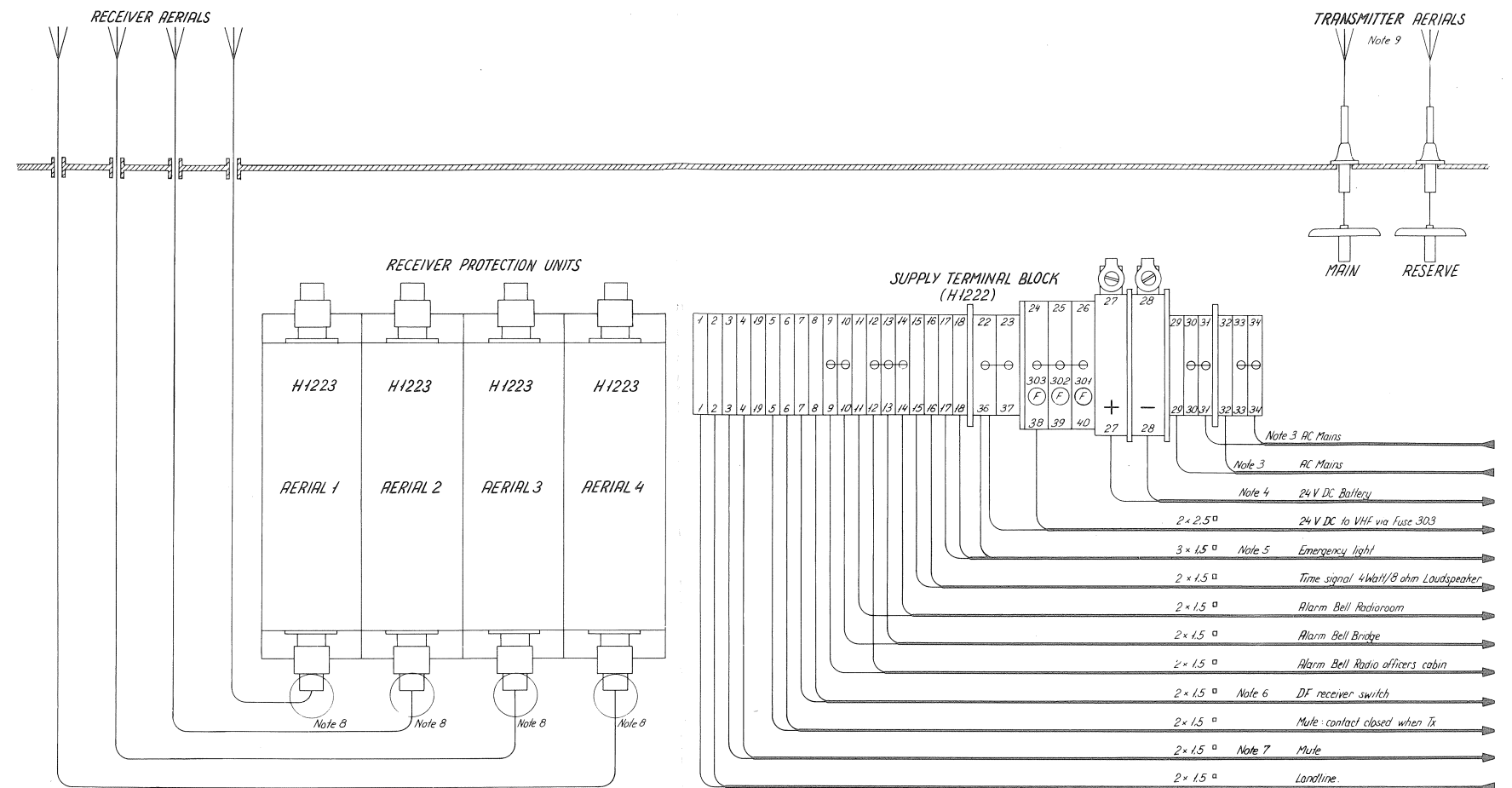
Note 8.

Receiver coaxial cable.
 If 50 ohm coaxial cable RG213U is used, the cable has to run in steel tube (conduit). If 50 ohm triaxial cable H1213 (S.P. Radio) is used, outer screen has to be earthed at console end only.



Note 9.

Recommended main and reserve transmitter aerials.
 Whip aerial from DUK Antennen STA 150 C - HF/MF
 Whip aerial from TjøSTHEIM Antennas AS 9 STX
 Wire aerial: Length between 15 and 22 m.



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WIRING TO
SAILOR TANDEM STATION

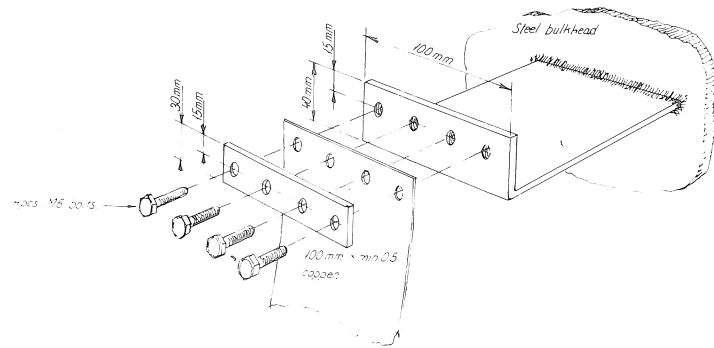
H 1222

Note 1.

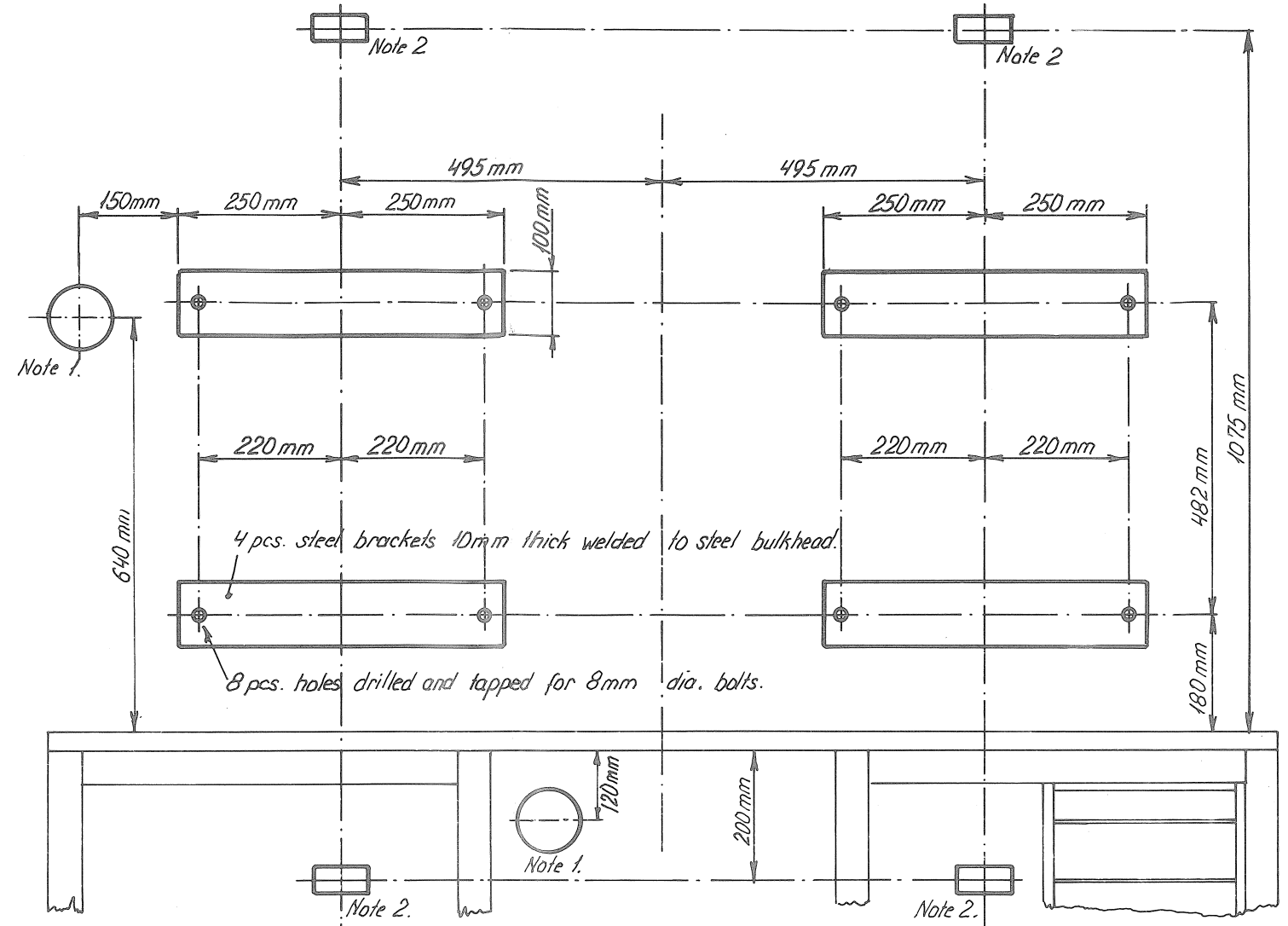
The position for the exhaust vents (non return) to outside of superstructure, is shown as close as possible to the radio station. They can be placed in the radio room, where it is convenient.
 Max. Temperature for air outlet is 50° C.
 Diameter of AIR OUTLET COUPLING FLANGE H1221 is 100 mm.
 Vent Pipe Data: Max. 130° C., min. diameter 100 mm.

Note 2.

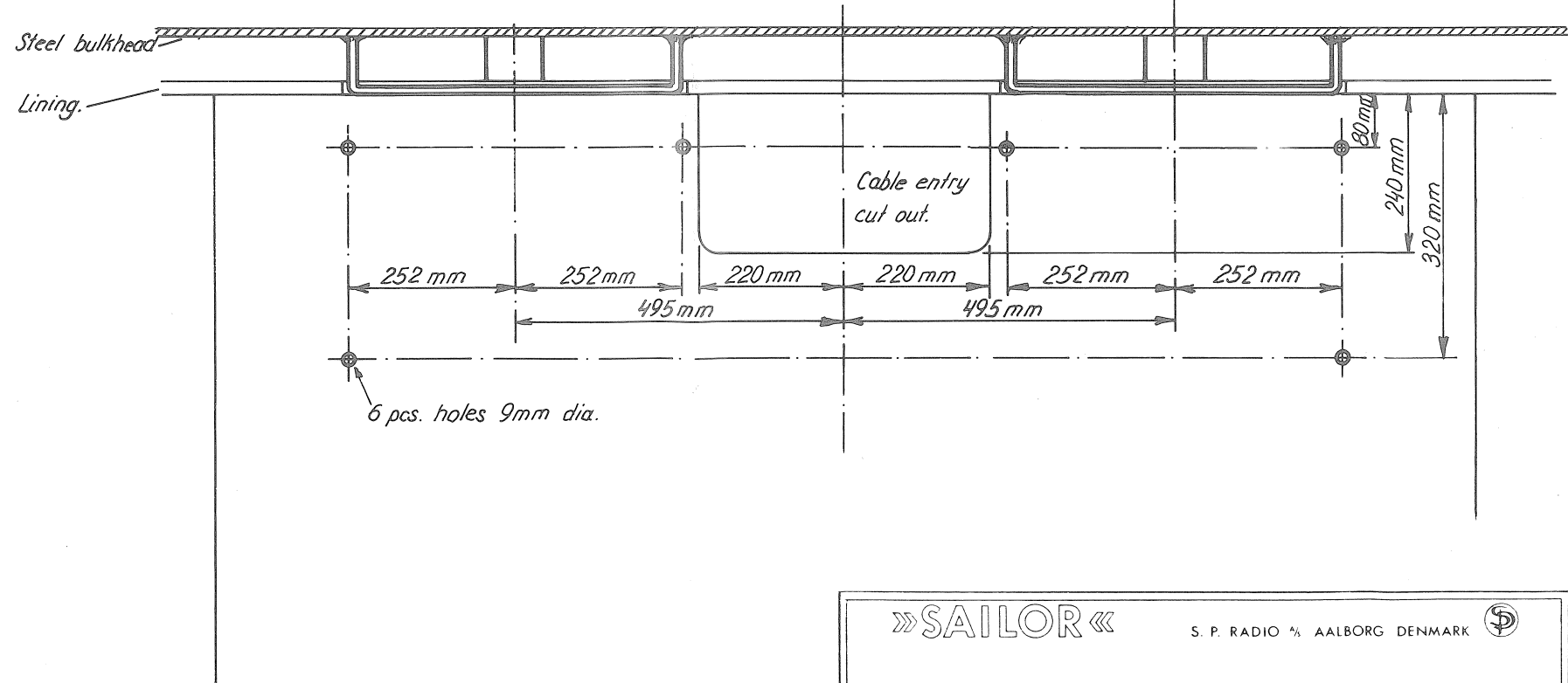
The Earth Stubs to be made of Stainless Steel (18-8-3).
 The Earth Stubs must be welded to the steel bulkhead with ESAB welding rod OK6775.



BULKHEAD DRILLING PLAN



DESK TOP DRILLING PLAN

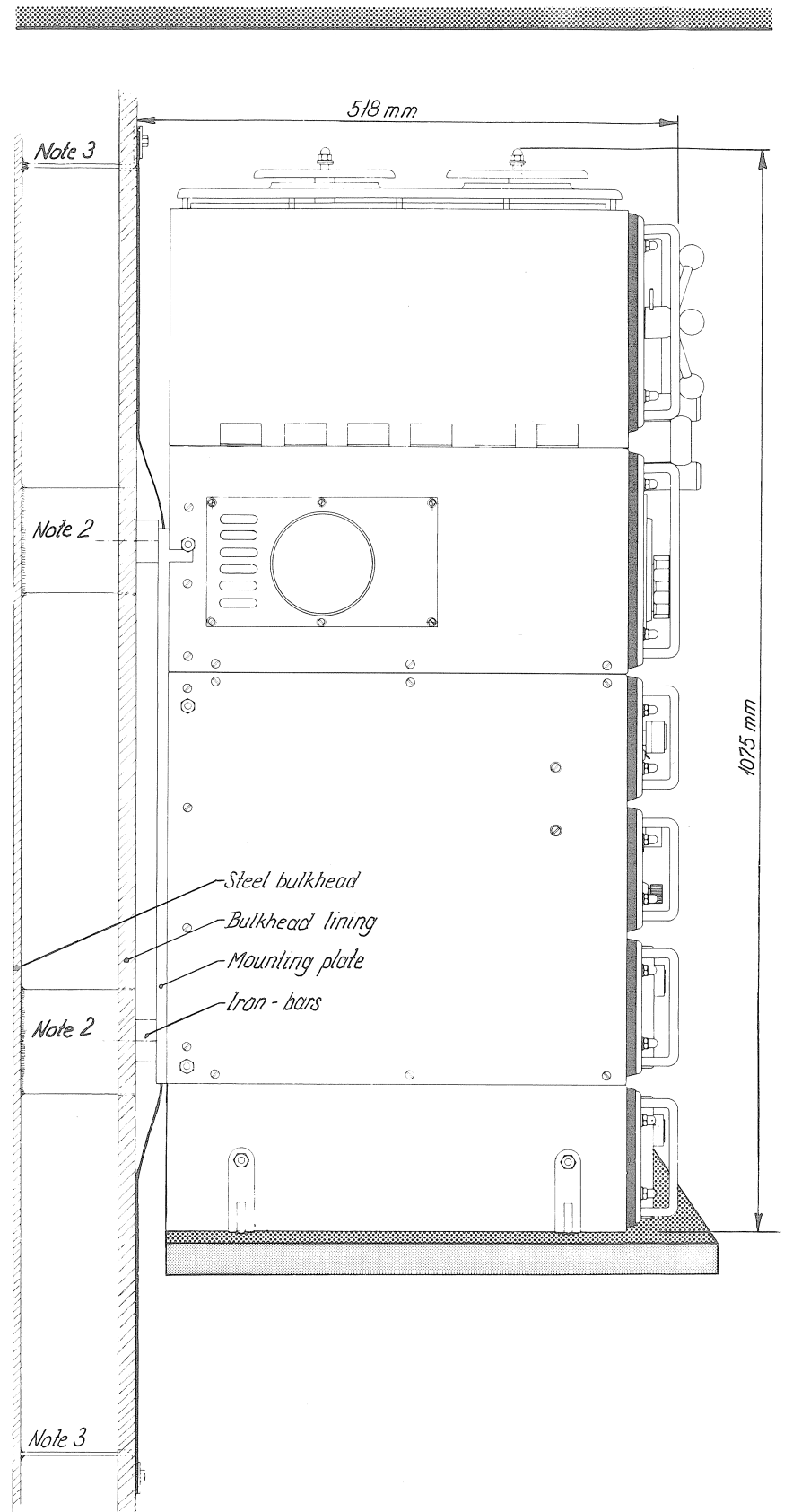
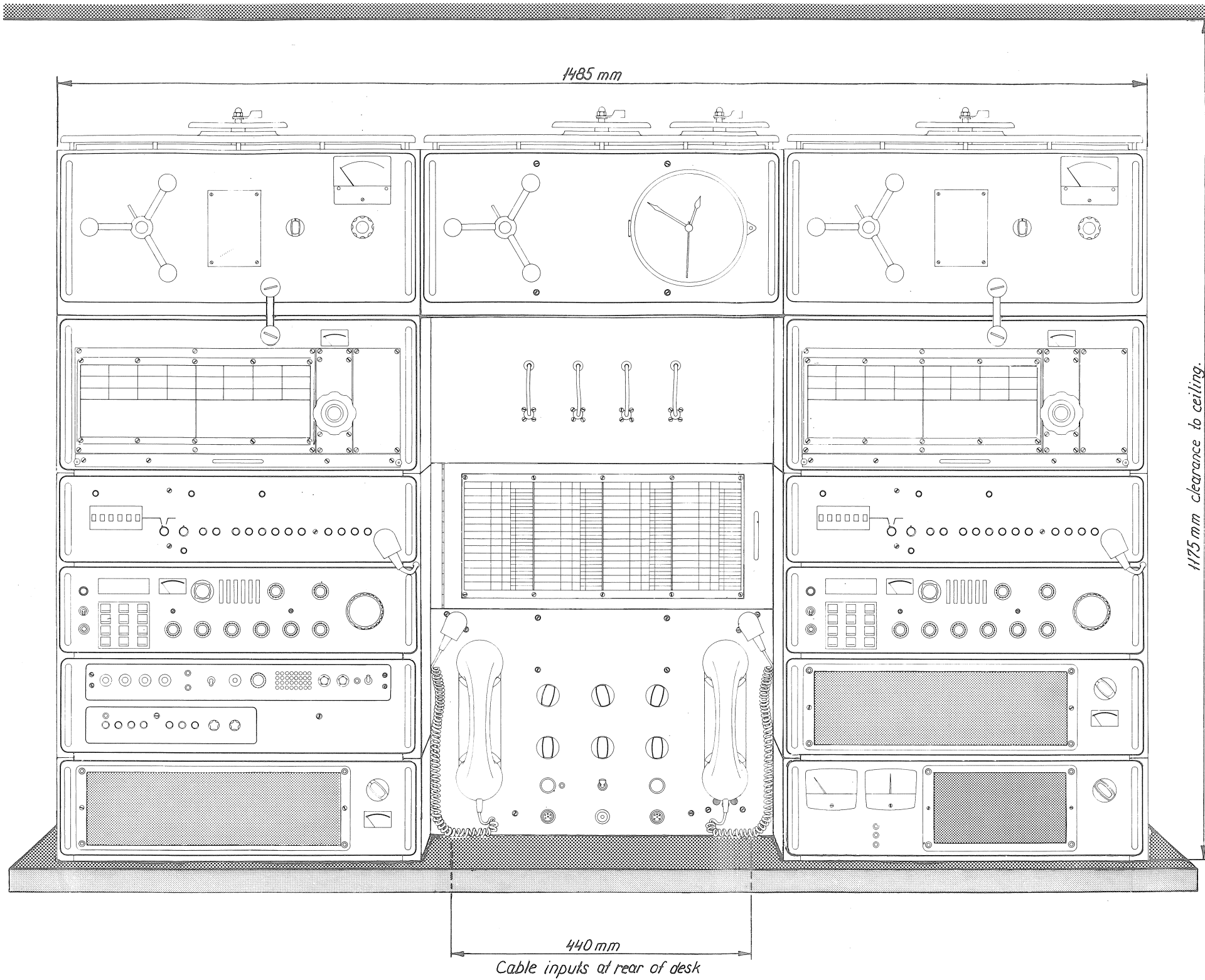


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DRILLING PLAN FOR
 SAILOR TANDEM STATION



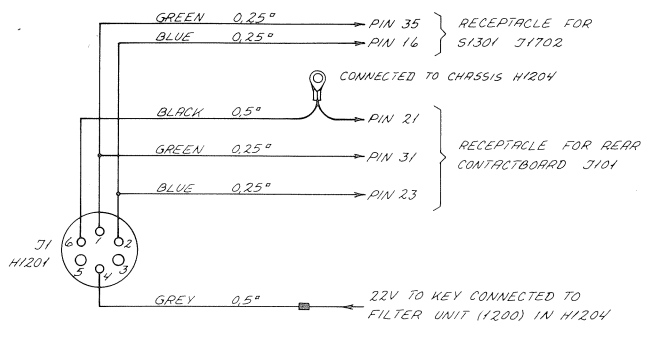
Note 1.
Weight of Console 400 kg.
Desk construction to suit.

Note 2.
Steel mounting brackets
100 mm x 500 mm and 10 mm
thick welded to bulkhead.

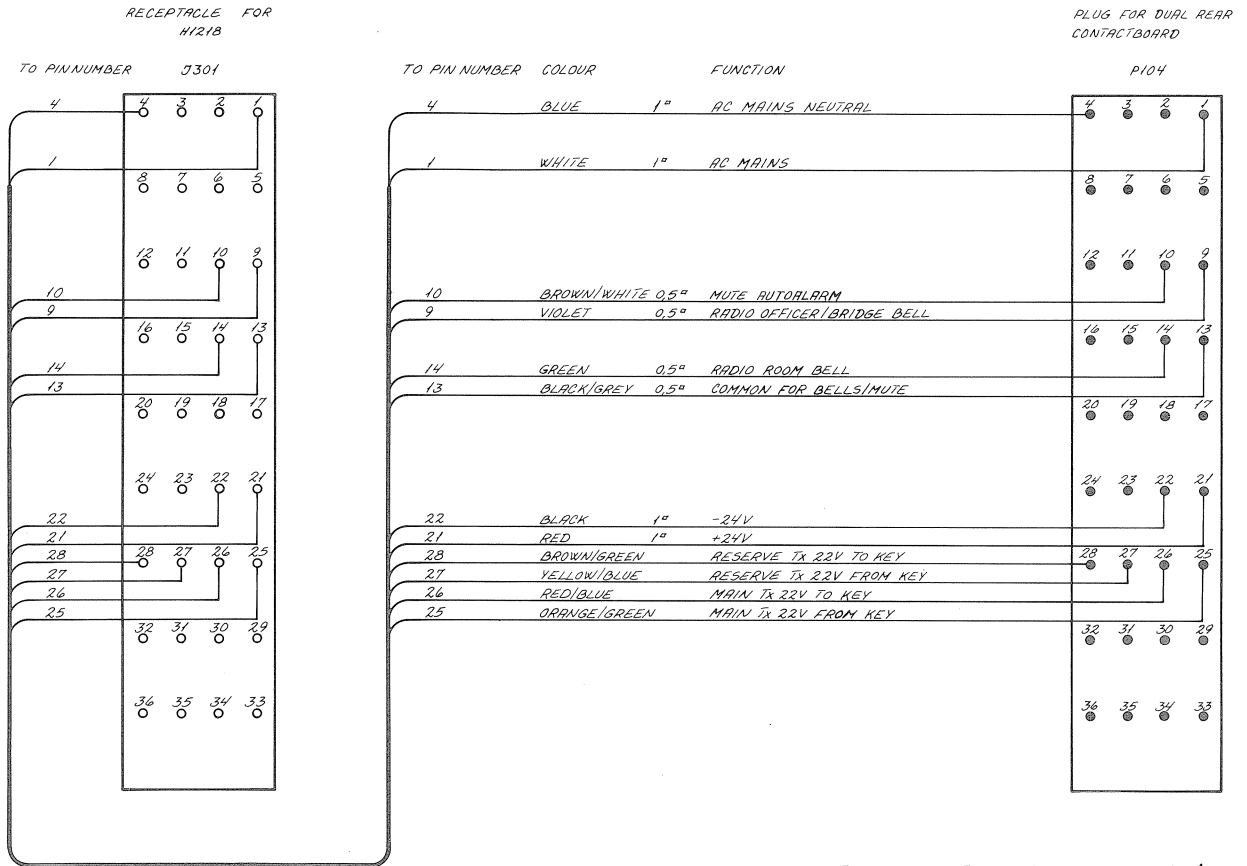
Note 3.
Earth stubs. See Drilling Plan.

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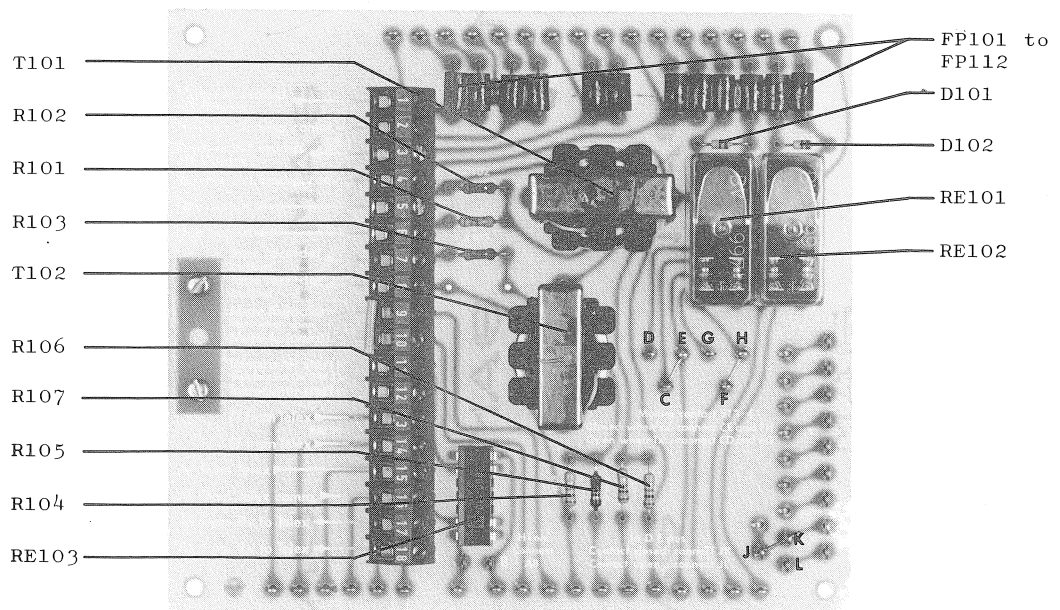
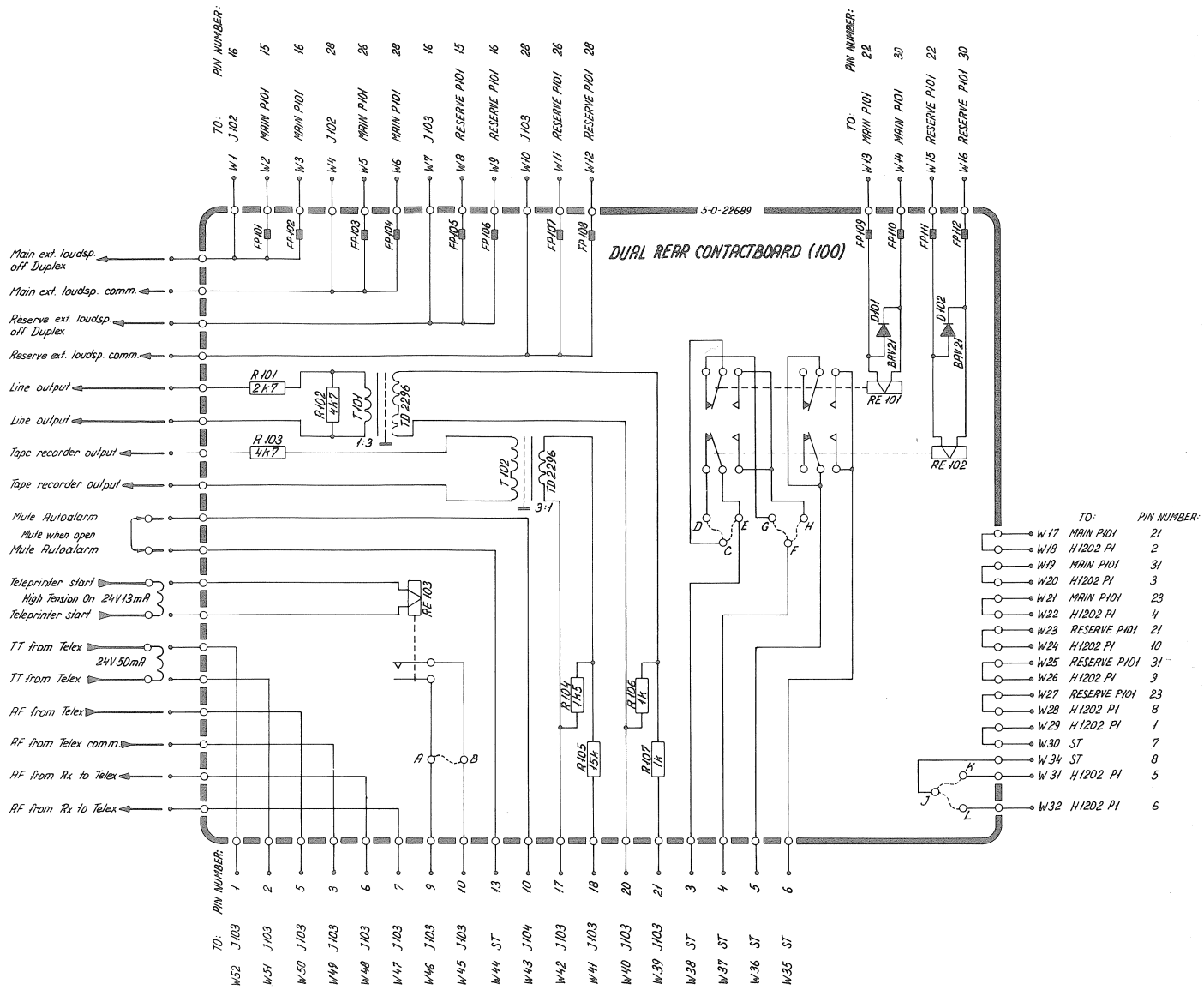
DIMENSIONAL DRAWING FOR
SAILOR TANDEM STATION



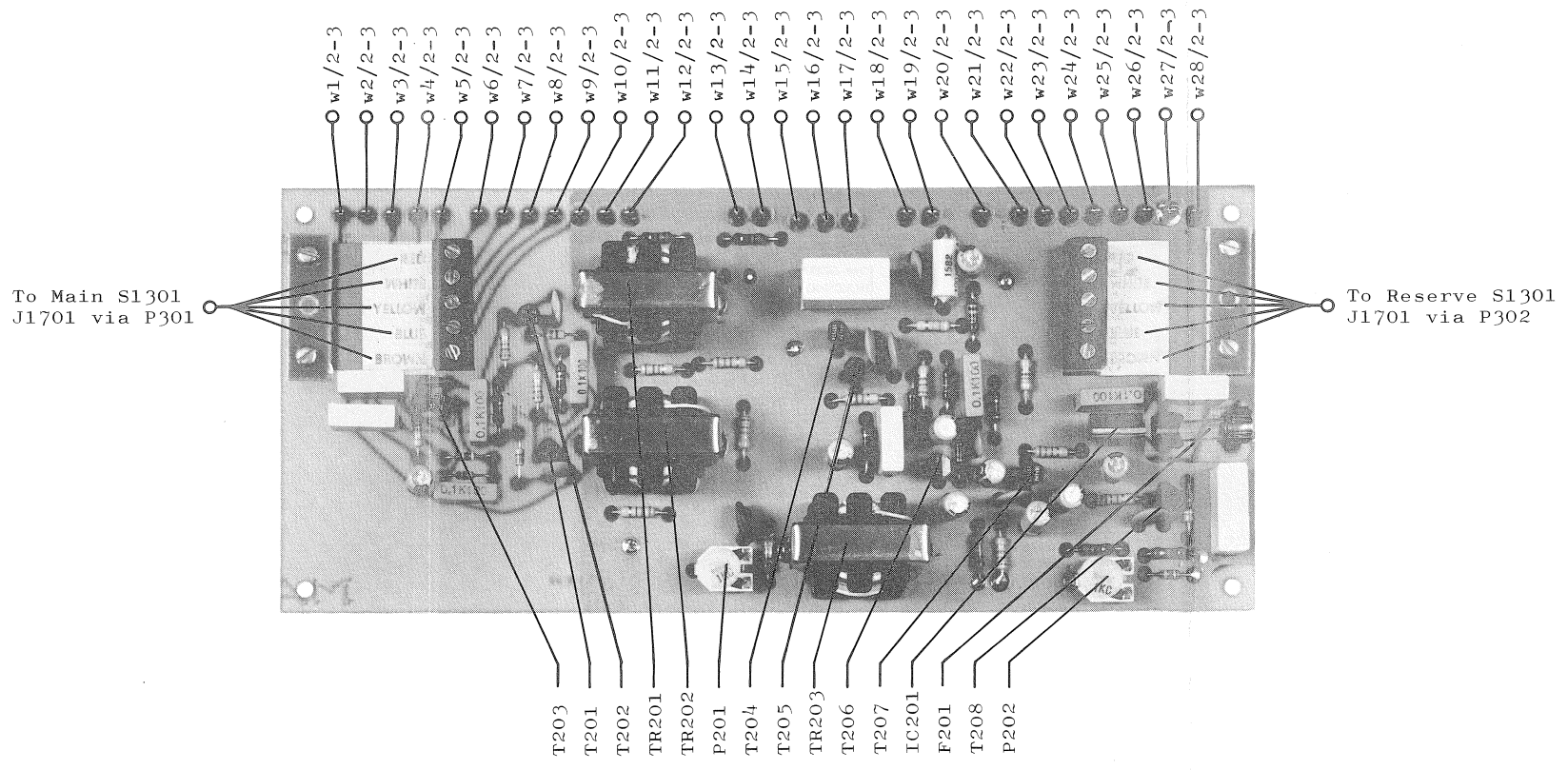
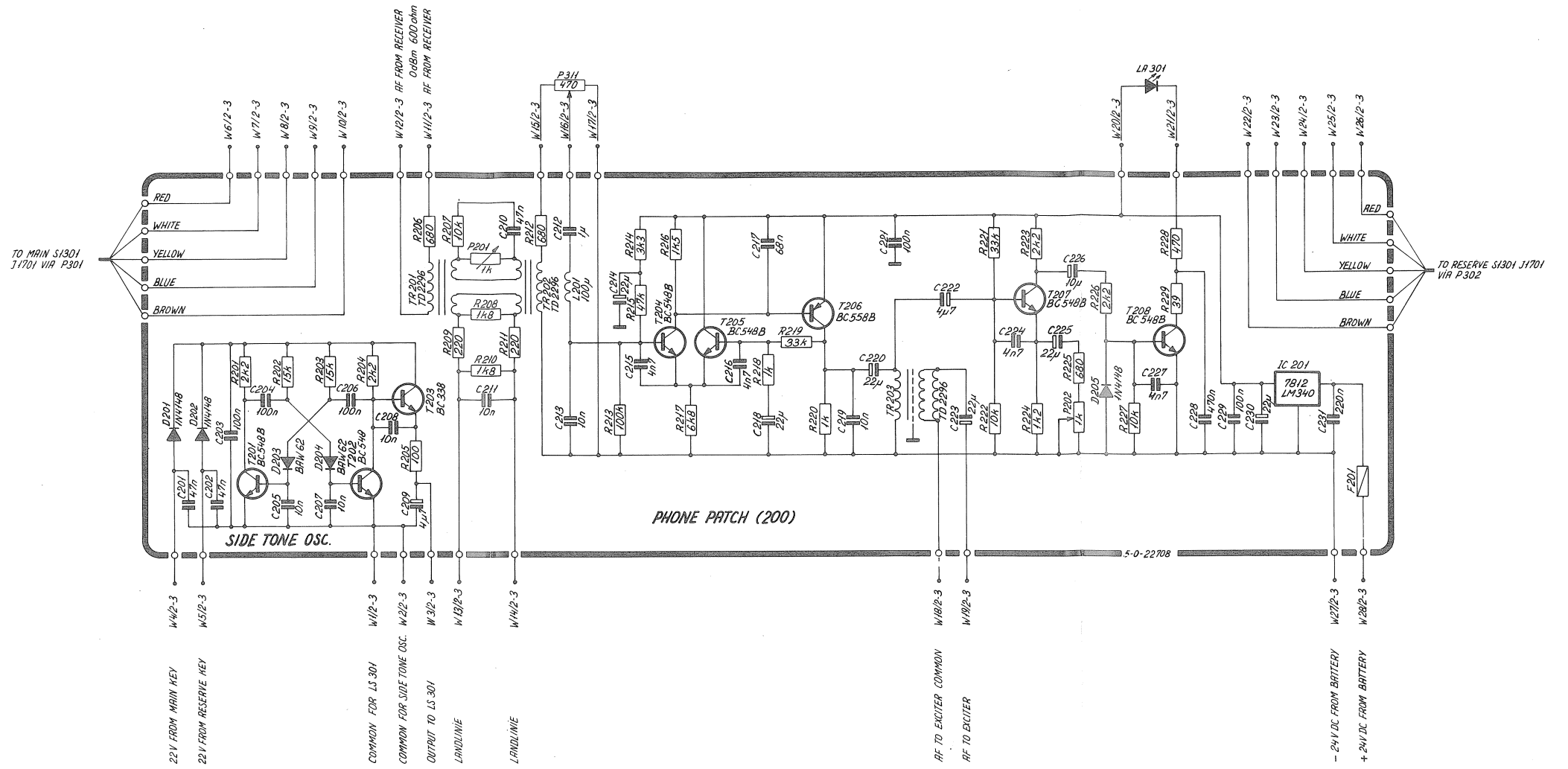
INTERCONNECTION CABLE H1201/H1202 AND S1301

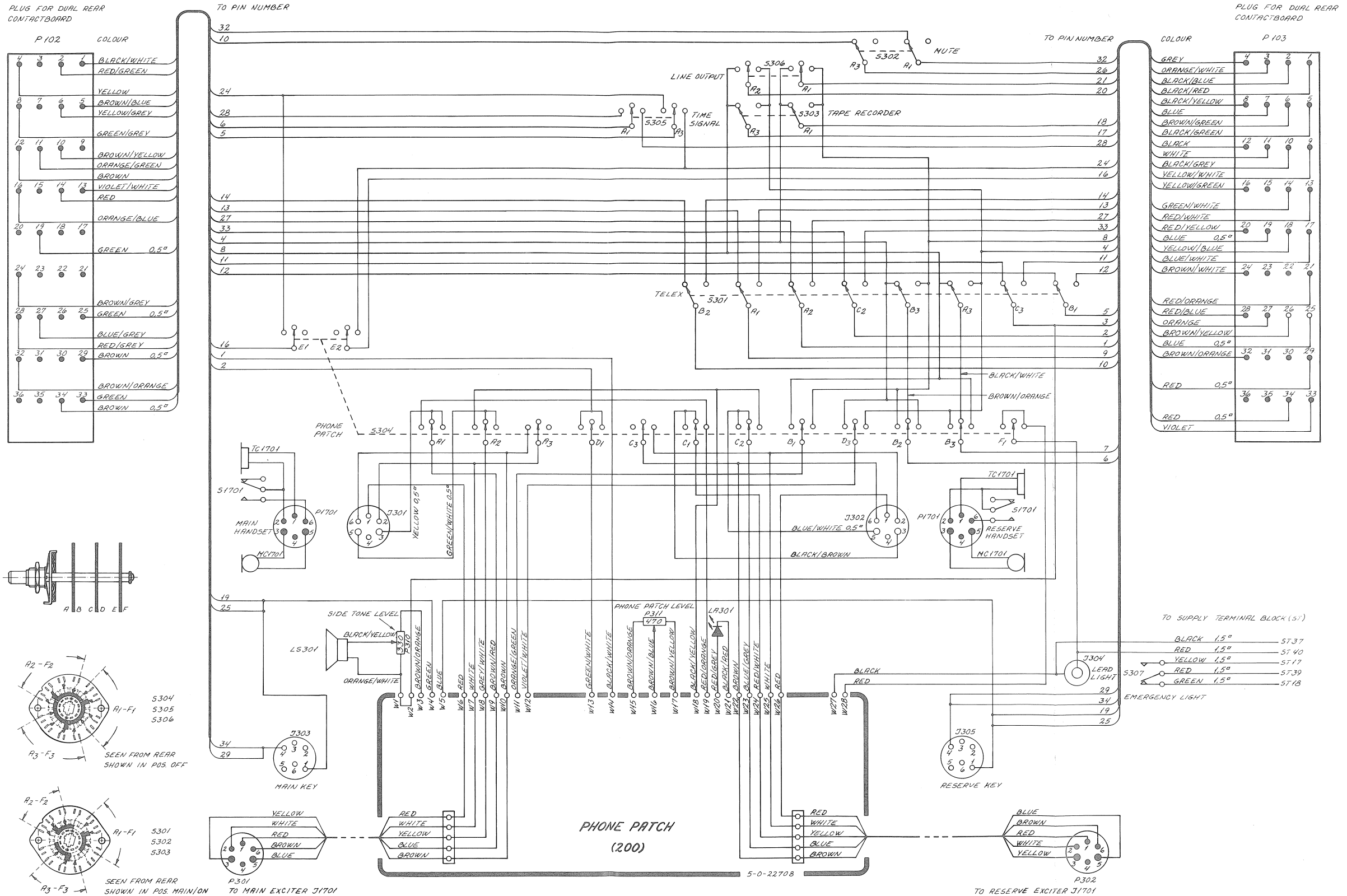


INTERCONNECTION CABLE H1218/
 (A) DUAL REAR CONTACTBOARD H1222



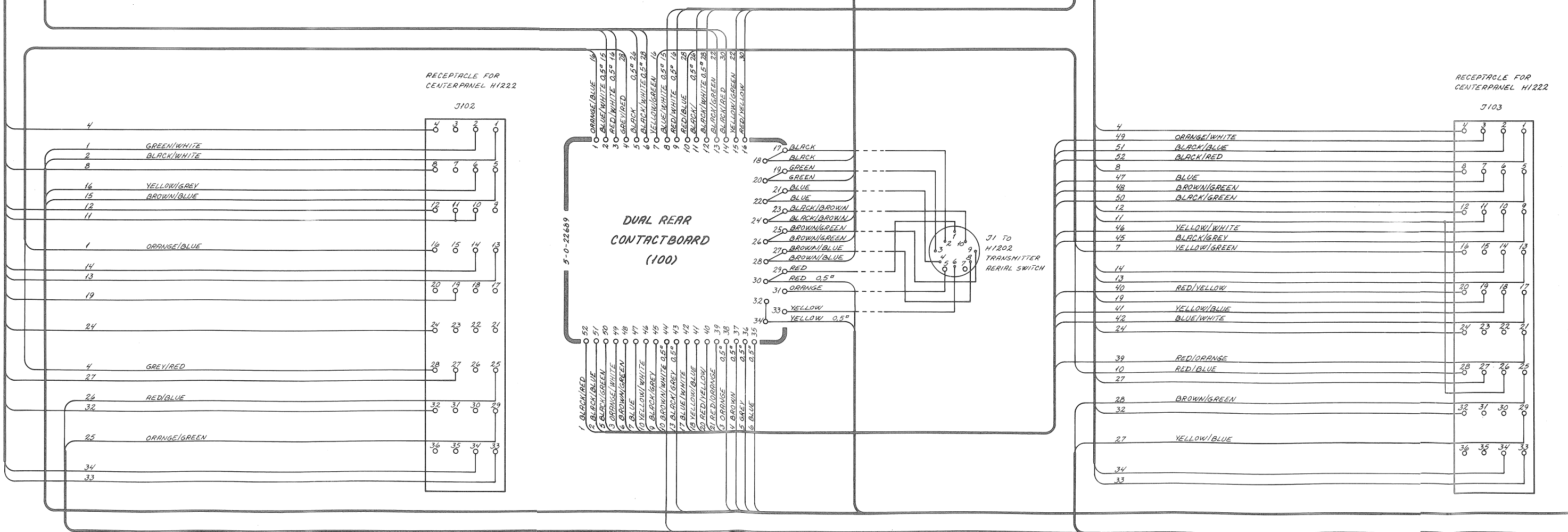
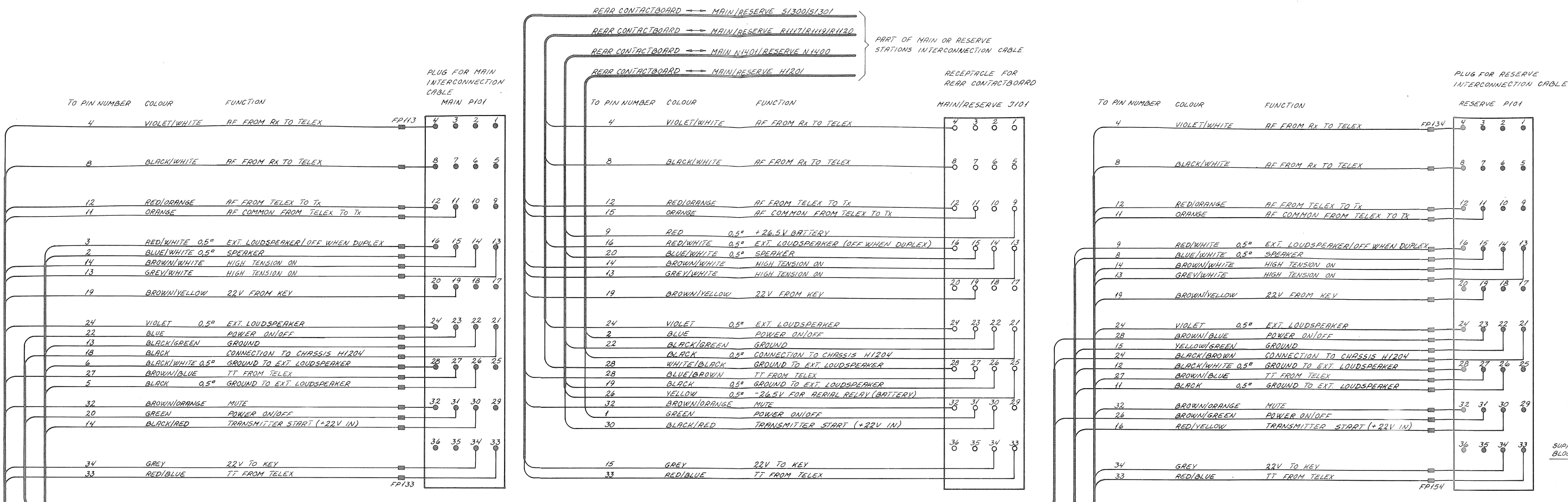
DUAL REAR CONTACT BOARD



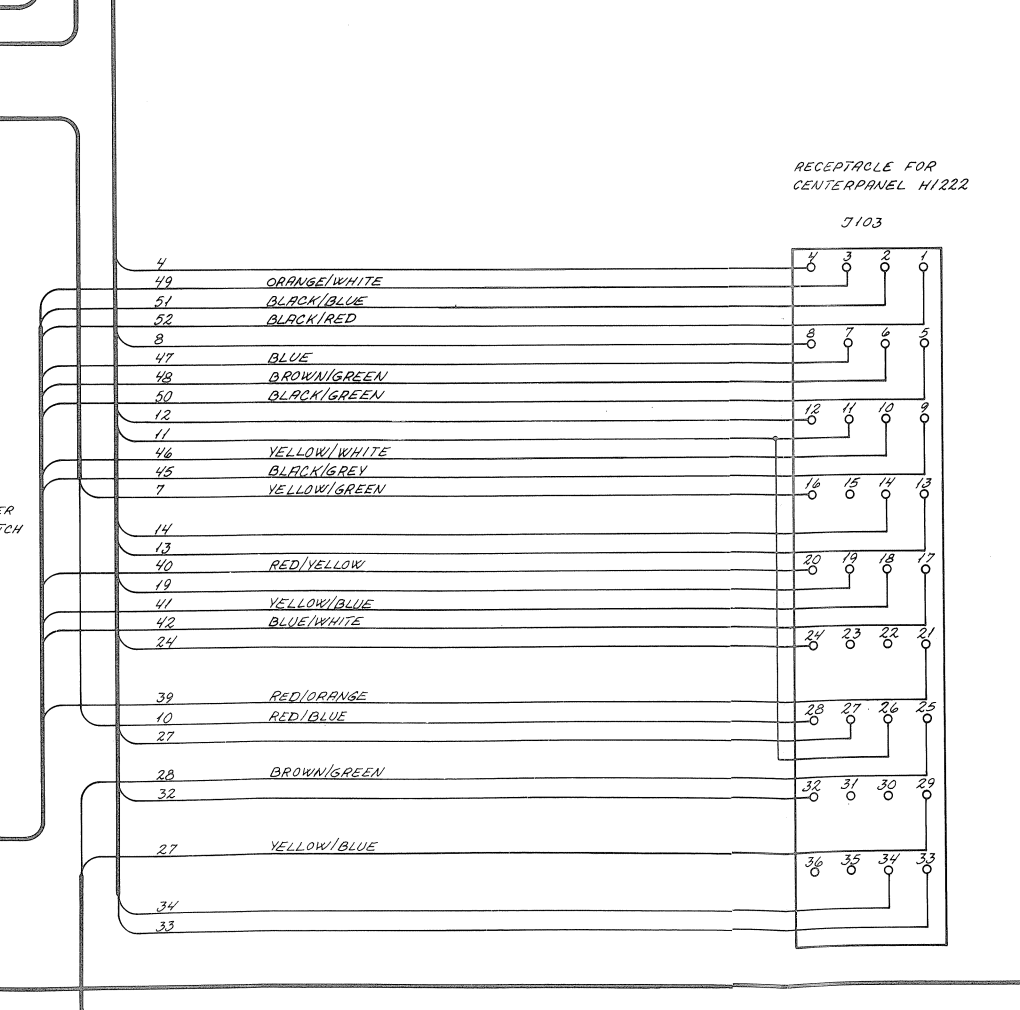
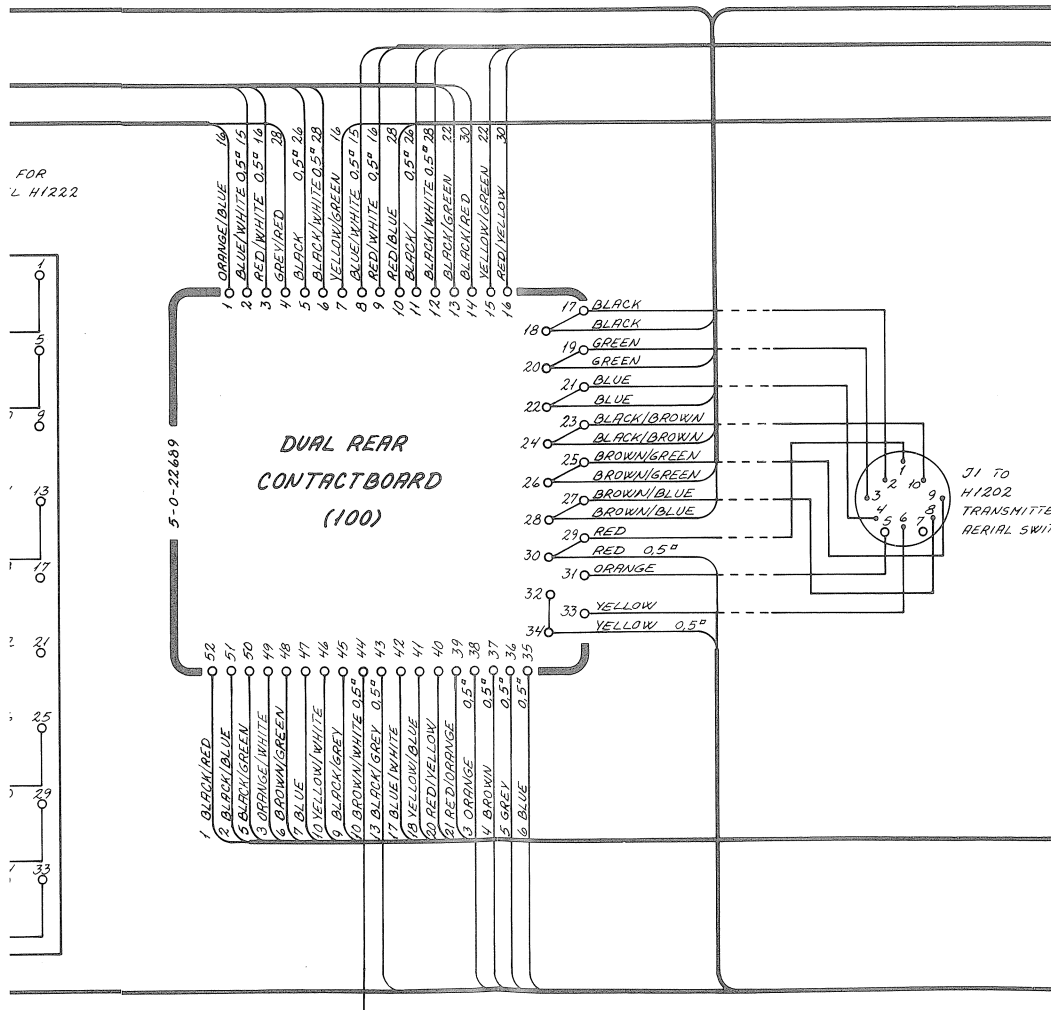
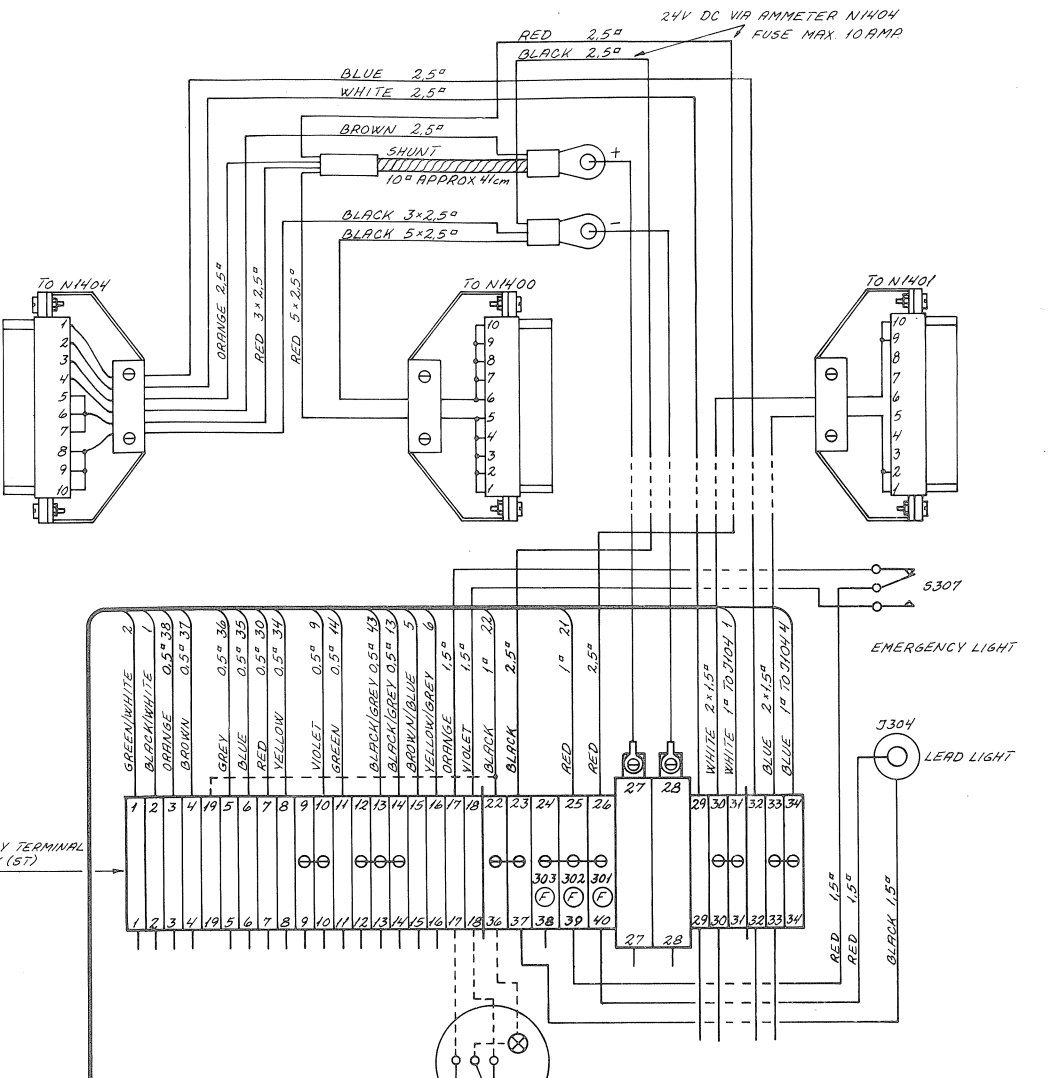
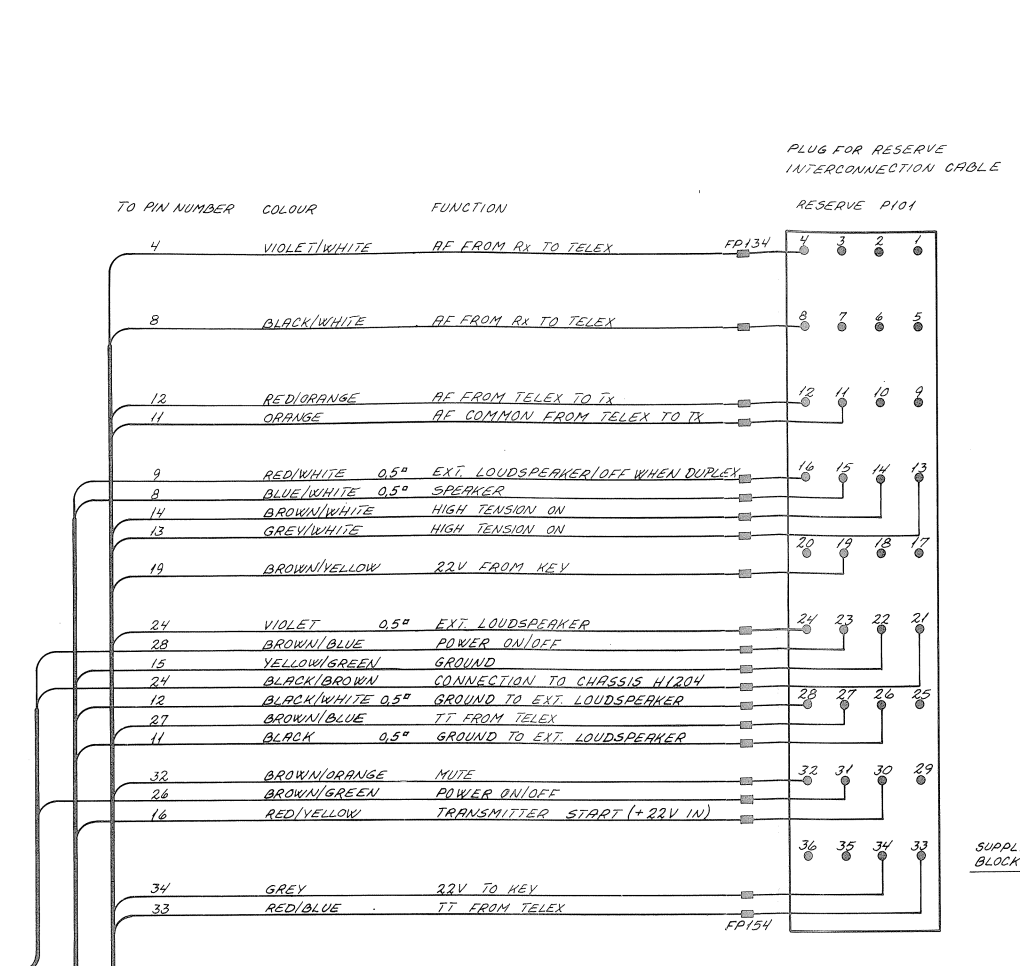
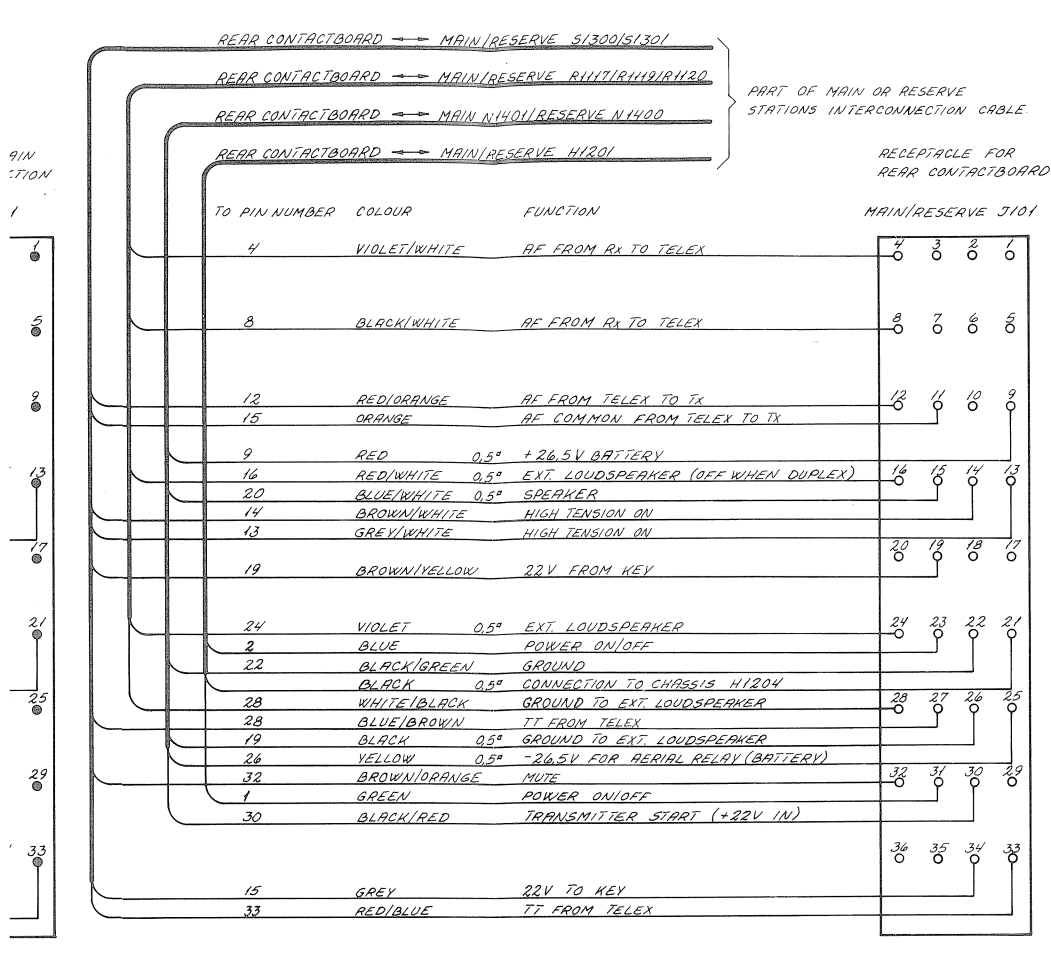


PLUG IS SEEN FROM BEHIND. WHEN NO WIRE SIZE IS GIVEN, THE SIZE IS 0.25"

(A) DIAGRAM FOR CENTERPANEL HI222

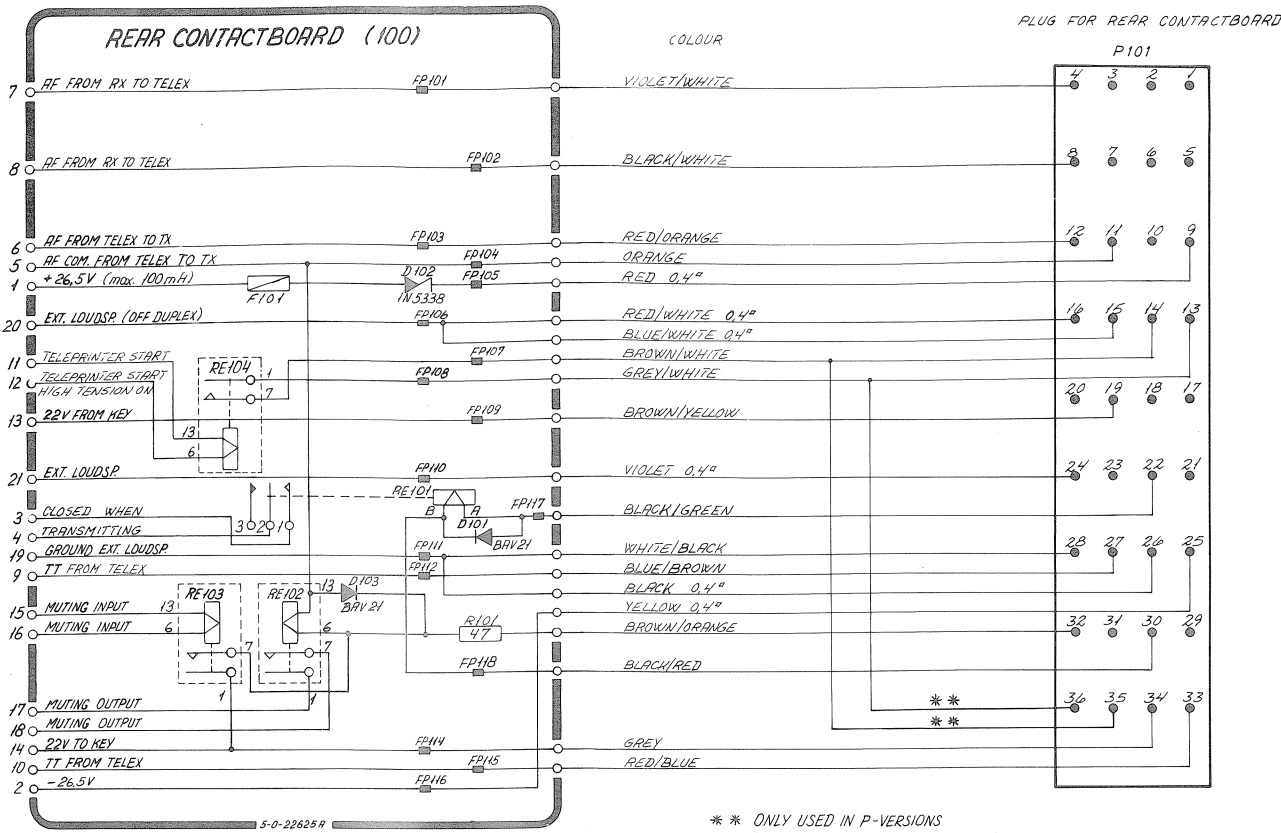


SUPPLY TO BLOCK (5)

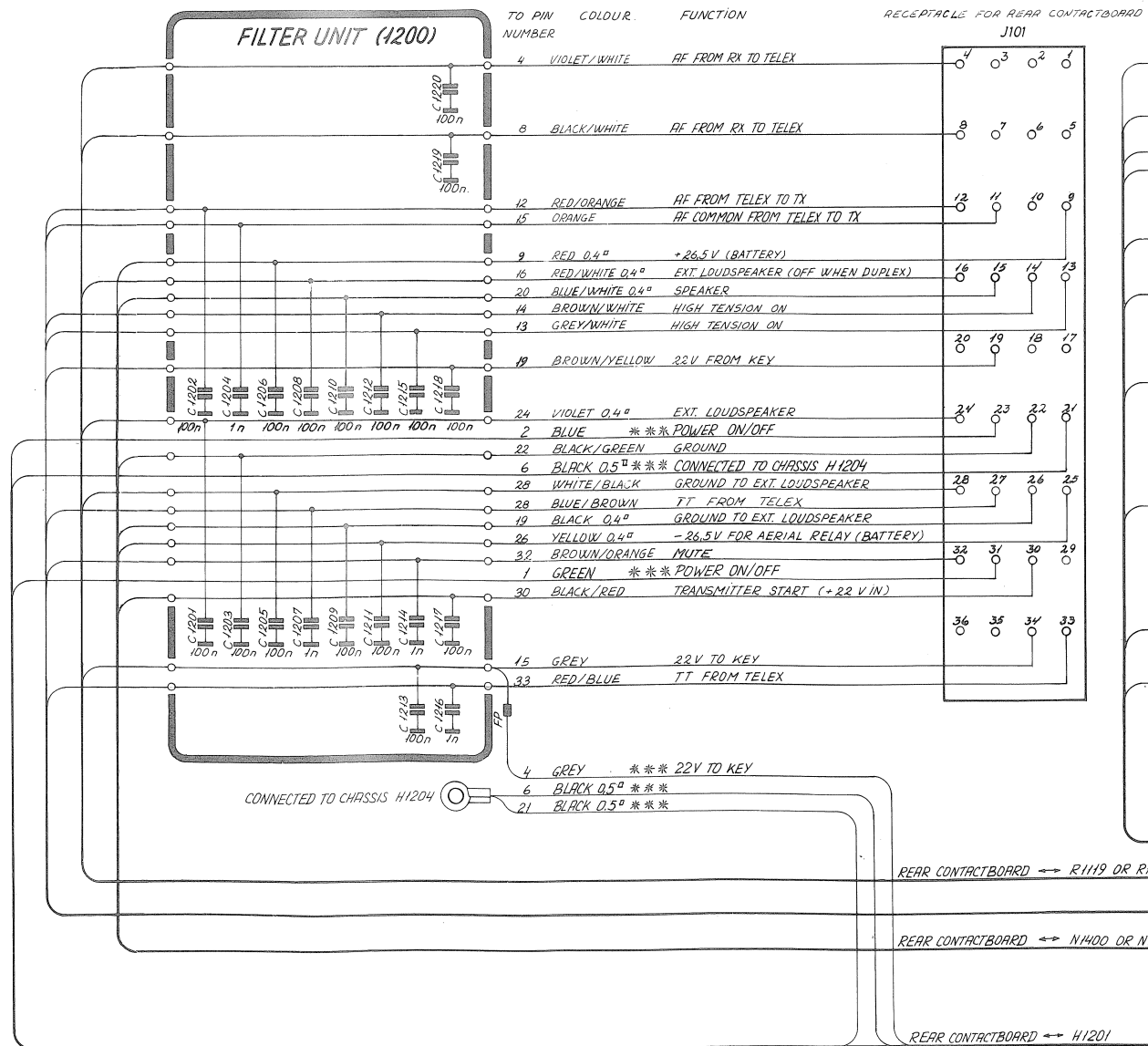


RECEPTACLE IS SEEN FROM THE FRONTSIDE.
 PLUG IS SEEN FROM BEHIND.
 WHEN NO WIRE SIZE IS GIVEN, THE SIZE IS 0.25"

INTERCONNECTION DIAGRAM FOR DUAL REAR CONTACTBOARD AND SUPPLY TERMINAL BLOCK H1222



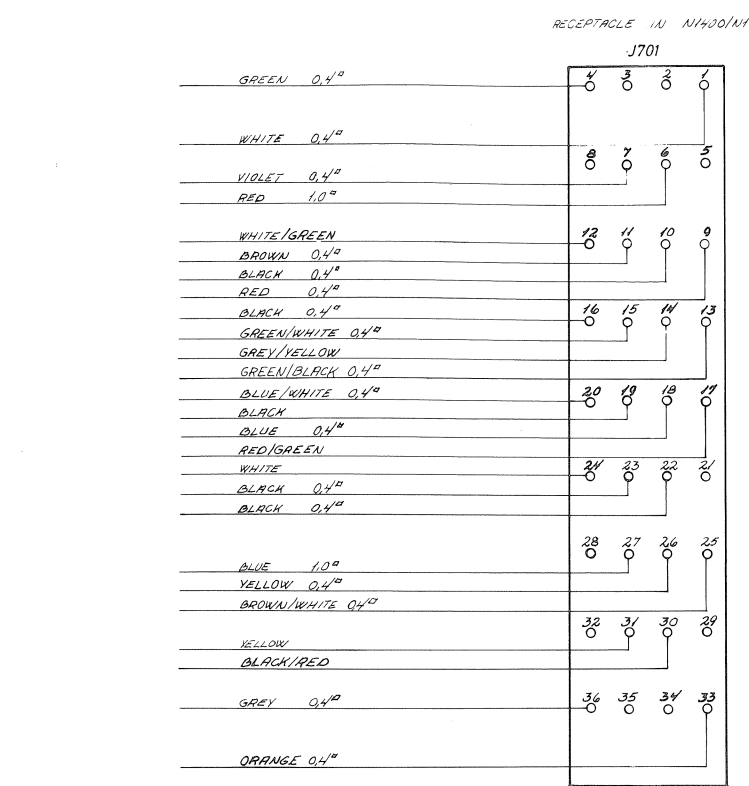
*** ONLY USED IN P-VERSIONS
SEE ALSO ADDITIONAL INTERCONNECTION
CABLE FOR P-VERSIONS.



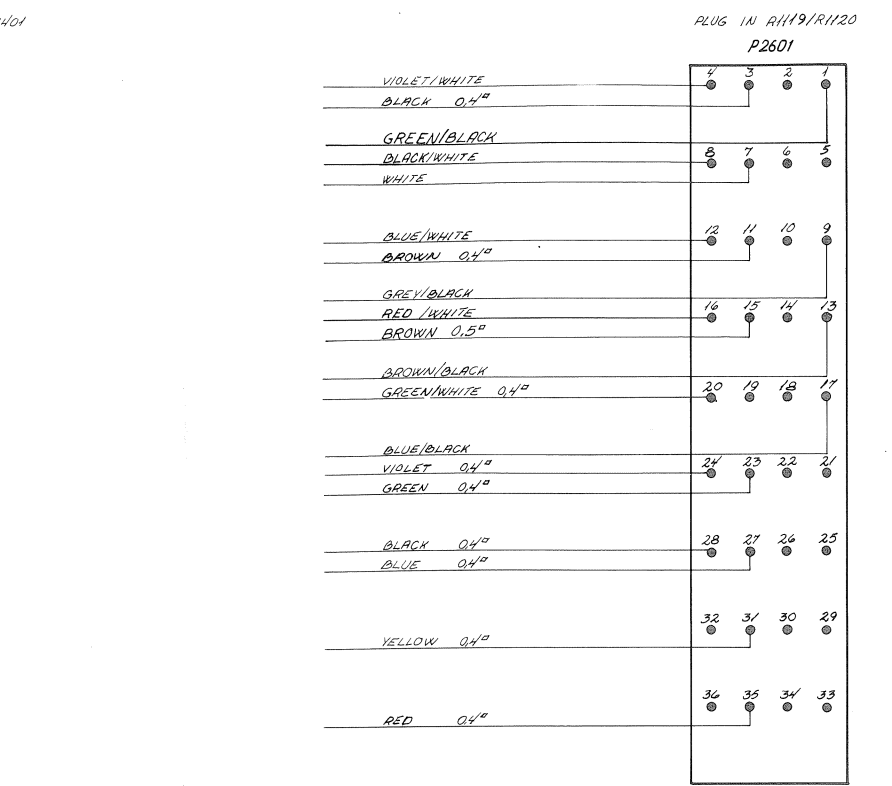
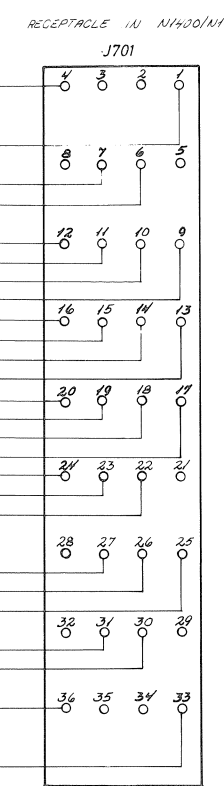
REAR CONTACTBOARD ↔ R119 OR R120

REAR CONTACTBOARD ↔ N1400 OR N1401

REAR CONTACTBOARD ↔ H1201



N1400 OR N1401 ↔ R119 OR R120



R119 OR R120 ↔ S1300 OR S1301

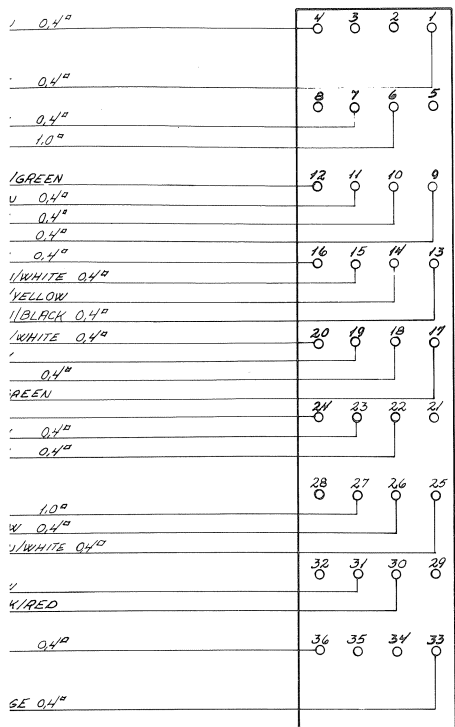
N1400 OR N1401 ↔ S1300 OR S1301

N1400 OR N1401 ↔ T1121 OR H1200

REAR CONTACTBOARD ↔ S1300 OR S1301

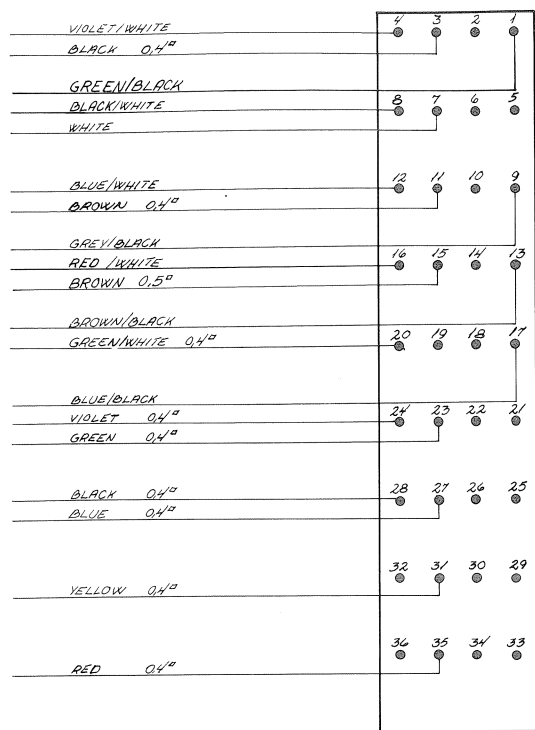
RECEPTACLE IN NH400/NH401

J701



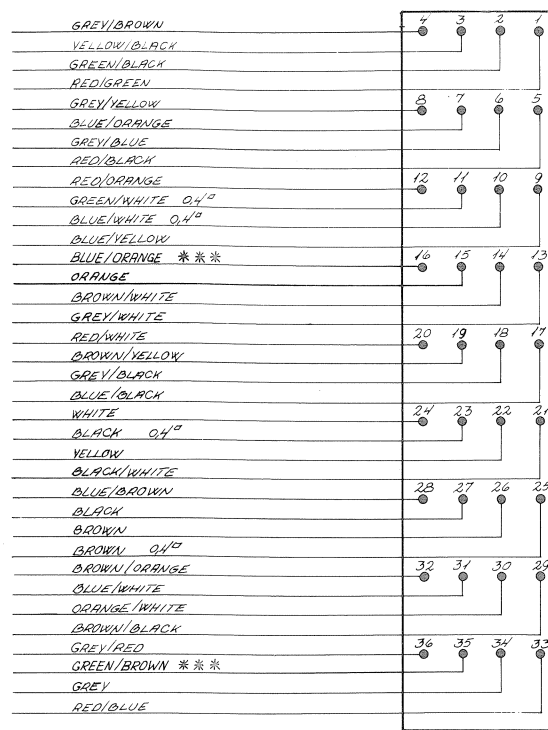
PLUG IN RH119/RH120

P2601



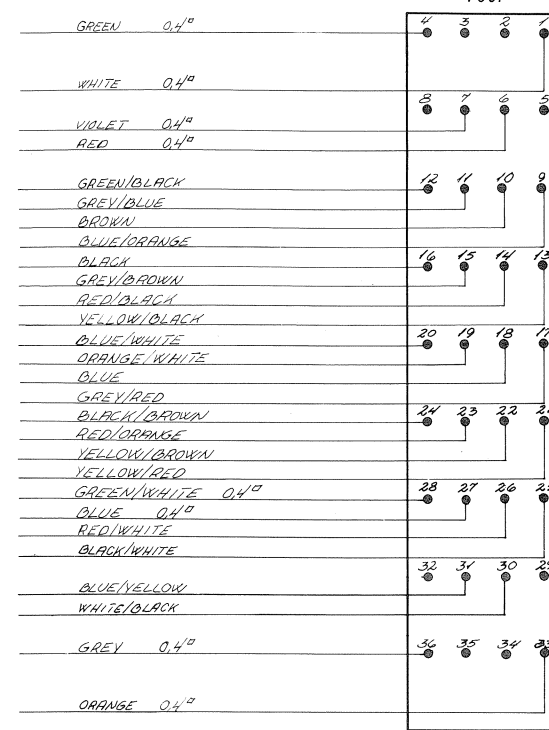
PLUG IN S130X

P1702



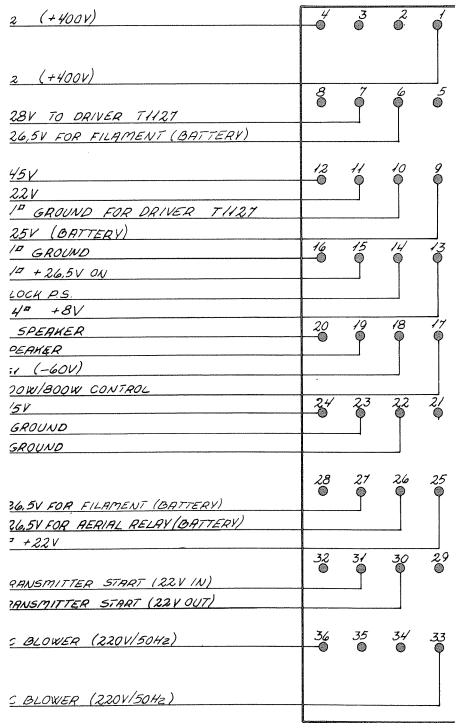
PLUG IN TH27

P901



WIRE ACTION PLUG FOR NH400/NH401

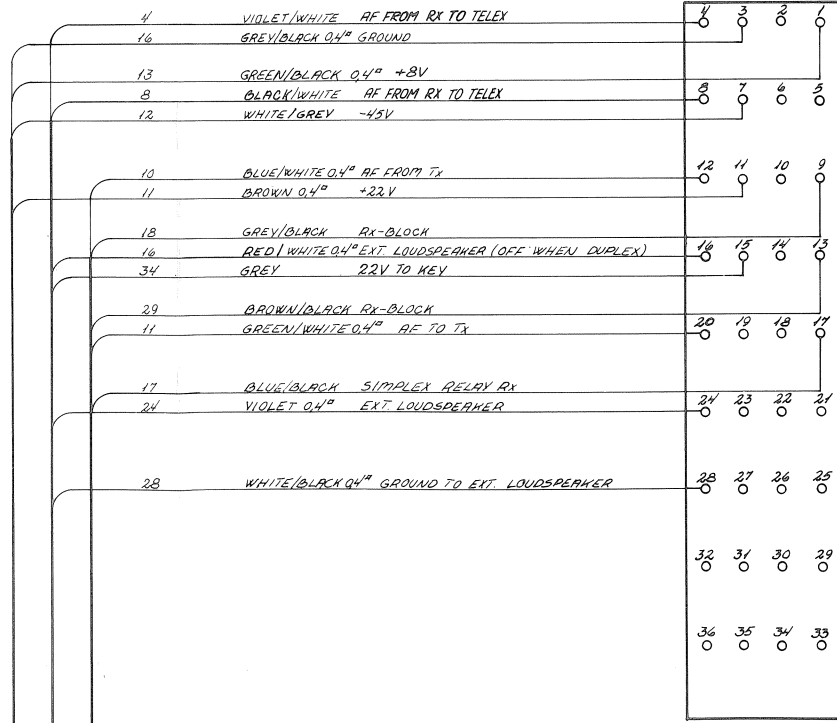
P701



TO PIN NUMBER COLOUR FUNCTION

RECEPTACLE FOR RH119, RH120

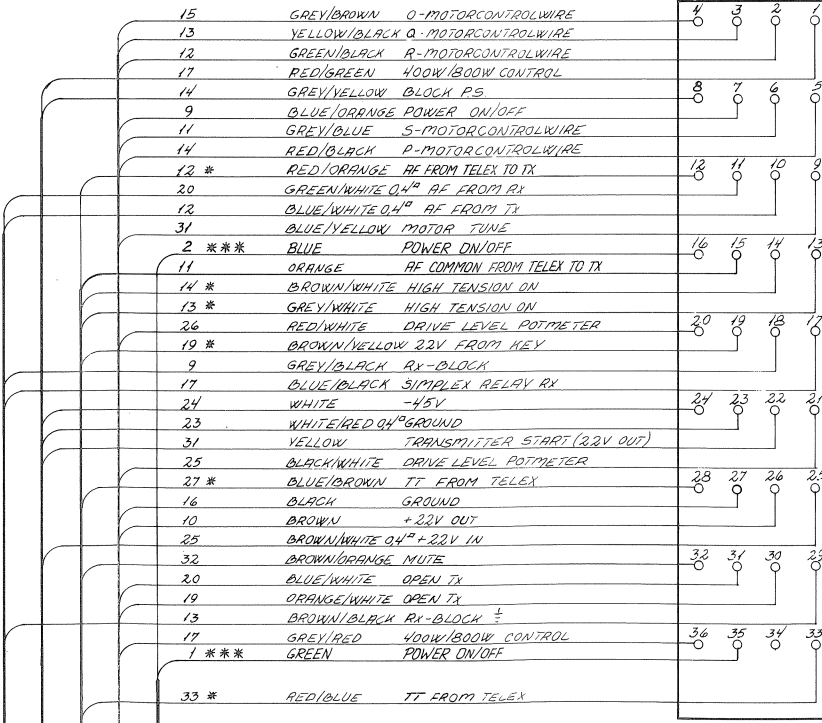
J2001



TO PIN NUMBER COLOUR FUNCTION

RECEPTACLE FOR S130X

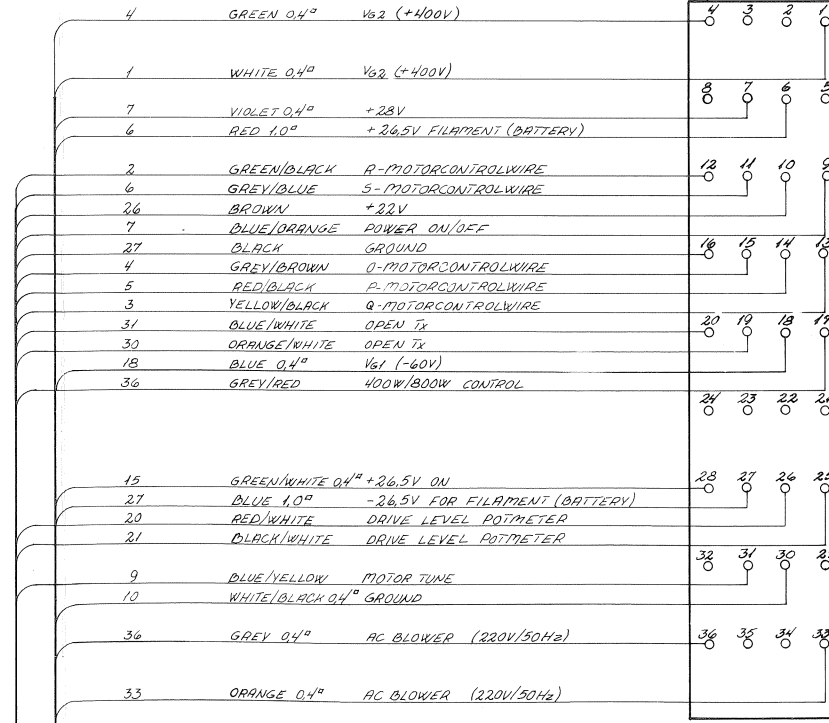
J1702



TO PIN NUMBER COLOUR FUNCTION

RECEPTACLE FOR TH27 OR H1200

J901



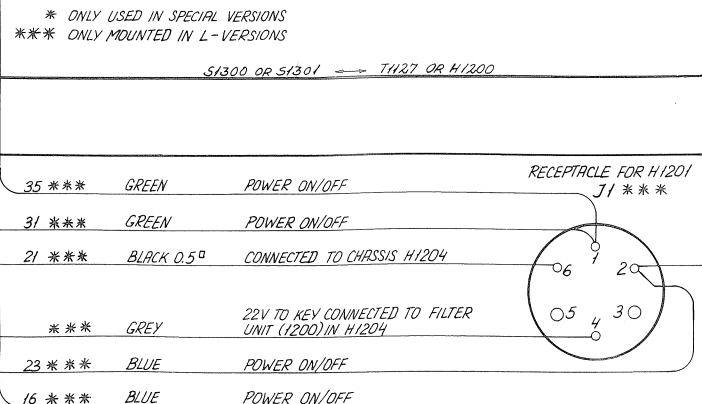
1 OR NH401 -> RH119 OR RH120

RH119 OR RH120 -> S1300 OR S1301

NH400 OR NH401 -> S1300 OR S1301

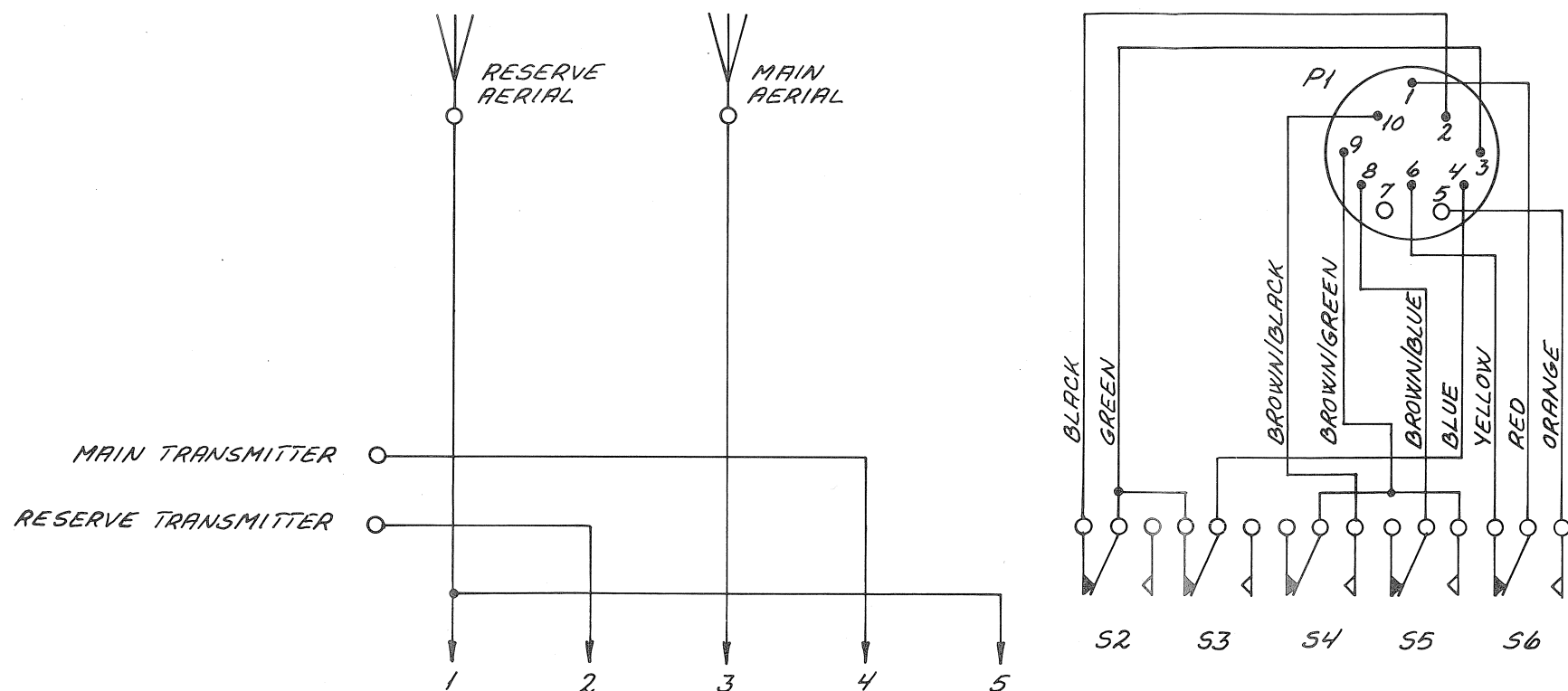
NH400 OR NH401 -> TH27 OR H1200

REAR CONTACT BOARD -> S1300 OR S1301



RECEPTACLE IS SEEN FROM THE FRONTSIDE
 PLUG IS SEEN FROM BEHIND
 WHEN NO WIRE SIZE IS GIVEN, THE SIZE IS 0.25"

D
 INTERCONNECTION CABLE FOR SAILOR
 SHORT - WAVE PROGRAM 1000



S2 AND S3 ARE BLOCKING CONTROL FOR MAIN TRANSMITTER

S4 AND S5 ARE BLOCKING CONTROL FOR RESERVE TRANSMITTER

S6 IS BLOCKING CONTROL FOR D.F. RECEIVER

											OPEN AERIALS FOR D.F.
											GROUNDED AERIALS
											MAIN TRANSMITTER on RESERVE AERIAL
*											MAIN TRANSMITTER on MAIN AERIAL
											RESERVE TRANSMITTER on RESERVE AERIAL
											RESERVE TRANSMITTER on MAIN AERIAL

S1

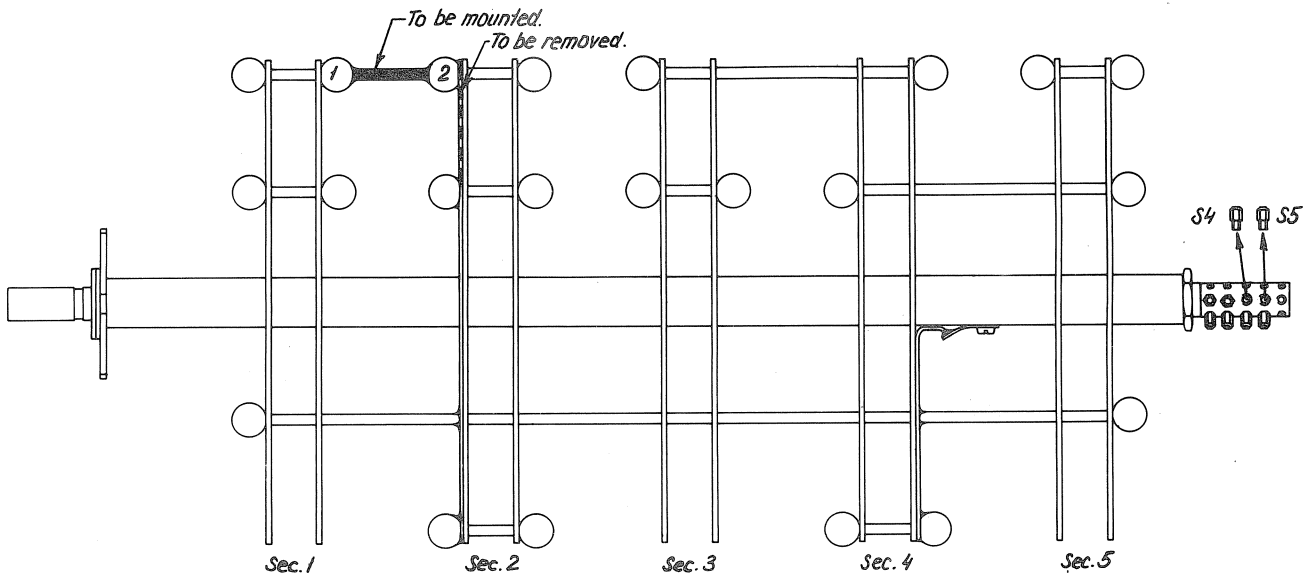
PROGRAMMING OF AERIAL SWITCH

* OPTION
 IN POSITION MAIN TRANSMITTER ON MAIN AERIAL IT IS POSSIBLE TO HAVE MAIN AND RESERVE TRANSMITTER WORKING SIMULTANEOUSLY.
 AS REGARDS MODIFICATION SEE NEXT PAGE.

SAILOR 55B H1202 (B)

For SAILOR TANDEM STATION it is possible to work with both the main- and reserve transmitter at the same time.

SAILOR AERIAL SWITCH H1202 has to be modified in the position MAIN TRANSMITTER on MAIN AERIAL. The RESERVE TRANSMITTER will then be connected to RESERVE AERIAL and the safety circuit will have to be modified so both transmitters can transmit at the same time.



MODIFICATION

The dot- and dash wire is to be cut out and resoldered between the two balls 1 and 2 as shown on the drawing.

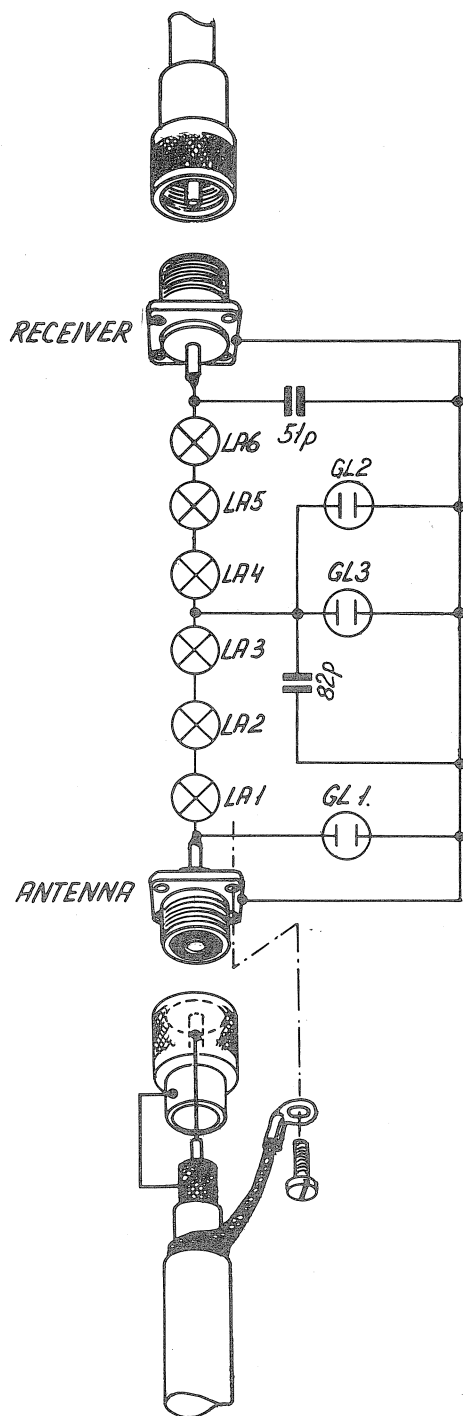
The Hexagon screw is to be removed in S4 and S5. The enclosed sticker "RESERVE TRANSMITTER on RESERVE AERIAL and" from bag P is to be placed on the front plate of H1202.

IMPORTANT

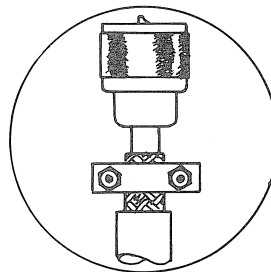
When both transmitters have to transmit at the same time it is not allowed in the same maritime band. From 1.6 MHz to 4 MHz it is allowed to transmit with both transmitters if you have a reasonable separation between the frequencies. We think at least 10 % is necessary but depending on the aerial installation.

»SAILOR« RECEIVER PROTECTOR TYPE H1223

S. P. RADIO A/S AALBORG DENMARK



Receiver coaxial cable.
 If 50 ohm coaxial cable RG213U is used,
 the cable has to run in steel tube
 (conduit). If 50 ohm triaxial cable H1213
 (S.P. Radio) is used, outer screen has
 to be earthed at console end only.



- LA1-3: 12V 5W Philips 12821
- LA4-6: 24V 10W Philips 13814
- GL1: Glow lamp. 150V Siemens A70-A150-Q69-X245
- GL2: Glow lamp. 90V Siemens A70-C90-Q69-X247
- GL3: Glow lamp. 90V Siemens A70-C90-Q69-X247
- Glow capacitor 51 pF 10% 500V Jahre 49.54/5
- Glow capacitor 82 pF 10% 500V Jahre 49.54/5

<i>Symbol</i>	<i>Description</i>			<i>Manufact.</i>		
R101	Resistor	2,7 Kohm	<u>+5%</u>	0,33W	Philips	2322 211 13272
R102	Resistor	4,7 Kohm	<u>+5%</u>	0,33W	Philips	2322 211 13472
R103	Resistor	4,7 Kohm	<u>+5%</u>	0,33W	Philips	2322 211 13472
R104	Resistor	1,5 Kohm	<u>+5%</u>	0,33W	Philips	2322 211 13152
R105	Resistor	15 Kohm	<u>+5%</u>	0,33W	Philips	2322 211 13153
R106	Resistor	1 Kohm	<u>+5%</u>	0,33W	Philips	2322 211 13102
R107	Resistor	1 Kohm	<u>+5%</u>	0,33W	Philips	2322 211 13102
D101	Diode				Philips	BAV21
D102	Diode				Philips	BAV21
RE101	Relay			24V	PASI	BV997
RE102	Relay			24V	PASI	BV997
RE103	Relay			24V	CP.Clare	PRME 15003A
T101	Transformer				TRADANIA	TD2296
T102	Transformer				TRADANIA	TD2296
J101	Plug	MEK100			Hirschman	973 033-100
J102	Plug				MOLEX	03-06-1363
J103	Plug				MOLEX	03-06-1363
J104	Plug				MOLEX	03-06-1363
P101	Main plug				MOLEX	03-06-2364
P101	Reserve plug				MOLEX	03-06-2364
FP101-						
FP154	Ferrite bead				Kaschke	K3/1200/0,1 Hz/ 4/2/7A

<i>Symbol</i>	<i>Description</i>			<i>Manufact.</i>		
R201	Resistor	2,2 Kohm	<u>+5%</u>	0,33W	Philips	2322 211 13222
R202	Resistor	15 Kohm	<u>+5%</u>	0,33W	Philips	2322 211 13153
R203	Resistor	15 Kohm	<u>+5%</u>	0,33W	Philips	2322 211 13153
R204	Resistor	2,2 Kohm	<u>+5%</u>	0,33W	Philips	2322 211 13222
R205	Resistor	100 Ohm	<u>+5%</u>	0,33W	Philips	2322 211 13101
R206	Resistor	680 Ohm	<u>+5%</u>	0,33W	Philips	2322 211 13681
R207	Resistor	10 Kohm	<u>+5%</u>	0,33W	Philips	2322 211 13103
R208	Resistor	1,8 Kohm	<u>+5%</u>	0,33W	Philips	2322 211 13182
R209	Resistor	220 Ohm	<u>+5%</u>	0,33W	Philips	2322 211 13221
R210	Resistor	1,8 Kohm	<u>+5%</u>	0,33W	Philips	2322 211 13182
R211	Resistor	220 Ohm	<u>+5%</u>	0,33W	Philips	2322 211 13221
R212	Resistor	680 Ohm	<u>+5%</u>	0,33W	Philips	2322 211 13681
R213	Resistor	100 Kohm	<u>+5%</u>	0,33W	Philips	2322 211 13101
R214	Resistor	3,3 Kohm	<u>+5%</u>	0,33W	Philips	2322 211 13332
R215	Resistor	47 Kohm	<u>+5%</u>	0,33W	Philips	2322 211 13473
R216	Resistor	1,5 Kohm	<u>+5%</u>	0,33W	Philips	2322 211 13152
R217	Resistor	6,8 Kohm	<u>+5%</u>	0,33W	Philips	2322 211 13682
R218	Resistor	1 Kohm	<u>+5%</u>	0,33W	Philips	2322 211 13102
R219	Resistor	33 Kohm	<u>+5%</u>	0,33W	Philips	2322 211 13333
R220	Resistor	1 Kohm	<u>+5%</u>	0,33W	Philips	2322 211 13102
R221	Resistor	33 Kohm	<u>+5%</u>	0,33W	Philips	2322 211 13333
R222	Resistor	10 Kohm	<u>+5%</u>	0,33W	Philips	2322 211 13103
R223	Resistor	2,2 Kohm	<u>+5%</u>	0,33W	Philips	2322 211 13222
R224	Resistor	1,2 Kohm	<u>+5%</u>	0,33W	Philips	2322 211 13122
R225	Resistor	680 Ohm	<u>+5%</u>	0,33W	Philips	2322 211 13681
R226	Resistor	2,2 Kohm	<u>+5%</u>	0,33W	Philips	2322 211 13222
R227	Resistor	10 Kohm	<u>+5%</u>	0,33W	Philips	2322 211 13103
R228	Resistor	470 Ohm	<u>+5%</u>	0,33W	Philips	2322 211 13471
R229	Resistor	39 Ohm	<u>+5%</u>	0,33W	Philips	2322 211 13390
P201	Potentiometer	1 Kohm	<u>+20%</u>		Noble	TM8KV2-1S
P202	Potentiometer	1 Kohm	<u>+20%</u>		Noble	TM8-KV2-1S
C201	Capacitor polyester	47 n/100V	<u>+20%</u>		Philips	2222 344 24473
C202	Capacitor polyester	47 n/100V	<u>+20%</u>		Philips	2222 344 24473
C203	Capacitor polyester	100 n/100V	<u>+20%</u>		Philips	2222 344 24104
C204	Capacitor polyester	100 n/100V	<u>+20%</u>		Philips	2222 344 24104
C205	Capacitor ceramic	10 n/50V	<u>-20%</u> <u>+80%</u>		KCK	HE-70SJ-YF-103Z

<i>Symbol</i>	<i>Description</i>	<i>Manufact.</i>	
C206	Capacitor polyester 100 n/100V $\pm 20\%$	Philips	2222 344 24104
C207	Capacitor ceramic 10 n/50V $\begin{matrix} -20 \\ +80\% \end{matrix}$	KCK	HE-70SJ-YF-103Z
C208	Capacitor ceramic 10 n/50V $\begin{matrix} -20 \\ +80\% \end{matrix}$	KCK	HE-70SJ-YF-103Z
C209	Capacitor electrolytic 4,7 u/50V $\pm 20\%$	ROE	EKI 00AA 147H
C210	Capacitor ceramic 47 n/ 16V	KCK	
C211	Capacitor ceramic 10 n/50V $\begin{matrix} -20 \\ +80\% \end{matrix}$	KCK	HE-70SJ-YF-103Z
C212	Capacitor polyester 1 u/100V $\pm 20\%$	Philips	2222 344 24105
C213	Capacitor ceramic 10 n/50V $\begin{matrix} -20 \\ +80\% \end{matrix}$	KCK	HE-70SJ-YF-103Z
C214	Capacitor electrolytic 22 u/25V $\pm 20\%$	ROE	EKI 00AA 222E
C215	Capacitor ceramic 4,7 n/50V $\begin{matrix} -20 \\ +80\% \end{matrix}$	KCK	HE-80SJ-YD-472M
C216	Capacitor ceramic 4,7 n/50V $\begin{matrix} -20 \\ +80\% \end{matrix}$	KCK	HE-80SJ-YD-472M
C217	Capacitor polyester 68 n/250V $\pm 10\%$	Philips	2222 344 41683
C218	Capacitor electrolytic 22 u/25V $\pm 20\%$	ROE	EKI 00AA 222E
C219	Capacitor ceramic 10 n/50V $\begin{matrix} -20 \\ +80\% \end{matrix}$	KCK	HE-70SJ-YF-103Z
C220	Capacitor electrolytic 22 u/25V $\pm 20\%$	ROE	EKI 00AA 222E
C221	Capacitor polyester 100 n/100V $\pm 10\%$	Philips	2222 344 24104
C222	Capacitor electrolytic 4,7 u/50V $\pm 20\%$	ROE	EKI 00AA 147H
C223	Capacitor electrolytic 22 u/25V $\pm 20\%$	ROE	EKI 00AA 222E
C224	Capacitor ceramic 4,7 n/50V $\begin{matrix} -20 \\ +80\% \end{matrix}$	KCK	HE-80SJ-YD-472M
C225	Capacitor electrolytic 22 u/25V $\pm 20\%$	ROE	EKI 00AA 222E
C226	Capacitor electrolytic 10 u/35V $\pm 20\%$	ROE	EKI 00AA 210F
C227	Capacitor ceramic 4,7 n/50V $\begin{matrix} -20 \\ +80\% \end{matrix}$	KCK	HE-80SJ-YD-472M
C228	Capacitor polyester 470 n/100V $\pm 10\%$	Philips	2222 344 24474
C229	Capacitor polyester 100 n/100V $\pm 10\%$	Philips	2222 344 24104
C230	Capacitor electrolytic 22 u/25V $\pm 20\%$	ROE	EKI 00AA 222E
C231	Capacitor polyester 220 n/100V	Philips	2222 344 24224
D201	Diode	Philips	1N4148
D202	Diode	Philips	1N4148
D203	Diode	Philips	BAW62
D204	Diode	Philips	BAW62
D205	Diode	Philips	1N4148
T201	Transistor	Philips	BC548B
T202	Transistor	Philips	BC548B
T203	Transistor	Philips	BC338-25
T204	Transistor	Philips	BC548B
T205	Transistor	Philips	BC548B

<i>Symbol</i>	<i>Description</i>	<i>Manufact.</i>	
T206	Transistor	Philips	BC558B
T207	Transistor	Philips	BC548B
T208	Transistor	Philips	BC548B
IC201	Voltage regulator	National	LM 340 T12
L201	Choke	100 uH	0,2A Ferroperm 1582
F201	Fuse	ø5x20 mm	160 mA Wickmann Middeltræg
TR201	Transformer	Tradania	TD2296
TR202	Transformer	Tradania	TD2296
TR203	Transformer	Tradania	TD2296

<i>Symbol</i>	<i>Description</i>	<i>Manufact.</i>	
R310	Potentiometer wire wound 330 Ohm Lin	Danotherm	
P311	Potentiometer 470 Ohm Lin CP23	Philips	2322 350 70703
S301	Switch 6x2 pos. 2 sekt. non shorting	MEC	120
S302	Switch 6x2 pos. 2 sekt. non shorting	MEC	120
S303	Switch 6x2 pos. 2 sekt. non shorting	MEC	120
S304	Switch 6x3 pos. 3 sekt. non shorting	MEC	120
S305	Switch 6x3 pos. 1 sekt. non shorting	MEC	120
S306	Switch 6x3 pos. 2 sekt. non shorting	MEC	120
S307	Switch	ADR	20 646 N/2
J301	Microtelephone jack (female) MEB60H	Hirschmann	973 031-100
J302	Microtelephone jack (female) MEB60H	Hirschmann	973 031-100
J303	Key jack (female)	Tuchel	T3403/1
J304	Lead light jack (female)	Bosch	0-352-222-006
J305	Key jack (female)	Tuchel	T3403/1
P102	Plug	Molex	03-06-2364
P103	Plug	Molex	03-06-2364
LA301	Diode light emitting	Xciton	XC5053R
LS301	Great HT 50 Ohm	Ekløw	P24R015

