

Sailor

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**INSTRUKTIONSBOG FOR
SAILOR N1405 / H1225**

**INSTRUCTION BOOK FOR
SAILOR N1405 / H1225**



A/S S. P. RADIO · AALBORG · DENMARK

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GENERAL DESCRIPTION

SAILOR N1405 is a combined AC/DC power supply intended to supply a SAILOR SSB short-wave receiver from AC mains or from a 24V battery. With both AC and DC supply present the N1405 automatically takes its supply from the AC mains. If the AC mains fails the N1405 automatically and with no break switches over and takes its supply from the 24V battery (ex. the emergency battery).

APPLICATION OF AC/DC POWER SUPPLY N1405

SAILOR N1405 can be used to supply a SAILOR SSB short-wave receiver which is located either in a rack as part of a short-wave station, in conjunction with a SAILOR SSB transmitter, or a separate receiver.

TECHNICAL DATA

The power supply N1405 delivers all necessary voltages to a SAILOR SSB short-wave receiver (R1117, R1119 and R1120).

Input voltages : AC: 110/127/220/237V $\pm 10\%$
50 - 60 Hz
DC: normal voltage 26.4V
extreme voltage 21.6 ... 31.2V

Output voltages : DC stabilized: 22V max. load 1A
8V max. load 1A
If the 8V is unloaded the max. load on 22V can be increased to 1.4A.
DC unstabilized: -45V max. load 0.1A

Operation temperature range : -15°C to 55°C

Cooling : The cooling takes place via convection, and adequate free space around the power supply shall be ensured.
The openings must not be covered.

CHANGE OF AC INPUT VOLTAGE

In order to change the AC input from the low values 110/127V to the high values 220/237V or inverse following components must be altered together with change of strapping on TR102 (see the diagram).

Fuse F101

110/127V AC	0.8A time-lag
220/237V AC	0.5A time-lag

Relay RE101

110/127V AC	WSU/GD-6-C BV1062
220/237V AC	WSU/GD-7-C

PRINCIPLE OF OPERATION

The main switch on the receiver controls if the power supply N1405 shall be connected or not.

If AC mains is present RE101 is activated and the DC supply is prevented from getting connected.

If no AC mains is present the break contact of RE101 is closed and the relay RE103 is activated, whereby the DC supply is connected to the DC-DC converter, the converter consisting of the transformers TR101 and TR102 and the transistors T101 and T102 will operate.

The outputs from TR102 are rectified, filtered and stabilized in a circuit which are used for both AC and DC operation.

The relay RE102 is activated when the power supply is operating from a DC supply, the open break-contact of RE102 disconnects the transformer from the AC mains and no noise from the converter is allowed to make disturbance on the AC mains.

INSTALLATION IN CONJUNCTION WITH A RACK

This type of installation can take place in cases where the receiver R1117 is replaced with one of the receivers R1119 and R1120 and the actual power supply N1400 or N1401 do not have built-in 8V supply.

Another situation for using this type of installation is when it is required that reception shall perform with no-break.

Installation procedure

- 1 The receiver which shall be replaced is removed from the rack.
- 2 The cable N1405 - H1204 is used and the plug P101 is connected with the receptacle J2001 of the rack.
- 3 The plug P102 of the cable N1405 - H1204 is then led out through hole F (the left one in the room for the receiver) to the power supply N1405 and inserted in the receptacle on the power supply N1405.
NB! When leading the cable through hole F it may be necessary to remove the rack from its place.
- 4 The power supply N1405 is wall mounted with adequate space around it and far away from heaters. The openings must be free.
- 5 The receptacle J102 is inserted in plug J2004 of the receiver. Do also insert the aerial plug. Remember to tune the aerial trimmer on 2182 kHz. The receiver can now be pushed into its correct position again.
NB! The control functions and outputs specified on the terminal board of N1405 are out of function.

INSTALLATION WITH CABINET H1225

This type of installation is used when a SAILOR SSB short-wave receiver is used for special purposes ex. Telex-, Teleprinting-, Broadcast- or Watch Keeping receiver.

Installation procedure

- 1 The receiver in its cabinet is placed in the required position.
- 2 With the cable N1405 - R111X the receiver is connected to the power supply N1405.
- 3 When the cover of N1405 is removed the terminal board of N1405 is accessible. Supply voltages are led to terminals for AC and DC input.
- 4 Depending on the use of the receiver the required inputs and outputs are connected to the terminal board.
Technical informations concerned are found in the instruction books for the actual receiver with the belonging cabinet (informations about muting on page 6).

INSTALLATION WITH A SAILOR SSB TRANSMITTER T121, T122, T124, T126 OR T128.

Installation and operation in conjunction with one of the above transmitters is possible (except T122 with AC power supply and T121, T124 and T128 with 12V DC supply).

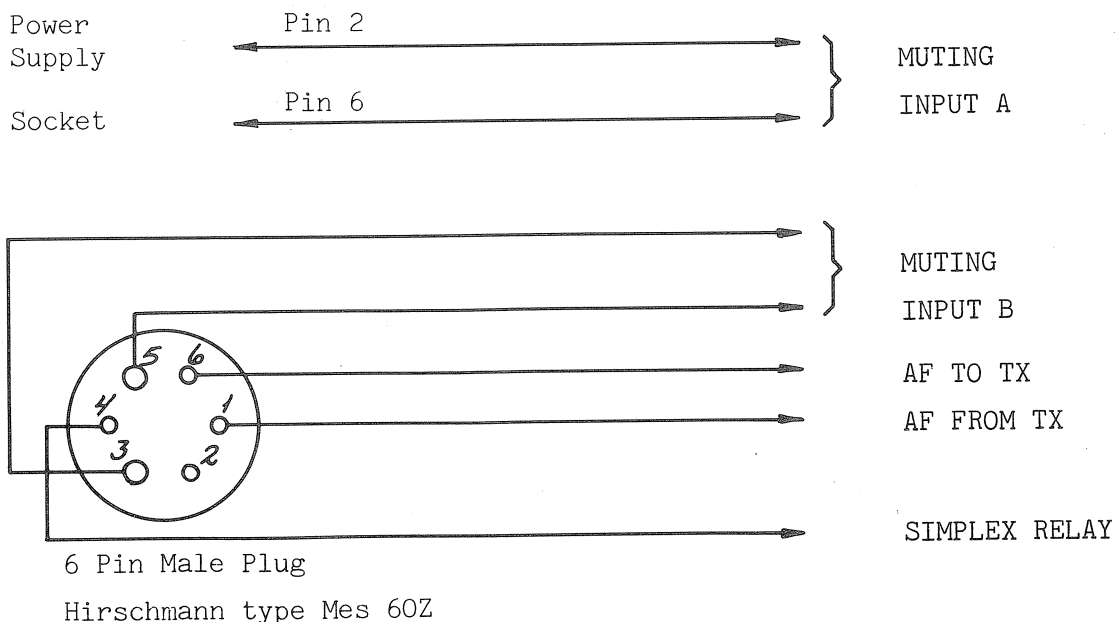
Installation procedure

- 1 The receiver is connected to the power supply N1405 with a cable type N1405 - R111X.
- 2 On the terminal board of N1405 two pieces of wire jumpers are established, one between SIMPLEX RELAY \downarrow and TT FROM TELEX and the other between SIMPLEX RELAY and the other TT FROM TELEX terminal.
- 3 From the receiver supply plug of the actual transmitter some connections to the terminal board of N1405 are made.
 - a. the pins No. 3 & 5 are connected to the two terminals marked MUTING INPUT B,
 - b. the pin No. 4 is connected to the terminal marked SIMPLEX RELAY
 - c. the pin No. 6 is connected to the terminal marked AF TO TX,
 - d. the pin No. 1 is connected to the terminal marked AF FROM TX;
- 4 From pins Nos 2 and 6 of the plug on the cable coming from the power supply belonging to the transmitter a couple of wires are taken (the voltage is named start power supply) and led to the terminals marked MUTING INPUT A.
NB! For T122 only, pins Nos 3 and 5 of the plug J704 EXT. RELAY are used instead.

OBS! No wire jumpers between A.B.C. terminals.

With the installation made as specified above the SAILOR SSB short-wave receiver can operate normally in conjunction with the mentioned SAILOR SSB transmitters.

Connections between T12X and N1405 terminal board.



OTHER POSSIBLE MUTING FUNCTIONS

Case A

The receiver must be muted when a 24V DC voltage is present.

- 1 Make wire jumpers between
 - a. SIMPLEX RELAY \perp and TT FROM TELEX,
 - b. SIMPLEX RELAY and the other TT FROM TELEX,
 - c. A AND B TERMINALS.
- 2 Connect the control voltage 24V DC to the two terminals marked MUTING INPUT A.

Case B

The receiver must be muted when no voltage is present and in function when a 24V DC is present.

- 1 Make wire jumpers between
 - a. SIMPLEX RELAY \perp and TT FROM TELEX,
 - b. SIMPLEX RELAY and the other TT FROM TELEX,
 - c. B AND C TERMINALS.
- 2 Connect the control voltage 24V DC to the two terminals marked MUTING INPUT B.

Case C

The receiver must be muted when a voltage of + or - 24V DC with reference to the chassis of the receiver is present.

- 1 Make wire jumpers between
 - a. SIMPLEX RELAY \perp and TT FROM TELEX,
 - b. SIMPLEX RELAY and the other TT FROM TELEX.
- 2 Connect the control voltage to the two terminals SIMPLEX RELAY and TT FROM TELEX (already connected).

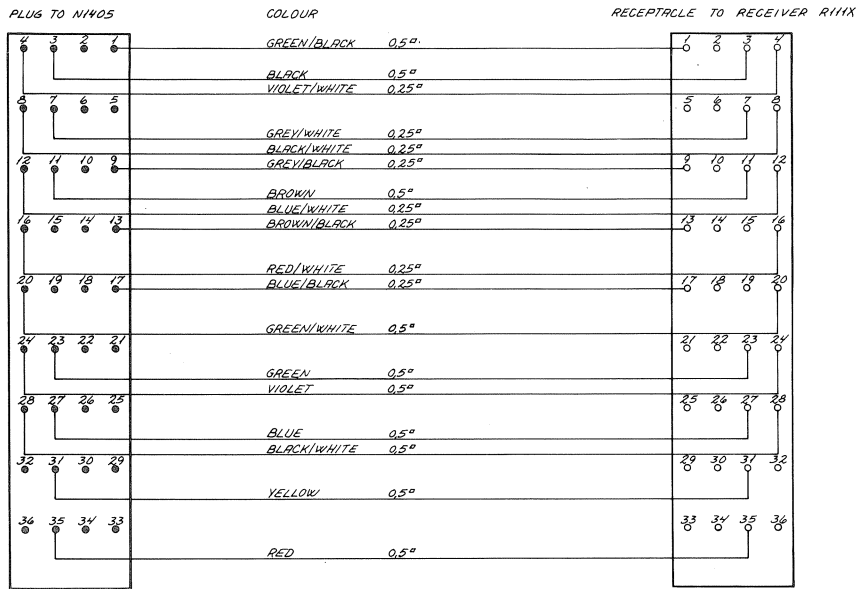
Case D

The receiver must be muted when a contact is closed (the contact must not have any connection to chassis or other voltages).

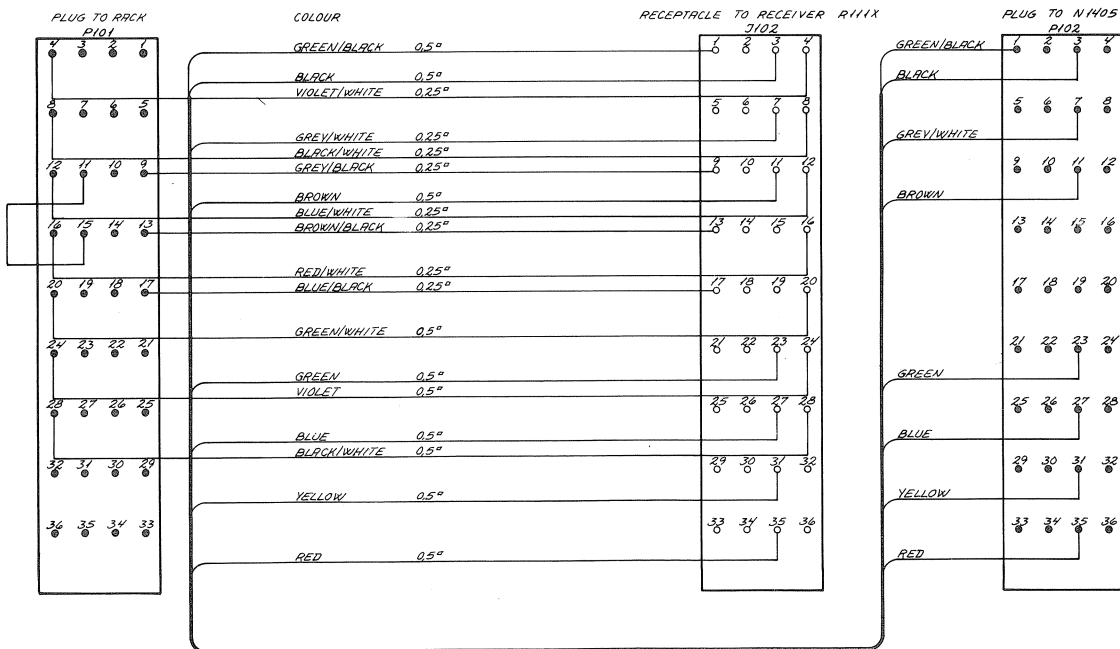
- 1 Make wire jumpers between
 - a. SIMPLEX RELAY \perp and TT FROM TELEX,
 - b. SIMPLEX RELAY and the other TT FROM TELEX.
- 2 Connect the contact between the joint of the terminals SIMPLEX RELAY and TT FROM TELEX and the terminal 22V OUT max. 100 mA.

CONNECTION CABLES

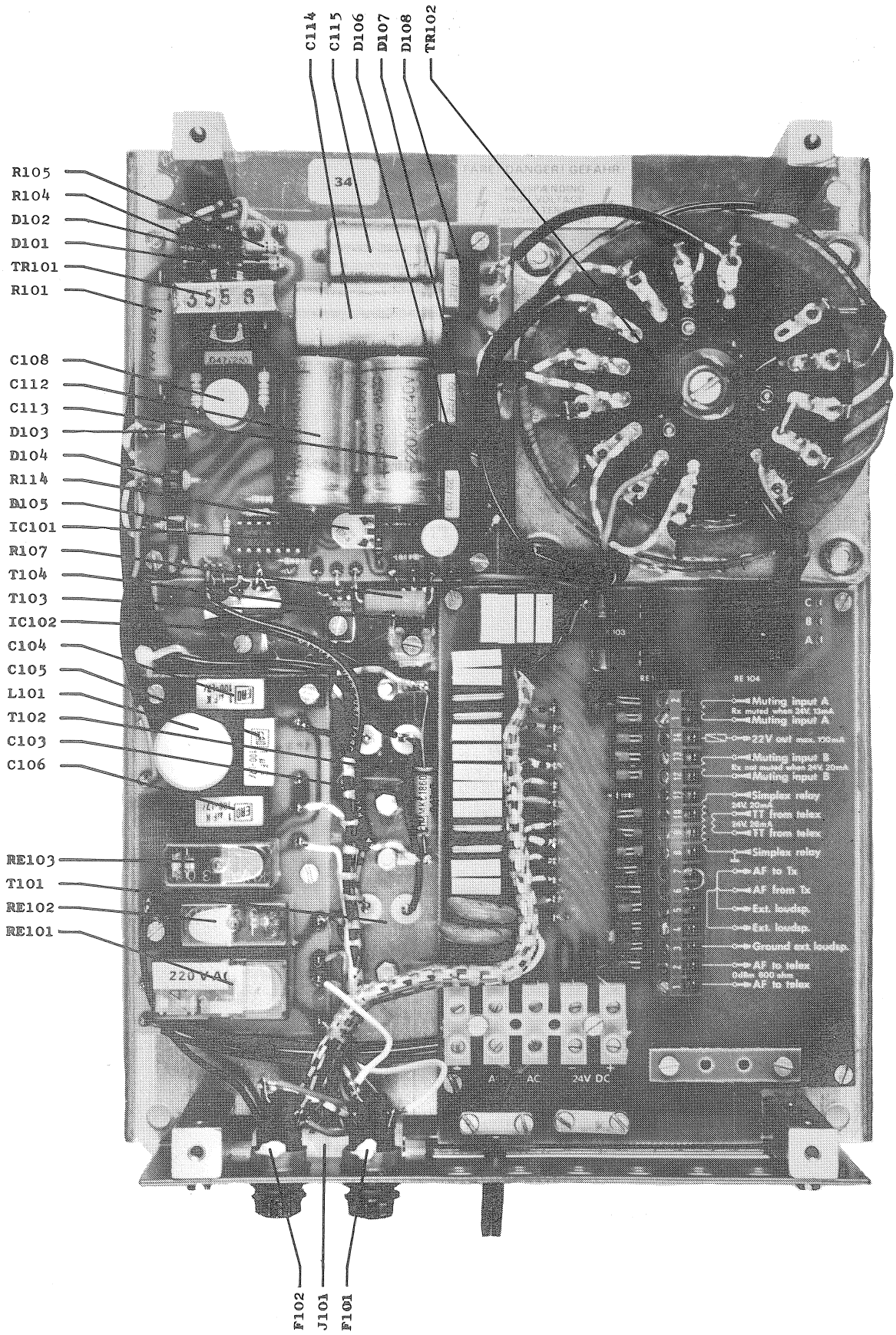
CABLE N1405-R111X



CABLE N1405-H1204



COMPONENT LOCATION/ EXTERNAL CONNECTIONS



Receiver AC/DC Power Supply SAILOR N1405

Symbol	Description	Manufact.	
R101	Resistor 270 ohm 7W	Philips	2322 329 07271
R102	Resistor 2.2Kohm 0.5W	Philips	2322 212 13222
R103	Resistor 2.2Kohm 0.5W	Philips	2322 212 13222
R104	Resistor 10Kohm 0.5W	Philips	2322 212 13103
R105	Resistor 10Kohm 0.5W	Philips	2322 212 13103
R106	Resistor 150 ohm 0.33W	Philips	2322 211 13151
R107	Resistor 180 ohm 4W	Philips	2322 329 04181
R108	Resistor 820 ohm 0.33W	Philips	2322 211 13821
R109	Resistor 820 ohm 0.33W	Philips	2322 211 13821
R110	Resistor 2.7Kohm 0.33W	Philips	2322 211 13272
R111	Resistor 2.7Kohm 0.33W	Philips	2322 211 13272
R112	Resistor 5.6Kohm 0.33W	Philips	2322 211 13562
R113	Resistor 3.9Kohm 0.33W	Philips	2322 211 13392
R114	Potentiometer 10Kohm	NOBLE	TM8 KV2-1S/10K
R115	Resistor 47 ohm 0.33W	Philips	2322 211 13479
C101	Capacitor, ceramic 4.7nF 5kV	Ferroperm	9/0138.9 isol.
C102	Capacitor, ceramic 4.7nF 5kV	Ferroperm	9/0138.9 isol.
C103	Capacitor 470nF 250V	ERO	MKC 1860-447/2
C104	Capacitor, polyester 1uF 100V	ERO	MKT 1822-510/0
C105	Capacitor, polyester 1uF 100V	ERO	MKT 1822-510/0
C106	Capacitor, polyester 1uF 100V	ERO	MKT 1822-510/0
C107	Capacitor, polyester 47nF 250V	ERO	MKT 1822-347/2
C108	Capacitor, electrolytic 100uF 40V	FRAKO	EP-100 uF/40V
C109	Capacitor, polyester 220nF 100V	ERO	MKT 1822-422/0
C110	Capacitor, polyester 220nF 100V	ERO	MKT 1822-422/0
C111	Capacitor, polyester 220nF 100V	ERO	MKT 1822-422/0
C112	Capacitor, electrolytic 2200uF 40V	Siemens	B41010-C7228-T
C113	Capacitor, electrolytic 2200uF 40V	Siemens	B41010-C7228-T
C114	Capacitor, electrolytic 2200uF 25V	Siemens	B41010-C5228-T
C115	Capacitor, electrolytic 220uF 100V	Siemens	B41010-D9227-T
C116	Capacitor, ceramic 2.2nF 40V	Ferroperm	9/0129.8
C117	Capacitor, electrolytic 100uF 25V	FRAKO	EP-100 uF/25V
C118	Capacitor, polyester 100nF 250V	Philips	2222 352 45104
C119	Capacitor, polyester 100nF 250V	Philips	2222 352 45104
C120	Capacitor, polycarbonate 1nF 630V	ERO	KC 1849-210/6
C121	Capacitor, polycarbonate 1nF 630V	ERO	KC 1849-210/6
C122	Capacitor, polyester 100nF 100V	ERO	MKT 1822-410/0
C123	Capacitor, polyester 100nF 100V	ERO	MKT 1822-410/0
C124	Capacitor, polyester 100nF 100V	ERO	MKT 1822-410/0

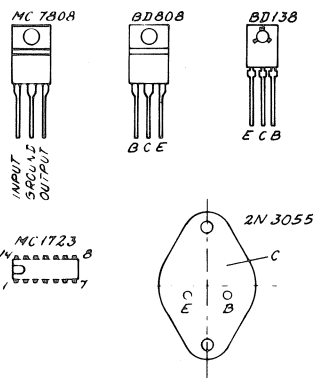
Receiver AC/DC Power Supply SAILOR N1405

Symbol	Description	Manufact.	
C125	Capacitor, polyester 100nF 100V	ERO	MKT 1822-410/0
C126	Capacitor, polyester 100nF 100V	ERO	MKT 1822-410/0
C127	Capacitor, polycarbonate 1nF 630V	ERO	KC 1849-210/6
C128	Capacitor, polycarbonate 1nF 630V	ERO	KC 1849-210/6
C129	Capacitor, polyester 100nF 100V	ERO	MKT 1822-410/0
C130	Capacitor, polyester 100nF 100V	ERO	MKT 1822-410/0
C131	Capacitor, polyester 100nF 100V	ERO	MKT 1822-410/0
C132	Capacitor, polyester 100nF 100V	ERO	MKT 1822-410/0
C133	Capacitor, polyester 100nF 100V	ERO	MKT 1822-410/0
C134	Capacitor, polyester 100nF 100V	ERO	MKT 1822-410/0
C135	Capacitor, polyester 100nF 100V	ERO	MKT 1822-410/0
C136	Capacitor, polyester 100nF 100V	ERO	MKT 1822-410/0
FP101- FP119	Ferrit bead	Kaschke	K3/1200/0.1Hz 4/2/7A
T101	Transistor matched pair	Motorola	2N 3055
T102	Transistor	Motorola	2N 3055
T103	Transistor	Motorola	BD 808
T104	Transistor	Philips	BD 138
D101	Diode	Motorola	MR 850
D102	Diode	Motorola	MR 850
D103	Diode	Motorola	MR 751
D104	Diode	Motorola	MR 751
D105	Diode	Motorola	MR 751
D106	Diode, bridge	Motorola	MDA 200
D107	Diode, bridge	Motorola	MDA 104 A
D108	Diode, bridge	Motorola	MDA 104 A
IC101	Integrated circuit	Motorola	MC 1723 CL
IC102	Integrated circuit	Motorola	MC 7808 CT
L101	Choke	ERO	F1753-210-124
TR101	Transformer drive	TRADANIA	TD 3556
TR102	Transformer	TRADANIA	TD 275 A
RE102	Relay	PASI	KH/R-3-C

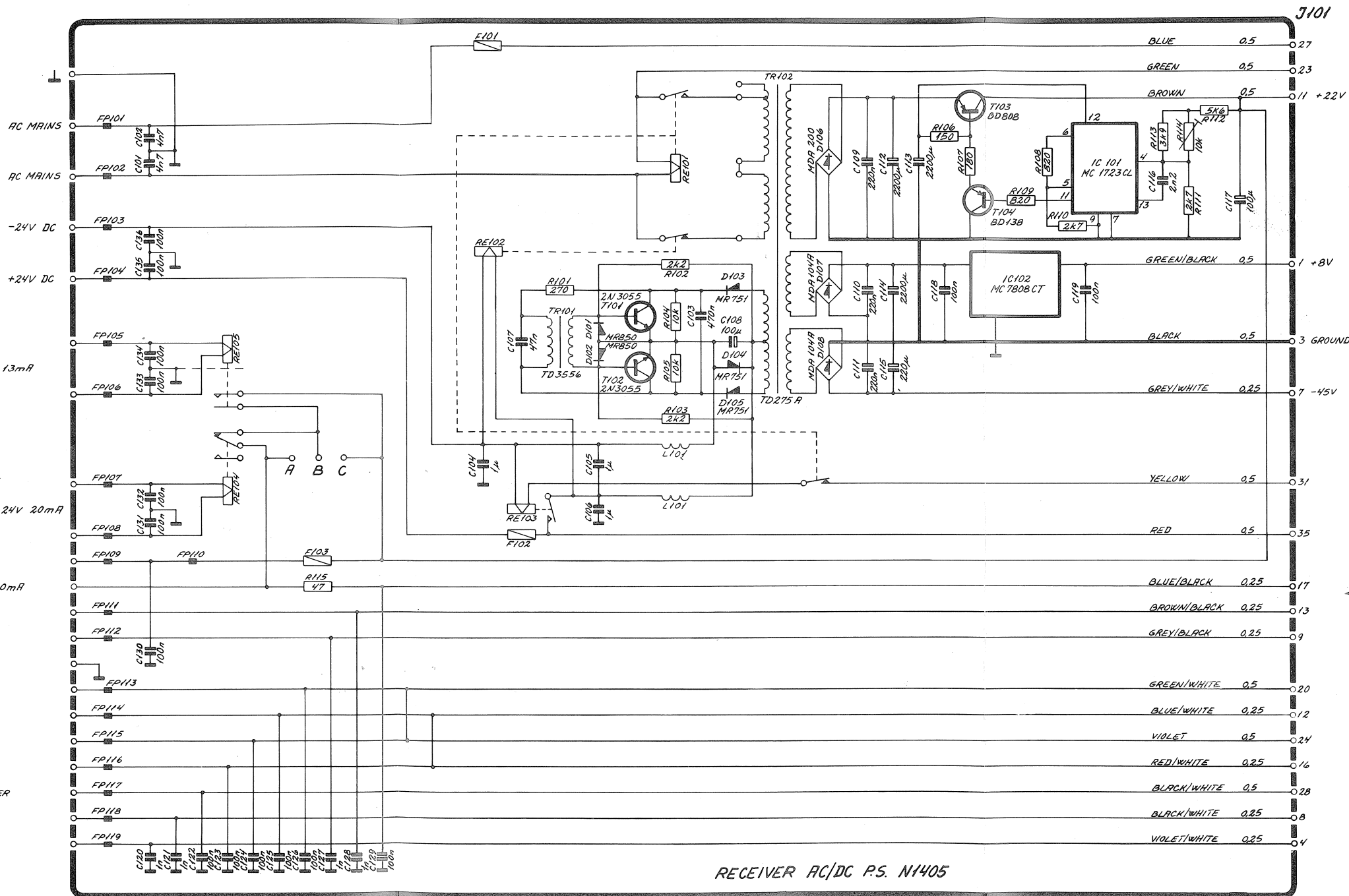
Receiver AC/DC Power Supply SAILOR N1405

<i>Symbol</i>	<i>Description</i>	<i>Manufact.</i>	
RE103	Relay	PASI	KH/A-3-C
RE104	Relay	ITT	LZ 24H
RE105	Relay	Clare	PREME 15003A
F102	Fuse 2.5A time-lag	ELU	2.5AT/5x20mm
F103	Fuse 0.16A time-lag	ELU	0.16AT/5x20mm
	<u>110-127V version only</u>		
F101	Fuse 0.8A time-lag	ELU	0.8AT/5x20mm
RE101	Relay	PASI	WSU/GD-6-C BV 1062
	<u>220-237V version only</u>		
F101	Fuse 0.5A time-lag	ELU	0.5AT/5x20mm
RE101	Relay	PASI	WSU/GD-7-C

MAINS VOLTAGE	110V AC	127V AC	220V AC	237V AC
CONNECTIONS ON TX 102				
F101	0.8A TIME-LAG		0.5A TIME-LAG	
RE 101	WSU/GD-6-C BY 1062		WSU/GD-7-C	



- MUTING INPUT A
Rx IS MUTED WHEN 24V 13mA
- MUTING INPUT B
Rx IS NOT MUTED WHEN 24V 20mA
- 22V OUT MAX. 100mA
- SIMPLEX RELAY 24V 20mA
- TT FROM TELEX.
24V 26mA
- TT FROM TELEX.
- SIMPLEX RELAY
- RF TO TX
- RF FROM TX
- EXT. LOUDSPEAKER
- EXT. LOUDSPEAKER
- GROUND EXT. LOUDSPEAKER
- RF TO TELEX
0dBm 600 ohm
- RF TO TELEX



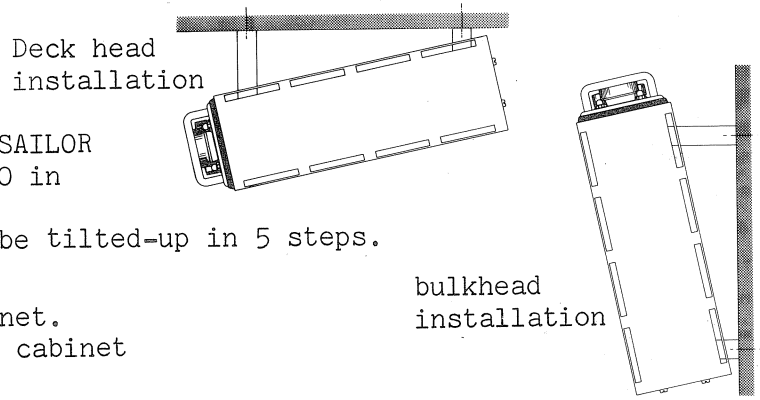
RECEIVER AC/DC P.S. N1405

H1225

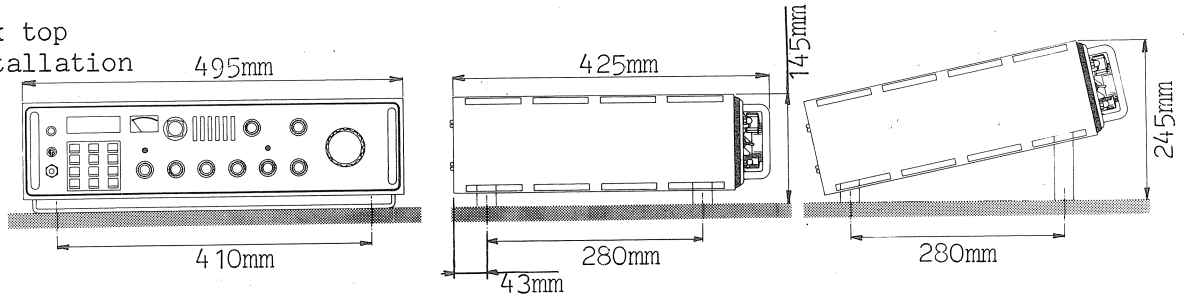
Installation possibilities for SAILOR receivers R1117, R1119 and R1120 in cabinet H1225.

The receiver cabinet H1225 can be tilted-up in 5 steps.

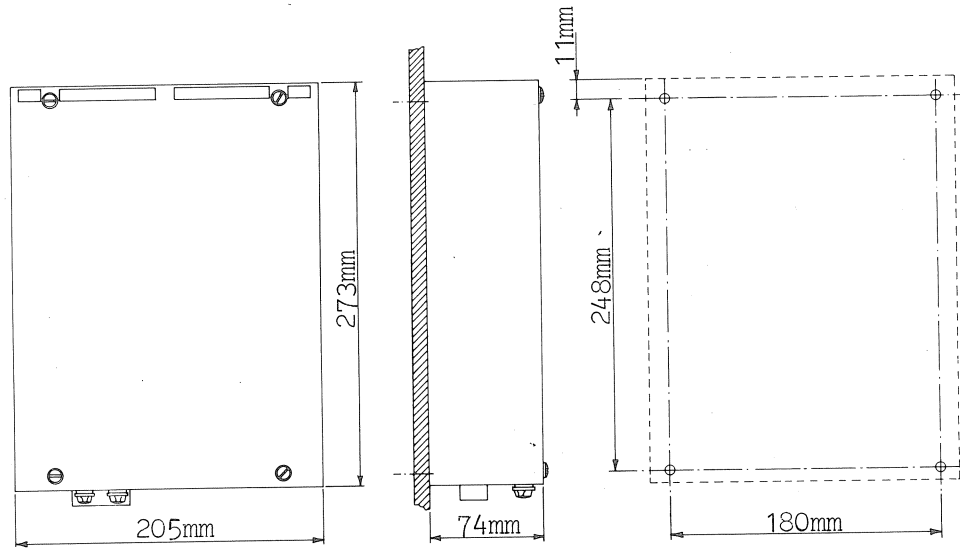
20 mm clearance around the cabinet.
50 mm clearance of rear side of cabinet



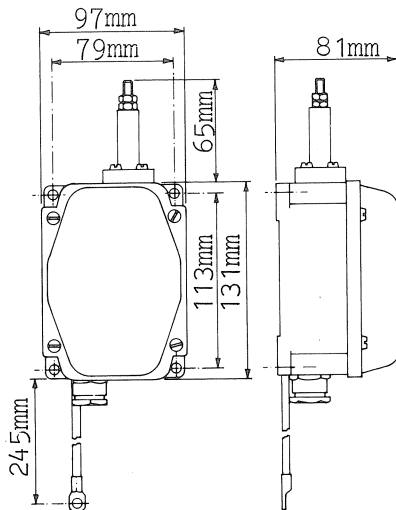
Desk top installation



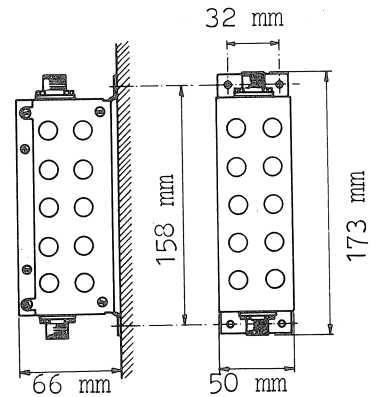
N1405



H1209



H1223



RECEIVER AERIAL:

For receiver aerial use a 6-9 meter long whip aerial, e.g. KUM850, placed as high and as much in the clear as possible, and for duplex reasons as far as possible from the transmitter aerial.

For lead-in use either 50 ohm coaxial cable, e.g. RG213U, mounted in a grounded steel tube or 50 ohm triaxial cable, e.g. SAILOR H213. See fig. 1 and fig. 2. (The losses for the lead-in cable shall be equal to or less than for RG213U).

For aerial and cable connection use a junction box mounted at the footpoint of the aerials. The junction box must be designed for outside mounting in maritime environments. E.g. SAILOR H1209, see fig. 1 and fig. 2.

NOTE: The aerial must be connected directly to the cable. No transformer or protection diodes must be used. If the receiver has to be protected against a near by transmitter, use the SAILOR RECEIVER PROTECTION UNIT H1223 shown at fig. 1 and fig. 2.

If it is impossible to use a whip aerial, a wire aerial may be used. Keep the aerial as vertical as possible. For good short-wave performance keep the length between 6 and 12 meters. For good duplex performance keep the angle between the aerial lead-in and the transmitter aerial as perpendicular as possible.

EARTHING:

Aerial lead-in: see fig. 1 and fig. 2.

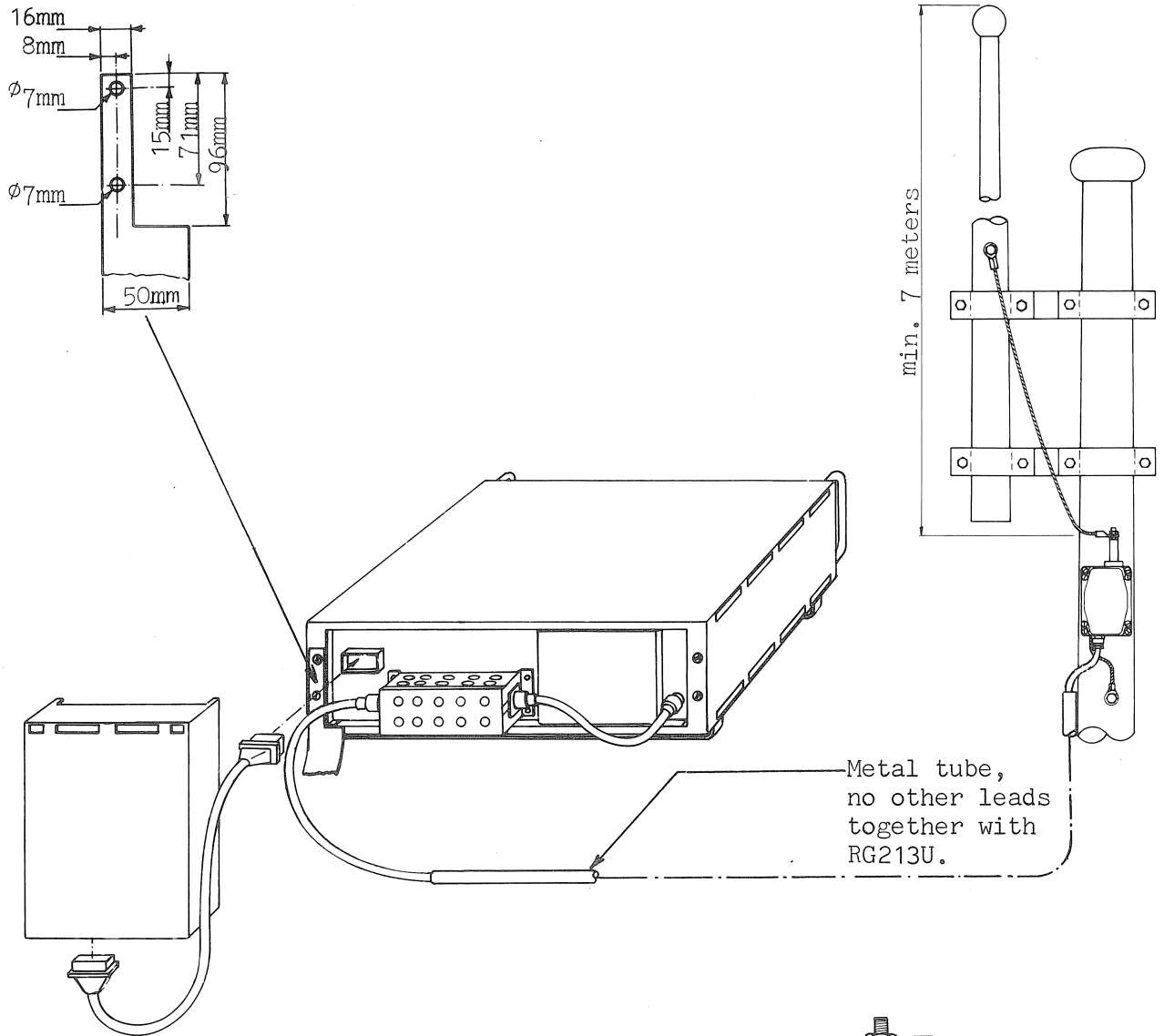
Receiver without transmitter:

In iron vessels the earthband is led to the deck (hull) of the vessel or to the deckhouse.

In fibre-glass and wooden vessels the earthband is led either to a keel bolt if the vessel has an external ballast keel (sailing vessels), or to an external metal plate of at least 1 sqm. on the hull below the water-line.

Receiver in conjunction with a transmitter:

Connect the earthband to the transmitter earth terminal in the shortest possible way to keep the receiver at the same RF potential as the transmitter.



To be grounded effectively. →

If metal mast to mast.

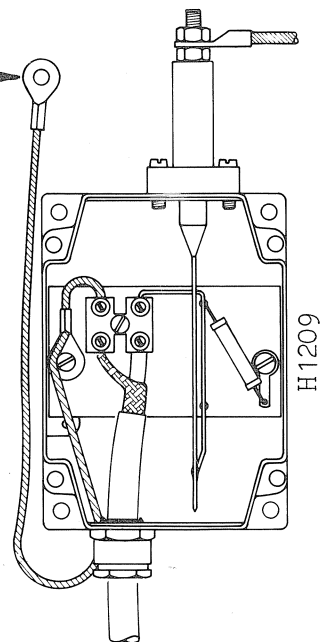
Metal mast must be connected to either metal hull or to grounding system.

If wooden mast to cu-strip (50x1) fastened to the mast and connected to tube around RG213U.

In the lower end the strip must be connected to hull (if metal ship) or to separate grounding system (equal to transmitter system) close to mast.

All standing rigging must in the top end be connected to metal mast or cu-strip and in the receiver end to cu-strip or grounding system.

To avoid crackling noise make all connections by welding, bolting or soldering.



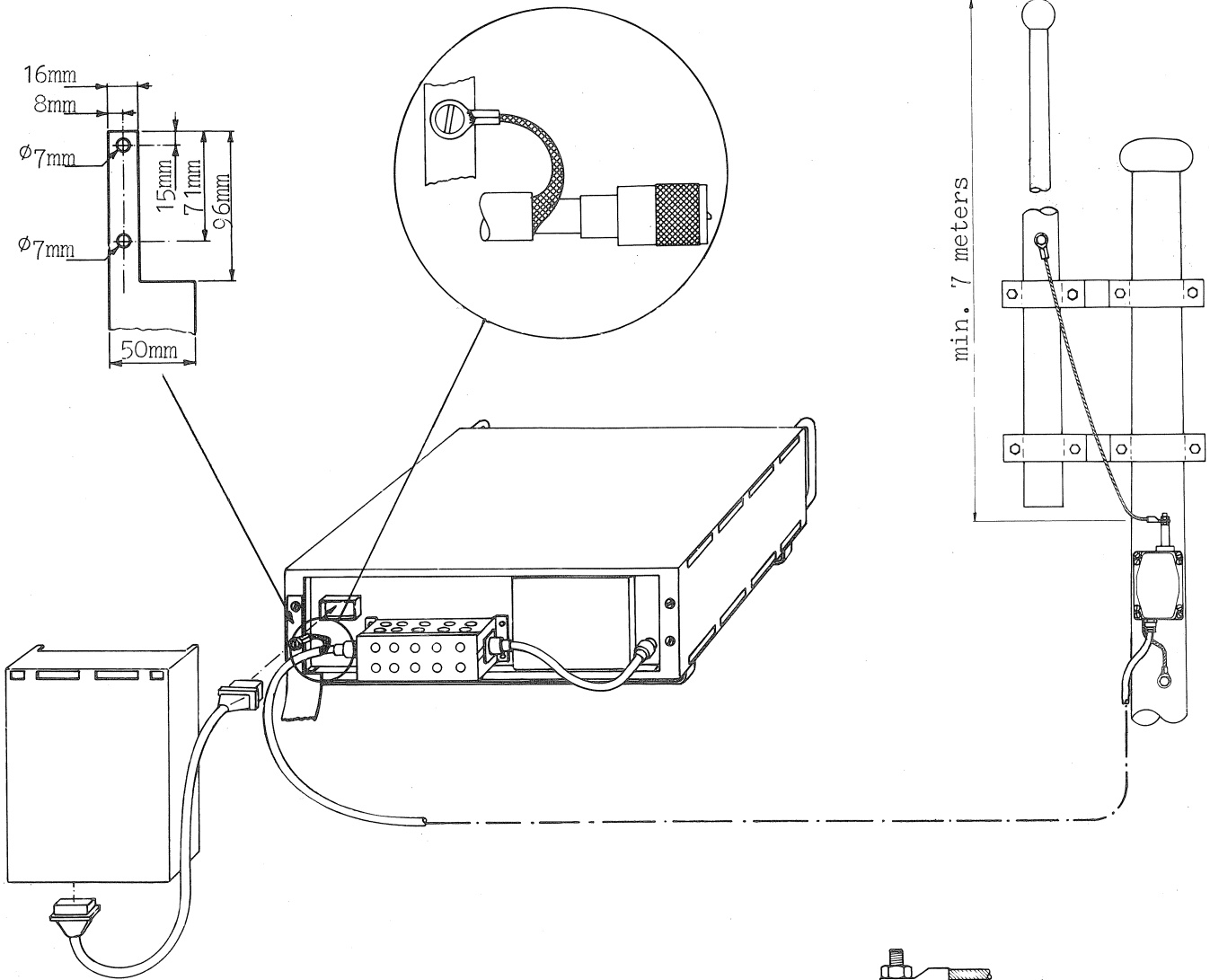
NOTE

Do not use other cables than 50 ohm coaxial cable with same electrical data as RG213U.

FIG. 1

WHIP RECEIVER ARRANGEMENT
FOR SHORT WAVE RECEIVER
WITH COAXIAL CABLE

Top capacity to avoid static noise



To be grounded effectively.

If metal mast to mast.

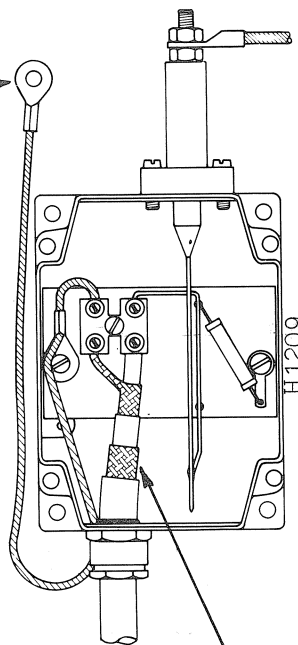
Metal mast must be connected to either metal hull or to grounding system.

If wooden mast to cu-strip (50x1) fastened to the mast.

In the lower end the strip must be connected to deck (if metal ship) or to separate grounding system (equal to transmitter system) close to mast.

All standing rigging must in the top end be connected to metal mast or cu-strip and in the receiver end to cu-strip or grounding system.

To avoid crackling noise make all connections by welding, bolting or soldering.



Outer screen is not connected to ground at this end.

FIG. 2

WHIP RECEIVER ARRANGEMENT
FOR SHORT WAVE RECEIVER
WITH TRIAXIAL CABLE

NOTE

Do not use other cables than 50 ohm triaxial cable with same electrical data as RG213U.
E.g. SP type H1213.