

ARDFrx2.2 Partslist 2018**1127**. 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 !

		Conrad orderNr
C1	68p NP0	457221
C2,4	10p NP0	457124
C5	6p8 NP0	457108
C30,31	470p	531759
C3,6	100p NP0	531906
C7	3p3 NP0 (determents the tuning range, abt. 850kHz)	451216
C41,47	100n	531855
C8	150p	
C9	10uF	421986
C10	1uF ceramic RM5 (or elco 5mm dia.)	453382
C11,13,15,16,17,18, 23,24,43,44,45,46, 51,109,112,205	22n ceramic.	531808
C12,40	100uF max d=6.3 - RM2.5	443906
C14	1000uF 6.3V. max d=8 - RM3.5	422024
C25	47-56p NP0 . Depends on used coil for L3.	
C26	39-47p NP0 . Depends on used coil for L6.	
C32	4n7 FILM (! NO ceramic Cs, micro phonic here !)	455059
C33	3.3uF RM2.5 tantalum	481696
C34,35	47n	531718
C36,37,203,204	220p NP0	1420310
C38	4u7. d=5, RM2 (elco or tantalum)	1471077
C39	150n ceramic RM5 (while R20=470 Ohm). See "Setup" for details.	531872
C47	22n film	1235248
C48,49	47p	531826
C202	22p NP0	531975
C207	4p7. See "Setup" for details.	451232

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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. See "Housing" for details. OR Vishay Precision potmeter 10-turn Mono 2 W 50 kΩ	424196 429325
R21	50k lin. See "Housing" for details.	424196
R6	220k	
R7,26	2k2	
R13,14	470k	
R15,18	22k. Change their value for chanig total gain (for 0.3Vrmd noise at R19)	
R16,17	330k	
R19	4k7	
R20	470 See "Setup" for details.	
R8,11,22,27,28	100k	
R24	22k Sets minimum sensitivity. See "Setup" for details.	
R30,31	220	
R201	680k	
Rx	1k5 as for Xtal filter 10M12B . Rx = (ZinFilter-1k5). To be adapted to the characteristic impedance of the used crystal filter.	
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. To be adapted to the characteristic impedance of the used crystal filter.	
IC1	NE or SA 612N or 602N	box73.de
IC2	TL072	155617
VR1	LE50 5V Low drop	1184984
D1,2	1N4148	162280
D3	zener diode 5V1	1110814
D4	1N4000 / 4001 / 4002 etc.	1262761
FET1,4	Wide leg = S and is connected to mass. BF998R : Legs should tough the PCB, and you should see its top. or BF998 : Soldered UPSIDE-DOWN. Bend legs a little down if needed.	
FET5	BF256b pinning DSG (Ids=200uA @ Vgs=1.6-3.8V). See PCB top silk.	563810
CD1	BB535 or BB149 or eq. Anode connected to mass. (Cd varying between 18 and 9.5pF with Vd varying between 1V and 5V).	153196
LED	Bright red. (Battery condition indicator).	184560
T1	BC547c or equivalent. Pinning. See PCB top silk.	140539

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Use for Neosid coils a special 1mm x 2mm trimming tool, obtainable from box73.de "ABGL-SD".

L1, L2:

Neosid 7mm coil type **BV5061** obtainable from 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..

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 the core is fully on top of the coil :
change the tuning capacitor for one with a little lower value.
- If after adjustment a coil the core is fully at the bottom of the coil :
add at the bottom of the PCB a small capacitor (a few pF) in parallel to the tuning capacitor.

Suggested usable Neosid standard coils, and "Pre adjusted filter coils" (Amidon.de)

L [uH]	Amidon	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 :

New PCB 20180123-14 :

The coil layouts are adapted for a variety of 7mm RM 2.25 and RM 2.5 coils.

Earlier 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 .. 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

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

9V block battery connector Conrad **650515**

(This is a good one.)
