

# ASSEMBLY GUIDE

V.3

## JUNIOR 1



**SHORTWAVE RECEIVER KIT**  
DOUBLE SUPER 10.7MHZ /455KHZ  
SSB/CW/AM 5.9 MHZ TO 8.1 NOMINAL

[www.heinzstampfl.ch](http://www.heinzstampfl.ch)

**STAMPFL**   
*SW-Receiver*

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## EDITORS NOTES

**THERE IS NO WARRANTY FOR THE KIT**  
If short circuits and smoking heads occur please use "FIRST AID!"

### TOOLS

- Screwdriver
- Flatnose Pliers
- Electric Soldering Iron
- Multimeter
- Insulated Pliers
- Small Pliers 2mm
- Fine Tweezers
- Magnifying glass

### GUIDANCE FROM:

- Fred **HB9JCP**
- Christoph **HB9TZU**
- Ray Evans (English Translation)

**THANK YOU FOR YOUR SUPPORT!**

**UUUPS! SHORT, MALFUNCTION, PROBLEMS? - FIRST AID (HELP INSTRUCTION GUIDE)**

1. Write a detailed Report
2. Make Photos of your kit and attach it to the E-mail 2x (front and back of the print)
3. Initiate calming measures
4. Wait for Help

**E-MAIL ADDRESS**  
[info@heinzstampfl.ch](mailto:info@heinzstampfl.ch)



# JUNIOR 1



**The Junior 1 is an easy and fast kit to assemble. It is double superhet technology and you do not need a special understanding of radio or engineering equipment to build it.**

The AM/FM IC GDR (A4100D) is specifically for battery-powered equipment. It has a very good Signal/noise ratio. This equipment has been developed according to the data sheet and is power efficient.

For the front end, the proven NE612 is used and will operate well with a dipole or coupled antenna. A G5RV antenna showed no signs of overloading. The receiver performs well even with just 1.5m of wire as an antenna (high impedance)

The low cost (10.7 Mhz) 1st I.F. filter offers Good bandwidth and improved adjacent Channel rejection.

The conversion oscillator (10.245) is monolithic and requires no adjustment. The frequency can be changed by the user.



The field strength indicator is a LED but could be replaced with a series resistor and suitable meter.

The oscillator circuit is set in its normal mode for 49m/41m bandwidth.

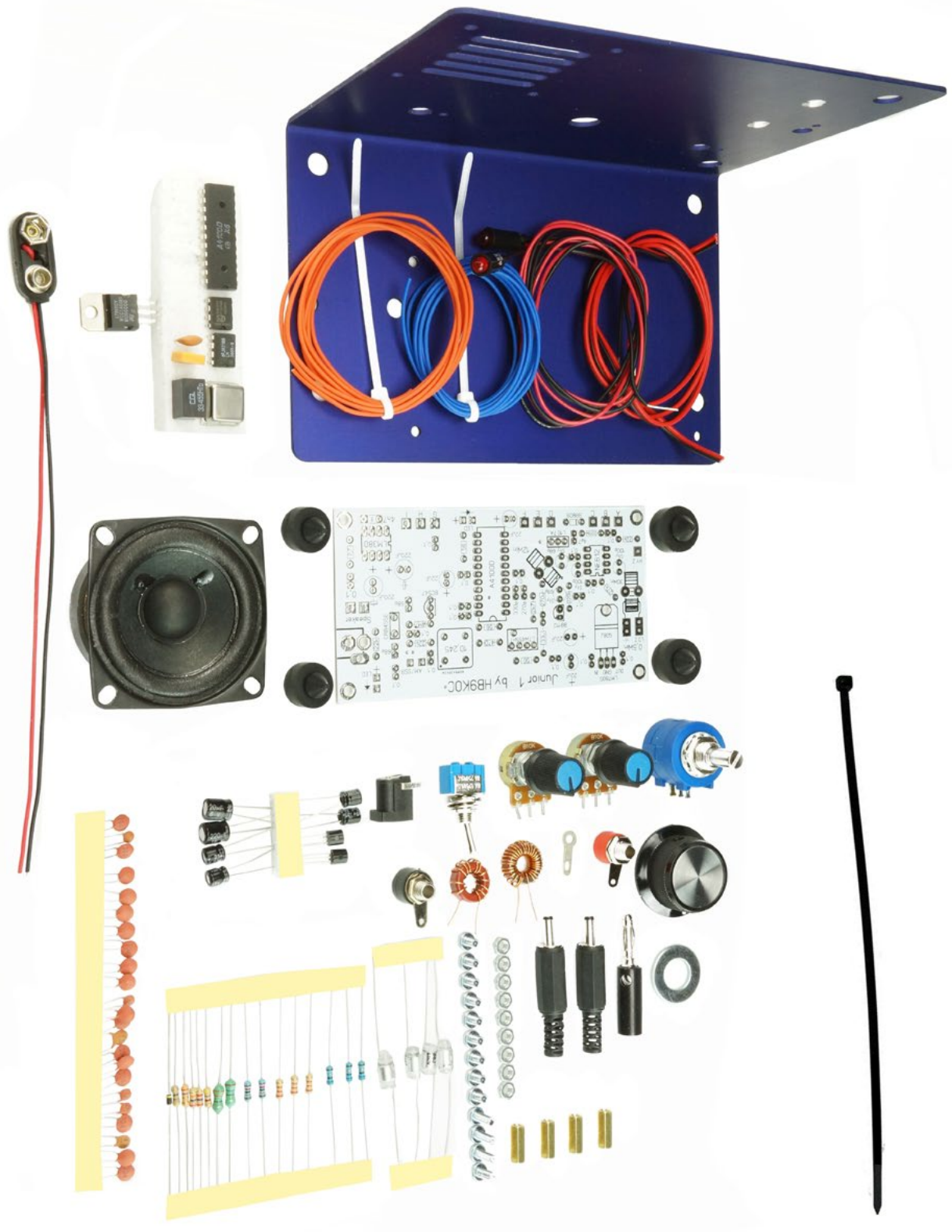
The control oscillator for ssb(bfo) has been designed for stability and allows the beginner to listen to amateurs for the first time. It is controlled by varactors.

The power requirements for the Junior 1 are 7.5 to 16 volts. At about 70mA.

A LM380 drives a 4 ohm loudspeaker giving ample volume.

What you have is a receiver with high selectivity, high sensitivity, and good audio output.

# JUNIOR 1 PARTS



# SMALL PARTS LIST

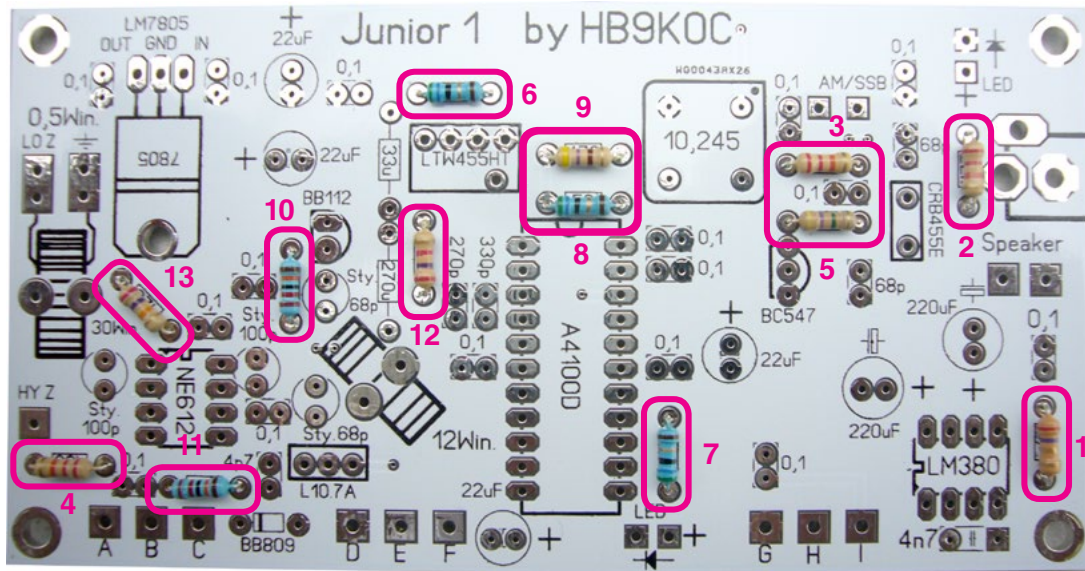
COMPONENT	Value	QTY.	Notes
Printed Circuit Board	116 X 60mm	1x	
Spacers	M3X12mm	4x	
Screws	M3X5mm	9x	
Soldering tag	M3	1x	
R Resistor	2,7 Ohm	1x	
R Resistor	22K	3x	
R Resistor	4M7	1x	
R Resistor	56	3x	
R Resistor	470	1x	
R Resistor	220k	2x	
R Resistor	2k7	1x	
R Resistor	27k	1x	
L Coil	33u	1x	
L Coil	270u	1x	
IC Integrated Circuit	NE612	1x	
IC Integrated Circuit	A4100D	1x	
IC Integrated Circuit	LM380	1x	
XO Crystal Oscillator	10,245	1x	Observe the correct position
IC Integrated Circuit	LM7805	1x	
Filter	M3	9x	
Filter	LTW455HT	1x	
Filter	10.7A	1x	Position doesn't matter
Ceramic Resonator	CRB455E	1x	Position doesn't matter
Transistor	BC547	1x	
C Varactor Diode	BB112	1x	Be careful not to short circuit
DC Jack		1x	
Elco (Electrolytic Capacitor)	22uF	4x	Check position!
Elco (Electrolytic Capacitor)	220uF	2x	Check position!
C Ceramic Capacitor	68p	2x	
C Ceramic Capacitor	330p	1x	
C Ceramic Capacitor	270p	1x	
C Ceramic Capacitor	4n7	1x	
C Ceramic Capacitor	4p7	1x	
C Varactor Diode	BB809	1x	
C Ceramic Capacitor	0,1	16+1	1x Reserve
C (Styroflex) Capacitor	100p	2x	
C (Styroflex) Capacitor	68p	2x	
L (Coil) T-50-2	„VFO“ 12Win.	1x	
L (Coil) T-50-2	„Eingang“ 30Win.	1x	
L (Coil) 0,5W	50 Ohm Eingang	1x	ca,40mm Litze

# HARDWARE COMPONENTS

COMPONENT	QTY.	NOTES
Chassis	1x	
Rubber feet	4x	
Potentiometer 10 K with knob	2x	
10 turn potentiometer	1x	
Tuning knob	1x	
AM /SSB and CW switch	1x	
Antenna Socket	1x	Red
Ground Socket	1x	Black
LED Front panel holder	2x	
LED Rear panel	2x	
LED	2x	
1,3m braid	1x	
Connection to RIT potentiometer	3x 60mm	
Connection to Volume potentiometer	3X 70mm	
Connection to Tuning potentiometer	3X 60mm	
Connection to AM/SSM switch	2X150mm	
HIGH Z connection	1X100mm	
Loudspeaker connection	2X100mm	
Loudspeaker	1x	
Screws M3X8	4x	
Black/Red wire	1x	
Connection to Field LED	2X100mm	black red
Connection to Power LED	2X160mm	black red
DC Cable 0,8m	1x	
DC Plug	2x	
9 Volt Battery Clip	1x	
Antenna Wire	1x	
Banana Plug	1x	Make sure of good connection
U-disk large	1x	
Cable tie	1x	

# ASSEMBLY GUIDE

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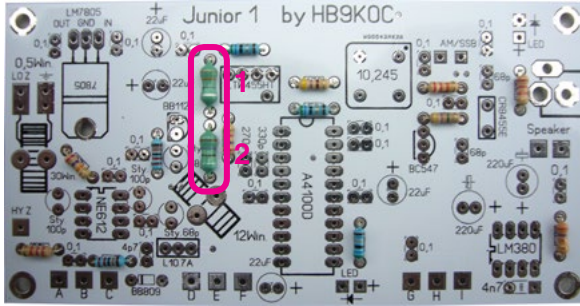
The kit contains a labeled and drilled blue anodized chassis and a plastic bag of parts.

Start by sorting and checking the components against the lists provided. If all the parts are correct we can make a start on the board. It might be helpful to arrange the components in small containers or place them on adhesive paper. Set the chassis aside.

A small electric soldering iron should be quite satisfactory for the soldering work.

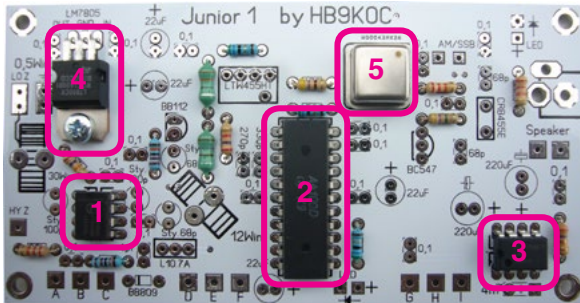
We will start with the resistors. Bend the wire ends close to the body so that they fit the holes on the board. If you have a suitable test meter it is worth checking the value before inserting them into the board.. Study the picture above.

COMPONENT	QTY.	NOTES
R1 2,7 (red-violet-gold-gold)	1x	
R2,3,4 22k (red-red-orange-gold)	3x	
R5 4M7 (yellow-violet-green-gold)	1x	
R6,7,8 56 (green-blue-black-gold)	3x	
R9 470 (yellow-violet-brown-gold)	1x	
R10,11 220k (red-red-yellow-gold)	2x	also: brown-orange-black-red-red
R12 2k7 (red-violet-red-gold)	1x	Red
R13 27k (red-violet-orange)	1x	Black



Now, the two coated coils. These look similar to a resistor. Also, their legs are close to the body angles

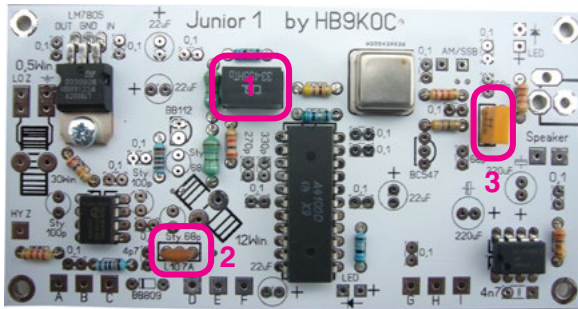
COMPONENT	QTY.	NOTES
L1 33uH (orange-orange-black-silver)	1x	
L2 270uH (red-violet-brown-silver)	1x	



Then add the IC's. These are attached on the white styrofoam. Check the correct installation position with the board photo and part number.

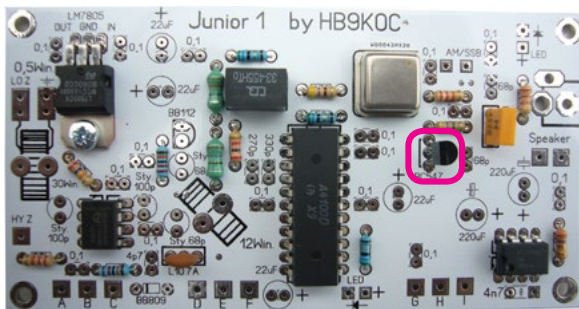
COMPONENT	QTY.	NOTES
IC1 NE612 8 Pins	1x	
IC2 A4100D 22 Pins	1x	
IC3 LM380 8 Pins		
IC4 LM7805 3 Pins	1x	Bend the legs of the voltage regulator to 90 angle, until the heat sink metal flange rests on the Board, secure with screw and nut to the board
XO5 10.245MHz 4 Pins	1x	Observe the correct installation position, Check with the board drawing.





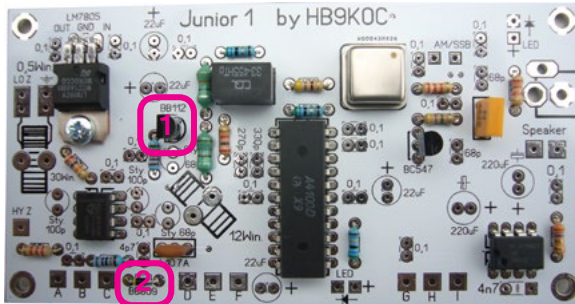
Continuing with the filters

COMPONENT	QTY.	NOTES
F11 LTW4455HT	1x	
F12 10.7A	1x	
F13 CRB455B	1x	



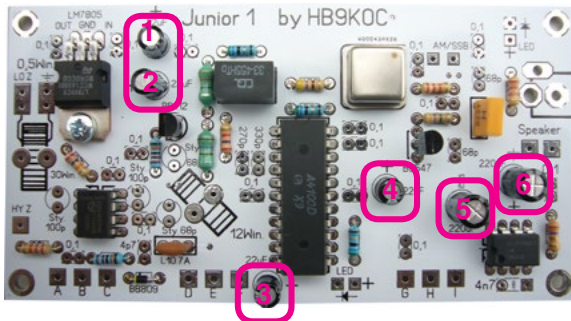
And the transistor

COMPONENT	QTY.	NOTES
Transistor BC547	1x	Check the position carefully



Now the diodes

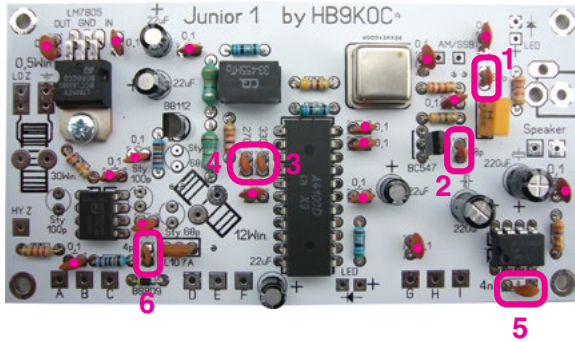
COMPONENT	QTY.	NOTES
D1 BB112	1x	Install with care making sure the diode is seated correctly
D2 BB809	1x	Install with ring marking to the left



Now the electrolytic capacitors, can be installed.

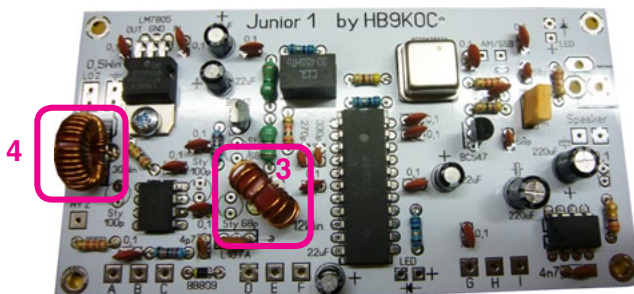
It is important that the the polarity is observed.  
(Note minus mark = short leg)

COMPONENT	QTY.	NOTES
Electolytic 1,2,3,4 22uF	4x	
Electolytic 5,6 220uF	2x	



And it continues with the Ceramic capacitors. There is NO polarity for these. Install in either direction

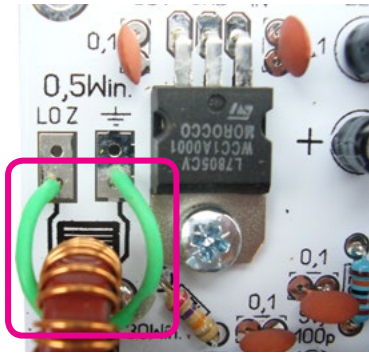
COMPONENT	QTY.	NOTES
C1,2 68pF (68)	2x	
C3 330pF (331)	1x	
C4 270pF (271)	1x	
C5 4n7F (472)	1x	
C6 4p7F (4.7)	1x	
C 0.1F (104)	16x	●



The Amidon toroidal cores are of exceptional quality. Their positions are clearly marked on the PCB. The quality of the toroids could be affected by heat. Care should be taken when soldering in place. Insulation can be removed by scraping.

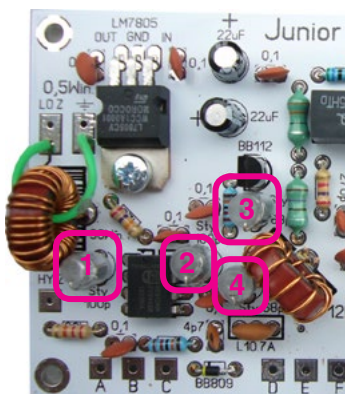
Tin with fresh solder if necessary and use extreme care not to damage the component.

COMPONENT	QTY.	NOTES
L3 T-50-2	1x	12 Turn for the VFO
L4 T-50-2	1x	30 Turn for the input



Prepare the 30 turn toroid and solder in place. Then passing through the inductor a short length of wire 3 - 4 mm long, prepared at each end and solder in place as indicated in the photo.

COMPONENT	QTY.	NOTES
Coupling	1x	Solder the wire to the LO Z pads



Now we will secure the Styroflex capacitors. Dress the lead to run down the side of the cap. This gives you two leads at one end. Put in place and solder.

COMPONENT	QTY.	NOTES
C1,2 100pF	2x	
C3,4 68pF	2x	



Fit the power socket as indicated

COMPONENT	QTY.	NOTES
Power Socket	1x	



Fit the stand off legs with parts provided.  
Make Sure to include the earth tag at the left of the chassis.

COMPONENT	QTY.	NOTES
Abstandhalter	4x	
Lötfahne	1x	



**Now for a nice cup of tea/coffee**

# WORK ON THE CHASSIS

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Firstly we will install the rubber feet.. Moisten the Foot and press into the chassis. See position.

COMPONENT	QTY.	NOTES
Rubber feet	4x	

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Next install the 2 10K potentiometers as shown. With connections toward the bottom of the chassis.

COMPONENT	QTY.	NOTES
Volume Potentiometer 10kOhm	1x	with knob
Feintune Potentiometer 10kOhm	1x	with knob



Fit the large 10 turn potentiometer in the center with the solder tags to the left. Fit the other two potentiometers with the tags pointing down. Fit the knobs.

COMPONENT		QTY.	NOTES
Tuning control	10-Gang Potentiometer	1x	
Distance rings		1x	
tune knob		1x	



Fit the switch with the two tags to the top. Make sure the switch is 'OFF' in the position shown.

COMPONENT		QTY.	NOTES
AM/SSB Switch		1x	



Fit the Antenna socket (Red) to the top left.  
And the Earth/Ground socket (Black) to the Bottom left.

COMPONENT		QTY.	NOTES
Antenna	Red	1x	
Ground/Earth	Black	1x	



Position the board as shown in the photograph.  
Fit the board observing the picture  
Fit the LED..Fit from the front and use the bushes  
to secure  
From the back.



**NOTES!**

If the LED are not pre-wired, assemble as indicated ensuring polarity is correct.

COMPONENT		QTY.	NOTES
LED Field	LED 3mm Red	1x	LED socket holder 100mm long
LED Power	LED 3mm Red	1x	(Incl. LED-hold) lenth ca. 160mm

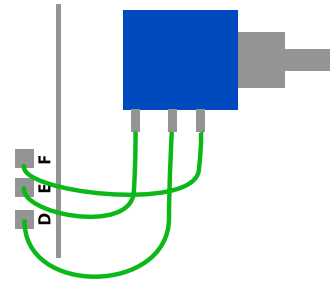


# WIRING DETAILS

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Connect all the potentiometers as seen in the photograph being careful to observe the connections for the 10 turn pot. As shown below



COMPONENT	QTY.	NOTES
Braid 70mm	3x	Volume
Braid 60mm	3x	Tune
Braid 60mm	3x	Fine Tune
Braid 100mm	1x	Antenna
Braid 150mm	2x	AM / SSB Switch

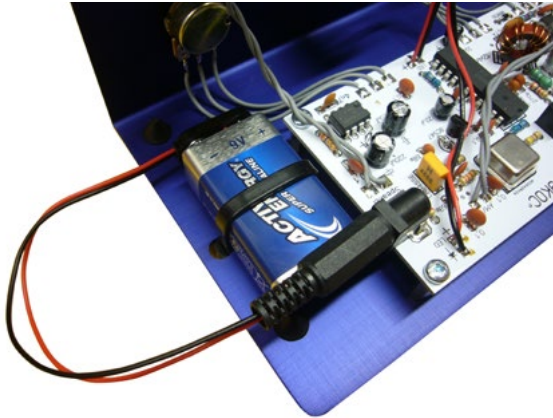
21



Mount the speaker directly behind the front panel Using the 4 M3 nuts as spacers



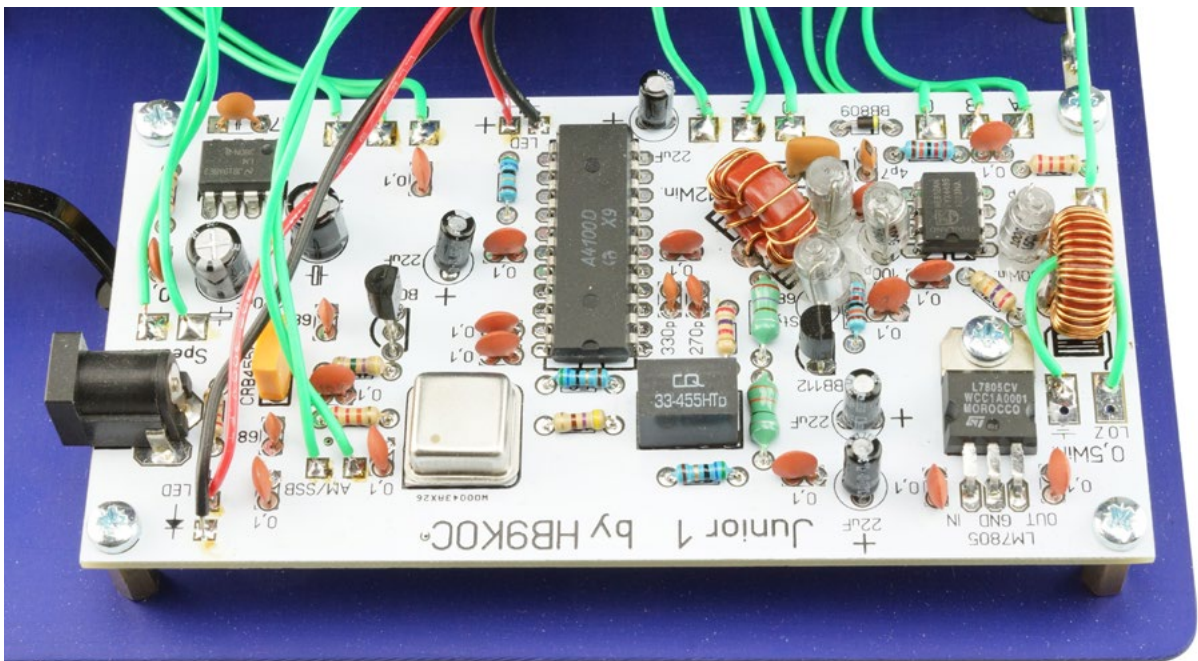
COMPONENT	QTY.	NOTES
Loudspeaker	1x	
M3 Nuts	4x	



Make up the power lead as shown below. Make certain that the positive (+ve) lead goes to the center pin of the plug.

**NOTES:**

**DON'T FILL THREAD WITH SOLDER!**



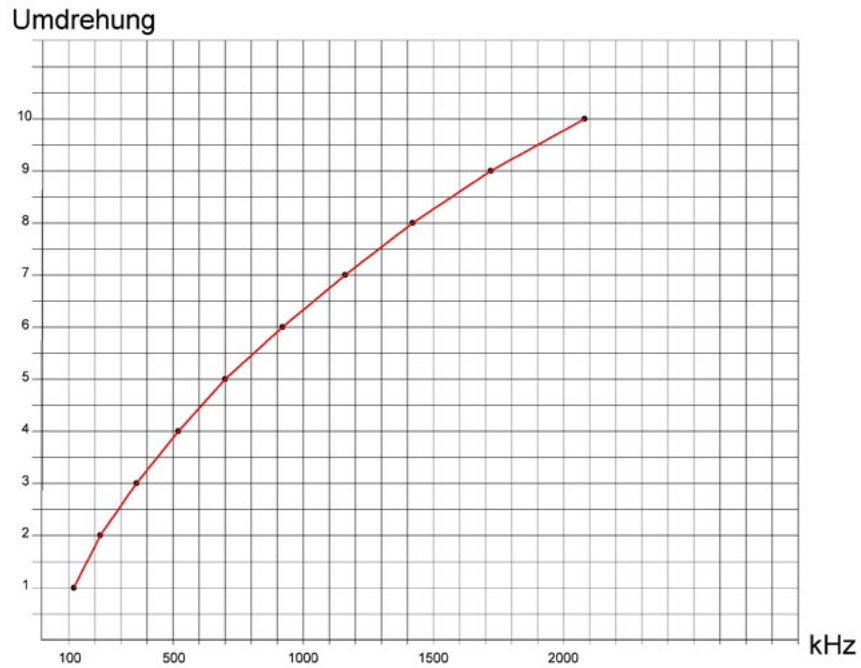
**SMALL ADJUSTMENT NOTE:**

BY MOVING THE WINDING UP OF THE TOROIDAL COIL (12 WINDINGS), THE AREA OF RECEPTION CAN BE ADJUSTED. "THE BROADCASTING BAND STARTS AT 49M 6,9MHZ"

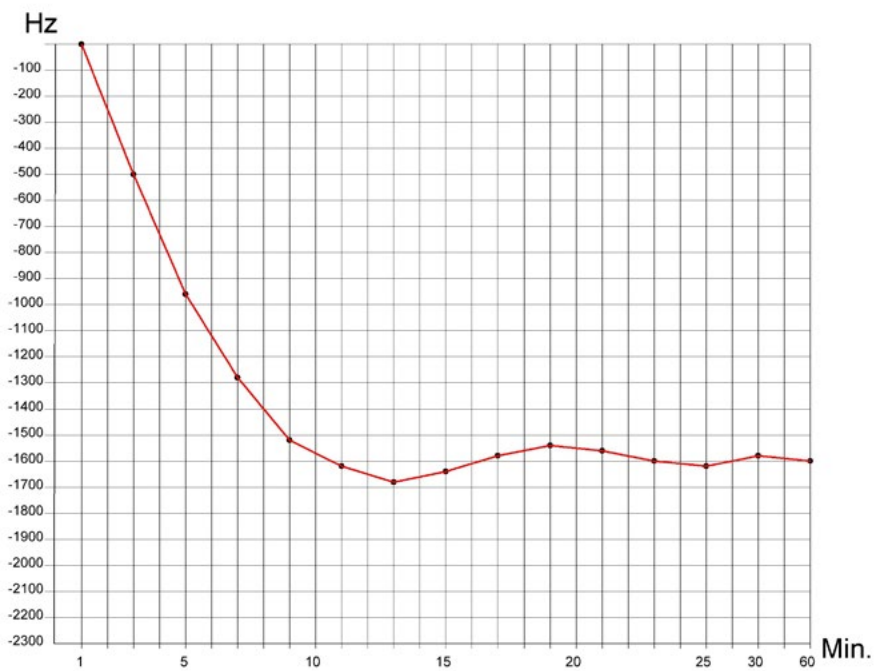
**HAVE FUN!**

# CURVES

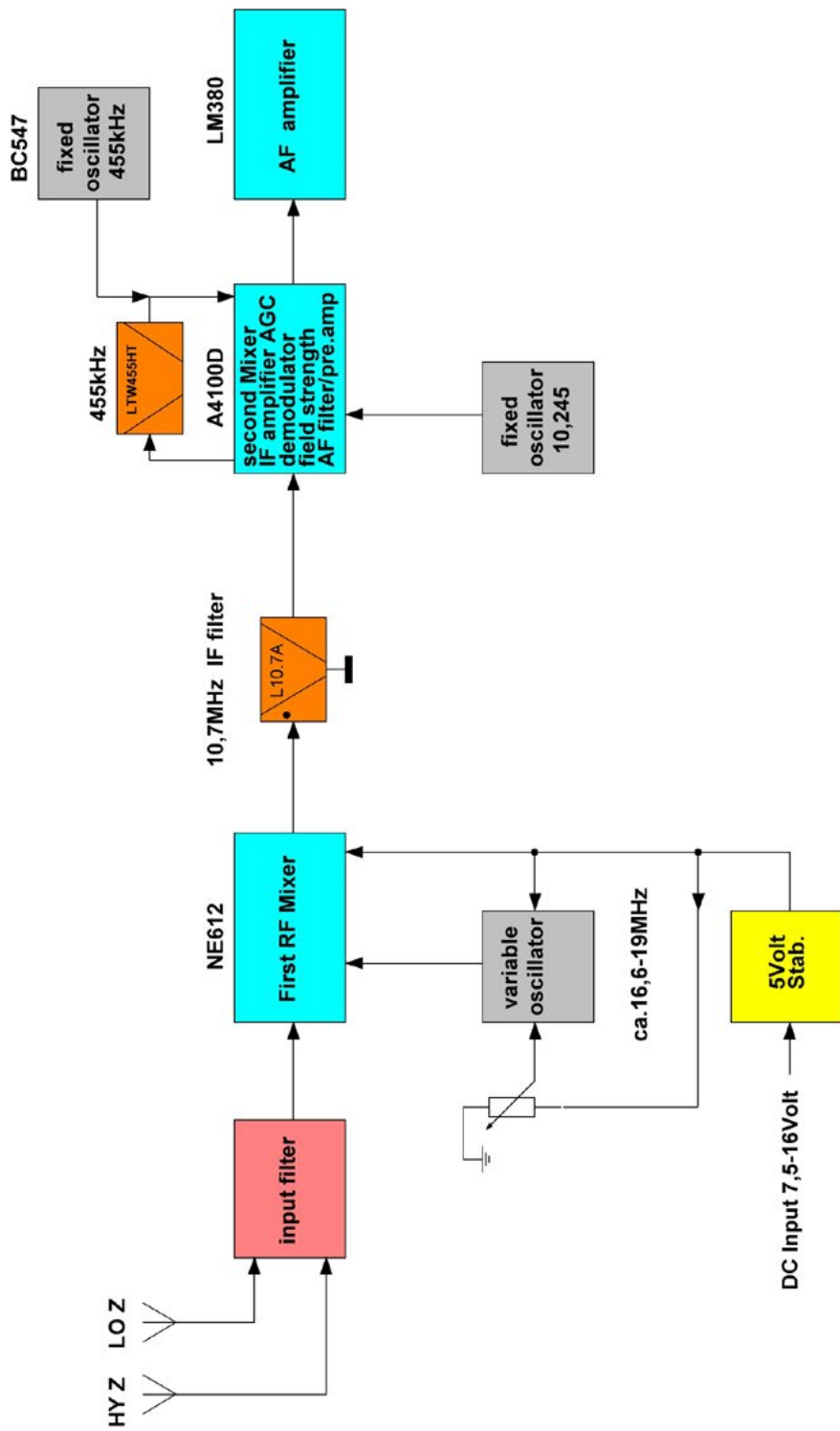
Frequenzgang pro Umdrehung Junior 1



Temperaturtrift Junior 1 7 MHz LO = 17,7MHz

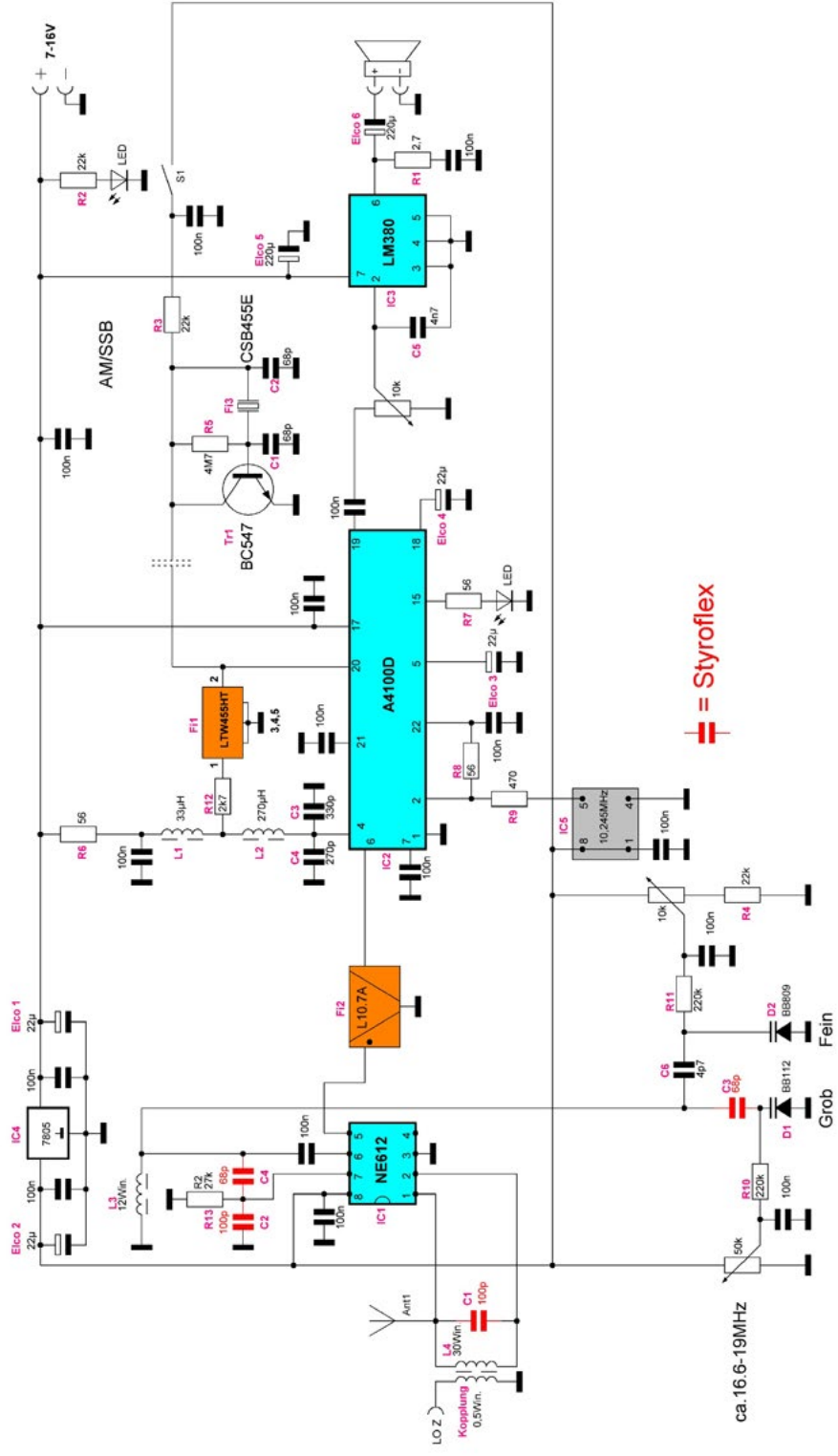


## 49/41/40m Shortwave band Receiver Junior 1 Block



# SCHEMATIC DIAGRAM

## Junior 1



# RANGE EXTENSION

## Empfangserweiterung Junior 1

Oszillatorspule <b>Empfangsbereich</b>	Antennenschwingkreis 30Windingen belassen! <b>100p sind zu entfernen!</b> 4,7p Parallel C	Koppelspule	Litzenantenne
5W. ca. 24-29MHz	8,2p	0,5W.	1,5m
6W. ca. 20-24MHz	12p	0,5W.	"
7W. ca. 16,5-20MHz	22p	0,5W.	"
8W. ca. 13,5-16,5MHz	39p	0,5W.	"
9W. ca. 11-14MHz	56p	0,5W.	"
10W. ca.9,2-11,6MHz	82p	0,5W.	"
11W. ca. 7,3-9,5MHz	100p	0,5W.	"
12W. ca. 6,1-8,1MHz	180p	0,5W.	"
13W. ca. 4-5,7MHz	390p	1W.	"
14W. ca. 3-4,7MHz	680p	2W.	2m
15W. ca. 2,4-4MHz	2,2n	3W.	2,5m
16W. ca. 1,2-2,6MHz	3,3n	4W.	3,5m
17W. ca. 0,72-2,1MHz	3,3n+10n	6W.	5m
18W. ca. 0,23-1,6MHz			

**Durch das schlechte LC Verhältnis nimmt die Empfindlichkeit ab, bei MW/LW**

An Pin7 des NE612 kann der FA Zähler BX-039 angeschlossen werden  
**Vorsicht! die Frequenzkonstanz kann sich verschlechtern.**