

Sailor

Sailor

**MOUNTING INSTRUCTIONS FOR
SAILOR PROGRAMME 1000/B**

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**INSTRUCTION BOOK FOR
CONNECTION BOX H1233/H1246**

&

**INSTRUCTION BOOK FOR
RACK H1235/H1236/H1237**



A/S S. P. RADIO · AALBORG · DENMARK

DESCRIPTION

SAILOR 400 Watt PEP Solid State Short Wave Station

TRANSMITTER T1130

T1130 is a fully transistorized 400 Watt PEP short wave transmitter to be used with the receiver R1119 or R1120 and the exciter S1302, S1303 or S1304.

The transmitter is designed for use in combination with the SAILOR Aerial Coupler AT1500. Both transmitter and aerial coupler are covering the frequency range 1.6 - 27.5 MHz continuously, and the possibility of frequency selection are depending on the chosen exciter.

The transmitter can also be used as 50 ohm transmitter, directly connected to a 50 ohm aerial system.

EXCITER S1302

For skipper operation

Frequency range:

1.6 - 4 MHz

and the 4-6-8-12-16-22 and 25 MHz maritime RF-bands.

Furthermore it will be possible to incorporate optionally 2 supplementary bands in the range from 12 - 27.5 MHz and have all frequencies from 1.6 - 8.4 MHz continuously.

Frequency selection:

Max. 240 channels can be programmed free selected in the entire frequency range.
Programming is like the Exciter S1300.

Transmitting modes:

Telephony A3J, A3A and A3H.

The aerial current meter at the front panel of the exciter shows the current measured at the aerial insulator of the coupler.

EXCITER S1303

For radio officer operation

Frequency range:

1.6 - 4 MHz

and the 4-6-8-12-16-22 and 25 MHz maritime RF-bands.

Furthermore it will be possible to incorporate optionally 2 supplementary bands in the range 12 - 27.5 MHz and have all frequencies from 1.6 - 8.4 MHz continuously.

Frequency selection:

Free selection of the transmitting frequency in the entire frequency range with keyboard.

LCD display for frequency read-out.

The transmitter frequency selection and transmitter start-up can be remote controlled (unattended use e.g. Maritex, telex).

Transmitting modes:

Telephony A3J, A3A and A3H.

Telegraphy A1 and A2H.

Telex F1.

The aerial current meter at the front panel of the exciter shows the current measured at the aerial insulator of the coupler.

EXCITER S1304 For skipper operation

Same facilities as for S1303.

Frequency selection as for S1303 but only the allocated frequencies can come in operation. 256 PROM programmed frequencies can be allocated.

AERIAL COUPLER AT1500

The aerial coupler is built in a watertight cabinet of acidproof stainless steel. The coupler is designed for mounting both inside and outside cabin.

The aerial coupler is automatically tuned. (Manual tuning is possible).

At installation no tuning or pre-adjustments in the coupler will have to be made.

Whip or wire aerials 5 - 14 meters can be used.

The cables between coupler and transmitter are comprising 1 pc. 16-conductor multicable and one coaxial cable.

All connections to the coupler are made in one specially designed multiplug, no soldering.

The coupler is provided with built-in aerial relay, dummy load and facilities making the following aerial switchings possible by means of the control knobs at the front panel of the set.

CONTROLS

ONE AERIAL SIMPLEX NORMAL

Handset key pressed: Transmitter connected to TX aerial, receiver blocked.

Handset key released: Receiver connected to TX aerial.

ONE AERIAL SIMPLEX NARROW

Handset key pressed: Transmitter connected to TX aerial, receiver blocked.

Handset key released: Receiver connected to TX aerial via aerial coupler. This position gives better sensitivity and better front end selectivity of receiver. Can only be used when RX and TX frequencies are the same or nearly the same.

TWO AERIALS SIMPLEX

Handset key pressed: Transmitter connected to TX aerial, receiver blocked.

Handset key released: Receiver connected to RX aerial.

TWO AERIALS DUPLEX

Handset key pressed: Transmitter connected to TX aerial. Receiver connected to RX aerial.

Handset key released: Transmitter blocked, receiver connected to RX aerial.

GROUNDING AERIAL

TX aerial connected to ground. Transmitter disabled.

D.F.

TX aerial open circuit and command given to D.F. receiver. Transmitter disabled.

DUMMY LOAD/HEAT

Handset key pressed: Transmitter connected to built-in dummy load in aerial coupler. Dummy load fulfils SOLAS regulations.

Handset key released: Heat dissipated in aerial coupler.

ARQ TELEX

The set is designed for one aerial ARQ Telex. Position ONE AERIAL NARROW is used for this mode.

POWER SUPPLY

The power supply is incorporated in the transmitter T1130. Power supply can either be 24Volt DC or 220/240V AC.

The power consumption of the set including receiver and exciter is:

		26.4V DC	220V AC
2-tone	approx.	30 Amp.	5.1 Amp.
Normal speech A3J	approx.	17 Amp.	3.0 Amp.
Normal speech A3H	approx.	24 Amp.	4.5 Amp.
Receiver only	approx.	2.5 Amp.	0.35 Amp.

INSTALLATIONCONNECTIONS:

Between set and connection box:

- 2 multicables with plugs
- 2 coaxcables
- 2 powercables.

All cables delivered with the set are ready for connection to the connection box. Standard length 2 metres.

Between connection box and aerial coupler AT1500:

- 1 multicable 16 x 0.5 mm² (up to 100 m) See also fig. 1.
- 1 triaxial RF cable H1213 or similar.

Max. length of cables only limited by loss in RF cable.

With 170 metres H1213 there will be a reduction about 3 dB in transmit output (12 MHz). If a better cable is used, the loss of output will be reduced.

EXTERNAL CONNECTIONS:

All external connections such as power, duplex antenna (if any), telex, remote control of transmitter, extra microtelephone, extra loudspeaker, mute etc. to be done in connection box.

RF GROUND

The RF ground must be connected to the coupler AT1500.

As RF ground can be used the hull/substructure/mast - if metal.

In not metal ships the grounding system is made as normal with metalplate under water.

If the coupler is placed in metalmast, the mast and rigging can be used as ground.

If land based station an artificial ground system must be made as usual. (16 cu strips creating a star).

TX ANTENNA

The antenna can be whip or wire.

Length between 5 and 14 metres (measured from aerial stand-off on coupler).

If the set is to be used mainly on frequencies higher than 4 MHz, 8.5 m whip is recommended.

If the set is to be used mainly on frequencies lower than 4 MHz, a total antenna-length of 12-14 metres will give the best result.

DUPLEX RX ANTENNA

The set will work simplex and semi-duplex without this antenna.

The antenna (if any) must be made as described in "Mounting Instructions for SAILOR Short-Wave Programme 1000".

GENERAL

All connections to tuner are made via specially designed multiplug. Multi- and coaxcable can be connected to this plug without soldering.

The plug is inserted in the button of the tuner.

To insert plug free space under tuner must be min. 250 mm.

The set is designed for shelf or table-top mounting.

The set has a forced air cooling system. The cooling air is leaving the set on the rear side. Free space behind set must be min. 40 mm.

If the set is installed in a fully enclosed box leaving only the front panel exposed, there must be holes of min. 200 cm² area to allow hot air to escape from the rear. If this is not possible min. 40 mm free space must be left above the equipment.

All cables are leaving the set at the rear side near the button.

All cables and connections are connected through the button of the connection box.

OPERATION

The operation of the short wave set is very simple.

TRANSMITTER:

SELECT FREQUENCY - PRESS THE BUTTON TUNE

Automatic tuning is now carried out.

RECEIVER:

SELECT FREQUENCY - TUNE AERIAL

TECHNICAL DATA

Fulfils all international regulations such as:

	CEPT regulations
U.K.	MPT 1224 regulations
U.S.	FCC regulations
Canadian	R.S.S. 181 regulations
Australian	R.B. 211D regulations.

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 leading-down from the aerial to receiver use 50 ohm coaxial cable of good quality e.g. RG213U in metal tube or triaxial cable H1213.

At the footpoint of the 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.

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

H1233 fig. 2/1

MOUNTED WITH TRIAXIAL CABLE

To be grounded effectively.

If metal mast to mast.

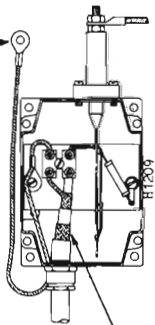
Metal mast must be connected to either metal hull or to grounding system.

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.

NOTE

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

MOUNTED WITH COAXIALCABLE

To be grounded effectively. —————>

If metal mast to mast.

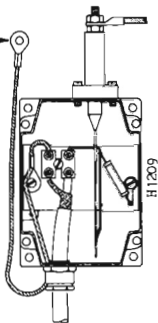
Metal mast must be connected to either metal hull or to grounding system.

If wooden mast to cu-strip (50x1) fastened to the mast and connected to tube around RC213U.

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 RC213U.

TRANSMITTER AERIAL

Most important for good communication is the aerial. The best efficiency of the aerial will be with the Aerial Coupler AT1500 mounted outdoors close to the footpoint of the aerial and the aerial placed as high and free as possible. The Aerial Coupler AT1500 has to be grounded carefully.

AERIAL LENGTH

Max. length 14 metres, min. length 5 metres. Aerial length measured from insulator on AT1500 to the top of the aerial.

If the transmitter has to work mainly on frequencies below 4 MHz a total aerial length of 12-14 metres is recommended.

If the transmitter has to work mainly on frequencies higher than 4 MHz an 8.5 m whip aerial is recommended.

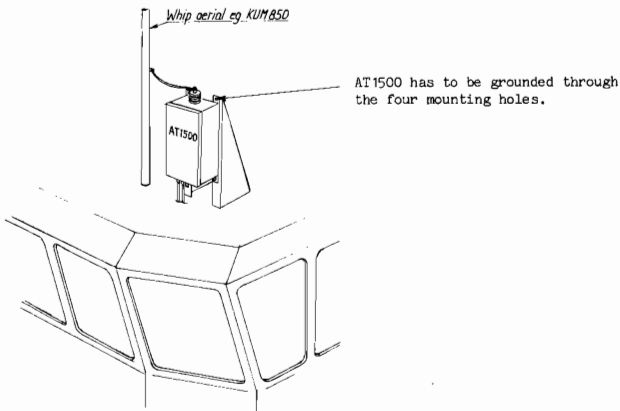
GROUND

AT1500 has to be grounded at the footpoint of the aerial.

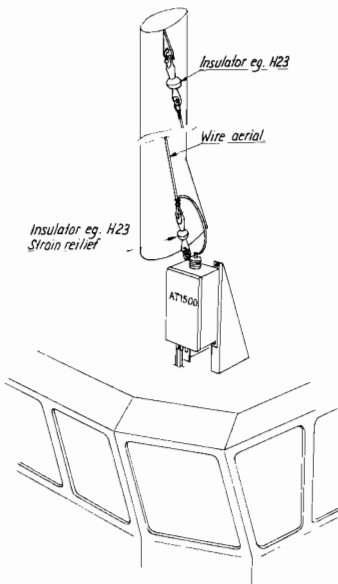
If a metal wheel house, weld up a pillar for AT1500 and bolt it to the pillar. This is the best way of getting a good ground for the aerial system.

If a wooden or fibre glass boat, connect all accessible metal parts together and connect them to the aerial coupler (one or more of the four mounting screws) with a copper strip (100 x 0.5 mm) making the copper strip as short as possible. You can also make an artificial ground under the aerial as shown in ex. 5.

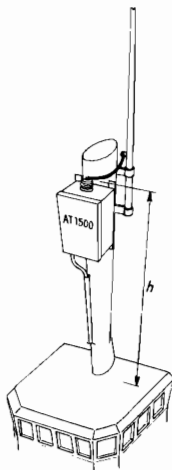
Ex. 1. AT1500 mounted on top of a wheel house with a whip aerial.



Ex. 2. AT1500 mounted on top of a wheel house with wire aerial.



Ex. 3. AT1500 mounted on top of a mast.

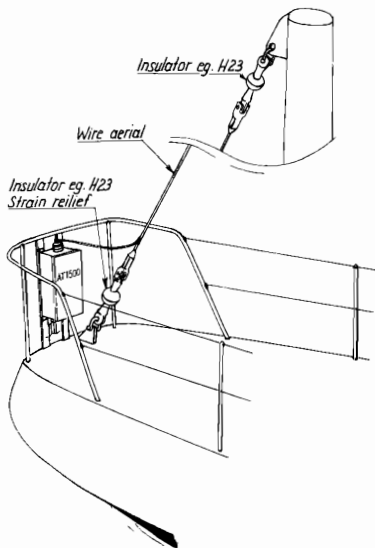


AT1500 has to be grounded to the mast if a metal mast.

If $h > 8$ m then the coax cable will work as ground and an acceptable performance will be obtained.

If $h < 8$ m then a copper strip (10 x 0.5 mm) has to be connected from AT1500 to ground. (See chapter GROUND).

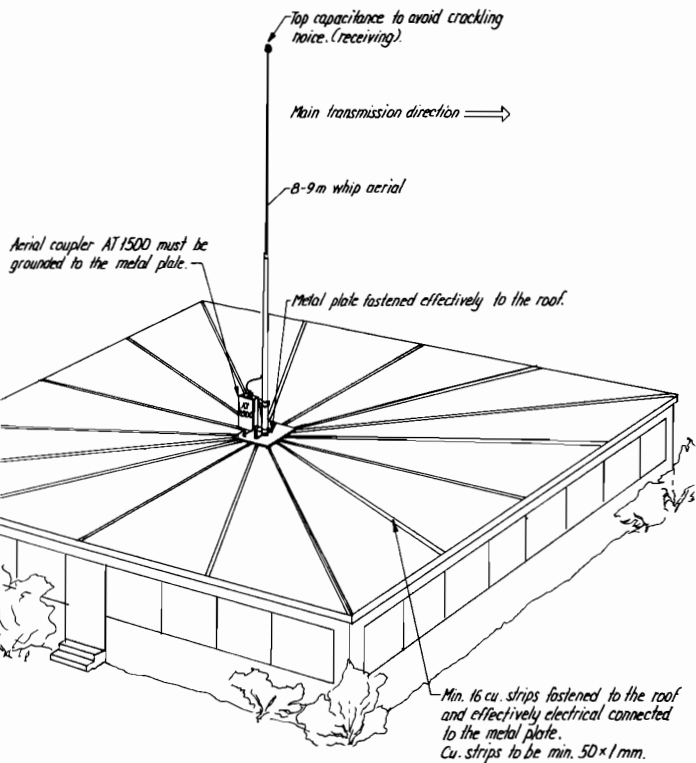
Ex. 4. AT1500 mounted on a sailing ship.



H1233 fig. 2/5

AT1500 has to be grounded eg. to the handrail or other metal parts.

Ex. 5. AT1500 mounted on top of a building.



PACKING LIST FOR SAILOR SHORT WAVE PROGRAMME 1000/B

- H1235 RACK 1000/B
 - Microtelephone
 - Microtelephone hook
 - Frequency table

- T1130 TRANSMITTER with one of the below mentioned power supplies.
 - N1406 12V DC
 - N1407 24V DC
 - N1408 32V DC
 - N1409 110/220/240V AC

- S1302 EXCITER for telephone. Skipper operated operation.
 - 10 pcs. programming strips
 - 1 pc. programming tool

- S1303 EXCITER for telephony, telegraphy and telex. Radio officer operated.

- S1304 EXCITER for telephony, telegraphy and telex. Skipper operated.

- R1119 RECEIVER, Communication

- R1120 RECEIVER, Main

- AT1500 AERIAL COUPLER
 - 1 pc. manual tuning indicator
 - 1 pc. manual tuning key
 - 1 pc. plug for AT1500

- H1233 CONNECTION BOX
 - Strain reliefs and screws for H1233

- Operation instructions

- Mounting instructions 1000/B

Manuals

Equipment

CONTENTS:

GENERAL DESCRIPTION OF SAILOR SHORT WAVE PROGRAMME 1000/B

DRILLING PLAN AND DIMENSIONS FOR PROGRAMME 1000/B

CABLE MOUNTING DETAILS IN PLUG FOR AERIAL COUPLER AT1500 FIG. 1

RECEIVER AND TRANSMITTER AERIALS FIG. 2

WIRING TO PROGRAMME 1000/B H1235 STANDARD RACK

INTERCONNECTION CABLE FOR BATTERY CHARGER N1404 AND 24V DC
SUPPLY N1407

WIRING TO PROGRAMME 1000/B H1235 STANDARD RACK WITH SEPARATE
BATTERY CHARGER N1404 IN H1229 RACK

WIRING TO PROGRAMME 1000/B H1235 STANDARD RACK AND H1236 RACK
FOR BATTERY CHARGER N1404 AND AC/DC CHANGE-OVER H1245

STRAPPING POSSIBILITIES IN CONNECTION BOX H1233

COMPONENT LOCATION FOR PCB IN CONNECTION BOX H1233

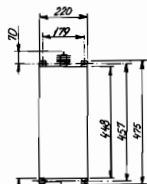
DIAGRAM FOR CONNECTION BOX H1233

PARTS LIST FOR CONNECTION BOX H1233

INTERCONNECTION CABLE DIAGRAM FOR H1235 STANDARD RACK

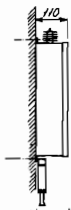
PARTS LIST FOR H1235 STANDARD RACK

INSTALLATION HARDWARE

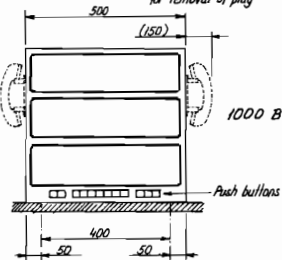


AT 1500

4 pcs. #8mm (M6 bolts must be ACID-PROOF STAINLESS STEEL)
(250) is necessary free distance for removal of plug

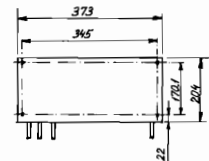
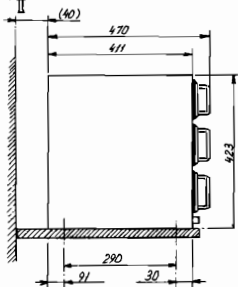


AT 1500 must be mounted as shown here (Vertically)
AT 1500 must not be painted.
AT 1500 must be RF-grounded.

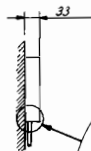


1000 B

Push buttons

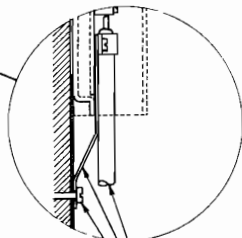


H 1233



Dimensions in brackets are min. free distances in mm.

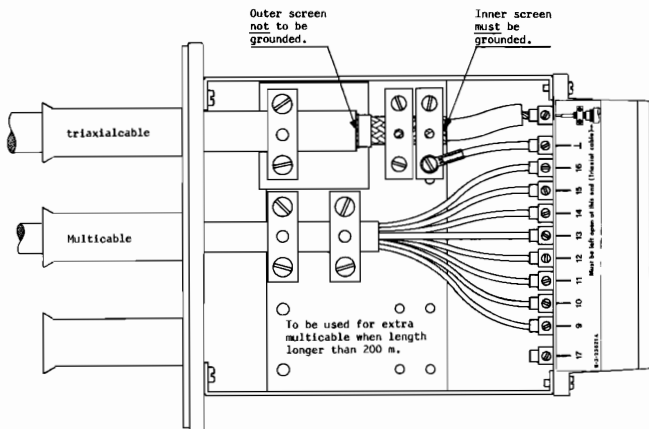
Cable length between 1000B rack and H1233 is 2.0 meters.



Receiver triaxial cable
Cu strip
Safty grounding point to ships hull.

DRILLING PLAN AND DIMENSIONS FOR PROGRAMME 1000/B

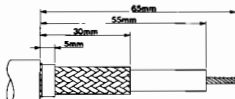
CABLE MOUNTING DETAILS IN PLUG FOR AT1500



Multicable: lead 9 - 16 incl. to be connected on this side. Lead 1 - 8 incl. to be connected on rear side.

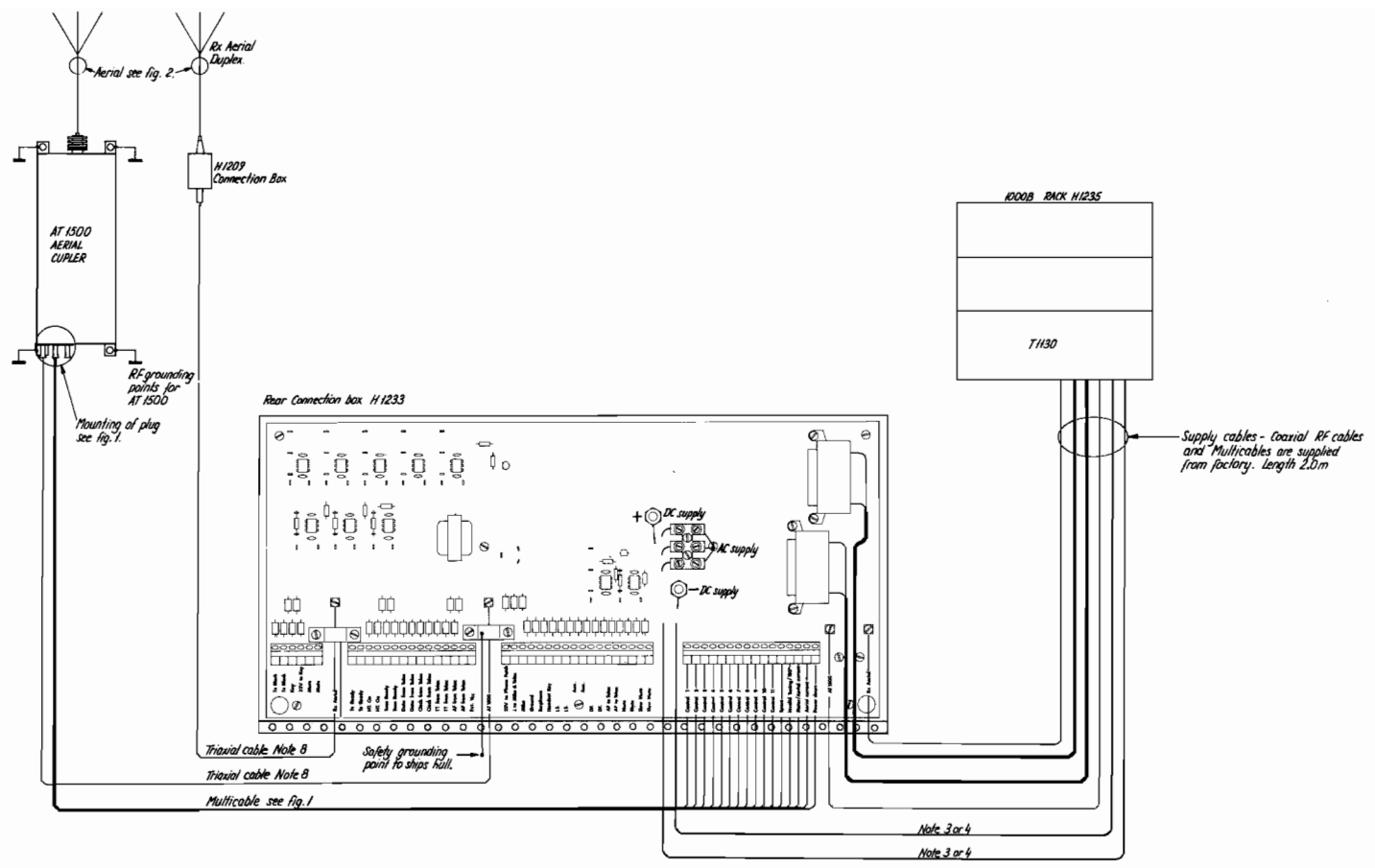
The numbers in plug for AT1500 correspond with the numbers on the supply terminal block in rear connection box H1233 (control 1, control 2, etc.).

Wire stripping for triaxial cable H1213

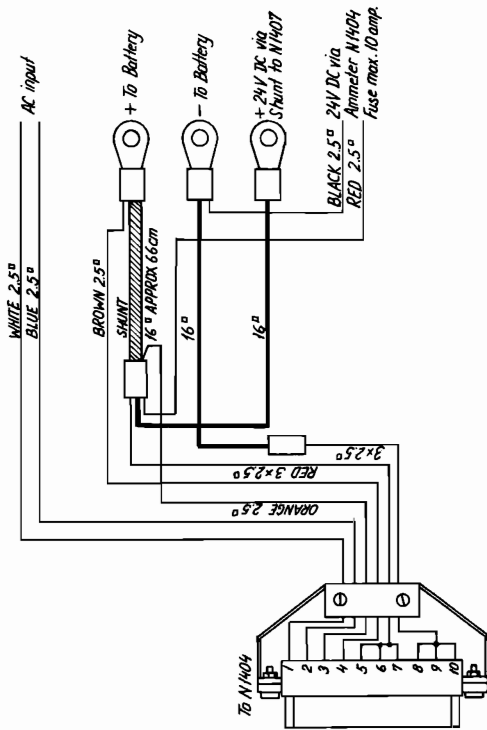


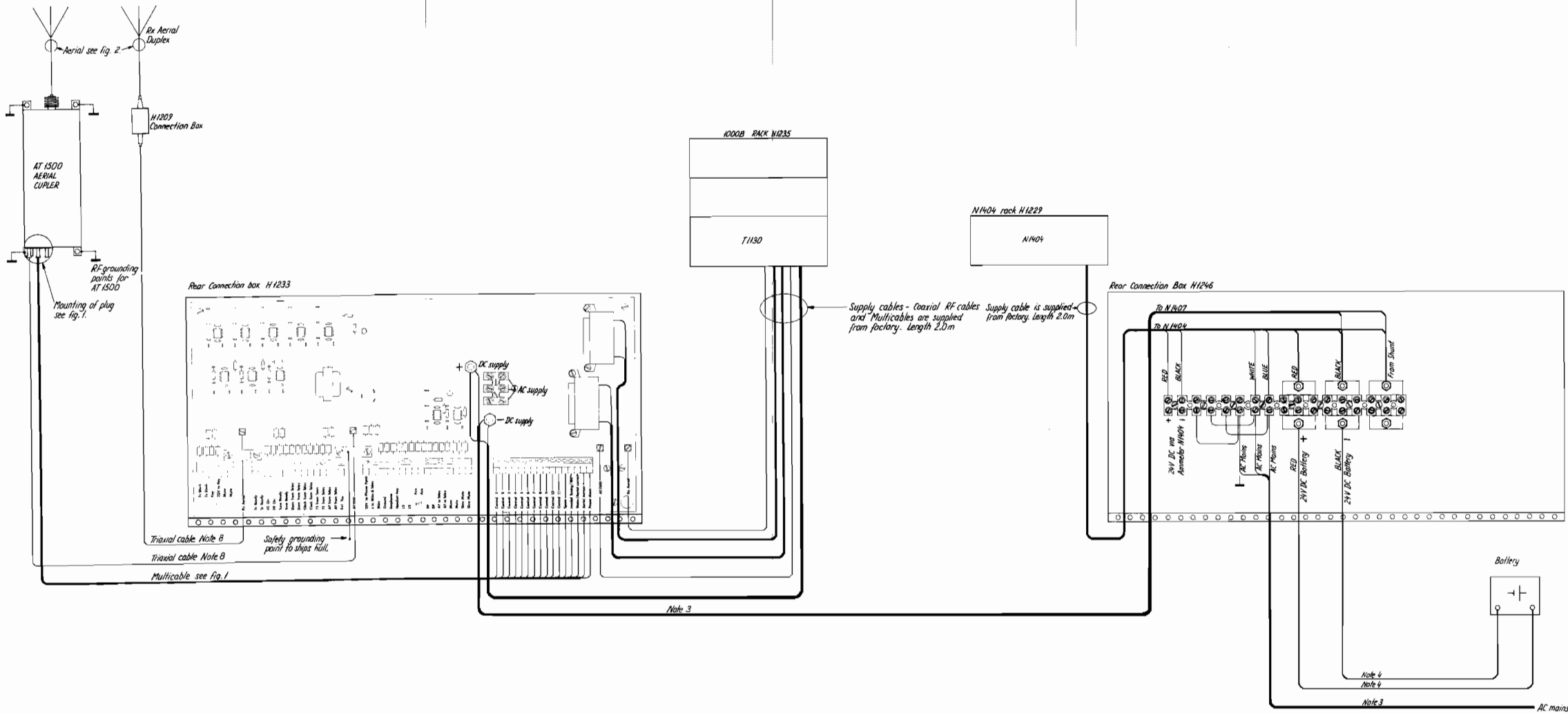
Multicable:	Max. diameter \varnothing 14.5 mm.
Length	Type
0 - 100 m	16 x 0.5 \varnothing
100 - 200 m	18 x 0.5 \varnothing
	Leads connected to terminals 1 and 3 to be doubled.
200 - 400 m	2 pcs. 18 x 0.5 \varnothing in parallel. Terminals 1 and 3 have 4 leads in parallel, other terminals has 2.

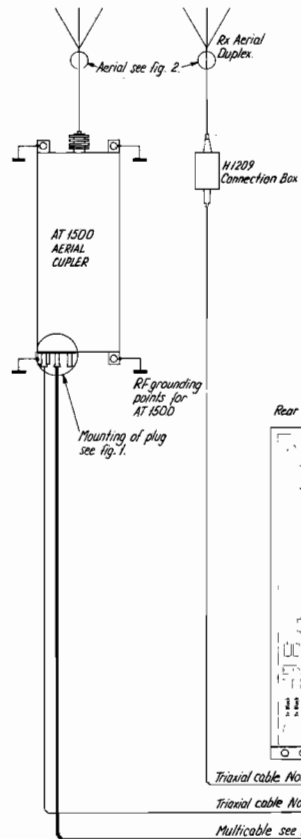
FIG.1



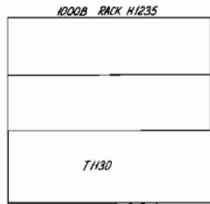
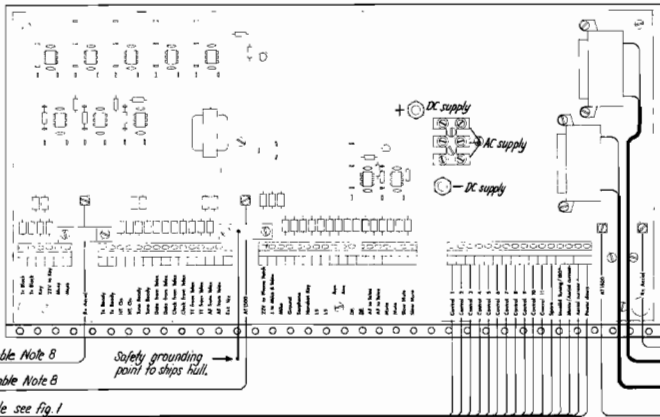
CONNECTION CABLE N1404/N1407







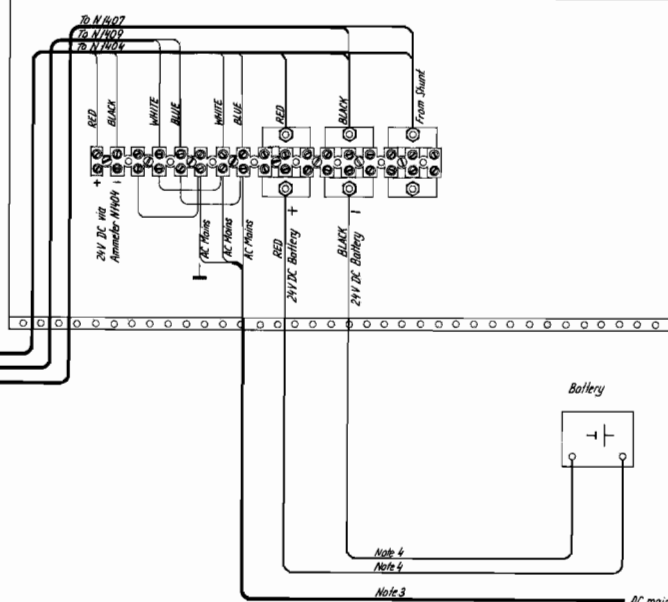
Rear Connection box H1233



Multicable 30x0.5
max. length = 3m
Multicable 6x2.5
max. length = 3m

Supply cables - Coaxial RF cables
and Multicables are supplied
from factory: length 2.0m

Rear Connection Box H1246



STRAPPING POSSIBILITIES IN CONNECTION BOX HL233

STANDARD FACTORY STRAPPING FOR HL233

The supply voltage for the optocoupler can be chosen either from the internal +22V or from an external power source via ST102 pin 15 Ext. Vcc (+) and ST103 pin 2 Ground for Mike and Telex (-).

STANDARD FACTORY SETTING

ST101A 22V INTERNAL
ST102B 22V EXTERNAL

OPTIONAL STRAPPING

ST101B 22V INTERNAL
ST102C 22V EXTERNAL

max. ratings for Optocoupler 4N32:

LED forward voltage nominal 1.2V.

LED forward current nominal 10 mA.

Transistor collector emitter voltage $V_{CE} = 30V$.

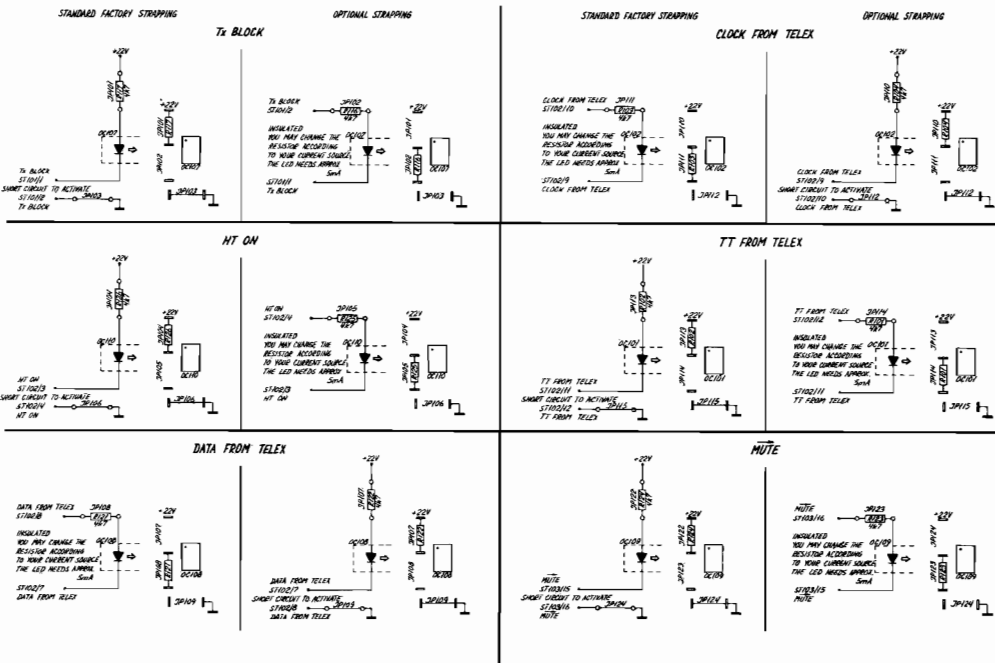
Transistor collector current max. 30 mA.

Collector emitter saturation voltage.

($I_C=2$ mA) $V_{CE}(sat) = 1V$.

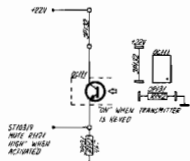
JP101	4.7 kohm	JP117	Jumper
JP102	Not used	JP118	4.7 kohm
JP103	Jumper	JP119	Jumper
JP104	4.7 kohm	JP120	4.7 kohm
JP105	Not used	JP121	Jumper
JP106	Jumper	JP122	4.7 kohm
JP107	Not used	JP123	Not used
JP108	4.7 kohm	JP124	Jumper
JP109	Not used	JP125	4.7 kohm
JP110	Not used	JP126	Jumper
JP111	4.7 kohm	JP127	Jumper
JP112	Not used	JP128	Not used
JP113	4.7 kohm	JP129	Jumper
JP114	Not used	JP130	Not used
JP115	Jumper	JP131	4.7 kohm
JP116	4.7 kohm	JP132	Jumper

OPTIONAL STRAPPING INFORMATION

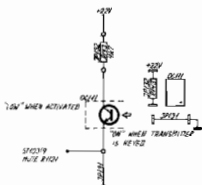


STANDARD FACTORY STRAPPING

NOTE

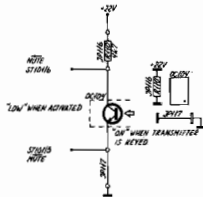


OPTIONAL STRAPPING

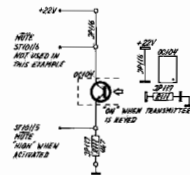


STANDARD FACTORY STRAPPING

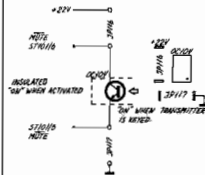
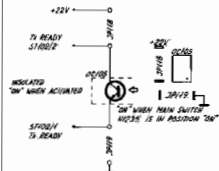
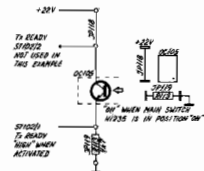
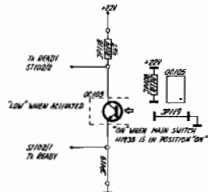
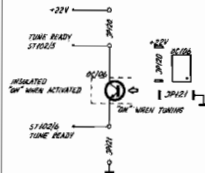
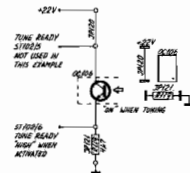
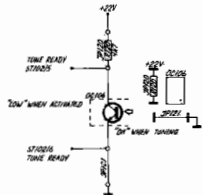
NOTE



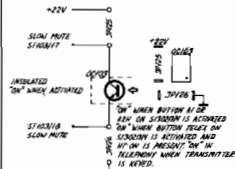
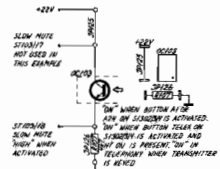
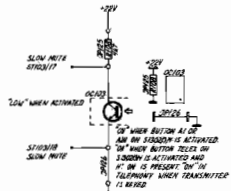
OPTIONAL STRAPPING

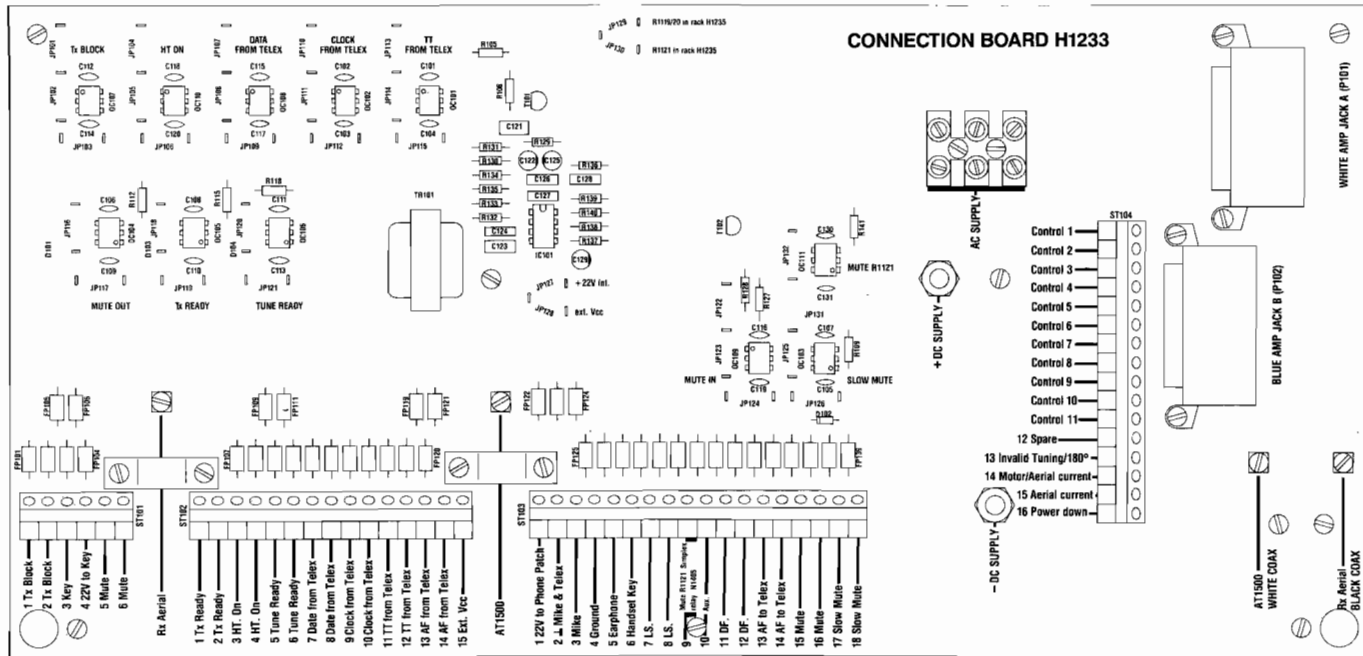


OPTIONAL STRAPPING

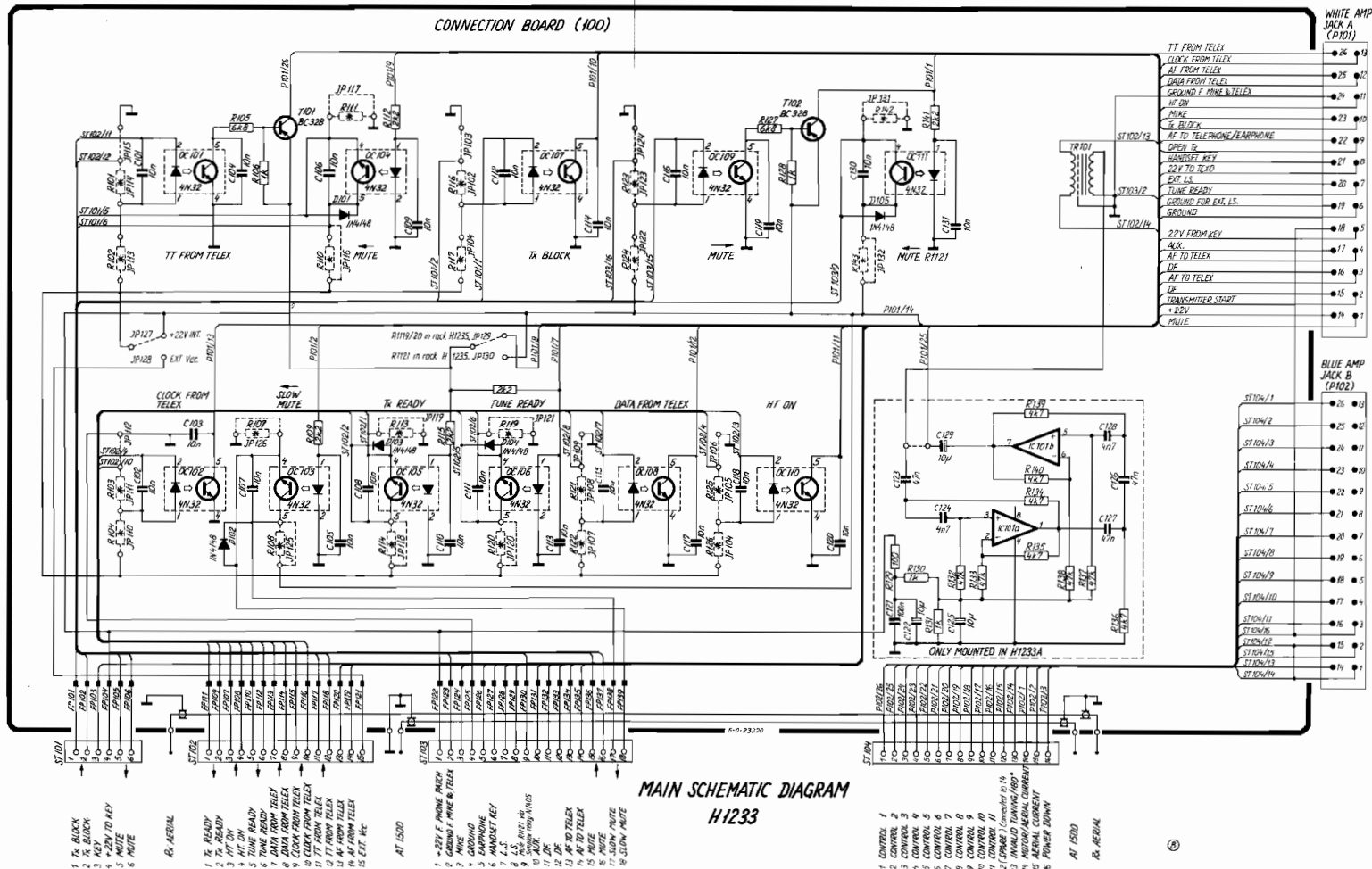
T₁ READYT₂ READY

SLOW NOTE





CONNECTION BOARD (100)



MAIN SCHEMATIC DIAGRAM
H1233

WHITE AMP JACK A (P101)

- TT FROM TELEX
- CLOCK FROM TELEX
- AF FROM TELEX
- DATA FROM TELEX
- GROUND F. FROM TELEX
- HT ON
- MUTE
- Tx BLOCK
- AF TO TELEPHONE EARPHONE
- OPEN S.
- SEND KEY
- 24X TO READ
- EX. LS
- TUNE READY
- GROUND FOR EX. LS
- GROUND
- 22V FROM KEY
- RAJ
- AF TO TELEX
- DE
- AF TO TELEX
- IS
- TRANSMITTER START
- REV
- MUTE

BLUE AMP JACK B (P102)

- ST10N/1
- ST10N/2
- ST10N/3
- ST10N/4
- ST10N/5
- ST10N/6
- ST10N/7
- ST10N/9
- ST10N/10
- ST10N/11
- ST10N/6
- ST10N/12
- ST10N/13
- ST10N/14

ONLY MOUNTED IN H1233A

- 1 Tx. BLOCK
- 2 Tx. BLOCK
- 3 KEY TO KEY
- 4 MUTE
- 5 A. AERIAL
- 6 TT READY
- 7 HT ON
- 8 MUTE
- 9 TUNE READY
- 10 DATA FROM TELEX
- 11 DATA FROM TELEX
- 12 DATA FROM TELEX
- 13 TT FROM TELEX
- 14 AF FROM TELEX
- 15 EXT. Wc
- 16 AT 1500
- 17 22V F. PHONE BATTERY
- 18 GROUND F. FROM TELEX
- 19 MUTE
- 20 MUTE
- 21 MUTE
- 22 MUTE
- 23 MUTE
- 24 MUTE
- 25 MUTE
- 26 MUTE
- 27 MUTE
- 28 MUTE
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- 98 MUTE
- 99 MUTE
- 100 MUTE

- 1 CONTROL
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- 98 CONTROL
- 99 CONTROL
- 100 CONTROL

Note 3.

RECOMMENDED AC SUPPLY CABLES:

110-117V AC conductor 1.5 mm², 1x16 Amp. supply.

220-240V AC conductor 1.5 mm², 1x10 Amp. supply.

Note 4.

RECOMMENDED DC SUPPLY CABLES:

In order to ensure low voltage drop between battery and short wave set use the adjoining table for supply cable.

Min. cable conductor in mm ² :	Distance between battery and pgr. 1000/B	
	12V (m)	24/32V (m)
6 mm ²	1.5	3
10 mm ²	2.5	5
16 mm ²	4	8
25 mm ²	6.2	12.4
35 mm ²	8.7	17.4
50 mm ²	12.4	24.8
70 mm ²	17.4	34.7

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.

REAR CONNECTION BOX HI233

1/4

Symbol	Description	Manufact.	
T101	Transistor	Philips	BC328
T102	Transistor	Philips	BC328
OC101	Opto Coupler	Motorola	4N32
OC102	Opto Coupler	Motorola	4N32
OC103	Opto Coupler	Motorola	4N32
OC104	Opto Coupler	Motorola	4N32
OC105	Opto Coupler	Motorola	4N32
OC106	Opto Coupler	Motorola	4N32
OC107	Opto Coupler	Motorola	4N32
OC108	Opto Coupler	Motorola	4N32
OC109	Opto Coupler	Motorola	4N32
OC110	Opto Coupler	Motorola	4N32
OC111	Opto Coupler	Motorola	4N32
R101	Resistor if fitted	4.7 kohm $\pm 5\%$ 0.33W	Philips 2322 211 13472
R102	Resistor if fitted	4.7 kohm $\pm 5\%$ 0.33W	Philips 2322 211 13472
R103	Resistor if fitted	4.7 kohm $\pm 5\%$ 0.33W	Philips 2322 211 13472
R104	Resistor if fitted	4.7 kohm $\pm 5\%$ 0.33W	Philips 2322 211 13472
R105	Resistor	6.8 kohm $\pm 5\%$ 0.33W	Philips 2322 211 13682
R106	Resistor	1 kohm $\pm 5\%$ 0.33W	Philips 2322 211 13102
R107	Resistor if fitted	4.7 kohm $\pm 5\%$ 0.33W	Philips 2322 211 13472
R108	Resistor if fitted	4.7 kohm $\pm 5\%$ 0.33W	Philips 2322 211 13472
R109	Resistor	2.2 kohm $\pm 5\%$ 0.33W	Philips 2322 211 13222
R110	Resistor if fitted	4.7 kohm $\pm 5\%$ 0.33W	Philips 2322 211 13472
R111	Resistor if fitted	4.7 kohm $\pm 5\%$ 0.33W	Philips 2322 211 13472
R112	Resistor	2.2 kohm $\pm 5\%$ 0.33W	Philips 2322 211 13222
R113	Resistor if fitted	4.7 kohm $\pm 5\%$ 0.33W	Philips 2322 211 13472
R114	Resistor if fitted	4.7 kohm $\pm 5\%$ 0.33W	Philips 2322 211 13472
R115	Resistor	2.2 kohm $\pm 5\%$ 0.33W	Philips 2322 211 13222
R116	Resistor if fitted	4.7 kohm $\pm 5\%$ 0.33W	Philips 2322 211 13472
R117	Resistor if fitted	4.7 kohm $\pm 5\%$ 0.33W	Philips 2322 211 13472
R118	Resistor	2.2 kohm $\pm 5\%$ 0.33W	Philips 2322 211 13222
R119	Resistor if fitted	4.7 kohm $\pm 5\%$ 0.33W	Philips 2322 211 13472
R120	Resistor if fitted	4.7 kohm $\pm 5\%$ 0.33W	Philips 2322 211 13472
R121	Resistor if fitted	4.7 kohm $\pm 5\%$ 0.33W	Philips 2322 211 13472
R122	Resistor if fitted	4.7 kohm $\pm 5\%$ 0.33W	Philips 2322 211 13472
R123	Resistor if fitted	4.7 kohm $\pm 5\%$ 0.33W	Philips 2322 211 13472
R124	Resistor if fitted	4.7 kohm $\pm 5\%$ 0.33W	Philips 2322 211 13472
R125	Resistor if fitted	4.7 kohm $\pm 5\%$ 0.33W	Philips 2322 211 13472

REAR CONNECTION BOX H1233

2/4

Symbol	Description	Manufac.	
R126	Resistor if fitted 4.7 kohm $\pm 5\%$ 0.33W	Philips	2322 211 13472
R127	Resistor 6.8 kohm $\pm 5\%$ 0.33W	Philips	2322 211 13682
R128	Resistor 1 kohm $\pm 5\%$ 0.33W	Philips	2322 211 13102
R129	Resistor only H1233A 100 ohm $\pm 5\%$ 0.33W	Philips	2322 211 13101
R130	Resistor only H1233A 1 kohm $\pm 5\%$ 0.33W	Philips	2322 211 13102
R131	Resistor only H1233A 1 kohm $\pm 5\%$ 0.33W	Philips	2322 211 13102
R132	Resistor only H1233A 47 kohm $\pm 5\%$ 0.33W	Philips	2322 211 13473
R133	Resistor only H1233A 47 kohm $\pm 5\%$ 0.33W	Philips	2322 211 13473
R134	Resistor only H1233A 4.7 kohm $\pm 5\%$ 0.33W	Philips	2322 211 13472
R135	Resistor only H1233A 4.7 kohm $\pm 5\%$ 0.33W	Philips	2322 211 13472
R136	Resistor only H1233A 4.7 kohm $\pm 5\%$ 0.33W	Philips	2322 211 13472
R137	Resistor only H1233A 47 kohm $\pm 5\%$ 0.33W	Philips	2322 211 13473
R138	Resistor only H1233A 47 kohm $\pm 5\%$ 0.33W	Philips	2322 211 13473
R139	Resistor only H1233A 4.7 kohm $\pm 5\%$ 0.33W	Philips	2322 211 13472
R140	Resistor only H1233A 4.7 kohm $\pm 5\%$ 0.33W	Philips	2322 211 13472
R141	Resistor 2.2 kohm $\pm 5\%$ 0.33W	Philips	2322 211 13222
R142	Resistor if fitted 4.7 kohm $\pm 5\%$ 0.33W	Philips	2322 211 13472
R143	Resistor if fitted 4.7 kohm $\pm 5\%$ 0.33W	Philips	2322 211 13472
C101	Capacitor ceramic 10 nF -20/+80% 50V	KCK	HE70SJYF103Z
C102	Capacitor ceramic 10 nF -20/+80% 50V	KCK	HE70SJYF103Z
C103	Capacitor ceramic 10 nF -20/+80% 50V	KCK	HE70SJYF103Z
C104	Capacitor ceramic 10 nF -20/+80% 50V	KCK	HE70SJYF103Z
C105	Capacitor ceramic 10 nF -20/+80% 50V	KCK	HE70SJYF103Z
C106	Capacitor ceramic 10 nF -20/+80% 50V	KCK	HE70SJYF103Z
C107	Capacitor ceramic 10 nF -20/+80% 50V	KCK	HE70SJYF103Z
C108	Capacitor ceramic 10 nF -20/+80% 50V	KCK	HE70SJYF103Z
C109	Capacitor ceramic 10 nF -20/+80% 50V	KCK	HE70SJYF103Z
C110	Capacitor ceramic 10 nF -20/+80% 50V	KCK	HE70SJYF103Z
C111	Capacitor ceramic 10 nF -20/+80% 50V	KCK	HE70SJYF103Z
C112	Capacitor ceramic 10 nF -20/+80% 50V	KCK	HE70SJYF103Z
C113	Capacitor ceramic 10 nF -20/+80% 50V	KCK	HE70SJYF103Z
C114	Capacitor ceramic 10 nF -20/+80% 50V	KCK	HE70SJYF103Z
C115	Capacitor ceramic 10 nF -20/+80% 50V	KCK	HE70SJYF103Z
C116	Capacitor ceramic 10 nF -20/+80% 50V	KCK	HE70SJYF103Z
C117	Capacitor ceramic 10 nF -20/+80% 50V	KCK	HE70SJYF103Z
C118	Capacitor ceramic 10 nF -20/+80% 50V	KCK	HE70SJYF103Z

REAR CONNECTION BOX H1233

3/4

Symbol	Description	Manufac.	
C119	Capacitor ceramic 10 nF -20/+80% 50V	KCK	HE70SJYF103Z
C120	Capacitor ceramic 10 nF -20/+80% 50V	KCK	HE70SJYF103Z
C121	Capacitor MKT 100 nF $\pm 10\%$ 250V	Siemens	B32510-D3108-K
C122	Capacitor electrolyt 10 uF 35V	ERO	EKI00AA210F
C123	Capacitor MKT 47 nF $\pm 10\%$ 250V	Siemens	B32510-D3473-K
C124	Capacitor MKT 4.7 nF $\pm 10\%$ 400V	Siemens	B32510-D6472-K
C125	Capacitor electrolyt 10 uF 35V	ERO	EKI00AA210F
C126	Capacitor MKT 47 nF $\pm 10\%$ 250V	Siemens	B32510-D3473-K
C127	Capacitor MKT 47 nF $\pm 10\%$ 250V	Siemens	B32510-D3473-K
C128	Capacitor MKT 4.7 nF $\pm 10\%$ 400V	Siemens	B32510-D6472-K
C129	Capacitor electrolyt 10 uF 35V	ERO	EKI00AA210F
C130	Capacitor ceramic 10 nF -20/+80% 50V	KCK	HE70SJYF103Z
C131	Capacitor ceramic 10 nF -20/+80% 50V	KCK	HE70SJYF103Z
T101	AF Transformer	Tradania	2296
FP101	Ferrit bead	Kaschke	K3/1200/0.1HZ4/2/7A
FP102	Ferrit bead	Kaschke	K3/1200/0.1HZ4/2/7A
FP103	Ferrit bead	Kaschke	K3/1200/0.1HZ4/2/7A
FP104	Ferrit bead	Kaschke	K3/1200/0.1HZ4/2/7A
FP105	Ferrit bead	Kaschke	K3/1200/0.1HZ4/2/7A
FP106	Ferrit bead	Kaschke	K3/1200/0.1HZ4/2/7A
FP107	Ferrit bead	Kaschke	K3/1200/0.1HZ4/2/7A
FP108	Ferrit bead	Kaschke	K3/1200/0.1HZ4/2/7A
FP109	Ferrit bead	Kaschke	K3/1200/0.1HZ4/2/7A
FP110	Ferrit bead	Kaschke	K3/1200/0.1HZ4/2/7A
FP111	Ferrit bead	Kaschke	K3/1200/0.1HZ4/2/7A
FP112	Ferrit bead	Kaschke	K3/1200/0.1HZ4/2/7A
FP113	Ferrit bead	Kaschke	K3/1200/0.1HZ4/2/7A
FP114	Ferrit bead	Kaschke	K3/1200/0.1HZ4/2/7A
FP115	Ferrit bead	Kaschke	K3/1200/0.1HZ4/2/7A
FP116	Ferrit bead	Kaschke	K3/1200/0.1HZ4/2/7A
FP117	Ferrit bead	Kaschke	K3/1200/0.1HZ4/2/7A
FP118	Ferrit bead	Kaschke	K3/1200/0.1HZ4/2/7A
FP119	Ferrit bead	Kaschke	K3/1200/0.1HZ4/2/7A
FP120	Ferrit bead	Kaschke	K3/1200/0.1HZ4/2/7A
FP121	Ferrit bead	Kaschke	K3/1200/0.1HZ4/2/7A
FP122	Ferrit bead	Kaschke	K3/1200/0.1HZ4/2/7A
FP123	Ferrit bead	Kaschke	K3/1200/0.1HZ4/2/7A

REAR CONNECTION BOX HI233

4/4

<i>Symbol</i>	<i>Description</i>	<i>Manuf. ac.</i>	
FP124	Ferrit bead	Kaschke	K3/1200/0.1HZ4/2/7A
FP125	Ferrit bead	Kaschke	K3/1200/0.1HZ4/2/7A
FP126	Ferrit bead	Kaschke	K3/1200/0.1HZ4/2/7A
FP127	Ferrit bead	Kaschke	K3/1200/0.1HZ4/2/7A
FP128	Ferrit bead	Kaschke	K3/1200/0.1HZ4/2/7A
FP129	Ferrit bead	Kaschke	K3/1200/0.1HZ4/2/7A
FP130	Ferrit bead	Kaschke	K3/1200/0.1HZ4/2/7A
FP131	Ferrit bead	Kaschke	K3/1200/0.1HZ4/2/7A
FP132	Ferrit bead	Kaschke	K3/1200/0.1HZ4/2/7A
FP133	Ferrit bead	Kaschke	K3/1200/0.1HZ4/2/7A
FP134	Ferrit bead	Kaschke	K3/1200/0.1HZ4/2/7A
FP135	Ferrit bead	Kaschke	K3/1200/0.1HZ4/2/7A
FP136	Ferrit bead	Kaschke	K3/1200/0.1HZ4/2/7A
FP137	Ferrit bead	Kaschke	K3/1200/0.1HZ4/2/7A
FP138	Ferrit bead	Kaschke	K3/1200/0.1HZ4/2/7A
FP139	Ferrit bead	Kaschke	K3/1200/0.1HZ4/2/7A
FP140	Ferrit bead	Kaschke	K3/1200/0.1HZ4/2/7A
D101	Diode	Philips	1N4148
D102	Diode	Philips	1N4148
D103	Diode	Philips	1N4148
D104	Diode	Philips	1N4148
D105	Diode	Philips	1N4148

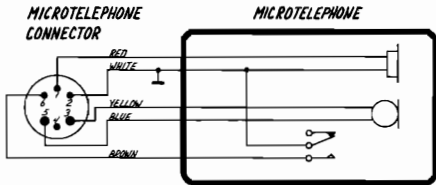
Symbol	Description			Manufact.	
C1	Capacitor polyester	100 nF	$\pm 10\%$	100V Siemens	B32510-D1104-K
C2	Capacitor polyester	100 nF	$\pm 10\%$	100V Siemens	B32510-D1104-K
C3	Capacitor polyester	100 nF	$\pm 10\%$	100V Siemens	B32510-D1104-K
C4	Capacitor polyester	100 nF	$\pm 10\%$	100V Siemens	B32510-D1104-K
C5	Capacitor polyester	100 nF	$\pm 10\%$	100V Siemens	B32510-D1104-K
C6	Capacitor polyester	100 nF	$\pm 10\%$	100V Siemens	B32510-D1104-K
C7	Capacitor polyester	100 nF	$\pm 10\%$	100V Siemens	B32510-D1104-K
C8	Capacitor polyester	470 nF	$\pm 20\%$	100V Philips	2322 344 26474
C9	Capacitor ceramic	10 nF	-10/+80%	50V KCK	HE70SJYF 103Z
C10	Capacitor ceramic	10 nF	-10/+80%	50V KCK	HE70SJYF 103Z
C11	Capacitor polyester	10 nF	$\pm 10\%$	250V Siemens	B32510-D6103-K
C12	Capacitor electrolytic	10 uF	-10/+100%	25V Siemens	B41313-A5106-V
C13	Capacitor polyester	100 nF	$\pm 20\%$	250V ERO	MKT 1822
C14	Capacitor ceramic	10 nF	-20/+80%	50V KCK	HE70SJYF 103Z
C15	Capacitor ceramic	10 nF	-20/+80%	50V KCK	HE70SJYF 103Z
C16	Capacitor ceramic	10 nF	-20/+80%	50V KCK	HE70SJYF 103Z
C17	Capacitor ceramic	10 nF	-20/+80%	50V KCK	HE70SJYF 103Z
C18	Capacitor electrolytic	10 uF	-10/+80%	25V Siemens	B41313-A5106-V
C19	Capacitor polyester	330 nF	$\pm 20\%$	250V Philips	2222 344 46334
C20	Capacitor polyester	330 nF	$\pm 20\%$	250V Philips	2222 344 46334
C21	Capacitor ceramic	1.8 nF	-20/+80%	400V Ferroperm	9/0141.9
C22	Capacitor ceramic	1.8 nF	-20/+80%	400V Ferroperm	9/0141.9
C23	Capacitor electrolytic	4,7uF	20%	50V ROE	EKI00AA147H
D1	Diode silicon			Philips	1N4148
D2	Diode silicon			Philips	1N4148
D3	Diode silicon			Philips	1N4148
D4	Diode silicon			Philips	1N4148
D5	Diode silicon			Philips	1N4148
FP1	Ferrit bead			Kaschke	K3/1200/0.1Hz 4/2/7A
IC1	Integrated circuit			Motorola	MC1458
R1	Resistor	390 ohm	$\pm 5\%$	0.33W Philips	2322 211 13391
R2	Resistor	390 ohm	$\pm 5\%$	0.33W Philips	2322 211 13391
R3	Resistor	390 ohm	$\pm 5\%$	0.33W Philips	2322 211 13391
R4	Resistor	390 ohm	$\pm 5\%$	0.33W Philips	2322 211 13391
R5	Resistor	390 ohm	$\pm 5\%$	0.33W Philips	2322 211 13391
R6	Resistor	390 ohm	$\pm 5\%$	0.33W Philips	2322 211 13391

Symbol	Description	Manuf.	
R7	Resistor 150 ohm $\pm 5\%$	0.33W Philips	2322 211 13151
R8	Resistor 150 ohm $\pm 5\%$	0.33W Philips	2322 211 13151
R9	Resistor 6.8 kohm $\pm 5\%$	0.33W Philips	2322 211 13682
R10	Resistor 1 kohm $\pm 5\%$	0.33W Philips	2322 211 13102
R11	Resistor 1 kohm $\pm 5\%$	0.33W Philips	2322 211 13102
R12	Resistor 2.2 kohm $\pm 10\%$	0.1W Philips	2322 410 03355
R13	Resistor 10 kohm $\pm 5\%$	0.33W Philips	2322 211 13103
R14	Resistor 22 ohm $\pm 5\%$	0.33W Philips	2322 211 13229
R15	Resistor 4.7 kohm $\pm 5\%$	0.33W Philips	2322 211 13473
R16	Resistor 560 ohm $\pm 5\%$	0.33W Philips	2322 211 13561
R17	Resistor 10 kohm $\pm 5\%$	0.33W Philips	2322 211 13103
R18	Resistor 47 kohm $\pm 5\%$	0.33W Philips	2322 211 13473
R19	Resistor 4.7 kohm $\pm 5\%$	0.33W Philips	2322 211 13472
R20	Resistor 4.7 kohm $\pm 5\%$	0.33W Philips	2322 211 13472
R21	Resistor 4.7 kohm $\pm 5\%$	0.33W Philips	2322 211 13472
R22	Resistor 1 kohm $\pm 5\%$	0.33W Philips	2322 211 13102
R23	Resistor 6.8 kohm $\pm 5\%$	0.33W Philips	2322 211 13682
R24	Resistor 100 ohm $\pm 5\%$	0.33W Philips	2322 211 13101
RE1	Relay	National	NF2E 12V
RE2	Relay	Siemens	V23040-0003-B101
RE3	Relay	S.D.S.	DR-15V
RE4	Relay	ITT	LZ-12H
S1	Switch 2xF,20 u/kn.2u EE	Shadow	SP No. 43.501
S2	Switch 7xF,20 u/kn.2u Gr	Shadow	SP No. 43.508
S3	Switch 3xF,20 u/kn.2u Gr Tast 1:4u, Tast 6: 4u, Tast 7: 6u	Shadow	SP No. 43.502
T1	Transistor	Philips	BC640
T2	Transistor	Philips	BC548B
T3	Transistor	Philips	BC328
J1	Jack	Hirschman	Meb 60H
J2	Jack	Hirschman	Meb 60H
Plug B	Plug	Amp	1-827 135-3

MICROTELEPHONE INSTALLATION 1000/B

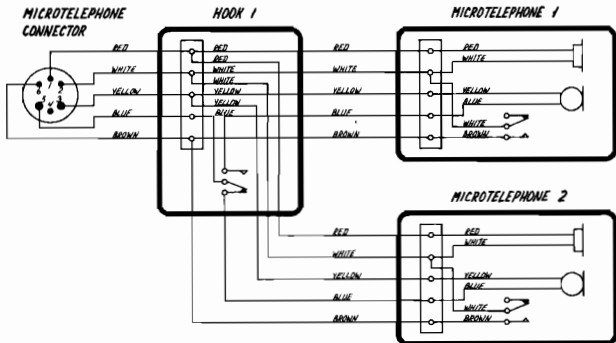
It is possible on request to get a special two microphone installation as described on the schematic diagram below.

NORMAL INSTALLATION WITH ONE MICROTELEPHONE



SPECIAL INSTALLATION WITH TWO MICROTELEPHONES

Microtelephone one with preference.



TUNING TABLE T1130/AT1500

When tuning please note the recorded figures in the table.

BANDS in T1130	MARITIME BANDS	RES.	LOAD	Γ_A
2182.0 kHz				
1 600.0 - 1 799.9 kHz	1 600.0 - 1 799.9 kHz			
1 800.0 - 1 999.9 kHz	1 800.0 - 1 999.9 kHz			
2 000.0 - 2 199.9 kHz	2 000.0 - 2 199.9 kHz			
2 200.0 - 2 399.9 kHz	2 200.0 - 2 399.9 kHz			
2 400.0 - 2 599.9 kHz	2 400.0 - 2 599.9 kHz			
2 600.0 - 2 799.9 kHz	2 600.0 - 2 799.9 kHz			
2 800.0 - 2 999.9 kHz	2 800.0 - 2 999.9 kHz			
3 000.0 - 3 099.9 kHz	3 000.0 - 3 099.9 kHz			
3 100.0 - 3 399.9 kHz	3 100.0 - 3 399.9 kHz			
3 400.0 - 3 699.9 kHz	3 400.0 - 3 699.9 kHz			
3 700.0 - 3 999.9 kHz	3 700.0 - 3 999.9 kHz			
4 000.0 - 4 299.9 kHz	4 063.0 - 4 219.4 kHz			
4 300.0 - 4 599.9 kHz				
4 600.0 - 4 999.9 kHz				
5 000.0 - 5 499.9 kHz				
5 500.0 - 5 999.9 kHz				
6 000.0 - 6 399.9 kHz	6 200.0 - 6 325.4 kHz			
6 400.0 - 6 999.9 kHz				
7 000.0 - 7 599.9 kHz				
7 600.0 - 7 999.9 kHz				
8 000.0 - 8 499.9 kHz	8 195.0 - 8 435.4 kHz			
12 300.0 - 12 699.9 kHz	12 330.0 - 12 652.3 kHz			
16 400.0 - 16 899.9 kHz	16 460.0 - 16 859.4 kHz			
22 000.0 - 22 399.9 kHz	22 000.0 - 22 310.5 kHz			
25 000.0 - 25 199.9 kHz	25 070.0 - 25 110.0 kHz			
Optional				
Optional				

T1130 No.: _____ Name of ship: _____

AT1500 No.: _____ Call signal: _____

Aerial type: _____ Installed/tuned by: _____

Length of aerial: _____

Return one TUNING CHART to S. P. Radio, Denmark, the other remains on board in the book.