

Sailor

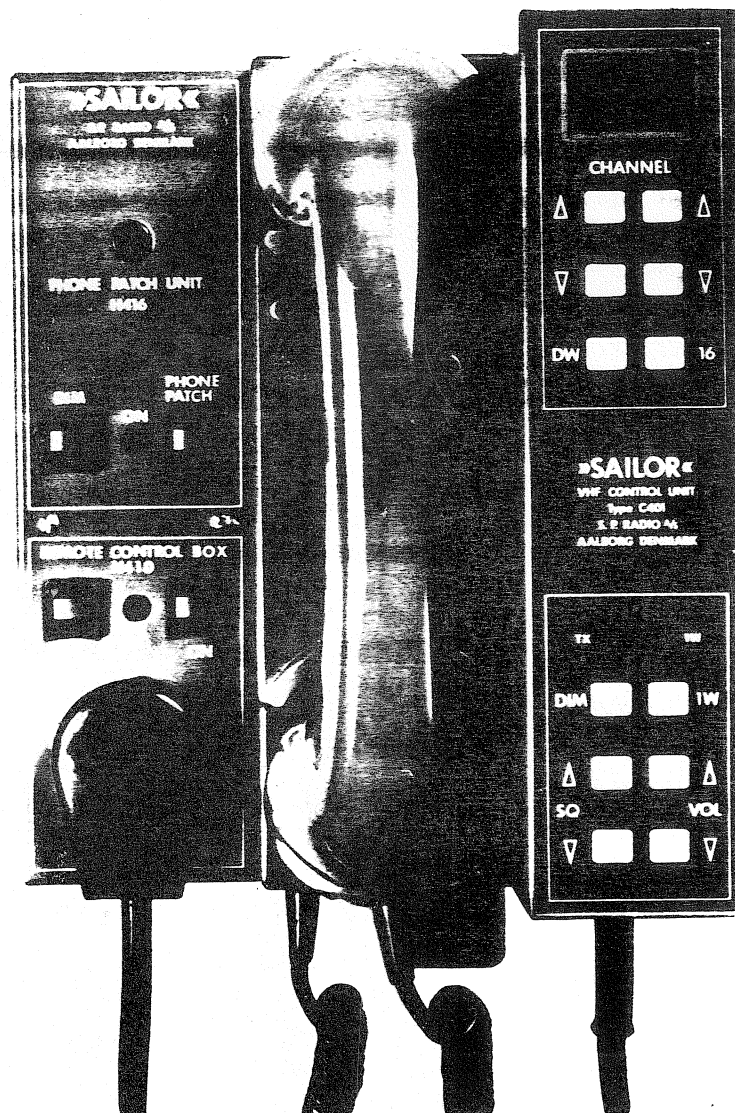
Sailor

**INSTRUCTIONBOOK FOR
SAILOR PHONE PATCH UNIT H 416**



A/S S. P. RADIO · AALBORG · DENMARK

INSTRUCTION MANUAL
FOR
PHONE PATCH UNIT H416



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FIG. 1 AND 2

DIAGRAM PHONE PATCH UNIT H416

PARTS LIST

TECHNICAL DATA

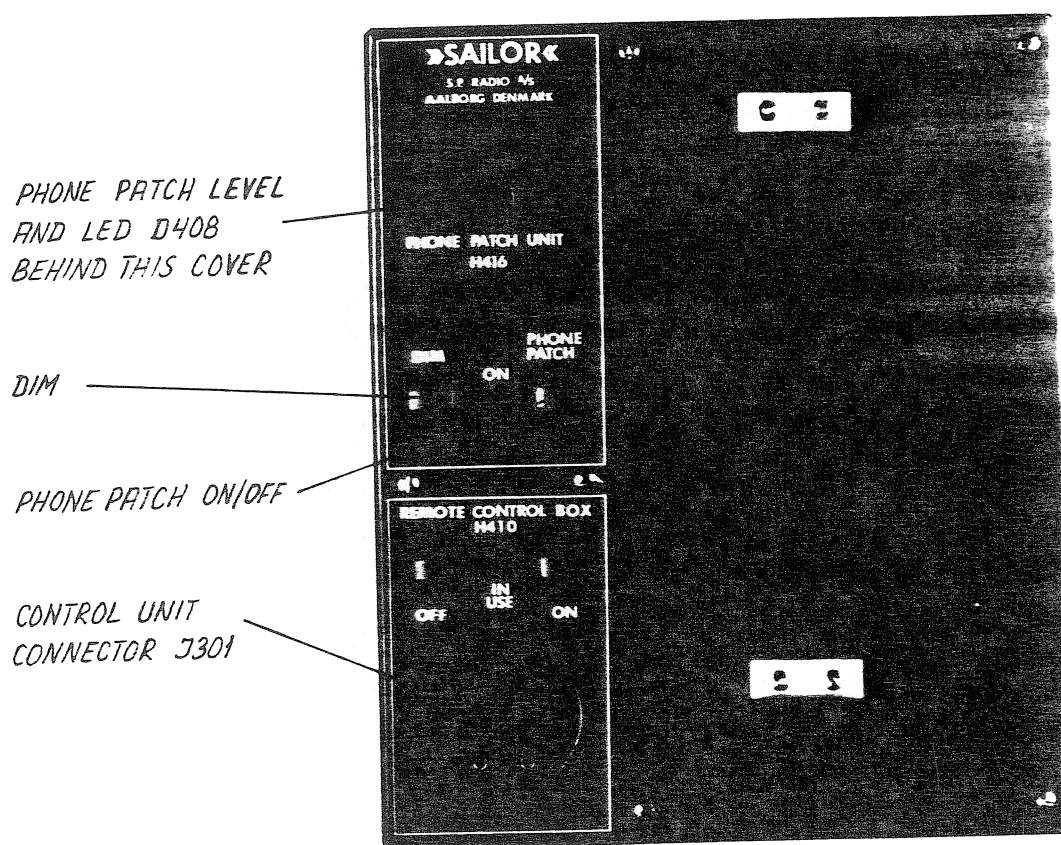
PHONE PATCH: AF output to telephone line 100 mV +2 dB/600 ohm.
AF output from telephone line 150 mV +15 dB/600 ohm.

FACSIMILE: AF output nominal -16 dB/600 ohm 125 mV.
DC line current standard 20 mA if external 24V DC is
connected.

APPLICATION

Phone Patch Unit H416 can be used wherever you want to connect a VHF set RT146 to a 600 ohm telephone system. E.g. when on board the ship you want to connect the internal telephone system via the VHF set and the coast station to a subscriber ashore, both VHF sets - i.e. the one on the ship and the one on the coast station - must have a phone patch unit for connection to the telephone line.

CONTROLS



PHONE PATCH OFF: The VHF set works normally.
The internal telephone instrument works normally.

PHONE PATCH ON: The VHF set is connected to the telephone line.
The transmitter is keyed constantly.
The lamp D202 lights constantly.

PHONE PATCH LEVEL: When installing Phone Patch Unit H416 the signal level from the telephone line can here be adjusted so that the transmitter will be modulated correctly. The lamp D408 flashes concurrently with the modulation when the level is adjusted correctly.

DIM: Dimmer control for the two lamps ON and IN USE.

DIRECTIONS FOR USE

- a. Radio communication is established with the microtelephone from the VHF set.
- b. The number of the desired subscriber is dialed on the telephone.
- c. When telephone connection is established the function switch is set to Phone Patch ON, and the telephone line is now connected to the VHF set. The microtelephone must be placed on the telephone cradle and the microtelephone of the VHF set can be placed in the holder. (Remember to turn off the Dual Watch (DW)).

The operator can monitor the connection from the loudspeaker of the VHF set.

Possible interruptions in the conversation can be made by means of the telephone instrument. Here it is possible to communicate with each party.

- d. When the communication is finished the function switch is set to position Phone Patch OFF.

PRINCIPLE OF OPERATION

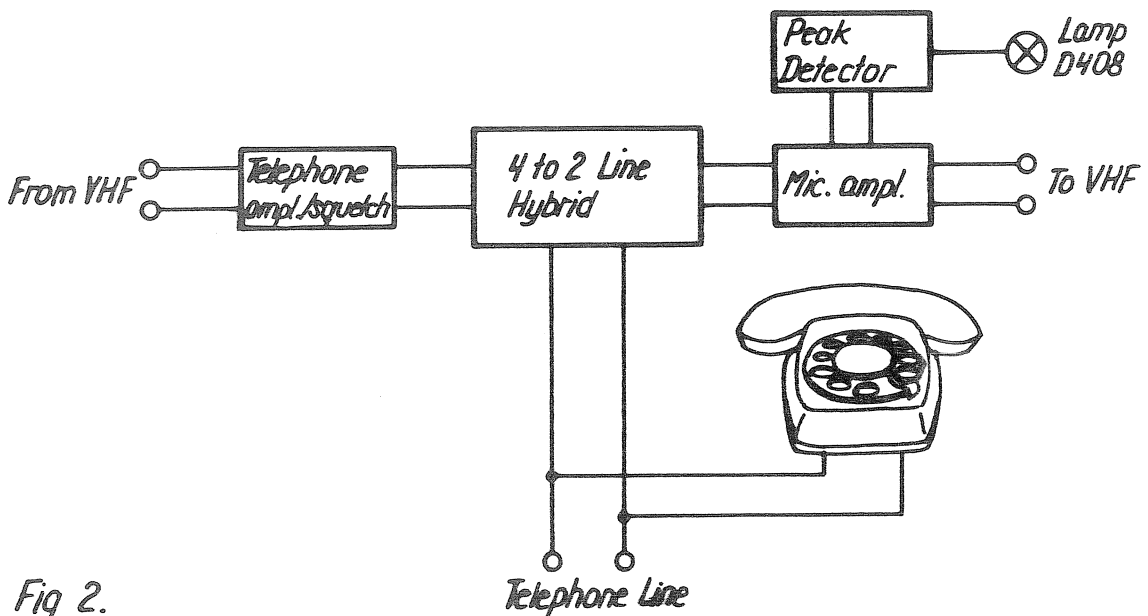


Fig 2.

The telephone amplifier consists of the transistors IC401b and T405.

The microphone amplifier consists of the transistors T408, T409, T410, and T411. There are approx. ± 3 kHz Deviation when lamp D408 is just starting to light with R465.

The circuit preventing cross talk from receiver to transmitter is performed with the transformers TR401 and TR402. Balance adjustment with R464.

The peak detector circuit consists of the transistors T412 and T413.

ADJUSTMENT PROCEDURE

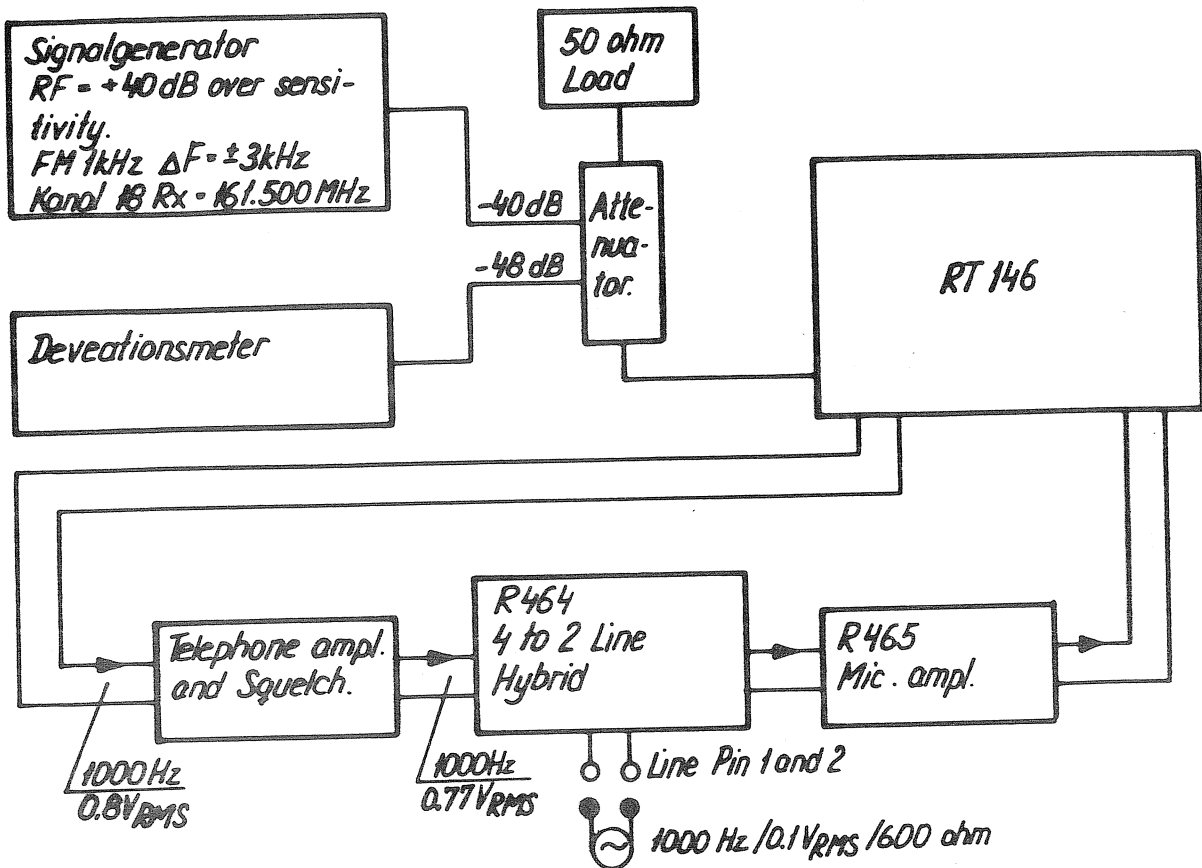


Fig 3.

For adjustment of Phone Patch Unit H416 connect the measuring instruments to the RT146 and H416 as shown on the drawing fig. 3.

Dial a telephone number and set phone patch switch on H416 to position ON. Place the telephone handset on the cradle (the telephone line must not be modulated).

If you do not have a telephone line then use a 600 ohm resistor connected to the two line plinth screws (ST1 and ST2).

ADJUSTMENT OF BALANCE

With Phone Patch Level R465 fully C.W. (all to the right) adjust R464 to minimum deviation on the modulation meter.

ADJUSTMENT OF MICROPHONE AMPLIFIER

Connect a 600 ohm signal generator to line pin 1 and 2 (1000 Hz and 0.1 V RMS / 600 ohm). Set the Phone Patch Level R465 to a level so that the lamp D408 is just starting to light.

Check that you have approx. ± 3 kHz frequency deviation on RT146.

STRAPPING POSSIBILITIES FOR H416

B. NORMAL FACTORY STRAPPING

With standard Control Unit C40X, the DUAL WATCH must be turned off by the operator before turning PHONE PATCH ON.

If you do not want dual watch facility, see instruction book for MULTI REMOTE VHF SYSTEM, part 1, section 5.4.:

MODIFICATION TO STOP DUAL WATCH FACILITY C40X.

A AND C STRAPPING

Dual watch facility intact with securing of DW function, so that Phone Patch H416 locks up the C40X on selected channel.

Modification of Control Unit C40X is necessary.

Security against start up of Remote Control Unit H410 without connected control unit is cancelled. This connection is used for dual watch control.

MODIFICATION IN CONTROL UNIT C40X

The multicable must be stripped in both ends because extra wire, grey/pink is used.

Connection in plug P601 between pin 1 and 6 must be removed and grey/pink wire is then soldered onto pin 6.

In the control unit the grey/pink wire must be extended onto print for switches and then soldered on vacant solder terminal nearest the screw, see fig. 4.

The microswitch is removed to the vacant hole for extra switch near the loudspeaker. Two soldering lugs must be mounted across the PCB, see fig. 5.

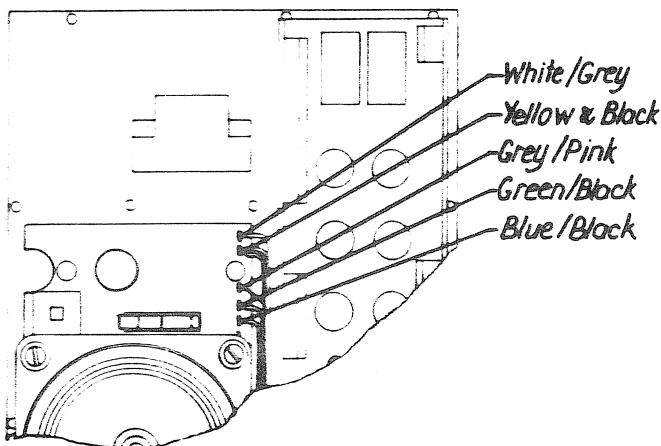


Fig. 4

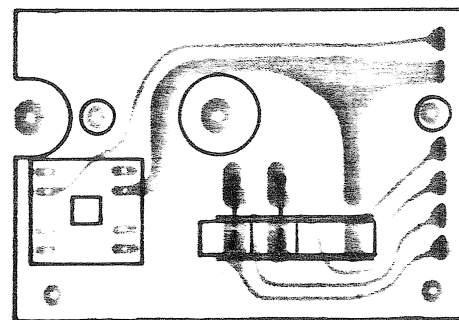


Fig. 5

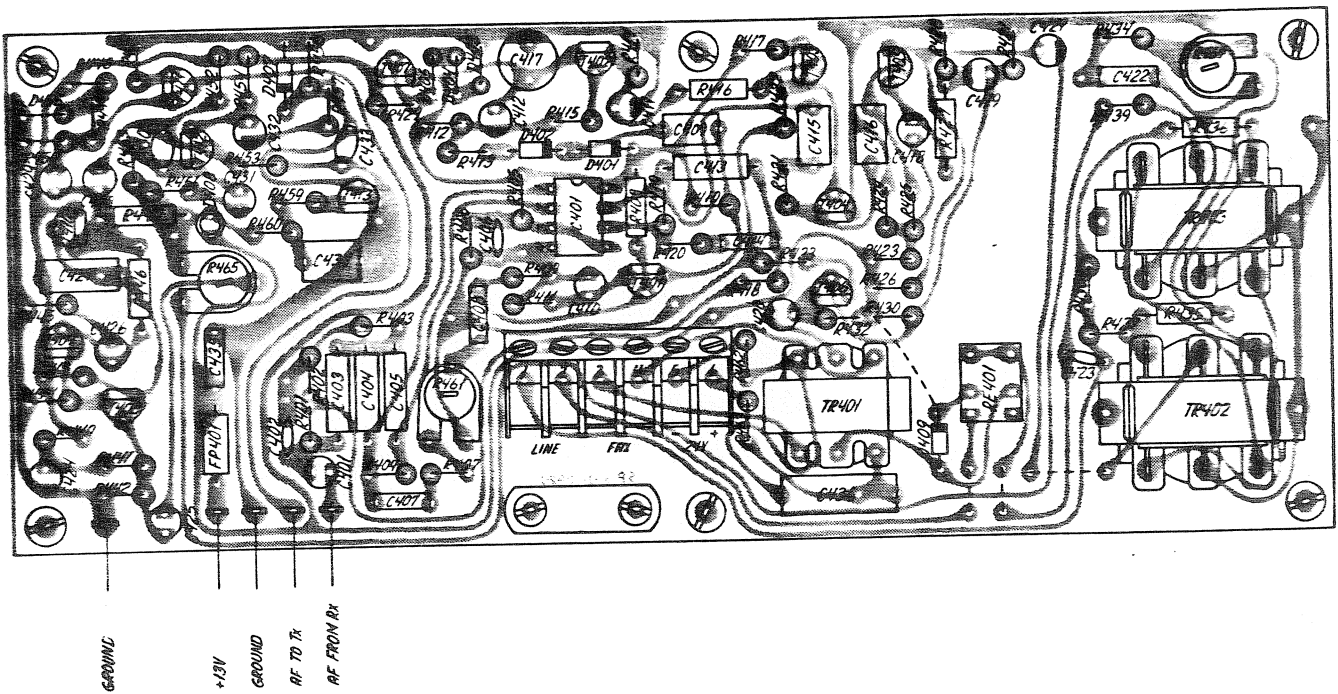
LINE CURRENT

The line current is obtained by connection of external power source 24V DC to supply terminal block pin 5 and 6.

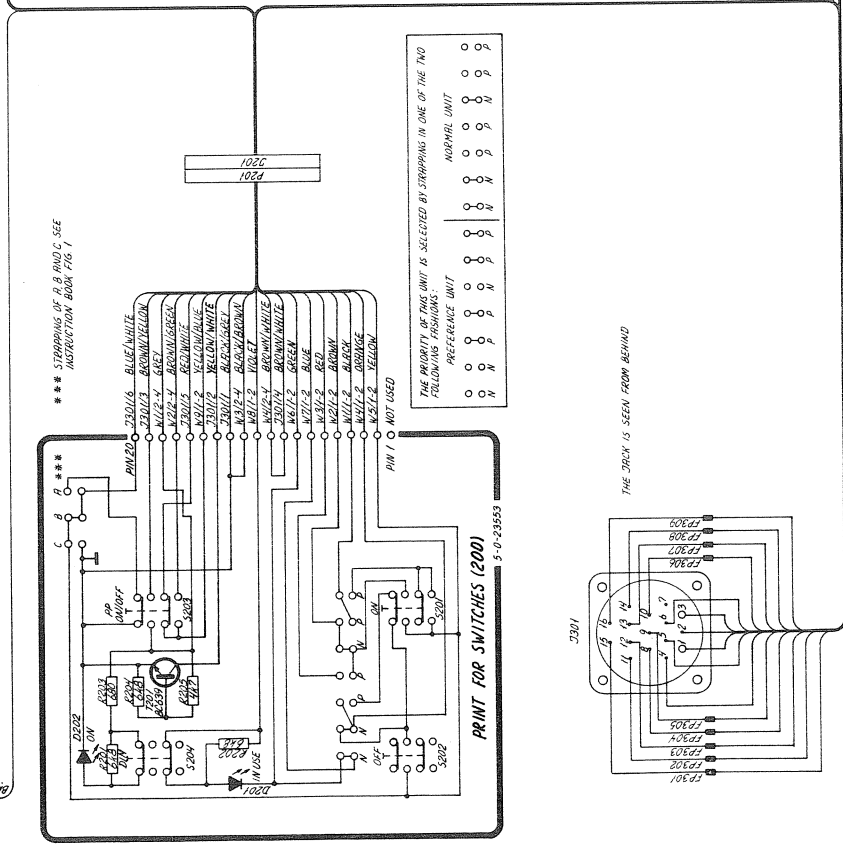
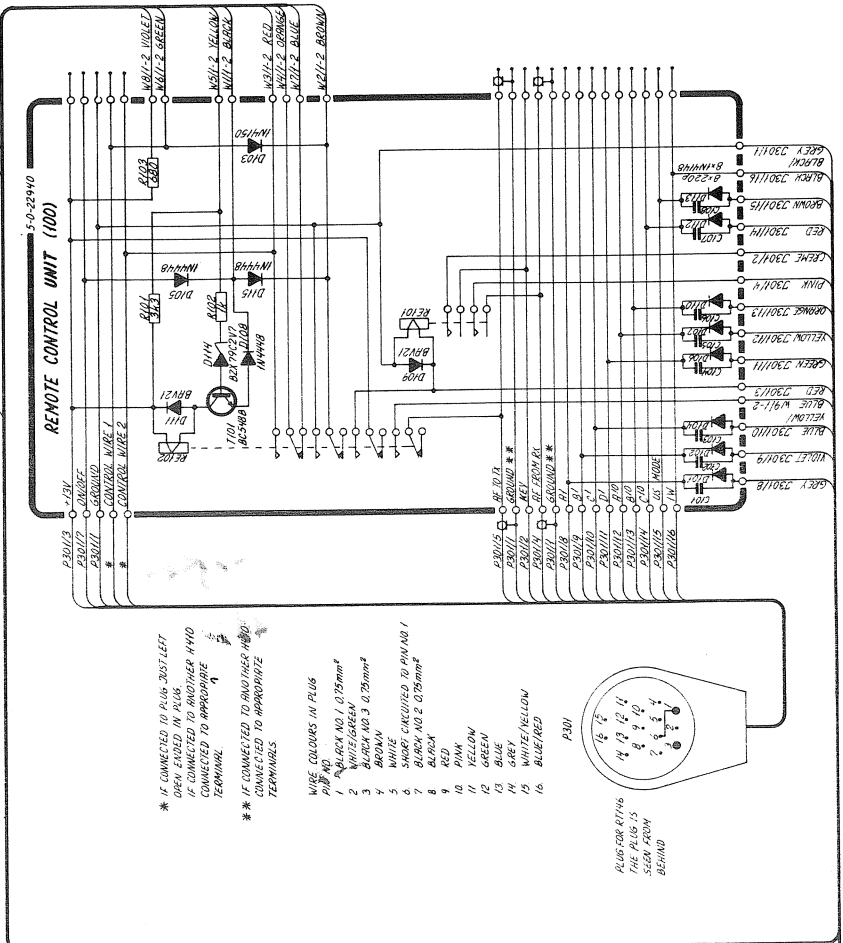
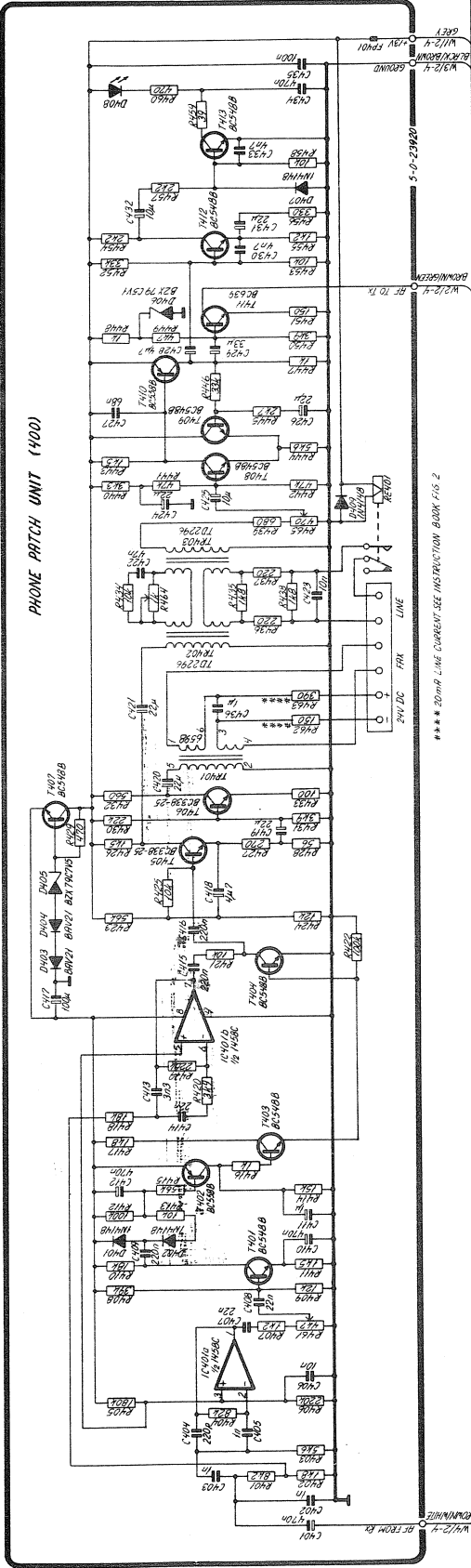
The resistors R462 and R463 are factory chosen for approx. 20 mA line current and it is possible to change the value of the resistors inside the following limits.

Max. DC current in TR401 pin 1 - 6, pin 3 - 4 is 35 mA.

OBS! 24V DC can change between 21.6 and 31.2V.



COMPONENT LOCATION PHONE PATCH UNIT H416



REMOTE CONTROL UNIT (100) FOR H410/H416

1

Symbol	Description	Manufact.	
C101- C108	Capacitor ceramic 220pF -20/+80%	400V Ferroperm	9/0129.9
D101	Diode	Philips	1N4148
D102	Diode	Philips	1N4148
D103	Diode	Philips	1N4150
D104	Diode	Philips	1N4148
D105	Diode	Philips	1N4448
D106	Diode	Philips	1N4148
D107	Diode	Philips	1N4148
D108	Diode	Philips	1N4448
D109	Diode	Philips	BAV21
D110	Diode	Philips	1N4148
D111	Diode	Philips	BAV21
D112	Diode	Philips	1N4148
D113	Diode	Philips	1N4148
D114	Diode, zener	Philips	BZX79C2V7
D115	Diode	Philips	1N4448
RE101	Reed relay (DPST)	Siemens	V23100-V43-12-B000
RE102	Relay (4PDT)	National	NF-4C-12V
R101	Resistor 3,3 Kohm \pm 5%	0.33W Philips	2322 211 13332
R102	Resistor 1 Kohm \pm 5%	0.33W Philips	2322 211 13102
R103	Resistor 680 Kohm \pm 5%	0.33W Philips	2322 211 13681
T101	Transistor	Philips	BC548B

PRINT FOR SWITCHES (200) FOR H410/H416

Symbol	Description	Manufact.	
D201	L.E.D. red	GeneralElect.	MV5753
D202	L.E.D. red	GeneralElect.	MV5753
R201	Resistor 6,8 Kohm \pm 5%	Philips	0.33W 2322 211 13682
R202	Resistor 6,8 Kohm \pm 5%	Philips	0.33W 2322 211 13682
R203	Resistor 680 ohm \pm 5%	Philips	0.33W 2322 211 13681
R204	Resistor 6,8 Kohm \pm 5%	Philips	0.33W 2322 211 13682
R205	Resistor 4,7 Kohm \pm 5%	Philips	0.33W 2322 211 13472
S201	Mini Switch, Unimec, momentary	M.E.C.	MKII
S202	Mini Switch	M.E.C.	MKII
S203	Mini Switch	M.E.C.	MKII
S204	Mini Switch	M.E.C.	MKII
T201	Transistor	Philips	BC639
FP301-			
FP309	Ferrit bead	Kaschke	K3/1200/0,1Hz/4/2/7 \pm
J301	Jack 16-polet	Hirschmann	MEB 160

Symbol	Description	Manufact.	
C401	Capacitor, electrolytic 0,47 uF $\pm 20\%$ 50V	ROE	EKI 00 AA 047H
C402	Capacitor, ceramic 1 nF $-20/+80\%$ 63V	Ferroperm	9/0129.8
C403	Capacitor, polystyrene 1 nF $\pm 5\%$ 160V	Philips	2222 425 21002
C404	Capacitor, polystyrene 220 pF $\pm 5\%$ 630V	Philips	2222 427 22201
C405	Capacitor, polystyrene 1 nF $\pm 5\%$ 160V	Philips	2222 425 21002
C406	Capacitor, ceramic 10 nF $-20/+80\%$ 40V	Ferroperm	9/0141.8
C407	Capacitor, MKT 22 nF $\pm 10\%$ 250V	Siemens	B32510-D3223-K
C408	Capacitor, MKT 22 nF $\pm 10\%$ 250V	Siemens	B32510-D3223-K
C409	Capacitor, MKT 220 nF $\pm 10\%$ 100V	Siemens	B32560-D1224-K
C410	Capacitor, electrolytic 0,47 uF $\pm 20\%$ 50V	ROE	EKI 00 AA 047H
C411	Capacitor, electrolytic 1 uF $\pm 20\%$ 50V	ROE	EKI 00 AA 110H
C412	Capacitor, electrolytic 0,47 uF $\pm 20\%$ 50V	ROE	EKI 00 AA 047H
C413	Capacitor, polystyrene 3,3 nF $\pm 1\%$ 63V	Philips	2222 424 43302
C414	Capacitor, MKT 22 nF $\pm 10\%$ 250V	Siemens	B32510-D3223-K
C415	Capacitor, MKT 220 nF $\pm 10\%$ 100V	Siemens	B32560-D1224-K
C416	Capacitor, MKT 220 nF $\pm 10\%$ 100V	Siemens	B32560-D1224-K
C417	Capacitor, electrolytic 100 uF $\pm 20\%$ 16V	ROE	EKM 00 CC 310D
C418	Capacitor, electrolytic 4,7 uF $\pm 20\%$ 50V	ROE	EKI 00 AA 147H
C419	Capacitor, electrolytic 22 uF $\pm 20\%$ 25V	ROE	EKI 00 AA 222E
C420	Capacitor, electrolytic 22 uF $\pm 20\%$ 25V	ROE	EKI 00 AA 222E
C421	Capacitor, electrolytic 22 uF $\pm 20\%$ 25V	ROE	EKI 00 AA 222E
C422	Capacitor, MKT 47 nF $\pm 5\%$ 250V	Siemens	B32560-D3473-J
C423	Capacitor, ceramic 10 nF $-20/+80\%$ 40V	Ferroperm	9/0141.8
C424	Capacitor, electrolytic 22 uF $\pm 20\%$ 25V	ROE	EKI 00 AA 222E
C425	Capacitor, electrolytic 10 uF $\pm 20\%$ 35V	ROE	EKI 00 AA 210F
C426	Capacitor, electrolytic 22 uF $\pm 20\%$ 25V	ROE	EKI 00 AA 222E
C427	Capacitor, polystyrene 68 nF $\pm 10\%$ 250V	ERO	MKT1822
C428	Capacitor, electrolytic 4,7 uF $\pm 20\%$ 50V	ROE	EKI 00 AA 147H
C429	Capacitor, electrolytic 33 uF $\pm 20\%$ 16V	ROE	EKI 00 AA 233D
C430	Capacitor, ceramic 4,7 nF $-20/+80\%$ 32V	Ferroperm	9/0145.9
C431	Capacitor, electrolytic 22 uF $\pm 20\%$ 25V	ROE	EKI 00 AA 222E
C432	Capacitor, electrolytic 10 uF $\pm 20\%$ 35V	ROE	EKI 00 AA 210F
C433	Capacitor, ceramic 4,7 nF $-20/+80\%$ 32V	Ferroperm	9/0145.9
C434	Capacitor, MKT 0,47 uF $\pm 10\%$ 100V	Siemens	B32560-D1474-J
C435	Capacitor, MKT 100 nF $\pm 10\%$ 100V	Siemens	B32510-D1104-K
C436	Capacitor, MKT 1 uF $\pm 10\%$ 100V	Siemens	B32512-D1105-K
D401	Diode	Philips	1N4148
D402	Diode	Philips	1N4148
D403	Diode	Philips	BAV21
D404	Diode	Philips	BAV21

Symbol	Description	Manufact.	
D405	Diode, zener	Motorola	BZX79C7V5
D406	Diode, zener	Motorola	BZX79C5V1
D407	Diode	Philips	1N4 148
D408	LED	G.I.	MV5753
FP401	Ferrit bead	Kaschke	K3/1200/0, 1Hz/4/2/7A
IC401	Integrated circuit	National	LM1458N
R401	Resistor	8,2 Kohm $\pm 5\%$	0,33W Philips 2322 181 33822
R402	Resistor	1,8 Kohm $\pm 5\%$	0,33W Philips 2322 181 33182
R403	Resistor	5,6 Kohm $\pm 5\%$	0,33W Philips 2322 181 33562
R404	Resistor	82 Kohm $\pm 5\%$	0,33W Philips 2322 181 33823
R405	Resistor	180 Kohm $\pm 5\%$	0,33W Philips 2322 181 33184
R406	Resistor	220 Kohm $\pm 5\%$	0,33W Philips 2322 181 33224
R407	Resistor	10 Kohm $\pm 5\%$	0,33W Philips 2322 181 33103
R408	Resistor	39 Kohm $\pm 5\%$	0,33W Philips 2322 181 13393
R409	Resistor	12 Kohm $\pm 5\%$	0,33W Philips 2322 181 33123
R4 10	Resistor	18 Kohm $\pm 5\%$	0,33W Philips 2322 181 33183
R4 11	Resistor	1,5 Kohm $\pm 5\%$	0,33W Philips 2322 181 33152
R4 12	Resistor	100 Kohm $\pm 5\%$	0,33W Philips 2322 181 33104
R4 13	Resistor	10 Kohm $\pm 5\%$	0,33W Philips 2322 181 33103
R4 14	Resistor	15 Kohm $\pm 5\%$	0,33W Philips 2322 181 33153
R4 15	Resistor	56 Kohm $\pm 5\%$	0,33W Philips 2322 181 33563
R4 16	Resistor	1 Kohm $\pm 5\%$	0,33W Philips 2322 181 13102
R4 17	Resistor	1,8 Kohm $\pm 5\%$	0,33W Philips 2322 181 33182
R4 18	Resistor	18 Kohm $\pm 5\%$	0,33W Philips 2322 181 33183
R4 19	Resistor	220 Kohm $\pm 5\%$	0,33W Philips 2322 181 33224
R420	Resistor	3,9 Kohm $\pm 5\%$	0,33W Philips 2322 181 33392
R421	Resistor	10 Kohm $\pm 5\%$	0,33W Philips 2322 181 33103
R422	Resistor	100 Kohm $\pm 5\%$	0,33W Philips 2322 181 33104
R423	Resistor	56 Kohm $\pm 5\%$	0,33W Philips 2322 181 33563
R424	Resistor	12 Kohm $\pm 5\%$	0,33W Philips 2322 181 33123
R425	Resistor	10 Kohm $\pm 5\%$	0,33W Philips 2322 181 33103
R426	Resistor	1,5 Kohm $\pm 5\%$	0,33W Philips 2322 181 33152
R427	Resistor	270 ohm $\pm 5\%$	0,33W Philips 2322 181 13271
R428	Resistor	56 ohm $\pm 5\%$	0,33W Philips 2322 181 33569
R429	Resistor	470 ohm $\pm 5\%$	0,33W Philips 2322 181 33471
R430	Resistor	22 Kohm $\pm 5\%$	0,33W Philips 2322 181 33223
R431	Resistor	3,9 Kohm $\pm 5\%$	0,33W Philips 2322 181 33392
R432	Resistor	560 ohm $\pm 5\%$	0,33W Philips 2322 181 33561

Symbol	Description	Manufact.	
R433	Resistor 100 ohm $\pm 5\%$	Philips	2322 181 33101
R434	Resistor 10 Kohm $\pm 5\%$	Philips	2322 181 33103
R435	Resistor 1,8 Kohm $\pm 5\%$	Philips	2322 181 13182
R436	Resistor 220 ohm $\pm 5\%$	Philips	2322 181 33221
R437	Resistor 220 ohm $\pm 5\%$	Philips	2322 181 13221
R438	Resistor 1,8 Kohm $\pm 5\%$	Philips	2322 181 33182
R439	Resistor 680 ohm $\pm 5\%$	Philips	2322 181 33681
R440	Resistor 3,3 Kohm $\pm 5\%$	Philips	2322 181 33332
R441	Resistor 47 Kohm $\pm 5\%$	Philips	2322 181 33473
R442	Resistor 47 Kohm $\pm 5\%$	Philips	2322 181 33473
R443	Resistor 1,5 Kohm $\pm 5\%$	Philips	2322 181 33152
R444	Resistor 5,6 Kohm $\pm 5\%$	Philips	2322 181 33562
R445	Resistor 2,7 Kohm $\pm 5\%$	Philips	2322 181 33272
R446	Resistor 33 Kohm $\pm 5\%$	Philips	2322 181 13333
R447	Resistor 1 Kohm $\pm 5\%$	Philips	2322 181 13102
R448	Resistor 1 Kohm $\pm 5\%$	Philips	2322 181 33102
R449	Resistor 4,7 Kohm $\pm 5\%$	Philips	2322 181 33472
R450	Resistor 3,9 Kohm $\pm 5\%$	Philips	2322 181 33392
R451	Resistor 150 ohm $\pm 5\%$	Philips	2322 181 33151
R452	Resistor 33 Kohm $\pm 5\%$	Philips	2322 181 33333
R453	Resistor 10 Kohm $\pm 5\%$	Philips	2322 181 33103
R454	Resistor 2,2 Kohm $\pm 5\%$	Philips	2322 181 33222
R455	Resistor 1,2 Kohm $\pm 5\%$	Philips	2322 181 33122
R456	Resistor 330 ohm $\pm 5\%$	Philips	2322 181 33331
R457	Resistor 2,2 Kohm $\pm 5\%$	Philips	2322 181 33222
R458	Resistor 10 Kohm $\pm 5\%$	Philips	2322 181 33103
R459	Resistor 39 ohm $\pm 5\%$	Philips	2322 181 33399
R460	Resistor 470 ohm $\pm 5\%$	Philips	2322 181 33471
R461	Potentiometer preset 4,7 Kohm $\pm 20\%$	Noble	TM8KV2-1S
R462	Resistor 150 ohm $\pm 5\%$	Philips	2322 181 33159
R463	Resistor 390 ohm $\pm 5\%$	Philips	2322 181 33399
R464	Potentiometer preset 1 Kohm $\pm 20\%$	Noble	TM8KV2-1S
R465	Potentiometer preset 470 ohm $\pm 20\%$	Noble	TM8KV2-1S
RE401	Relay	OUC	
T401	Transistor	Philips	BC548B
T402	Transistor	Philips	BC558B
T403	Transistor	Philips	BC548B
T404	Transistor	Philips	BC548B

<i>Symbol</i>	<i>Description</i>	<i>Manufact.</i>	
T405	Transistor	Philips	BC338-25
T406	Transistor	Philips	BC338-25
T407	Transistor	Philips	BC548B
T408	Transistor	Philips	BC548B
T409	Transistor	Philips	BC548B
T410	Transistor	Philips	BC558B
T411	Transistor	Philips	BC639
T412	Transistor	Philips	BC548B
T413	Transistor	Philips	BC548B
TR401	Transformer	Scan. Electr.	6598
TR402	Transformer	Tradania	2296
TR403	Transformer	Tradania	2296