

## ARDFrx2.2 Partslist 20180124. Schema 20180123. PCB 20180123-14.

In this design i tried to use only easy to obtain parts. At the date of publication all components were obtainable.  
Conrad / Box73 / Amidon.de ordering details are given for your convenience. Please respect component specifications.

**If Conrad.nl does not ship to your country, use the part info at Conrad.nl and find a another supplier.**

RM = hole spacing. Bend wires of components to fit the PCB if needed.

Most capacitors : RM5 or RM2.5. Keep capacitor wires as short as possible !

		<b>Conrad orderNr</b>
C1	<b>68p NP0</b>	<b>457221</b>
C2,4	<b>10p NP0</b>	<b>457124</b>
<b>C5</b>	<b>6p8 NP0</b>	<b>457108</b>
<b>C30,31</b>	<b>470p</b>	<b>531759</b>
C3,6	<b>100p NP0</b>	<b>531906</b>
C7	3p3 NP0 (determents the tuning range, abt. 850kHz)	<b>451216</b>
C41,47	100n	<b>531855</b>
C8	150p	
C9	10uF	<b>421986</b>
C10	1uF ceramic RM5 (or elco 5mm dia.)	<b>453382</b>
C11,13,15,16,17,18, 23,24,43,44,45,46, 51,109,112,205	22n ceramic.	<b>531808</b>
C12,40	100uF <b>max d=6.3 - RM2.5</b>	<b>443906</b>
C14	1000uF <b>6.3V. max d=8 - RM3.5</b>	<b>422024</b>
C25	47-56p <b>NP0</b> . Depends on used coil for L3.	
C26	39-47p <b>NP0</b> . Depends on used coil for L6.	
C32	4n7 <b>FILM</b> (! NO ceramic Cs, micro phonic here !)	<b>455059</b>
C33	3.3uF RM2.5 tantalum	<b>481696</b>
<b>C34,35</b>	<b>47n</b>	<b>531718</b>
C36,37,203,204	220p NP0	<b>1420310</b>
C38	4u7. d=5, RM2 (elco or tantalum)	<b>1471077</b>
C39	150n ceramic RM5 (while R20=470 Ohm). <b>See "Setup" for details.</b>	<b>531872</b>
C45,47	22n <b>film</b>	<b>1235248</b>
C48,49	47p	<b>531826</b>
C202	22p NP0	<b>531975</b>
C207	4p7. <b>See "Setup" for details.</b>	<b>451232</b>

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All resistors 2.5x6.5mm 0.25W **metalfilm**.

R1,30,33,203	1k	
R3	22k METAL FILM (! for minimal oscillator phase noise !)	
R4,12	10k	
R5	50k lin. <b>See "Housing" for details.</b> OR <b>Vishay Precision potmeter 10-turn Mono 2 W 50 kΩ</b>	<b>424196</b> <b>429325</b>
R21	50k lin. <b>See "Housing" for details.</b>	<b>424196</b>
R6	220k	
R7,26	2k2	
R13,14	470k	
<b>R15,18</b>	<b>22k. Change their value for chanig total gain (for 0.3Vrmd noise at R19)</b>	
R16,17	330k	
R19	4k7	
R20	470 <b>See "Setup" for details.</b>	
R8,11,22,27,28	100k	
<b>R24</b>	<b>22k</b> Sets minimum sensitivity. <b>See "Setup" for details.</b>	
<b>R30,31</b>	<b>220</b>	
R201	680k	
Rx	1k5 as for Xtal filter 10M12B . Rx = (ZinFilter-1k5). <b>To be adapted to the characteristic impedance of the used crystal filter.</b>	
Ry	3k0 (3k3//33k) as for Xtal filter 10M12B. Ry = ZoutFilter. Both resistors can be inserted at the top copper with two wires per hole. <b>To be adapted to the characteristic impedance of the used crystal filter.</b>	
IC1	NE or SA 612N or 602N	<b>box73.de</b>
IC2	TL072	<b>155617</b>
VR1	LE50 5V <b>Low drop</b>	<b>1184984</b>
D1,2	1N4148	<b>162280</b>
D3	zener diode 5V1	<b>1110814</b>
D4	1N4000 / 4001 / 4002 etc.	<b>1262761</b>
FET1,4	BF998. <b>Pinning.</b> Solder with pins bend towards the PCB, and wide pin to mass.	<b>153029</b>
FET5	<b>BF256b pinning DSG</b> (Ids=200uA @ Vgs=1.6-3.8V). <b>See PCB top silk.</b>	<b>563810</b>
CD1	BB535 or BB149 or eq. <b>Anode connected to mass.</b> (Cd varying between 18 and 9.5pF with Vd varying between 1V and 5V).	<b>153196</b>
LED	Bright red. (Battery condition indicator).	<b>184560</b>
T1	BC547c or equivalent. <b>Pinning. See PCB top silk.</b>	<b>140539</b>

Use for Neosid coils a special 1mm x 2mm trimming tool, obtainable from [box73.de](http://box73.de) "ABGL-SD".

**L1, L2:**

Neosid 7mm coil type **BV5061** obtainable from [Amidon.de](http://Amidon.de) .

You can wind your own with 6.2 turns (80nH) on a Neosid 7V1S coil form.

**L3,6:**

Neosid 10.7 Mhz IF coils 7x7mm RM 2.25 mm.

Useable coil inductances are between 2 uH and 6 uH.

You can wind your own with abt. 20 turns at a Neosid 7F1S coil forms. Start=5, End= 1 or 4.

The total value of tuning capacitors C25 and C26 is depending on the inductance value of the used coil :

- If after adjustment a coil core is fully on top of the coil, change the tuning capacitor for one with a little lower value.

- If after adjustment a coil core is fully inside the coil, add a small capacitor (a few pF) in parallel to the tuning capacitor. Solder the extra capacitor at the bottom side of the PCB.

The following Neosid standard coils, and "Pre adjusted filter coils" are obtainable from [Amidon.de](http://Amidon.de) :

L [uH]	Type	Start-End	RM	Neosid
4	5056	5-4	2.25	5056
3.3	5044	5-1	2.25	5044
3.3	WZ12,25	5-1	2.5	(5313 07)
3.9	WZ13,5	5-1	2.5	(5313 08)
4.7	WZ15,25	5-1	2.5	(5313 09)
5.6	WZ16.25	5-1	2.5	(5313 10)

REM : On PCB 20180117-10, when using coil 5056 for L3 and/or L6, make a connection between pins 2 and 4 at the bottom side of the PCB.  
See schematic.

For the other coils in the table, make a connection between pins 2 and 1.  
The pins of the WZ type coils must be bend a little to fit the PCB holes.

**L7,10,11,12,201 :**

Fastron or EPCOS axial 3x7mm 22uH choke (SRF >=11 MHz)

Conrad orderNr 440311

**L15 :**

Fastron or EPCOS axial 3x7mm 1uH choke (SRF abt. 180 MHz)

Conrad orderNr 440219

**F1+2:**

Crystal filter **10M12B** [box73.de](http://box73.de) .. Rx = Zfilter-1k5 (= 1k5) . Ry = Zfilter (3k0 = 3k3 // 33k)

-OR-

use filter type **10M16B** of **10M20B** and adapt Rx and Ry.

Xt crystal **10.7MHz HC18U** [box73.de](http://box73.de)

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Mechanical parts

Aluminum die cast box **Hammond 1590P1** Conrad **532514**

**SMA** chassis bus Conrad **739032**

**3,5mm stereo** chassis bus Conrad **718574**

**2x Knob** with scale and brake Conrad **184078**

Micro miniature **switch** 1x on/on Conrad **700568**

Fp1 en Fp2 : 9,5 x 9,5mm **ferrite pipes** Conrad **1086850**

9v block battery connector Conrad **650515**

(This is a good one.)

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