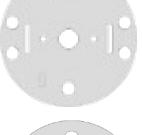
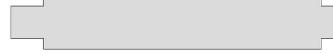


Antenna REFA

Number		Item	Type	thick	pcs
1		Item 1	Ballholder Ring Top	2mm	1pcs
2		Item 2	Ballholder Ring Upper	2mm	1pcs
3		Item 3	Ballholder Ring Middle	2mm	1pcs
4		Item 4	Ballholder Ring Wireout	2mm	1pcs
5		Item 5	Ballholder Ring Bottom	2mm	1pcs
6		Item 6	Copper Tube TOP	3mm	1pcs
7		Item 7	Copper Tube Holder Bottom & Item 13 Ring Tube Bottom Hole=6mm, Dia=25mm	3mm	1pcs
8		Item 8	Copper Tube Bottom & Item 14 Ring Nut Holder Tube (4mm Nut)=dia 7,9mm; Diameter 17,5mm	3mm	1pcs
9		Item 9	Motor Top	3mm	1pcs
10		Item 10	Motor Bottom & Item 15 17,5mm Hole 6mm	3mm	1pcs
11		Item 11	Motor Side1	2mm	1pcs

Antenna REFA

12		Item 12	Motor Side2	2mm	1pcs
13		Item 13	Ring inside item 7 ; 25mm; Hole 6mm	3mm	1pcs
14		Item 14	Ring inside Item 8 ; Nut holder 17,5mm M4-	3mm	1pcs
15		Item 15	Ring inside item 10 ; 17,5mm top; Hole 6mm	3mm	1pcs
16		Item 16	Emitter (Strahler) top 5,8mm/17,5mm	3mm	1pcs
17		Item 17	Emitter (Strahler) middle 5,8mm/17,5mm	3mm	1pcs
18		Item 18	Emitter (Strahler) bottom 4,4mm/17,5mm	3mm	1pcs
19		Item 19	Side part Motor	3mm	1pcs
20		Item 20	Side part Motor	3mm	1pcs
21		Item 21	Top inner Stabilizer 17mm; Hole 4,2mm	3mm	1pcs
22,23,24, 25,26,27, 28,29,30, 31,32,33		Item 22- 33	Nut M5 DIN934 ISO4032 1g 5mm	5mm	12 pcs
34		Item 34	Ring-Pin 3,2mm	3,2mm	1pcs
35		Item 35	Wattlet Wire		1pcs
36,37,38, 39,40,41, 42,43,44, 45		Item 36- 45	Flat-Washer 5,4mm DIN125 5,2mm	5,2mm	10 pcs

Antenna REFA

46,47,48, 49,50,51		Item 46- 51	Spring-Ring 5mm DIN127	5,2mm	6pcs
52		Item 52	Clamp-shoe		
53		Item 53	threaded rod 5mm	36cm	1pcs
54		Item 54	threaded rod 5mm	36cm	1pcs
55		Item 55	threaded rod 4mm transport	26cm	1pcs
56		Item 56	Motor Clutch 22/12mm	4mm	1pcs
57		Item 57	Motor-Controller Electronic		
58		Item 58	Gear DC-Motor 6V 24,5mm	69mm	1pcs
59,60		Item 59,60	Flat-Washer 3,2mm DIN125	3,2mm	2pcs
61,62,63		Item 61,62,63	Skrew Flat-Heat cross 3.0x10mm DIN965	3mm	3pcs
64		Item 64	Angle 90°	2,5mm	1pcs
65,66,67		Item 65,66,67	Skrew Flat-Head Cross 3.0 x 20mm DIN965		3pcs
68,69,70		Item 68,69,70	Spring-Ring 3,2mm		3pcs
71,72,73, 74,75,76		Item 71,72,73, 74,75,76	Flat-Washer 3,2mm		6pcs

Antenna REFA

77		Item 77	Couper-Tube 28mm/26mm inner		1pcs
78,79,80		Item 78,79,80	M4 Nut 0,6g DIN934	M4	3pcs
82,83		Item 82,83	Flat-Washer 4,3mm DIN125 4,4mm		2pcs
86,87		Item 86,87	Spring-Ring 4mm DIN127 Coil Silver coated 0,6mm/28cm/20mm Dia	4,2mm	2pcs
90		Item 90	UHF-Connector Jack Female front mount bulkhead RF connector solder 15,8mm inner, 15,8mm outer	28cm	
91		Item 91	15,9mm	15,9mm	1pcs
92,93,94		Item 92,93,94	M3 Hex-Nut DIN934	M3	3pcs
95,96,97		Item 95,96,97	Metal-Ball 6mm 1pcs Brass & 2pcs Steel	6mm	3pcs
98,99,100		Item 98,99,100	Spring 6mm	6,5x10 mm	3pcs
101		Item 101	Ring-Pin 3,2mm	3,2mm	1pcs

Antenna REFA

PO/SP/CP REFA 10pcs Handling Material Energie kWh REFA 20pcs REFA 30pcs

100/10/10

100/10/10

100/10/10

100/10/10

100/10/10 00:06:45

100/8/20 00:10:24

100/8/20 00:11:16

100/8/20 00:10:54

100/8/20 00:08:41 00:14:57

100/8/20 00:07:59

100/10/10 00:19:10

Antenna REFA

100/10/10

100/8/20

100/8/20

100/8/20 00:07:19

100/8/20

100/8/20

100/8/20

100/8/20

100/8/20

100/8/20

Datum	Item	Stück	goods Kurs	cost total	USD \$1,00
27.09.2019	Silver Draht				
04.10.2019	Silver Draht				
15.10.2019	JLCPCB				
16.10.2019	Reichelt Elektronik				
06.11.2019	TT-Motor 1:10 1:21 1:34			\$200,00	
03.02.2020	JLCPCB Proto				
07.05.2020	Metal			\$166,00	
16.05.2020	Metalteile Bauhaus diverse				
22.05.2020	OEM manufacture			\$248,02	
22.05.2020	Molding Fee			\$166,00	
06.06.2020	Schrumpfschlauch Bauhaus				
04.08.2020	VHF-Connector				
10.08.2020	Muttern Schrauben			\$482,00	
13.08.2020	Metal Winkel			\$418,96	
14.08.2020	Gewindestandeln 4mm 3mm			\$211,80	
09.09.2020	Plastik Sackerl Zip-Ties			\$119,00	
14.09.2020	Zip-Ties Zoll				
23.09.2020	Metal Bauhaus diverse				
29.10.2020	95			\$105,90	
16.10.2020	Fendern 10000Stück Zoll			\$125,00	
29.10.2020	Brass Kugeln			\$105,90	
11.11.2020	Fendern 10000Stück Zoll				
13.11.2020	Karton			\$302,00	
24.11.2020	Zoll				
23.12.2020	TT-Motor verschiedene			\$124,47	
25.05.2021	Silver Draht				
02.10.2021	Alurohr 6mm 1m Bauhaus				
14.11.2021	JLCPCB 20PCB				
25.10.2022	119	102	76x46-60 Metalgehäuse		\$285,90
13.01.2023	LCD 1,14"			\$245,36	
19.07.2023	SWR-Meter 4xPCB Prototypen			\$189,97	
21.07.2023	JLC Zoll				
29.08.2023	Reichelt 10x FT82-77 10xFT50-77				
12.04.2024	SWR-Meter 4xPCB			\$338,28	

cost total

18.04.2024

24.04.2024

Reichelt 40 Kerne FT82-77

Verpackung

5.2024

20sets Bleche Herry Lin

Total

\$3.835,56

cost total

Euro	name	email
€ 0,94		

€ 64,15
€ 64,15
€ 28,39
€ 94,14

€ 62,16
€ 187,25 Herry
€ 45,43
€ 279,77
€ 187,25 Herry
€ 6,50
€ 240,97 Ms.Wang
€ 543,70 David Chang
Herry
€ 238,91 David Chang
€ 134,23
€ 22,76
€ 33,13
€ 119,46
€ 117,50
€ 119,46
€ 22,76 David Chang
€ 487,73
€ 31,--
€ 140,40

€ 198,55
€ 19,90
€ 133,53

€ 322,49 QijunGu Jrsdzkt@163.com
€ 276,77 Jessie Su sruls.lnc@outlook.com
€ 214,29
€ 37,06
€ 39,62
€ 381,58

cost total

€ 97,72

€ 254,35

€ 177,--

€ 5.424,98

cost total

company

Bauteile

€240,97/200Stück= €1,20485
2 Rechnungen

keine Ahnung für was das ist???

Jinan Jinruisheng Electronics Technology Co. Ltd.

Shenzen Sanruisheng Technology Co Ltd.

Item Purchase

Item	DIY-Kit 59Antennas	0,85
1	Ballholder Ring Top	
2	Ballholder Ring Upper	
3	Ballholder Ring Middle	
4	Ballholder Ring Wireout	
5	Ballholder Ring Bottom	
6	Copper Tube TOP Copper Tube Holder Bottom & Item 13 Ring Tube Bottom	
7	Hole=6mm, Dia=25,7mm Copper Tube Bottom & Item 14 Ring Nut Holder Tube (4mm	
8	Nut)=dia 7,9mm; Diameter 17,8mm	
9	Motor Top	
10	Motor Bottom & Item15 17,8mm Hole 6mm	
11	Motor Side1	
12	Motor Side2	
13	Ring inside item 7; 25,7mm; Hole 6mm	
14	Ring inside Item 8; M4-Nut holder 17,8mm	
15	Ring inside item 10; 17,8mm top; Hole 6mm	
16	Emitter (Strahler) top 6mm/17,8mm	
17	Emitter (Strahler) middle 6mm/17,8mm	
18	Emitter (Strahler) bottom 4,4mm/17,8mm	
19	Side part Motor	
20	Side part Motor	
21	Top inner Stabilizer 17mm; Hole 4,2mm	
22	M5 Hex-Nut	
23	M5 Hex-Nut	
24	M5 Hex-Nut	
25	M5 Hex-Nut	
26	M5 Hex-Nut	
27	M5 Hex-Nut	
28	M5 Hex-Nut	
29	M5 Hex-Nut	
30	M5 Hex-Nut	
31	M5 Hex-Nut	
32	M5 Hex-Nut	
33	M5 Hex-Nut	
34	Ring-Pin 3,2mm	
35	-	
36	Flat-Washer 5,2mm	
37	Flat-Washer 5,2mm	
38	Flat-Washer 5,2mm	
39	Flat-Washer 5,2mm	
40	Flat-Washer 5,2mm	
41	Flat-Washer 5,2mm	
42	Flat-Washer 5,2mm	
43	Flat-Washer 5,2mm	
44	Flat-Washer 5,2mm	
45	Flat-Washer 5,2mm	
46	Spring-Ring 5,2mm	
47	Spring-Ring 5,2mm	
48	Spring-Ring 5,2mm	
49	Spring-Ring 5,2mm	

Item Purchase

50	Spring-Ring 5,2mm	
51	Spring-Ring 5,2mm	
52	Ring-Pin 5,2mm	
53	threaded rod	5mm
54	threaded rod	5mm
55	threaded rod	4mm
56	Motor Clutch 22/12mm	22mm
57	Motor-Controller Electronic	
58	Gear DC-Motor 6V	
59	Flat-Washer 3,2mm DIN125	3,2mm
60	Flat-Washer 3,2mm DIN125	3,2mm
61	Skrew Flat-Heat cross 3.0x10mm DIN965	3mm
62	Skrew Flat-Heat cross 3.0x10mm DIN965	3mm
63	Skrew Flat-Heat cross 3.0x10mm DIN965	3mm
64	Angle 90°	55mm 60mm
65	Skrew Flat-Head Cross 3.0 x 20mm DIN965	3mm
66	Skrew Flat-Head Cross 3.0 x 20mm DIN965	3mm
67	Skrew Flat-Head Cross 3.0 x 20mm DIN965	3mm
68	Spring-Ring 3,2mm	3,2mm
69	Spring-Ring 3,2mm	3,2mm
70	Spring-Ring 3,2mm	3,2mm
71	Flat-Washer 3,2mm	3,2mm
72	Flat-Washer 3,2mm	3,2mm
73	Flat-Washer 3,2mm	3,2mm
74	Flat-Washer 3,2mm	3,2mm
75	Flat-Washer 3,2mm	3,2mm
76	Flat-Washer 3,2mm	3,2mm
77	Couper-Tube 28mm/26mm inner	22cm
78	M4 Nut 0,6g DIN934	4mm
79	M4 Nut 0,6g DIN934	4mm
80	M4 Nut 0,6g DIN934	4mm
81	M4 Nut 0,6g DIN934	4mm
82	Flat-Washer 4,3mm DIN125	4,3mm
83	Flat-Washer 4,3mm DIN125	4,3mm
84	Flat-Washer 4,3mm DIN125	4,3mm
85	Flat-Washer 4,3mm DIN125	4,3mm
86	Spring-Ring 4mm DIN127	4mm
87	Spring-Ring 4mm DIN127	4mm
88	Spring-Ring 4mm DIN127	4mm
89	Spring-Ring 4mm DIN127	4mm
90	Coil Silver coated 0,6mm/28cm/20mm Dia	20mm
	VHF-Connector Jack Female front mount bulkhead RF connector	
91	solder 15,8mm inner, 15,8mm outer	15,8mm
92	M3 Hex-Nut DIN934	3mm
93	M3 Hex-Nut DIN934	3mm
94	M3 Hex-Nut DIN934	3mm
95	Metal-Ball Brass	6mm
96	Metal-Ball Steel	6mm
97	Metal-Ball Steel	6mm
98	Spring	6mm
99	Spring	6mm
100	Spring	6mm
101	Ring-Pin	3,2mm

Item Purchase

- 102 Plastik Pack
- 103 Plastik Pack
- 104 Plastik Pack
- 105 Plastik Pack
- 106 Plastik Pack
- 107
- 108 Kartonage 53x11x7cm weiß
- 109 Sack white over Kartonage
- 110
- 111
- 112
- 113 SWR-Meter Motor-Controller**
- 114 LCD1,14“ Display
- 115 Motherboard
- 116 CPU board
- 117 Front PCB
- 118 Back PCB
- 119 Metalbody
- 120 VHF-Plug
- 121 VHF-Plug
- 122 Core FT82-77
- 123 Core FT82-77
- 124 Wire 0,5mm
- 125 Wire 1,3mm
- 126 Worktime

Item Purchase

\$USD \$Total € pcs € Total

€ 7,77
\$0,0043
\$0,0043
\$0,0043
\$0,0043
\$0,0043
\$0,0043
\$0,0043
\$0,0043
\$0,0043
\$0,0043
\$0,0043
\$0,0043
\$0,0043
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\$0,0016
\$0,0016
\$0,0016
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\$0,0016
\$0,0016
\$0,0016
\$0,0016
\$0,0016
\$0,0016
\$0,0016
\$0,0012
\$0,0012
\$0,0012
\$0,0012

Item Purchase

\$0,0012
\$0,0012

€ 2,36
€ 6,68
€ 7,11

€ 2,33

\$0,0009
\$0,0009
\$0,0009
\$0,0010
\$0,0010
\$0,0010
\$0,0010
\$0,0010
\$0,0010

€ 1,72 € 18,90

\$0,0033
\$0,0033
\$0,0033
\$0,0033
\$0,0012
\$0,0012
\$0,0012
\$0,0012
\$0,0012
\$0,0012
\$0,0012
\$0,0012
\$0,0012

€ 1,20 € 240,97

\$0,0022
\$0,0022
\$0,0022

€ 0,12
€ 0,12
€ 0,12

Item Purchase

€ 0,01
€ 0,01
€ 0,01
€ 0,01
€ 0,01

\$1,10
\$1,21 € 0,51
 € 1,14
 € 31,25

€ 2,77

€ 19,07
€ 3,16
€ 1,20
€ 1,20
€ 2,43
€ 2,43
€ 0,50
€ 0,50
€ 0,--

€ 64,51

Item Purchase

Company

15min/20items=0,75min 60sec*0,75=45sec/item
CNC-Laser €51,80/h Selbstkosten
25,6sec/item*21= 538sec/60sec=8,96min ca.9min
€51,80/60= €0,863 *9min= €7,77/set plastic

4Std 29min/21item/30pcs=0,4269...*60sec= 25,6sec/pcs

DIN934 Hex Nut

10kg=10000g

Dongying Mingyang Precision Metal Co.Ltd.
CN, Shandong,Dongying,Room 601, Unit 1
Building 10, Jinghua Guandi, No156
Kangyang Road
Dongying District

Mr. David Zhang
DHL USD258,60 10.8.2020
Train USD123,20 10.8.2020
OrderNumber:49724079501022894

Dongying Mingyang Precision Metal Co.Ltd.

Item Purchase

€471,21/200pcs= €2,36
€133,53/20pcs= €6,68
TT-Motors Shenzen \$7,11

\$418,96 + \$83,79 = \$502,75/200pcs= \$2,51 = €2,33

Bauhaus €18,90 250cm Prod.Nr. 13641112

59Antennas

[Zhenjiang Xinhufeng Electronics Co., Ltd.](#)

Dongying Mingyang Precision Metal Co Ltd.

Item Purchase

Dongguan Yiwei Plastic Company Ltd.

500pcs*\$0,31=\$155 + \$302=\$457+\$91,40(20%)=\$548/500pcs=
\$200*€0,94=€188+66,50=€254,50/500Sack=€0,509
USD => Euro 0,94 Kurs

\$245,36 + \$49,07=\$294,43 * 0,94= 276,76/100pcs= €2,77
\$338,28 * 0,94= €317,98 + €63,59(EiSt.+20%)= €381,58
€381,58/20pcs= €19,07/pcs

€285,90*0,94=€268,75 + €53,75(EiSt.+20%)= €322,49/102pcs

€97/40pcs Reichelt = €2,43

Item Purchase

Information je 30pcs items Lasertime

15:23

20:01

20:52

21:39

17:20

28:29

13:00

29:14

22:23

25:36

07:17

07:17

07:43

07:43

07:17

06:58

06:58

03:58

04:29:08,00

The	304
DIN934	M3 Hex-Nut
DIN125	M3 washer
DIN127	M3 spring ring
DIN934	M4 Hex-Nut
DIN125	M4 washer
DIN127	M4 spring ring
DIN934	M5 Hex-Nut
DIN125	M5 washer
DIN127	M5 spring ring
GB819	M3*10
GB819	M3*20

Item Purchase

JLCPCB

0,861363757 GM25-370CA-22170-34

250cm/22cm=11,363.. €18,90/11Stück = €1,72

200pcs €176,79 + €64,18(Bischop EiSt.) €240,97/200pcs=€1,20 Mrs. Mandy Ju

David Chang

Item Purchase

10kpcs

Allison Lu

Chain1688@126.com WeChat:Chain1688 Chain Guo

Chain Guo

Shenzen Sanruisheng Technology Co Ltd

Jessica Su

Item Purchase

stainless steel		price
\$0,0022	6000	\$13,2000
\$0,0010	6000	\$6,0000
\$0,0009	6000	\$5,4000
\$0,0033	6000	\$19,8000
\$0,0012	6000	\$7,2000
\$0,0012	6000	\$7,2000
\$0,0043	6000	\$25,8000
\$0,0016	6000	\$9,6000
\$0,0021	6000	\$12,6000
\$0,0025	6000	\$15,0000
\$0,0042	6000	\$25,2000
	66000	\$147,0000
		\$123,20

Item Purchase

Xiangnai Hardware Shenzen Co.Ltd. Herry

\$566,23	100	€ 487,73	€ 124,47	Zoll EiSt
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Xiangnai Hardware Shenzen Co.Ltd. Herry

Zhenjiang City

Jiangsu ship Chanzhou

Item Purchase

TAT Packaging Products Limited
Fosun Trading

Item Purchase

\$270,20

Item Purchase

€ 612,20

Herry Lin

To: Herry Lin

Address: Block 4/109 zhongxing industrial zone chunagye road nanshan district shenchen city
 Guangdong province P.R. China Zip: 518032
 Phone:0086-18688722201

Herry Lin Metal parts
 Xiangnai Hardware (Shenzhen) Co., Ltd.
 Room 616 6 /F, Building A ZTE industrial city, Chuangye Road, Nanshan District, Shen:
 Uniform Social Credit Code91440300692540947A
 Registration BureauShenzhen City Guangdong Province
 Legal RepresentativeJEEBLAL BISHWAKARMA (JEEBLAL BISHWAKARMA
 Date of Incorporation (Years in Business)August 24, 2009 (More than 11 years

Pos	Name	mm thick [a]	mm depth [b]	mm wide [c]	USD
1	NoName	transparent	2	1220	2440 \$39,80
2	NoName	transparent	3	1220	2440 \$59,55
3	Plexiglas	transparent	2	1220	2440 \$61,00
4	Plexiglas	transparent	3	1220	2440 \$91,00
	Length [mm]	item size	pcs	pcs	
	2440	50	48,8	48*24	Pos 1
	1220	50	24,4	1152	2mm \$0,034549
	2440	50	48,8	48*24	Pos 2
	1220	50	24,4	1152	2mm \$0,051693
	2440	50	48,8	48*24	Pos 3
	1220	50	24,4	1152	2mm \$0,052951
	2440	50	48,8	48*24	Pos 4
	1220	50	24,4	1152	2mm \$0,078993
5	Motor Clutch 22/12mm				
		200			\$248,02
	CAD/CAM cost				\$166,00
	Zoll/Einfuhrumsatzsteuer				
6	200 Angle 90°	\$1,35			€ 2,36 USD 1,-
	Zoll/Einfuhrumsatzsteuer			? kein Zoll	\$270,00 \$0,00
					\$1,15

zhen City

Panel
Panel
Panel
Panel

pcs

pcs

pcs

pcs

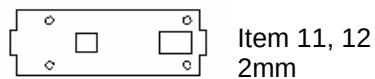
Transport

€ 240,59
€ 160,72
€ 69,90
€ 471,21

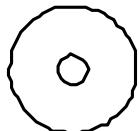
pcs

€ 0,85
€ 229,50
€ 0,00
€ 229,50

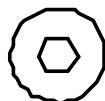
Item Emitter



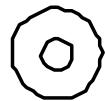
Item 11, 12
2mm



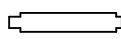
Item 13
25,7mm Hole
6mm



Item 14
17,8mm M4
Nut



Item 15
17,8mm Hole
6mm



Item 19,20



Item 17
Emitter
(Strahler)
middle 6mm
17,8mm



Item 18
Emitter
(Strahler)
bottom 4,4mm
17,8mm



Item 21
Stabilizer
17,5mm Hole
4mm

Manual_Pictures

Pic	Items	
1	P1020970	
2	P1020890	42,29
3	P1020972	37,23 42,29
4	P1020973	37,23, 42,29, 24,47,38,30,50,43
5	P1020974	9,58
6	P1020976	9,58
7	P1020977	9,58
8	P1020979	9,58 + 3mm Schrauben
9	P1020980	9,58,+ 9,58 + 3mm Schrauben
10	P1020981	9,58 + 3mm Schrauben
11	P1020982	9,58 + 3mm Schrauben
12	P1020984	Bild von oben
13	P1020987	Motorplatte aufgesteckt
14	P1020988	39,25+44,31 Platte anschrauben
15	P1020994	26,48,40+32,51,45,52
16	P1020999	Bild Unten
17	P1030001	10
18	P1030008	Winkel
19	P1030014	27,30 Endschrauben
20	P1030020	Seitenteil Motor einsetzen
21	P1030022	Seitenteil Motor einsetzen
22	P1030027	Motorplatte anschrauben
23	P1030028	Motoraufnahme Unterer Teil fertig
24	P1030033	7,8
25	P1030035	8
26	P1030037	8
27	P1030038	7 Holes on one side
28	P1030043	53,54 -36cm
29	P1020934	1,2,3,4,5,6,64,65,66,67,68,69,70,71,72,73,74,75
30	P1020936	6,70,71,72,64,65,66
31	P1020937	5,6
32	P1020890	Ringe
33		Ring upper Bottom
		Ring 5,6

DIN ISO Muttern

Sechskantmuttern gemäß DIN 934 / ISO 4032 in Edelstahl A2

Durchmesser (d) per Artikelbezeichnung

Technische Daten:

d (Durchmesse m (Höhe) r Innen)	e in mm	s (Durchmesse r Aussen) in mm	(Schlüsselweite) in mm
M1	0,8	2,71	SW 2,5
M1,2	1	3,28	SW 3
M1,4	1,2	3,28	SW 3
M1,6	1,3	3,48	SW 3,2
M1,7	1,4	3,82	SW 3,2
M1,8	1,4	4,21	SW 3,5
M2	1,6	4,32	SW 4
M2,3	1,8	4,88	SW 4,5
M2,5	2	5,45	SW 5
M2,6	2	5,45	SW 5
M3	2,4	6,01	SW 5,5
M3,5	2,8	6,58	SW 6
M4	3,2	7,66	SW 7
M5	4	8,79	SW 8
M6	5	11,05	SW 10
M7	5,5	12,12	SW 11
M8	6,5	14,38	SW 13
			SW 17 (SW)
M10	8	18,9	16) *1
			SW 19 (SW)
M12	10	21,1	18) *1
			SW 22 (SW)
M14	11	24,49	21) *1
M16	13	26,75	SW 24
M18	15	29,56	SW 27
M20	16	32,95	SW 30
			SW 32 (SW)
M22	18	35,03	34) *1
M24	19	39,55	SW 36
M27	22	45,2	SW 41
M30	24	50,85	SW 46
M33	26	55,37	SW 50
M36	29	60,79	SW 55
M39	31	66,44	SW 60
M42	34	71,3	SW 65
M45	36	76,95	SW 70
M48	38	82,6	SW 75
M52	42	88,25	SW 80

*1.. Schlüsselweiten DIN/ISO abweichend (Schlüsselweite in Klammer =

DIN ISO Muttern

Tel: 86-546-15318388980

Location: Shandong, China

order date	10.08.2020				
The	304	stainless steel		price	
DIN934	M3 Hex-Nut	\$0,0022	6000	\$13,20	
DIN125	M3 washer	\$0,0010	6000	\$6,00	
DIN127	M3 spring ring	\$0,0009	6000	\$5,40	
DIN934	M4 Hex-Nut	\$0,0033	6000	\$19,80	
DIN125	M4 washer	\$0,0012	6000	\$7,20	
DIN127	M4 spring ring	\$0,0012	6000	\$7,20	
DIN934	M5 Hex-Nut	\$0,0043	6000	\$25,80	
DIN125	M5 washer	\$0,0016	6000	\$9,60	
DIN127	M5 spring ring	\$0,0021	6000	\$12,60	
GB819	M3*10	\$0,0025	6000	\$15,00	
GB819	M3*20	\$0,0042	6000	\$25,20	
			66000	\$147,00	
DDP	Land Freight Rail		1	\$123,20	
delivery	13.10.2020			\$270,20	
order date	14.10.2020				
DIN975/976	M4*1000mm	\$0,48	100	\$48,00	
DIN975/976	M5*1000mm	\$0,64	100	\$64,00	
			200	\$112,00	
DDP	Land Freight Rail		1	\$99,80	
delivery	13.10.2020			\$211,80	

DIN ISO Muttern

- ISO Schüsselweite)

DIN ISO Muttern

all incl.	0,85
\$0,0041	€ 0,0035
\$0,0029	€ 0,0024
\$0,0028	€ 0,0024
\$0,0052	€ 0,0044
\$0,0031	€ 0,0026
\$0,0031	€ 0,0026
\$0,0062	€ 0,0052
\$0,0035	€ 0,0029
\$0,0040	€ 0,0034
\$0,0044	€ 0,0037
\$0,0061	€ 0,0052

Zoll? Habe ich keinen bekommen warum?

\$0,98
\$1,70

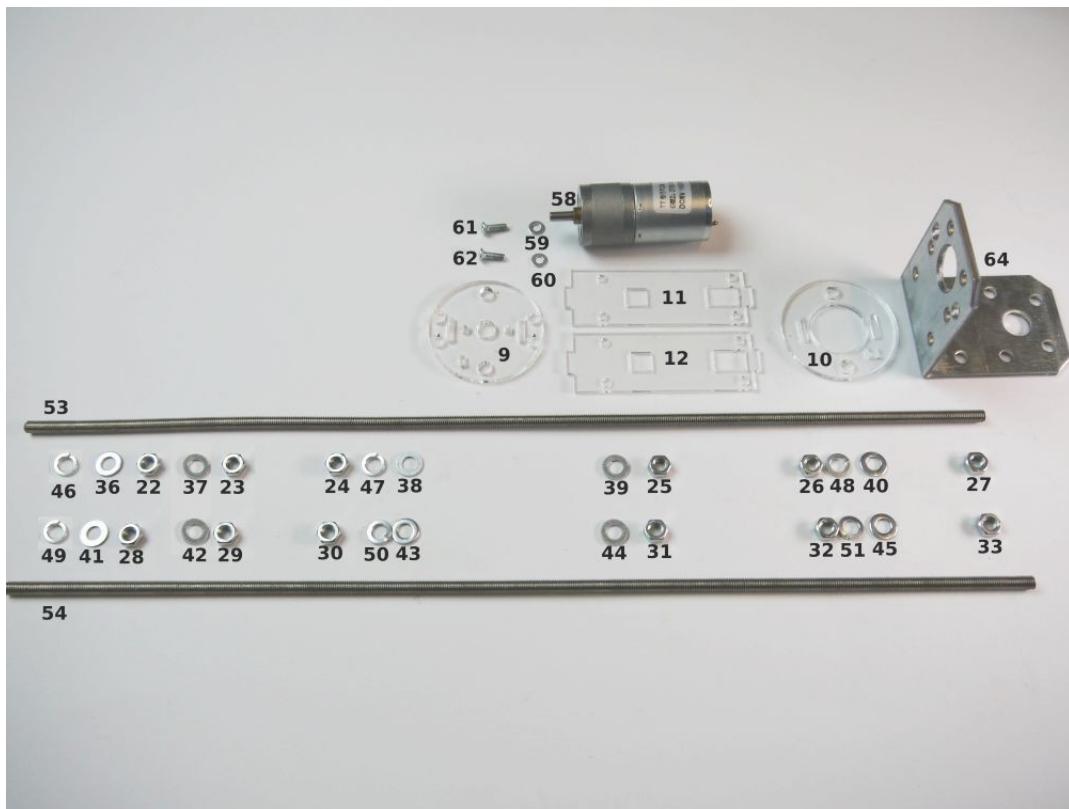
Zoll?

59Antennas.com

DIY – Do It Yourself

Electrical-Motor-Antenna

Thank you for choosing the DIY kit Electrical – Motor – Antenna.
Please first check all items in the pack - that everything is inside.
The list of all items is in this paper work.
it is only for indoor use – not rain proof (but there are options to use it outdoor)
Take the items on the picture and bring it in line as shown.



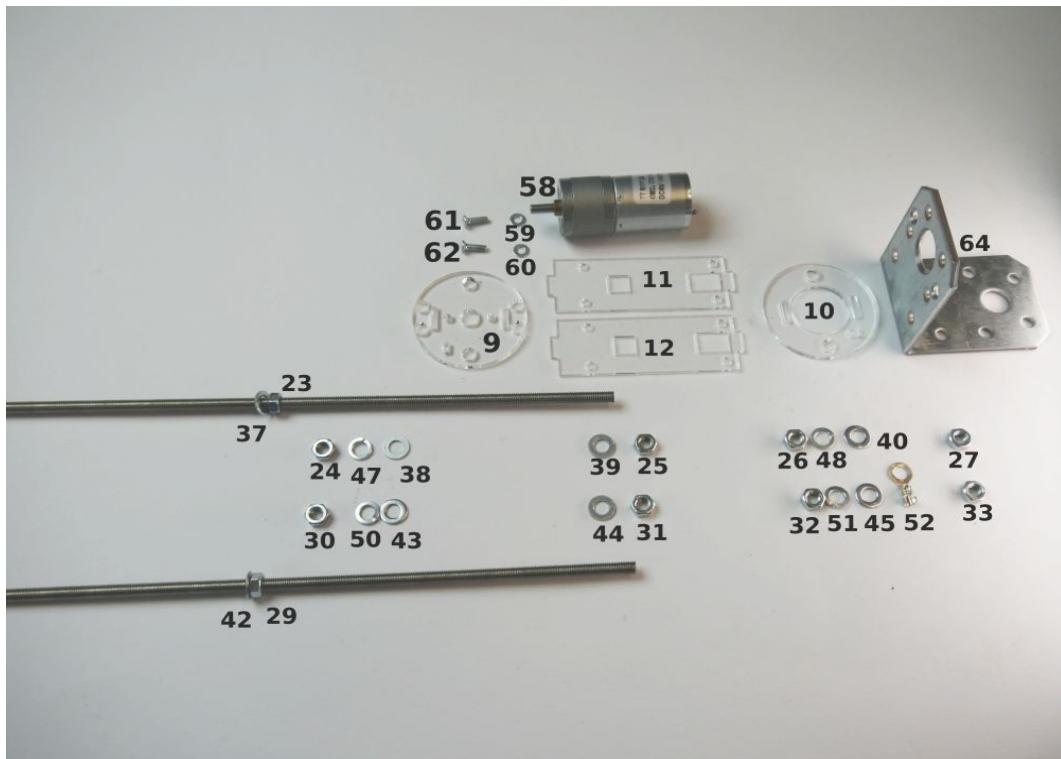
ATTENTION DANGER!

- Don't let children play with this Kit! There are small parts to swallow!
- Don't put the DIY-Kit into the Microwave oven!
- Don't star into the Metal Emitter

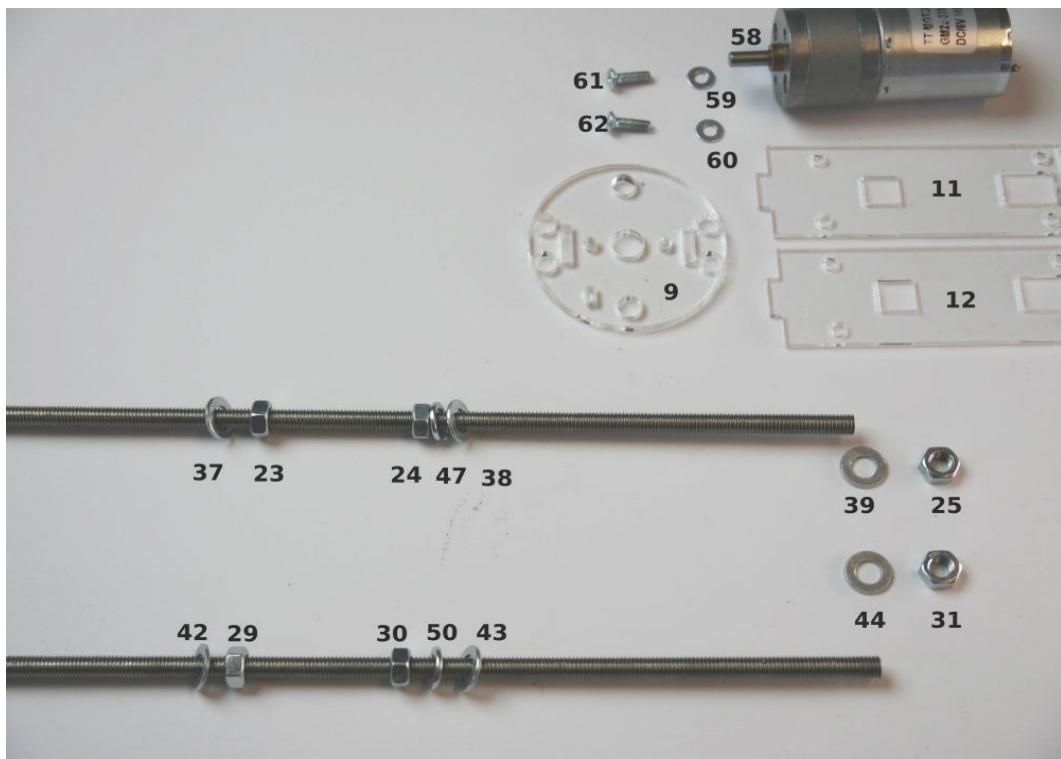
- Young people can do this DIY-Kit with 14 years up.
- Have a watch and Help your Children if they doing this DIY-Kit.
- Motor controller is soldered under ROHS
- the Control Voltage is on the emitter!

Manual_en

please install item 37 23 42 29

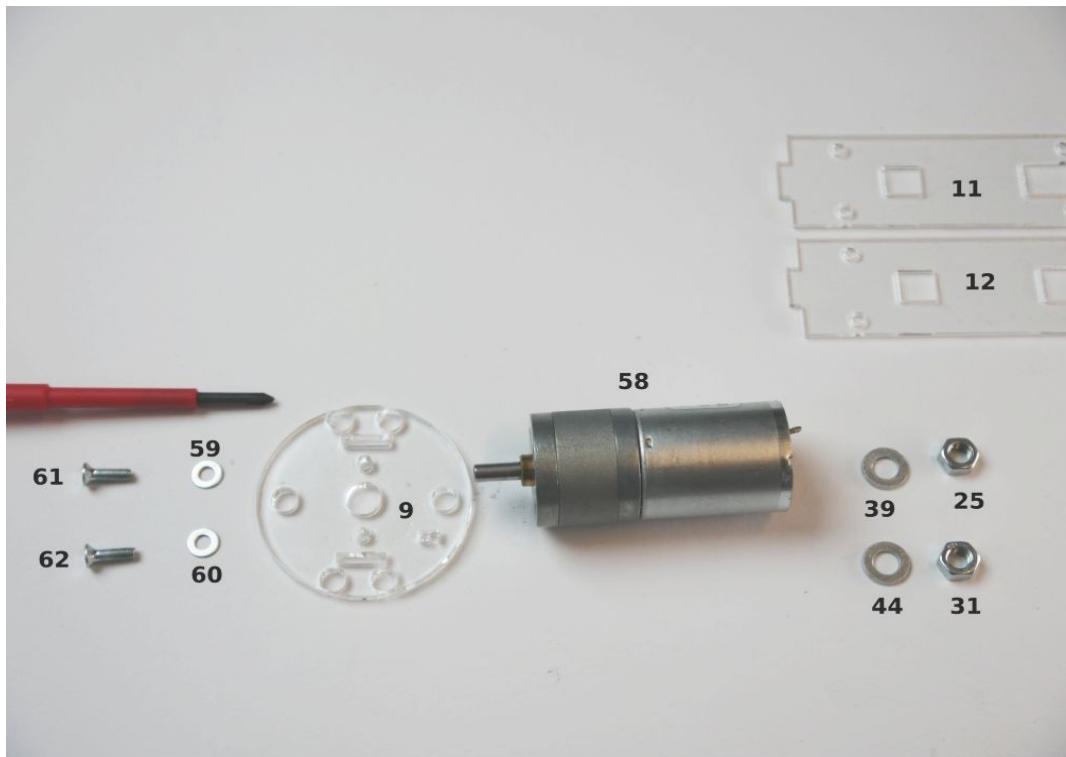


then install item 24 47 38 30 50 43



Manual_en

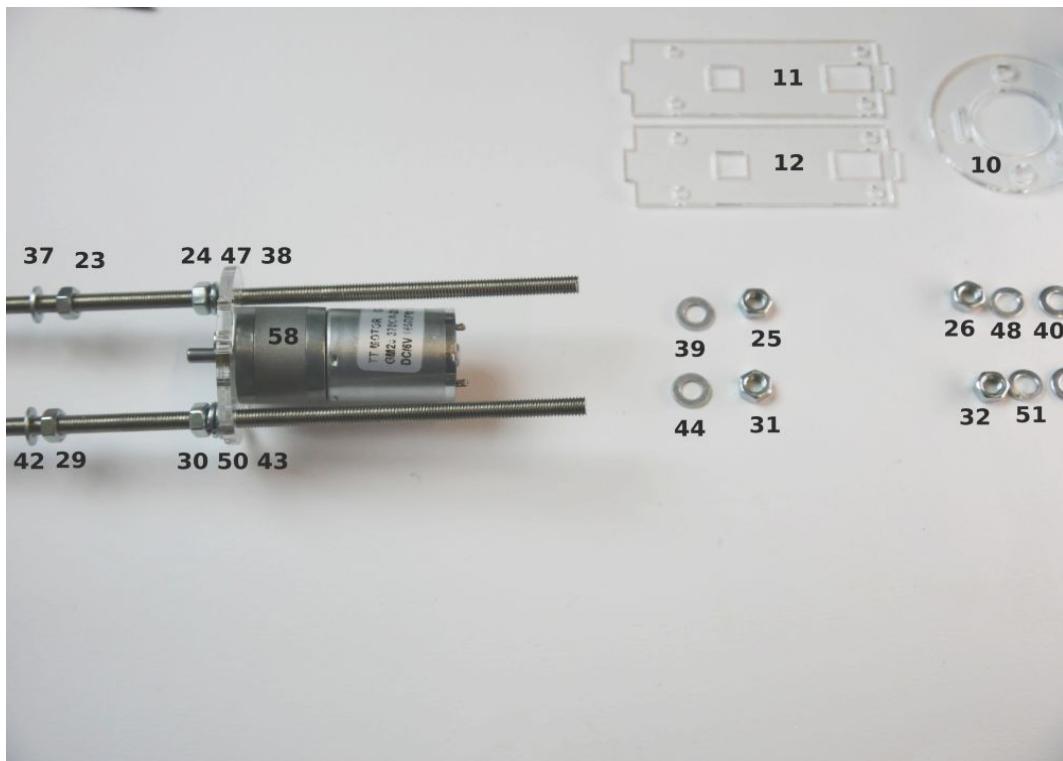
Mount 61 59 62 60 9 on 58



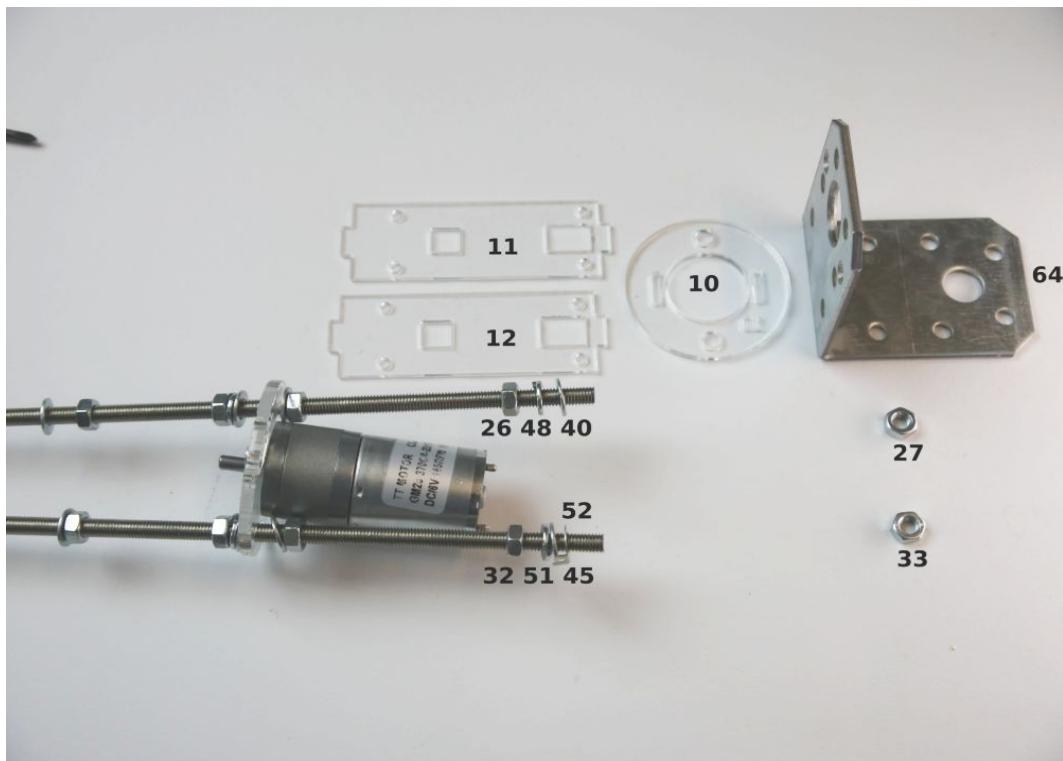
Motor installed



install Motor 58 on threaded-rod

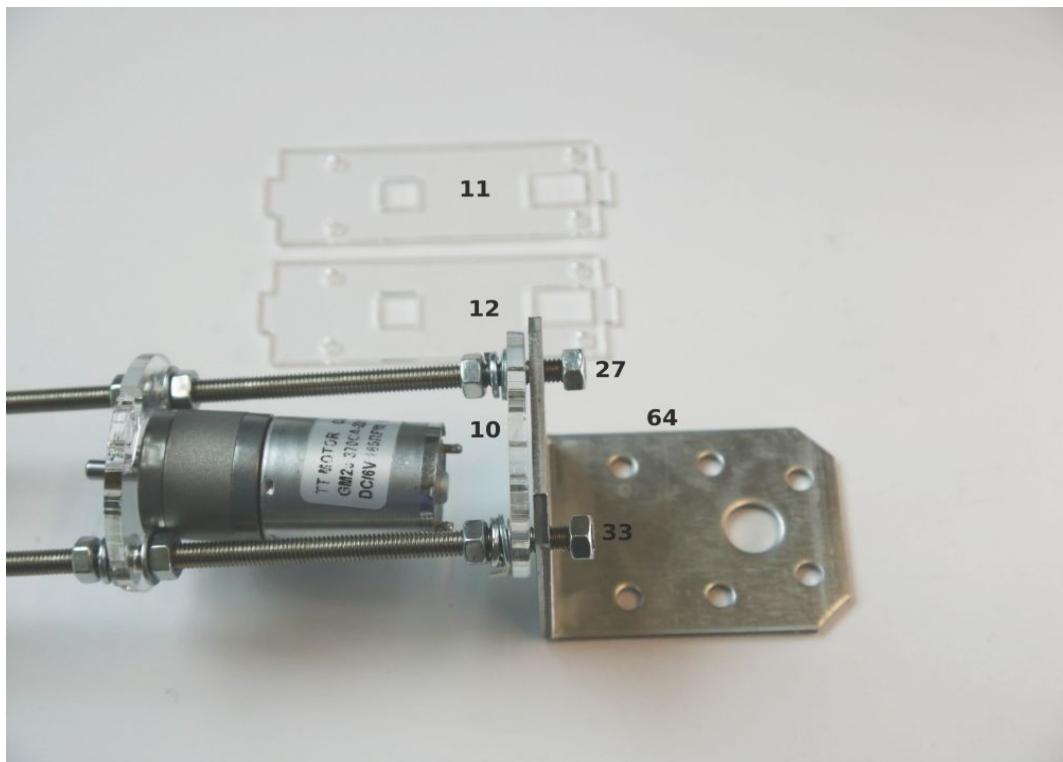


Install 26 48 40 32 51 45 52

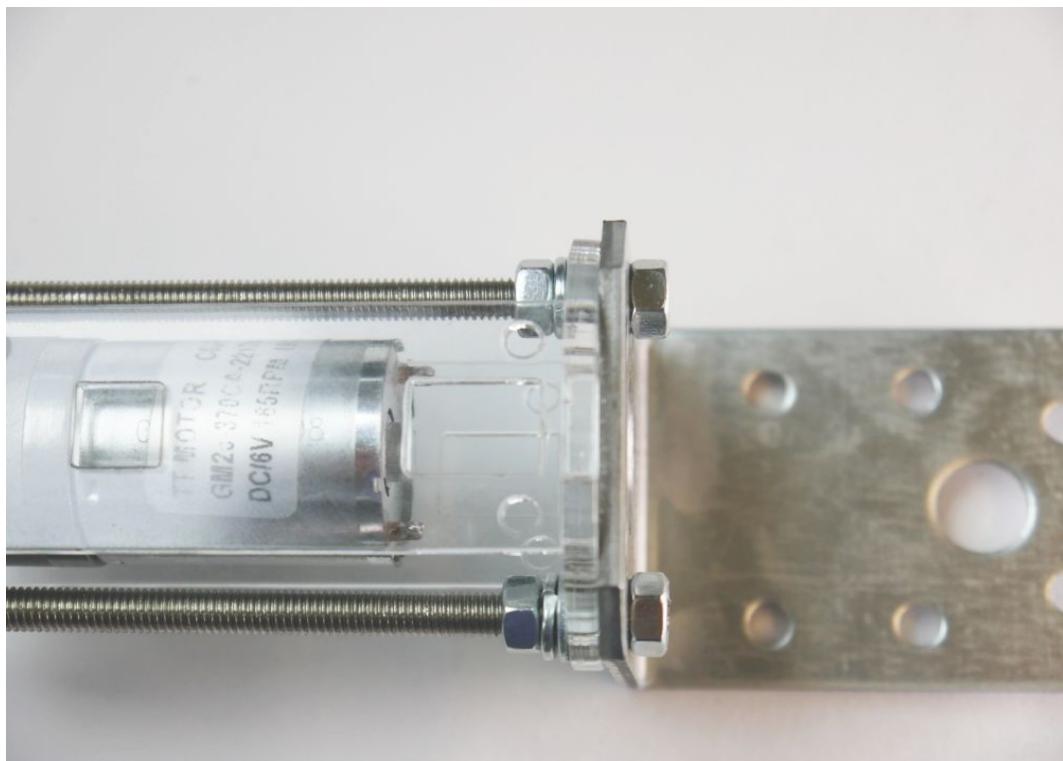


Manual_en

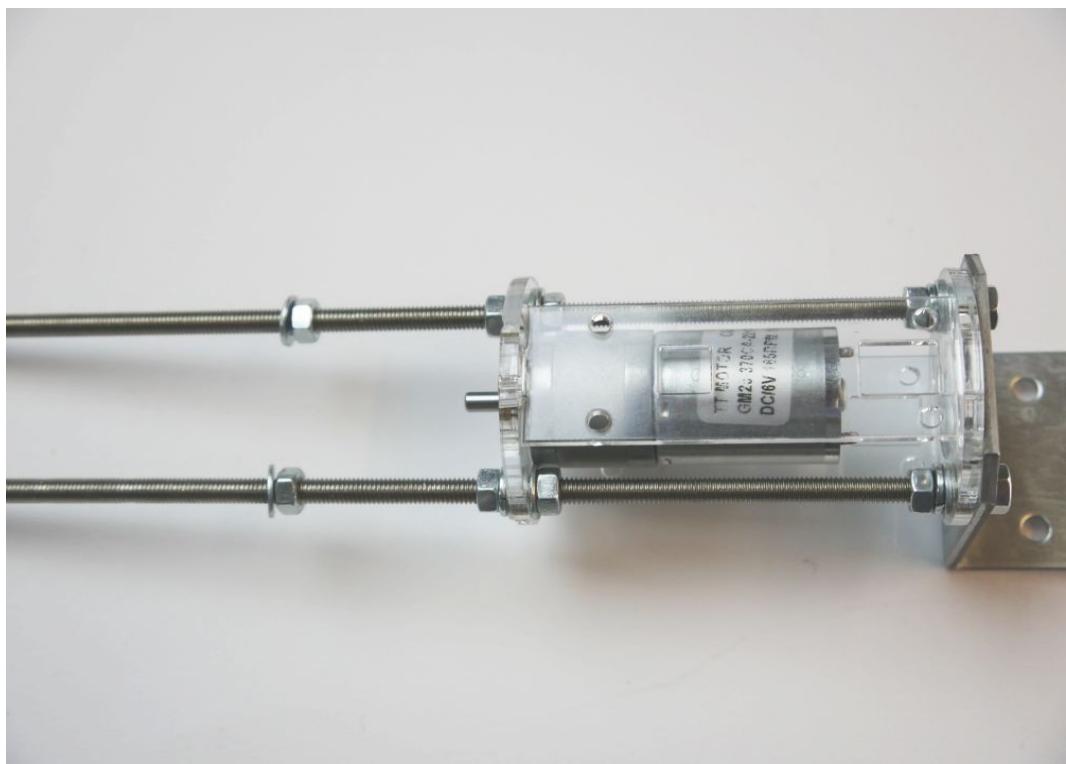
Install 10 64 27 33 11 12



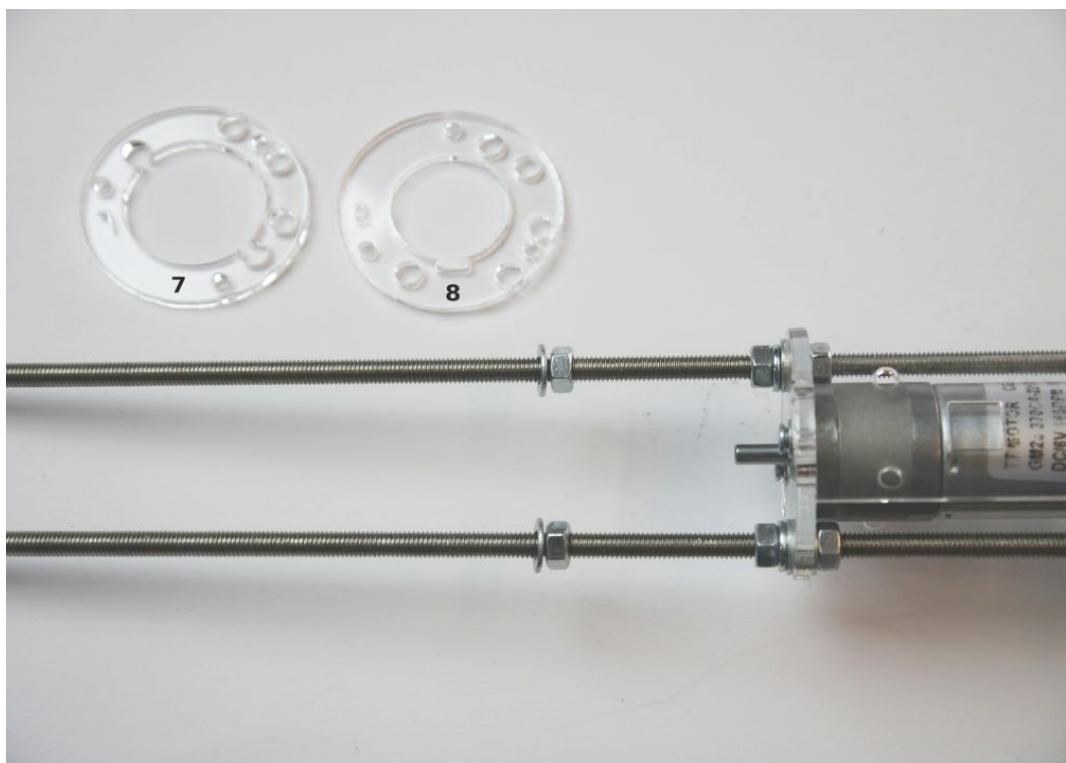
fix HEX-Nut



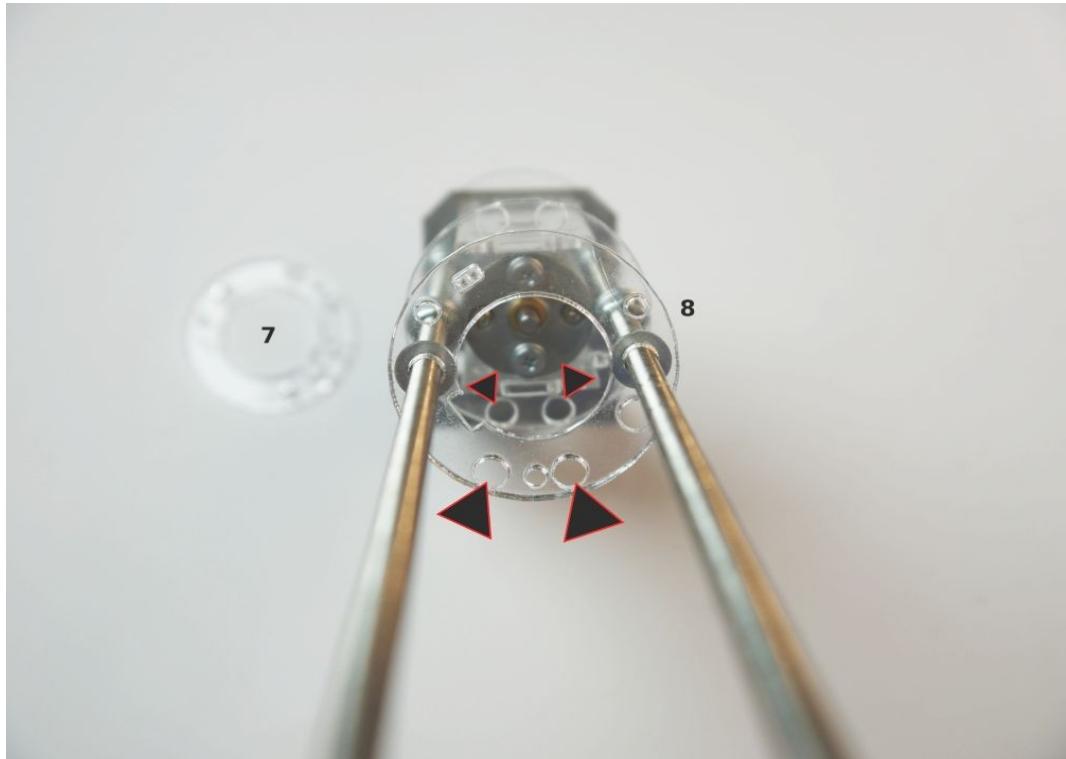
fix HEX-Nut



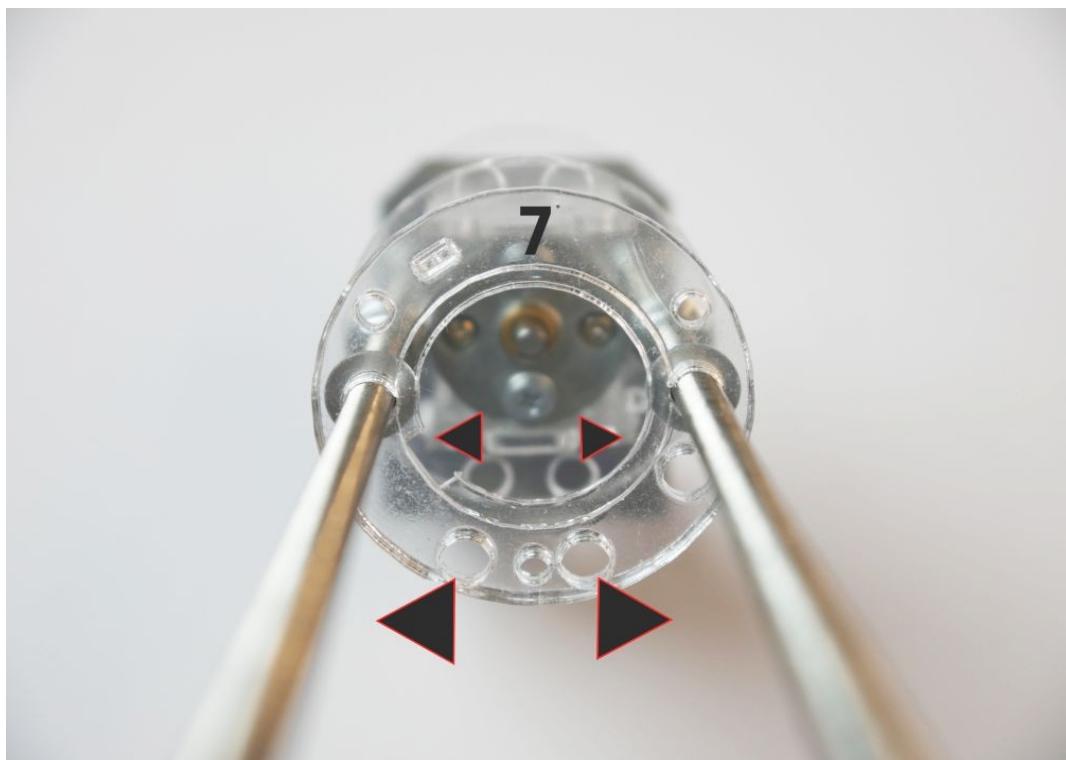
Install 7 8



Install 8 ATTENTION Holes must be here – on the same site

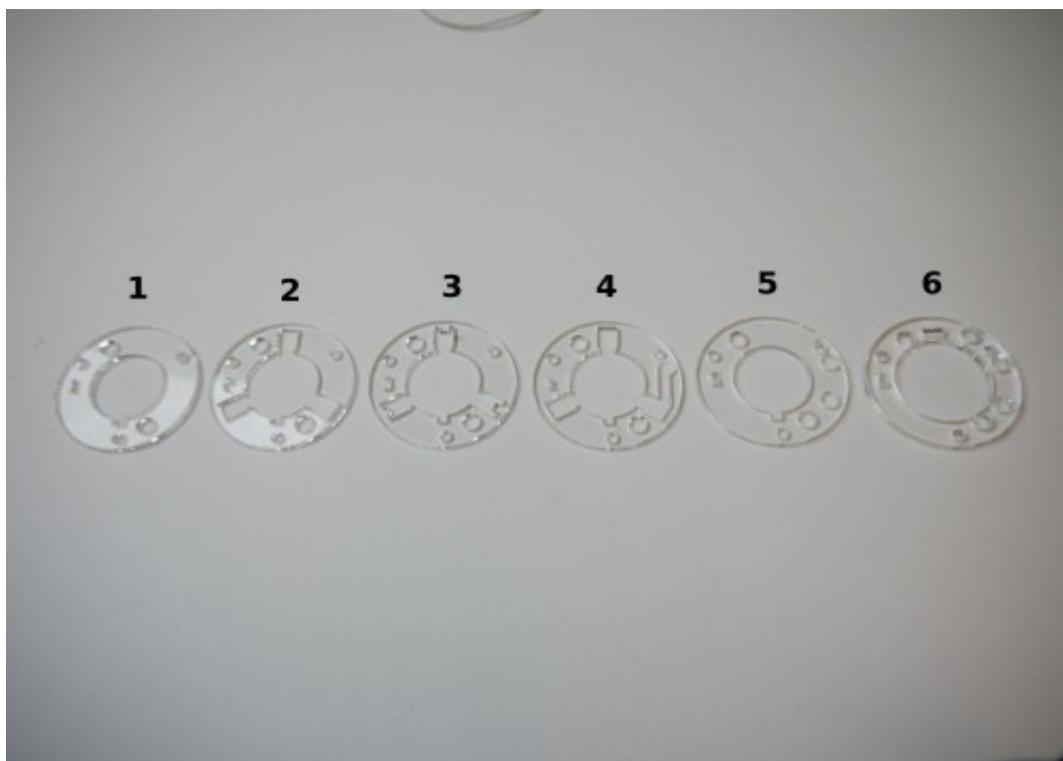


Install 7 The holes must be here on one side

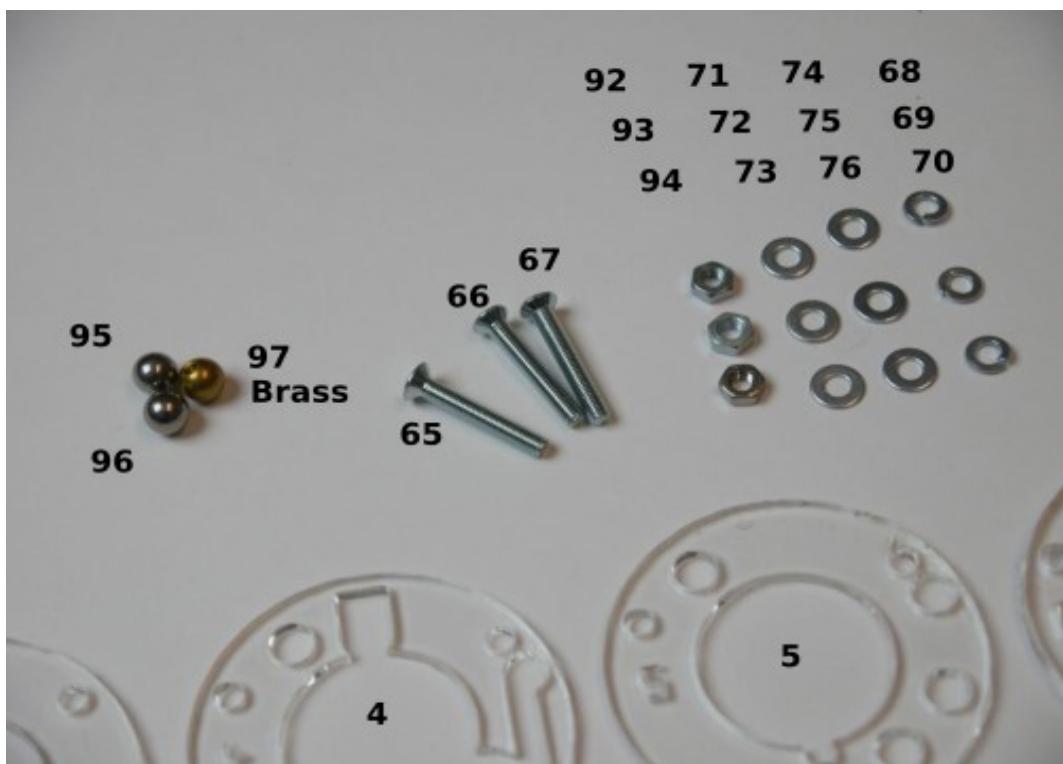


Manual_en

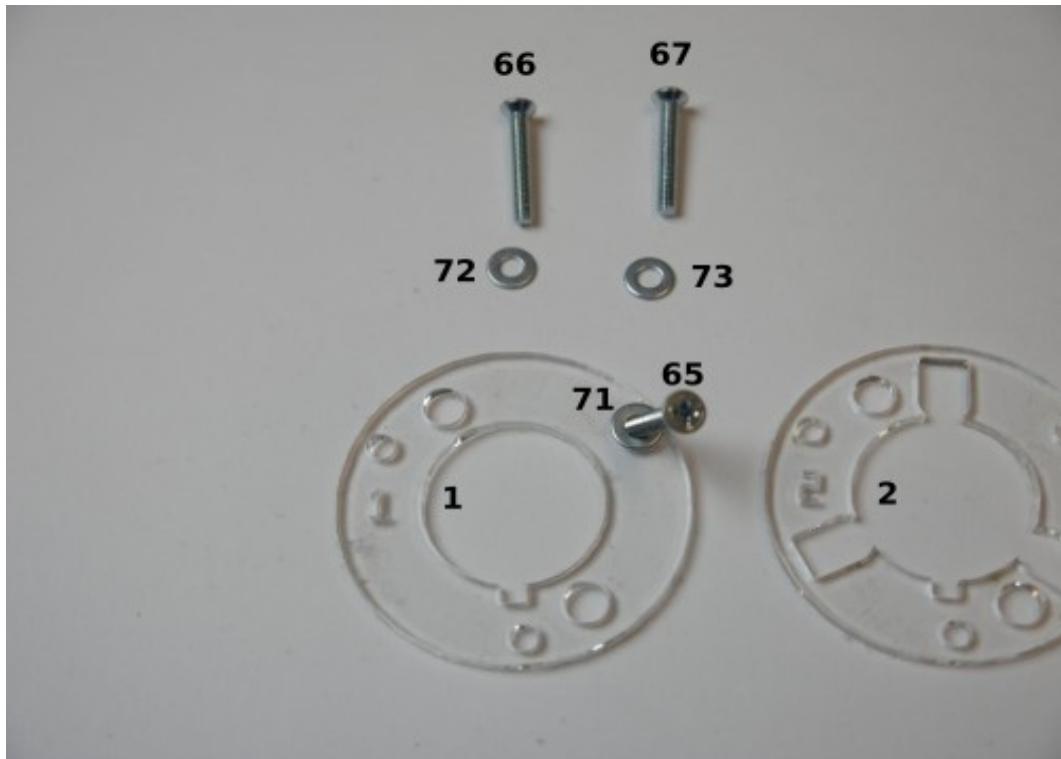
Ballring install 1 2 3 4 5 6 – 1 is Top till 6 is Bottom



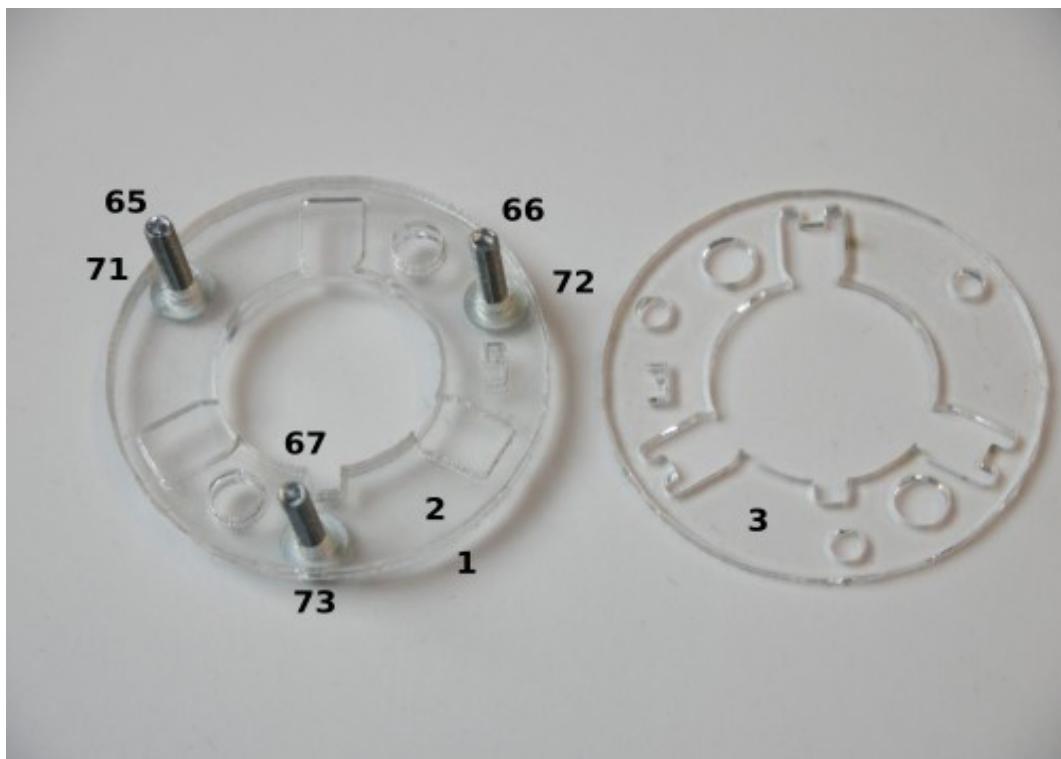
Insert 65 66 67 68 69 70 71 72 73 74 75 76 92 93 94, 95 96 97(Brass)



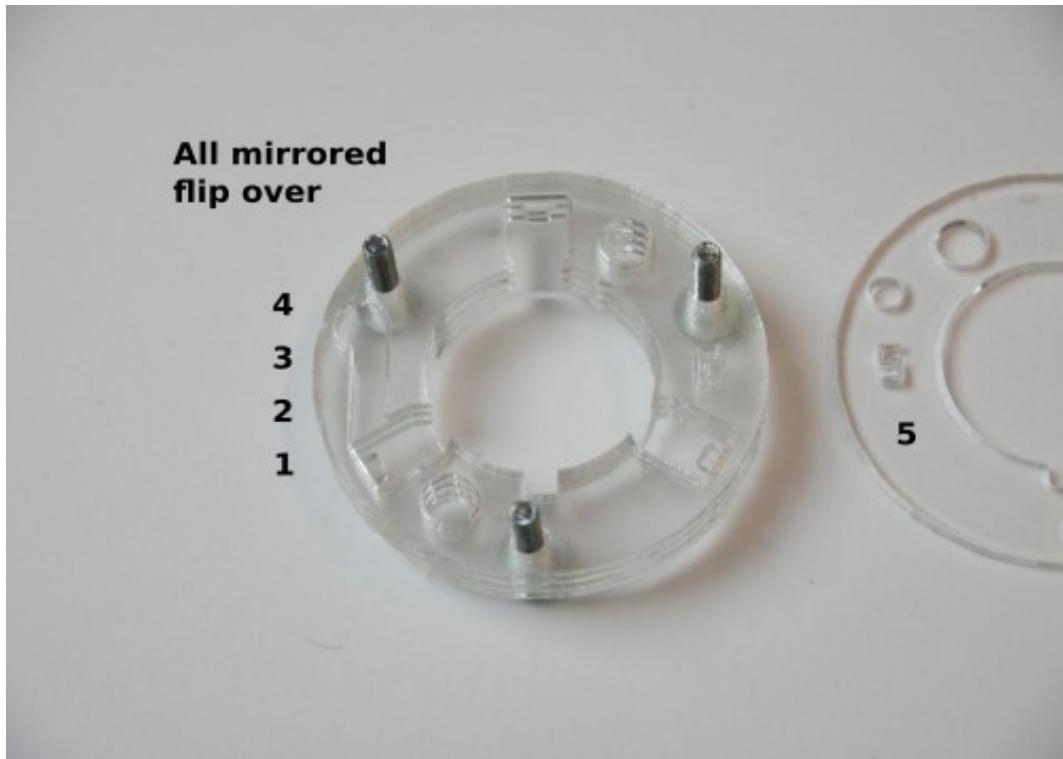
Insert 65 into 71 into 1



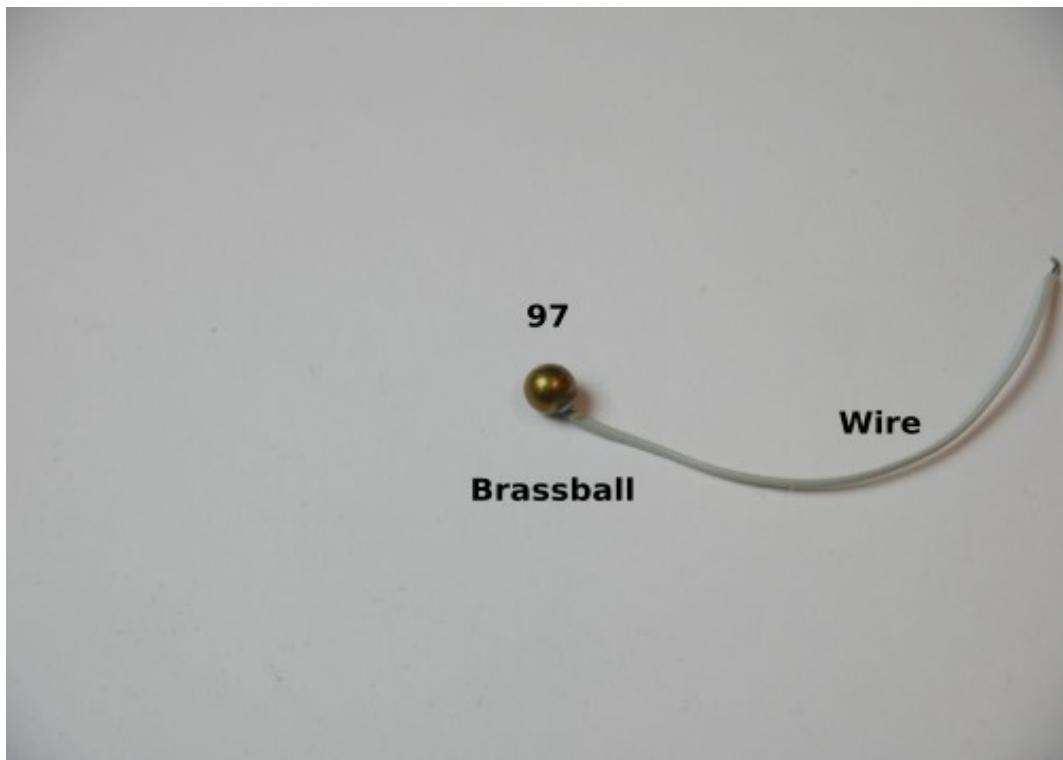
Mirror 1; Mirror 2 stack 2 up 1; insert 73 into 67 and in the rings; insert 72 into 66 and in the rings



Mirror 3 stack it up 2; Mirror 4 stack it up 3

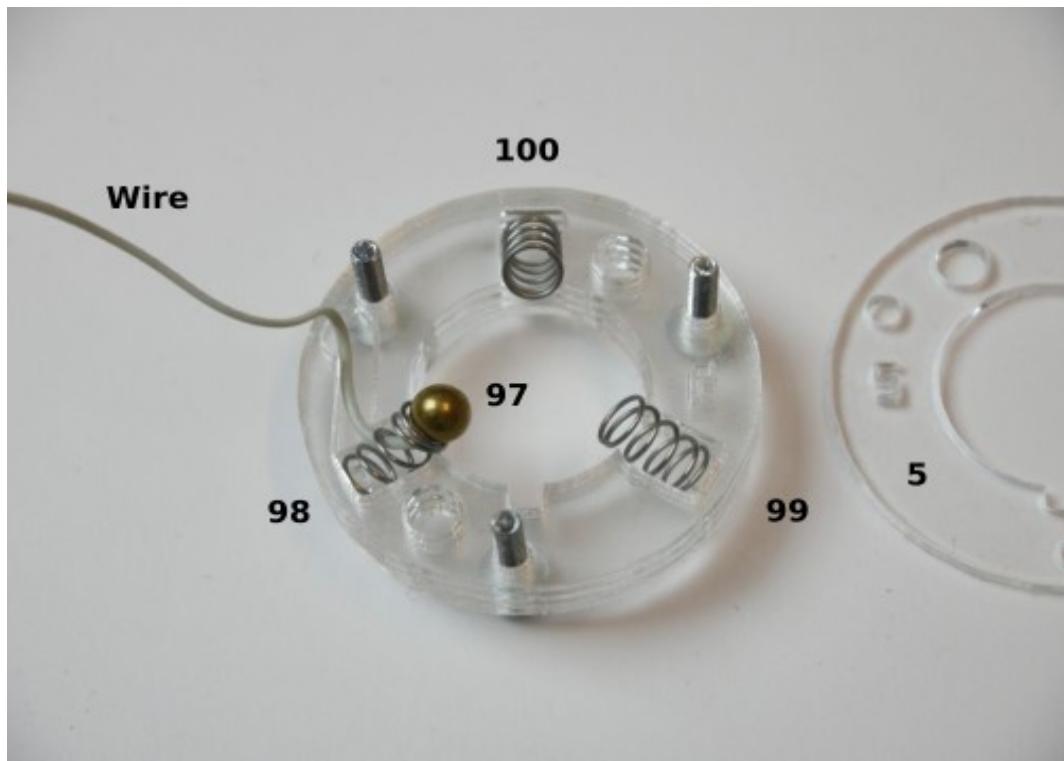


Please solder wire into brassball 97 for RF-connection

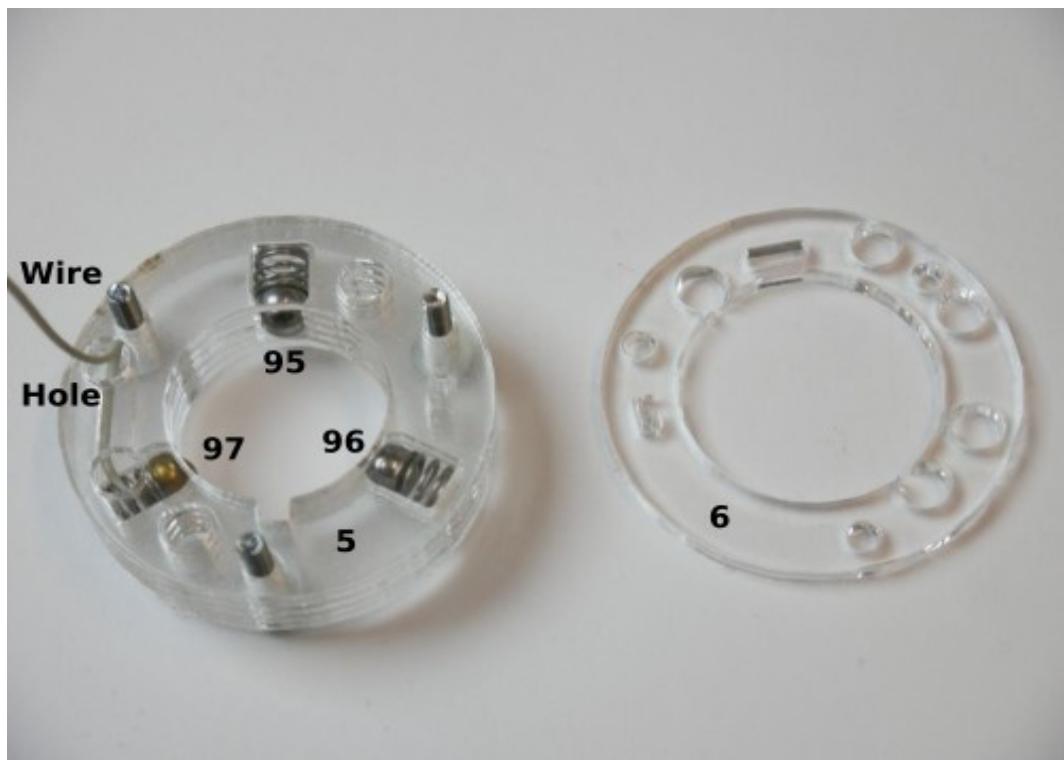


Manual_en

insert wire into spring 98, insert ball 97 Brass (wire come out in the mid of the spring), insert sprin

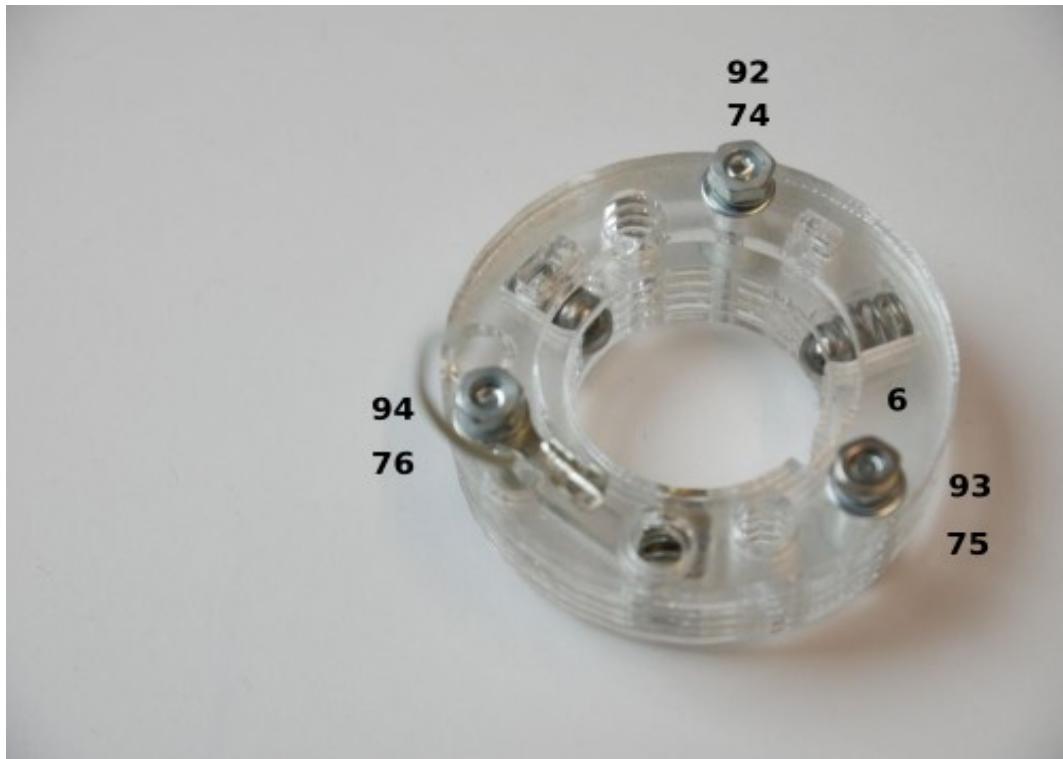


Insert ball 95, 96(silver); mirror 5 stack up 4 – wire must go out of the hole item 5

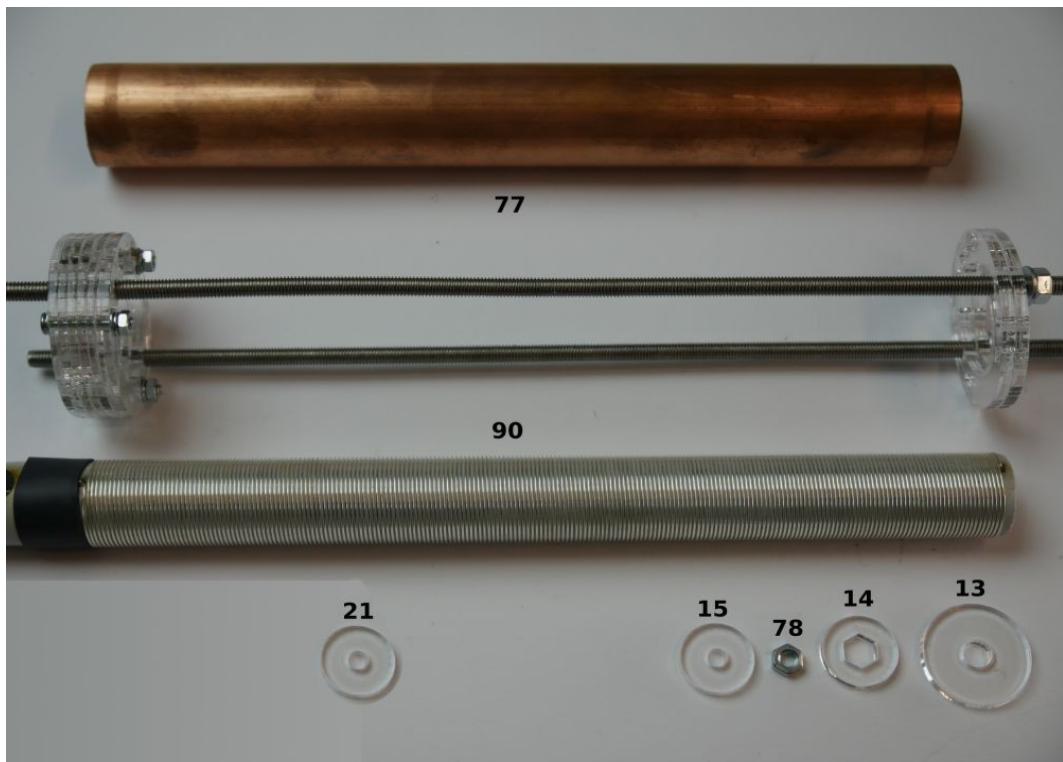


Manual_en

Install 74 75 76 92 93 94 and 32 – solder RF-wire to 32



Coil and CopperTube

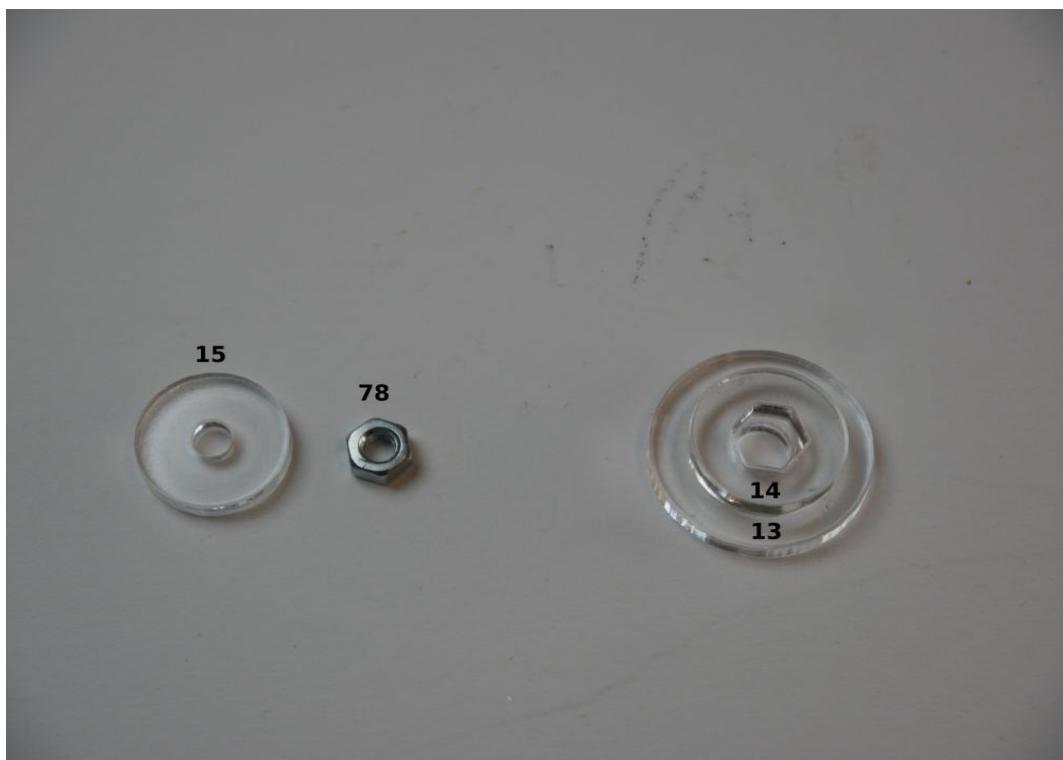


Manual_en

Coil Bottom Holder and Transport – could be „Already glued“ - is one item



Stack 14 up 13 center



Manual_en

Insert Hex-Nut M5 into center



Stack 15 up 14



Manual_en

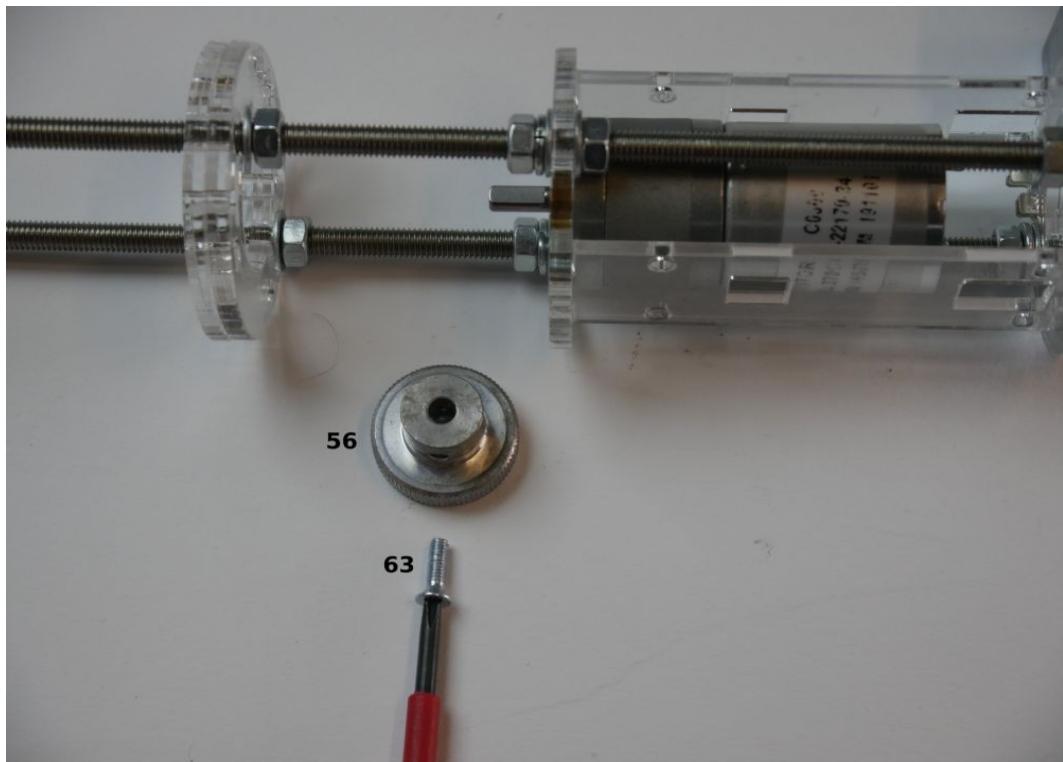
Methylenchlorid DANGER not include



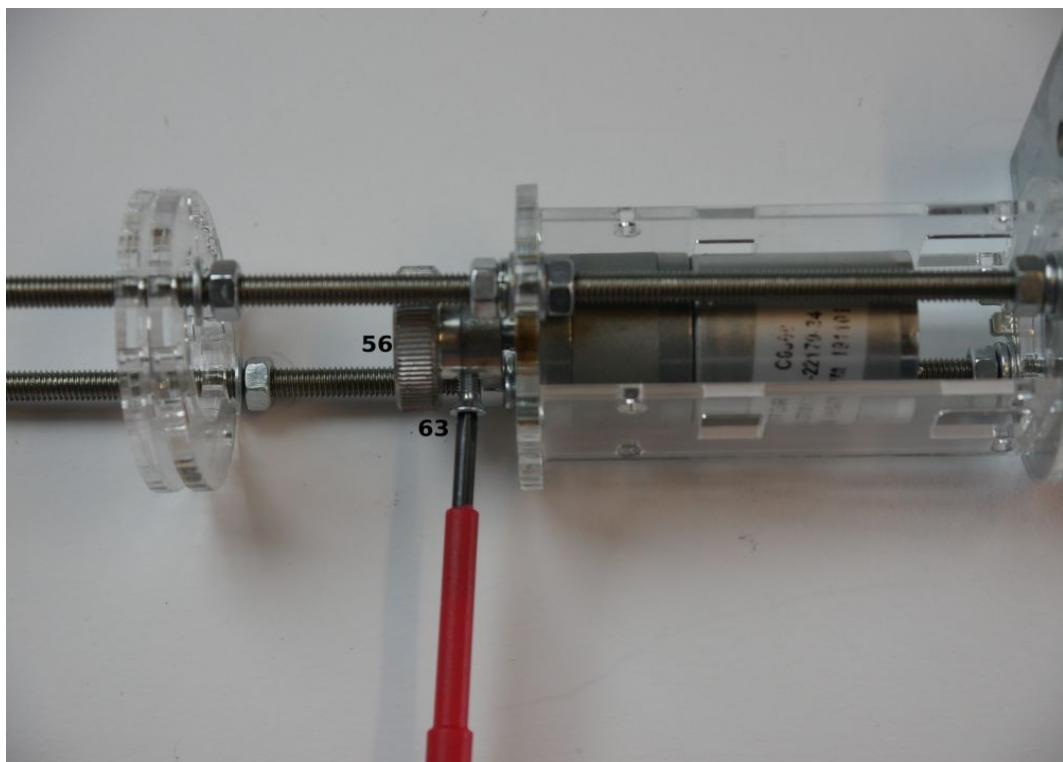
Glue (curing) with Methylenchlorid or a other Acrylic Glue



mount Motor clutch 56 63

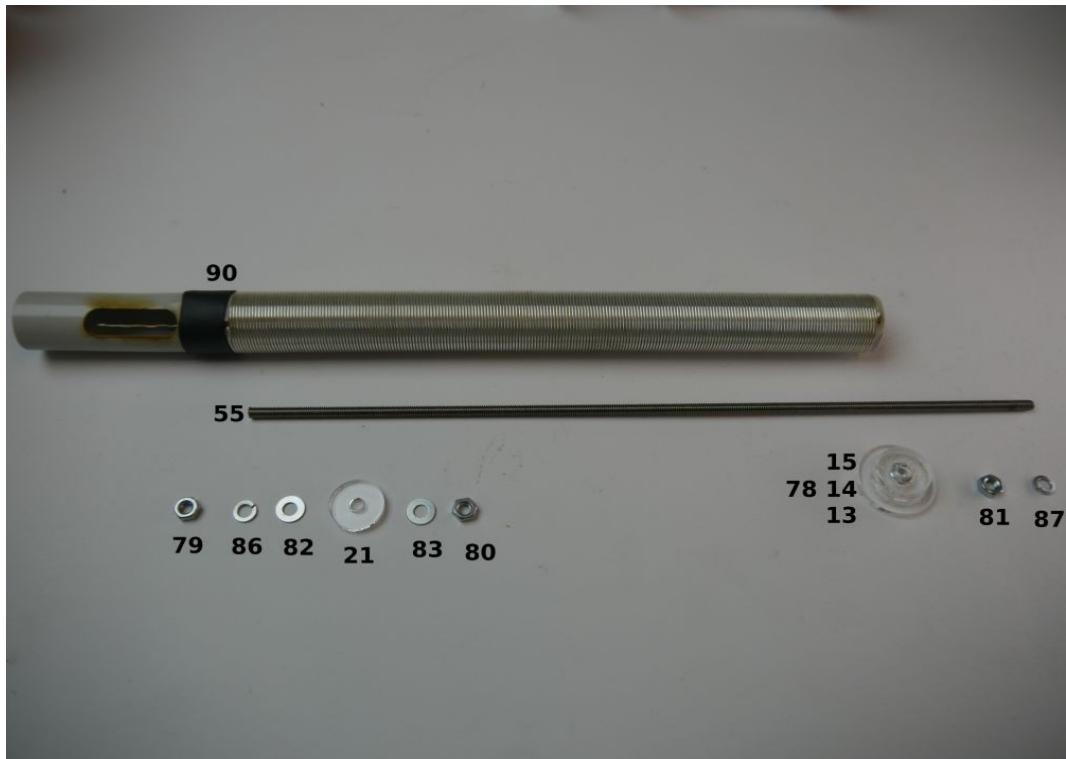


mount motor-cluch on motor axis



Manual_en

install stabilizor top and threaded-rod



Install 83 84

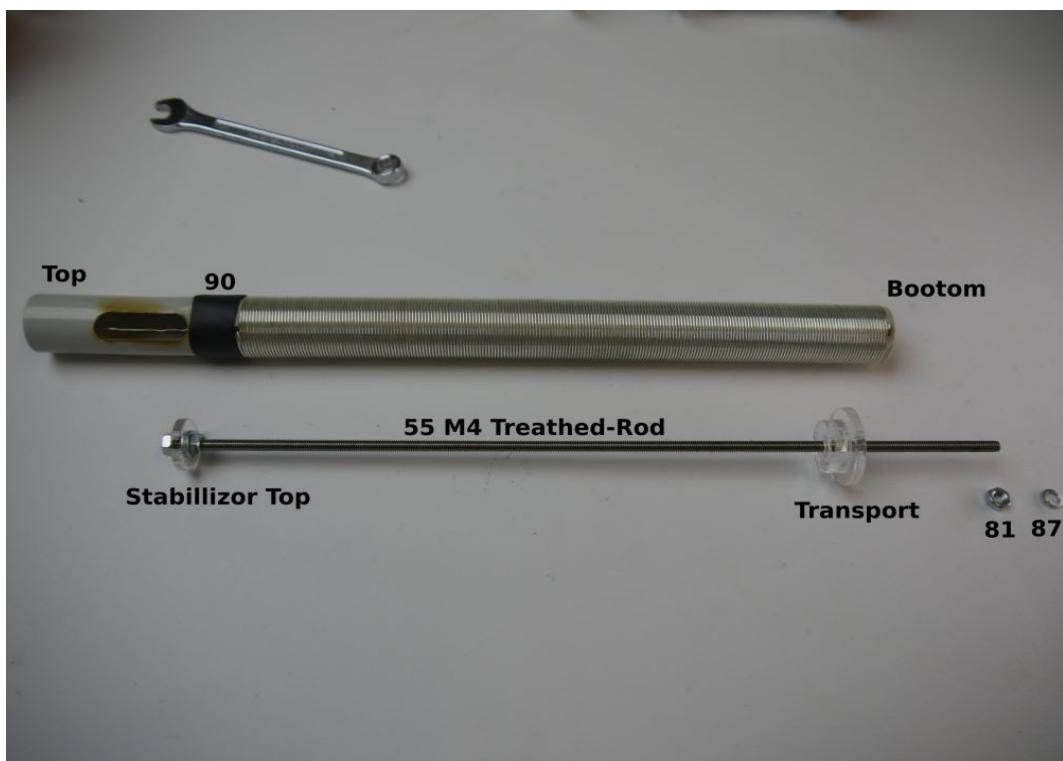


Manual_en

Install 79 86 82 21 stabillizor top

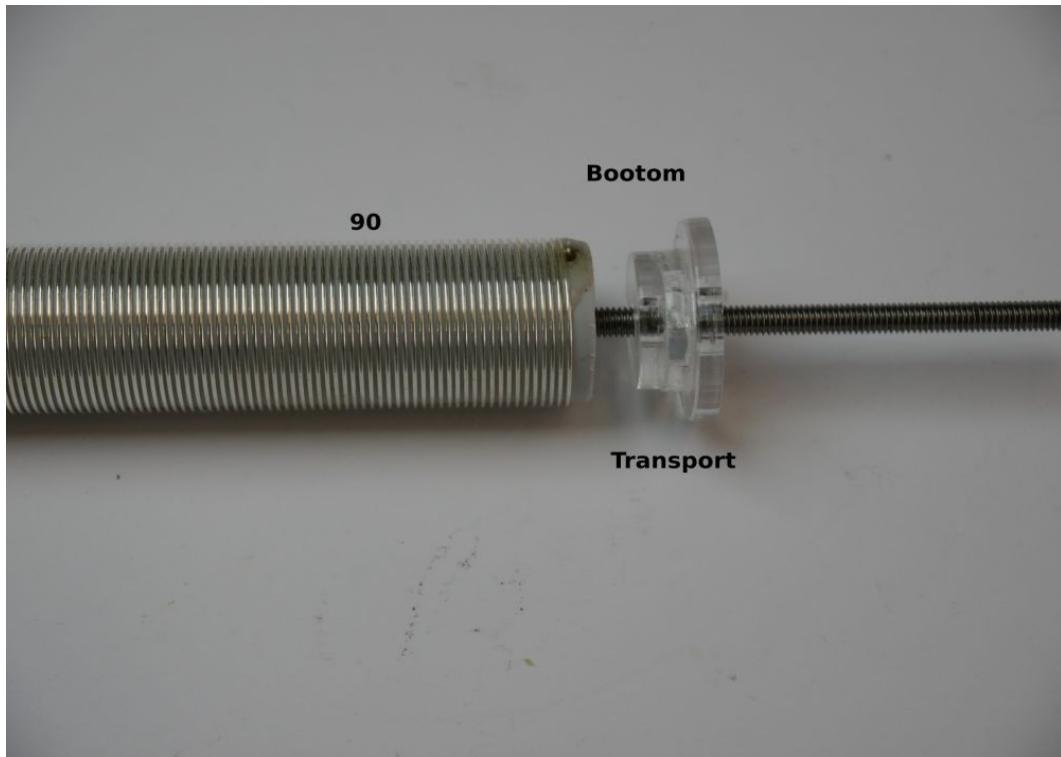


turn Transport on Threaded-Rod

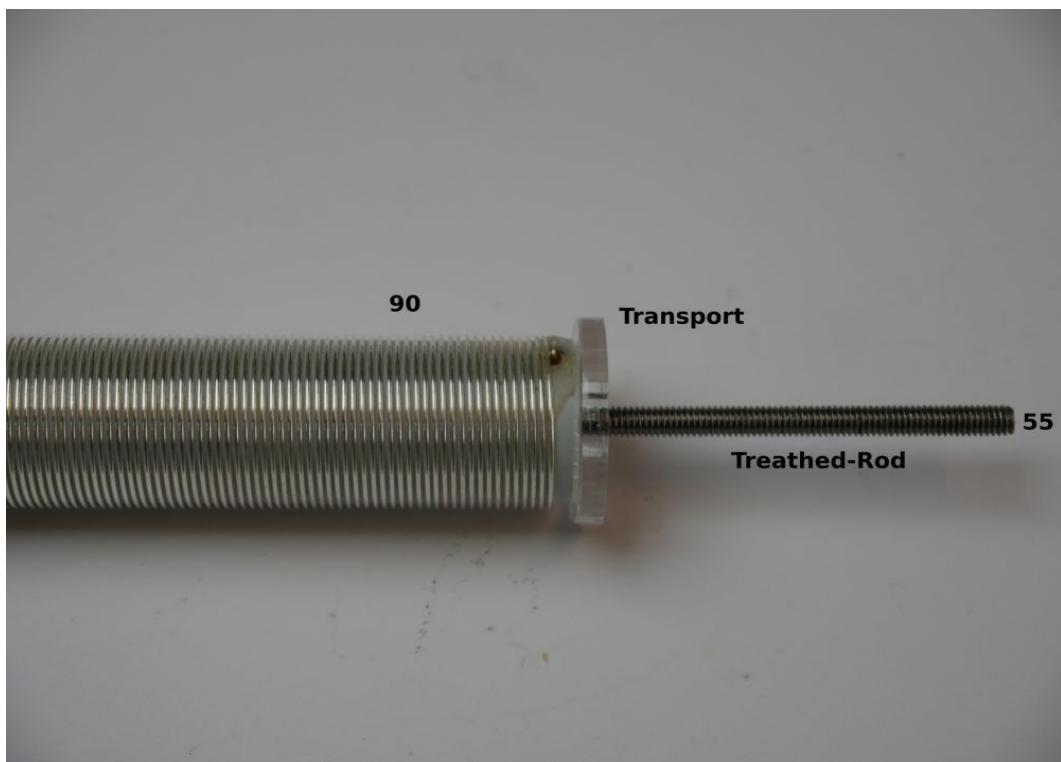


Manual_en

insert Transport in Coiltube and fix it with Glue



fix the transport and glue it to the coil



Install 81 87



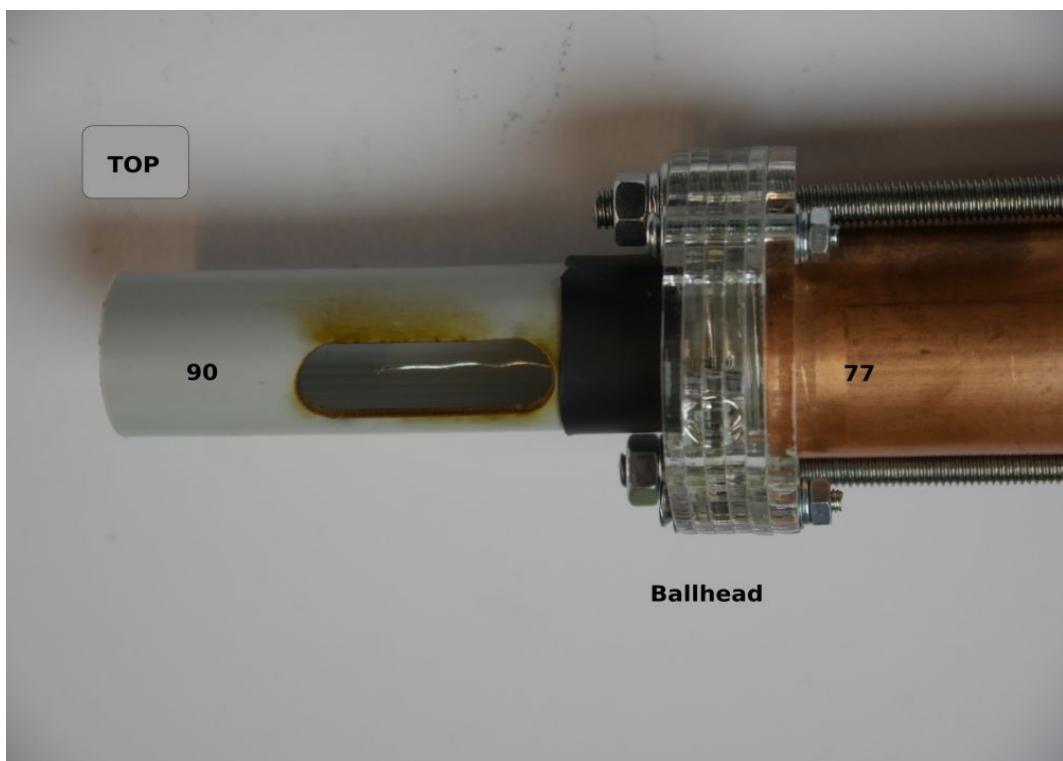
Remove Ballhead and insert Coil 90 fix it by tool



Install 77 and ballhead

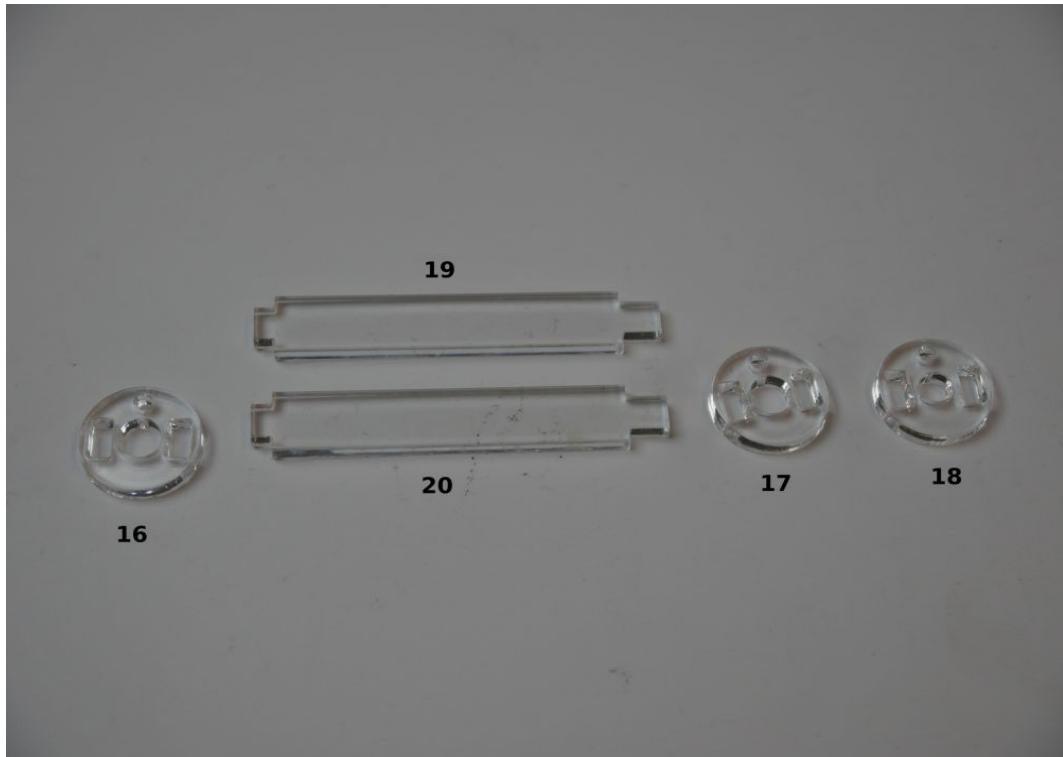


Transmitter TOP



Manual_en

Stack 17 up 18 insert 19 20 into 17 & 18 – it could be glued



Insert 19 20 into 17 and 18



Stack 16 up 19 & 20



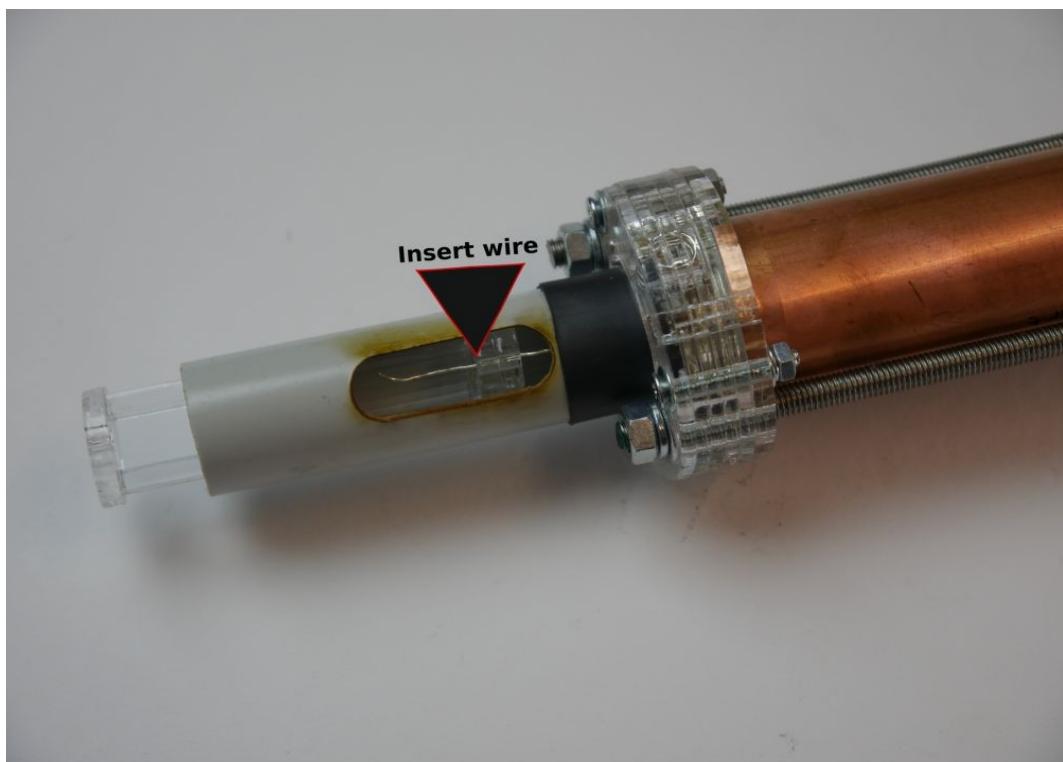
Methylenchlorid Glue it – DANGER take Saftyglasses! Holes on one side



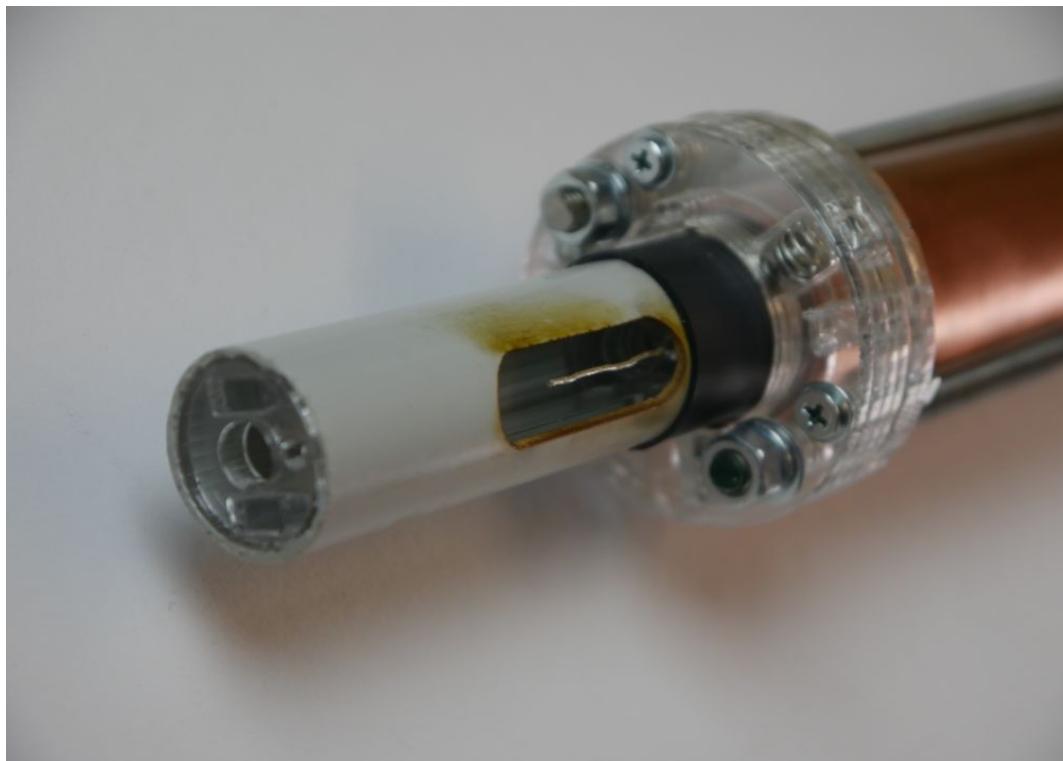
Heatshrink on top and Insert Emitter Holder



Insert wire



Insert Emitter Holder

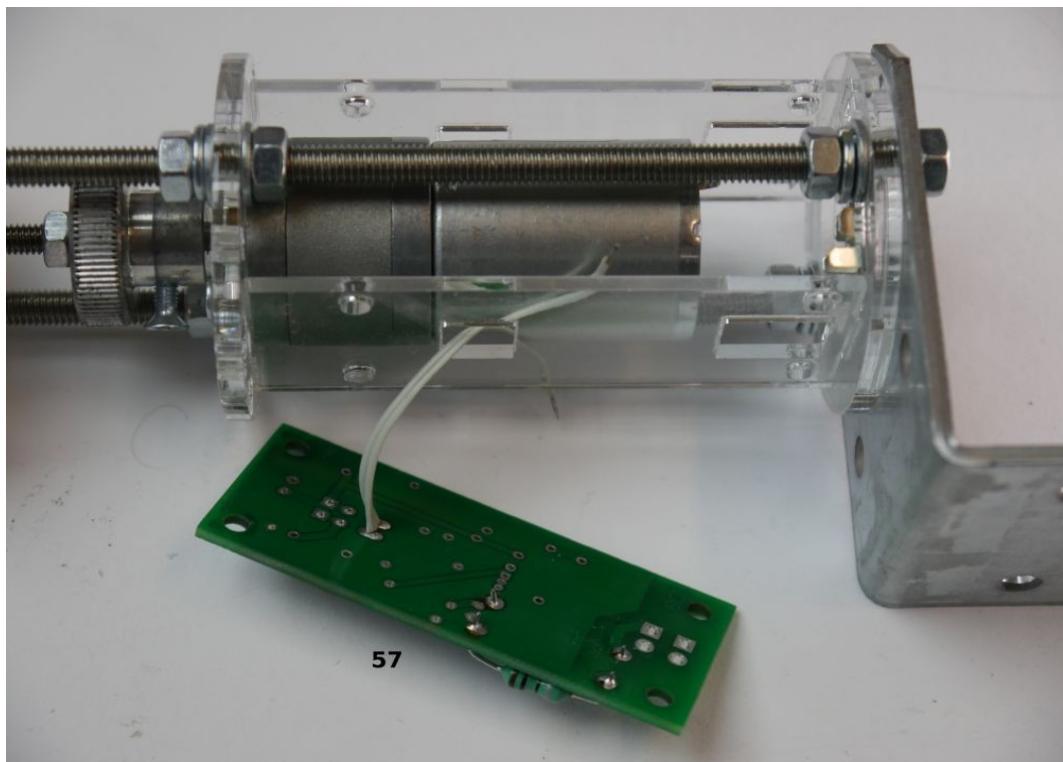


Insert Emitter 6mm Aluminium and connect it with a Zip tie Fix

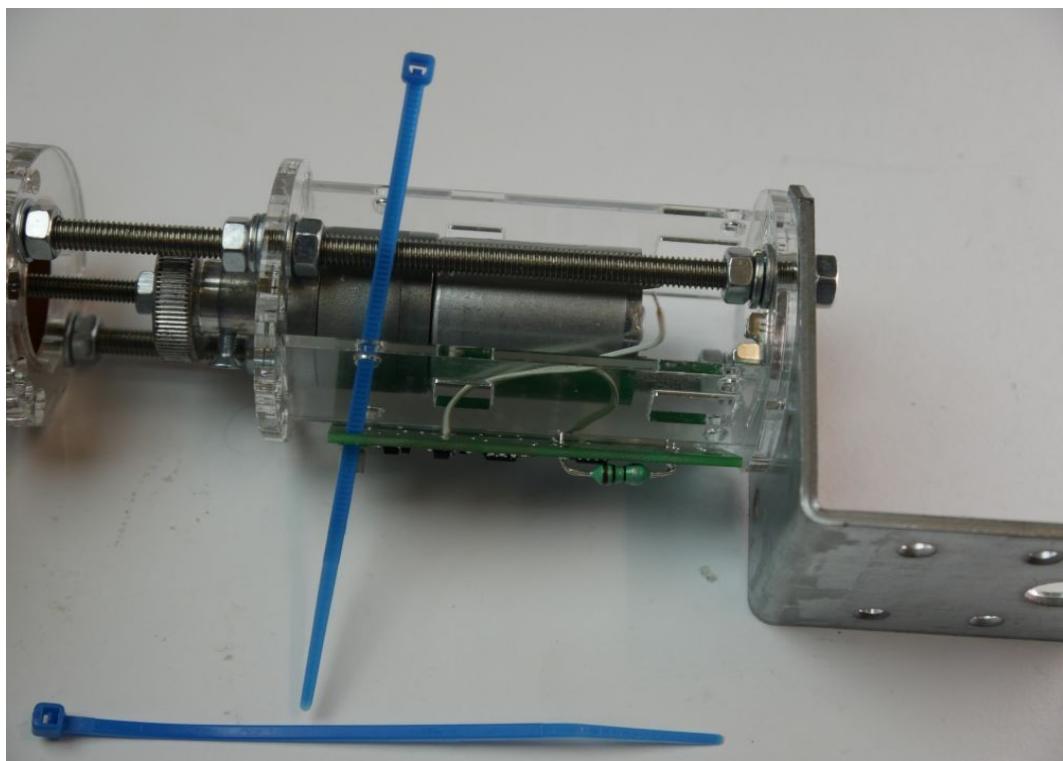


Manual_en

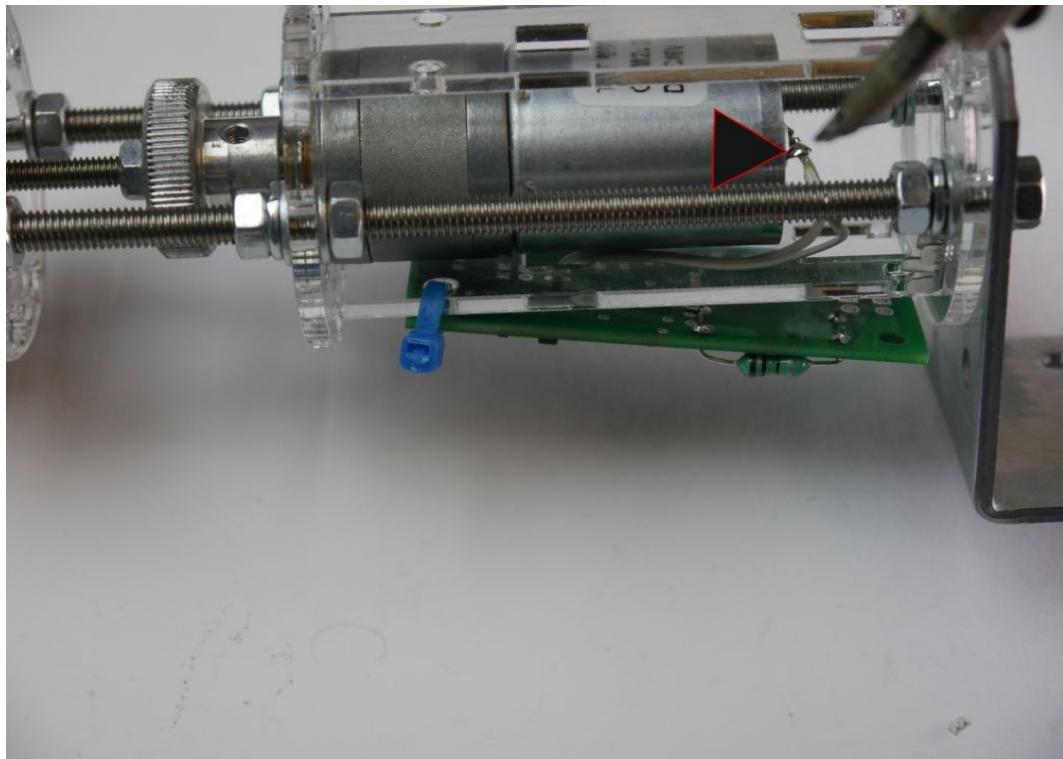
Install Motor Controller 57 to thread the cables for the Motor



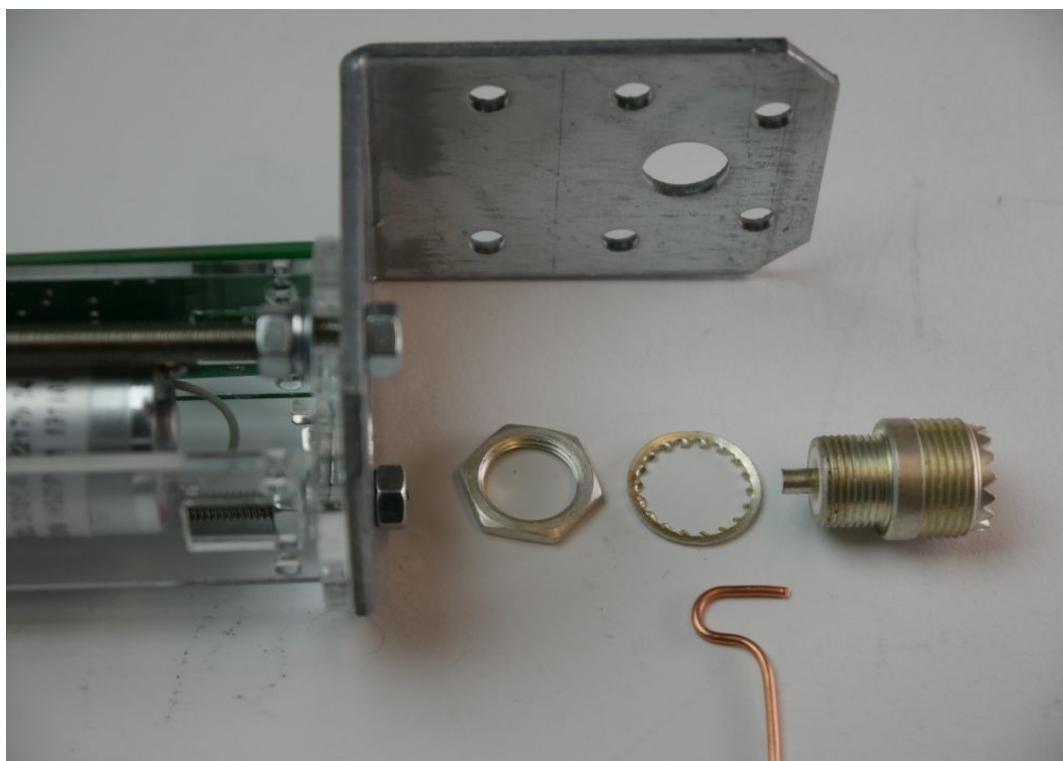
Fix Motor Controller with 2 zip ties and cut the zip ties



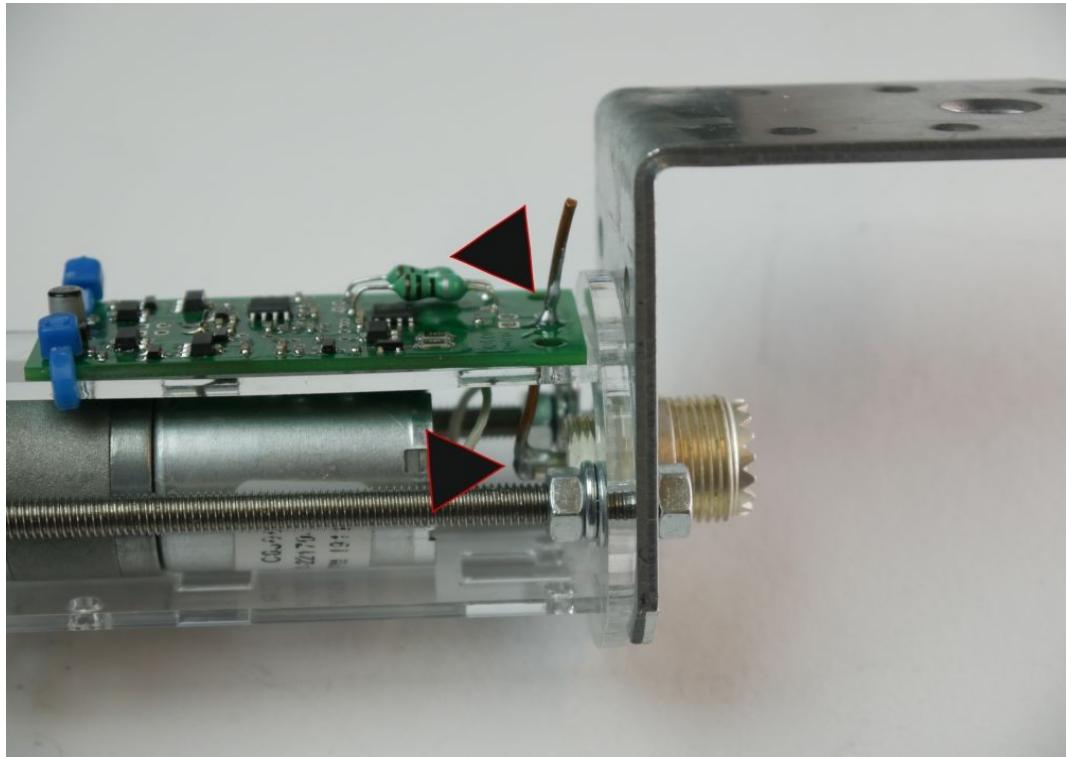
Solder motor wires – the motor direction depent on the connections



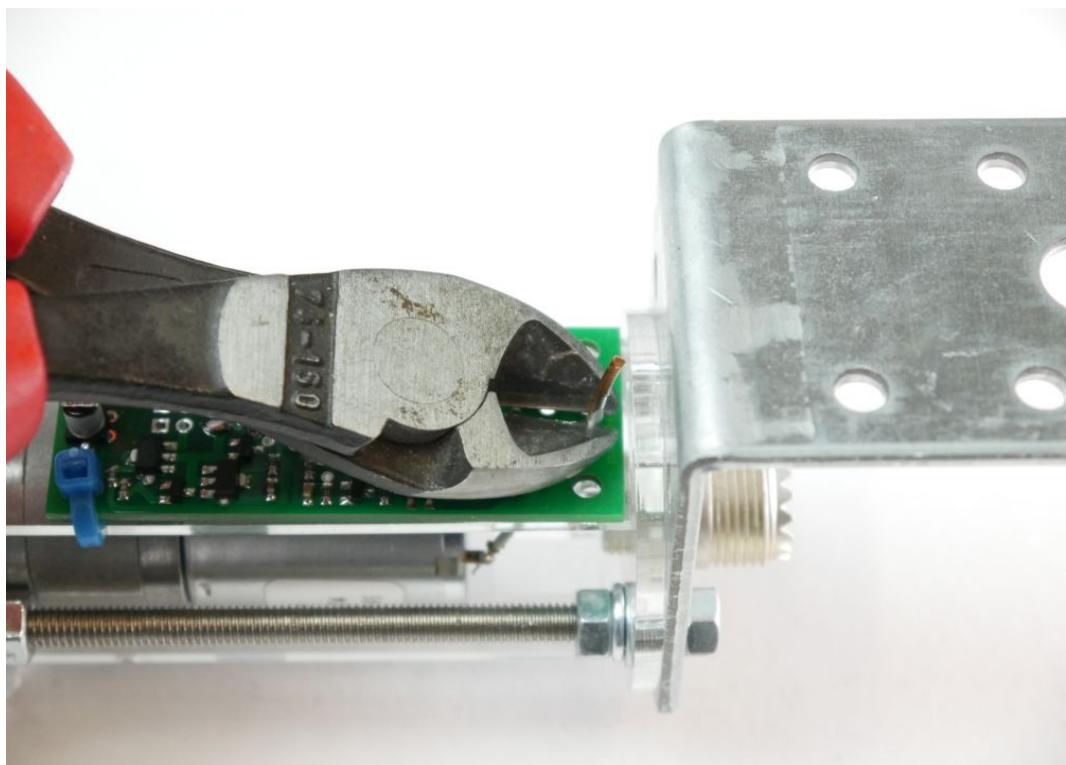
Install 91 - install also the contact ring (not show'n in this picture)



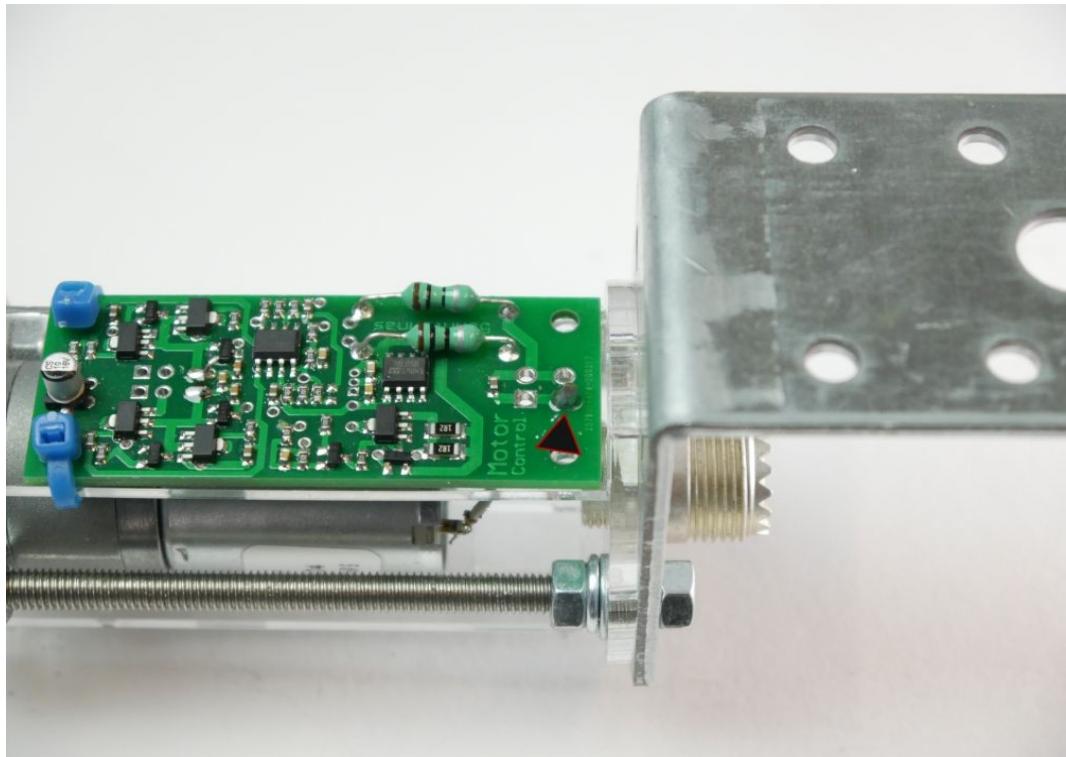
Solder pin hot UHF-connector and PCB rectangle pin



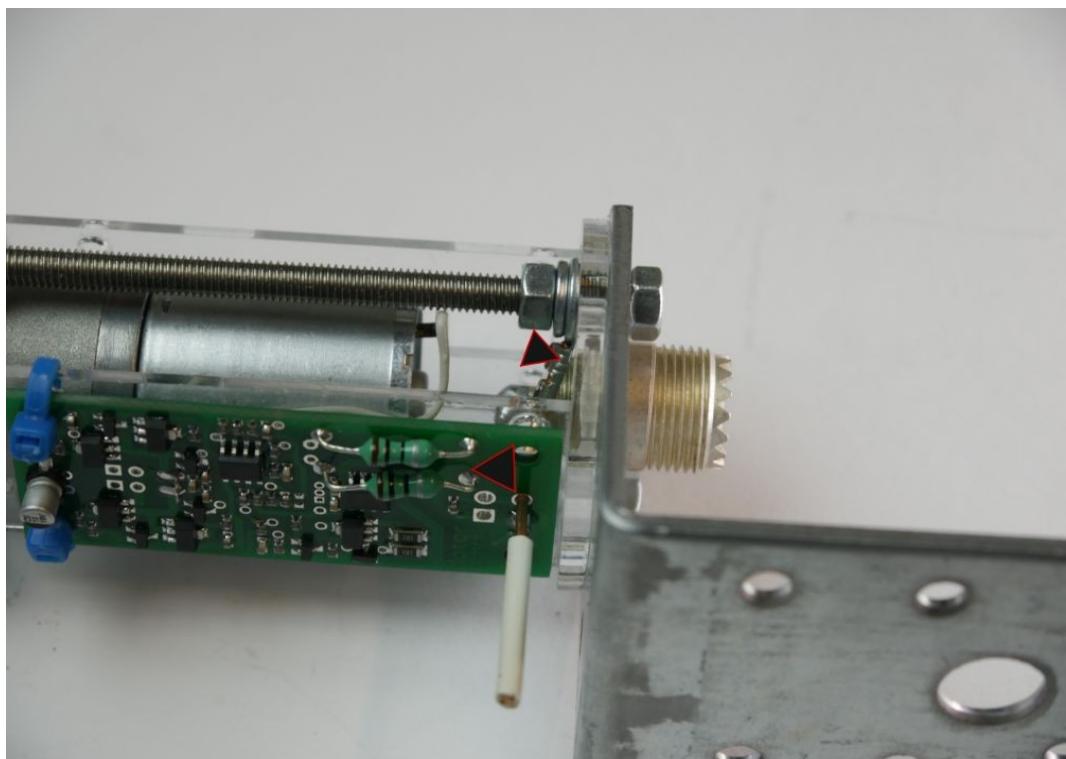
cut hot rectangel pin



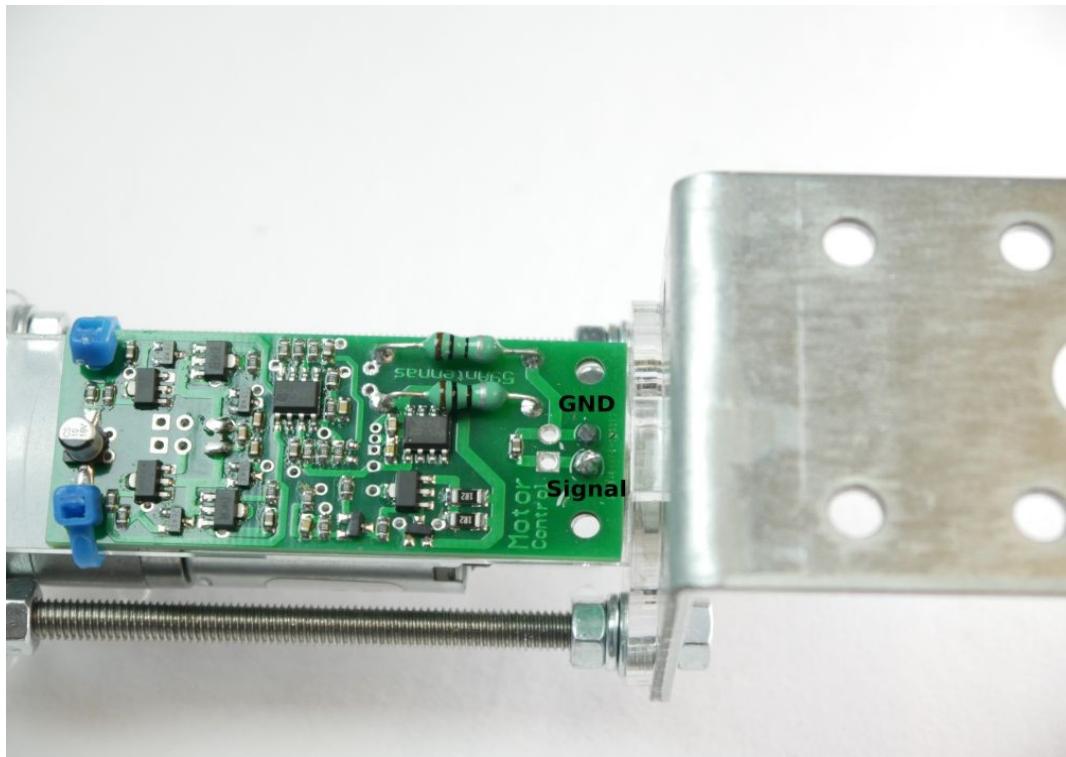
Rectangle center pin



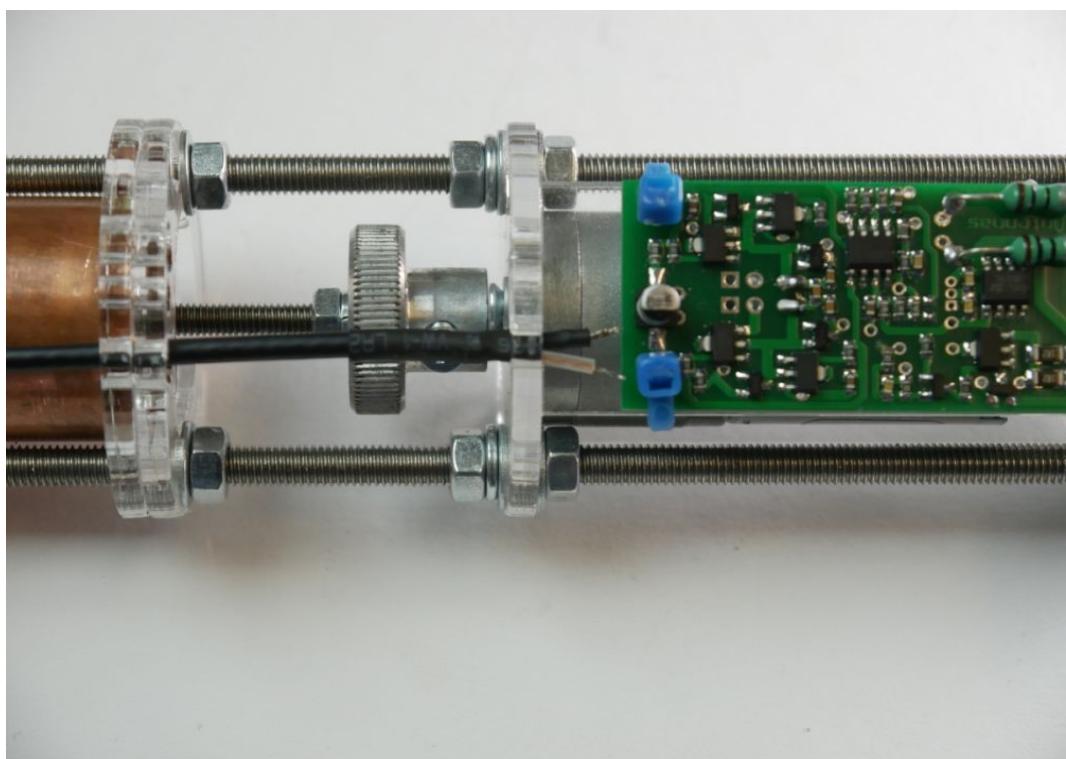
solder GND pin to the UHF-connector GND (could be also direct to the connector ring)



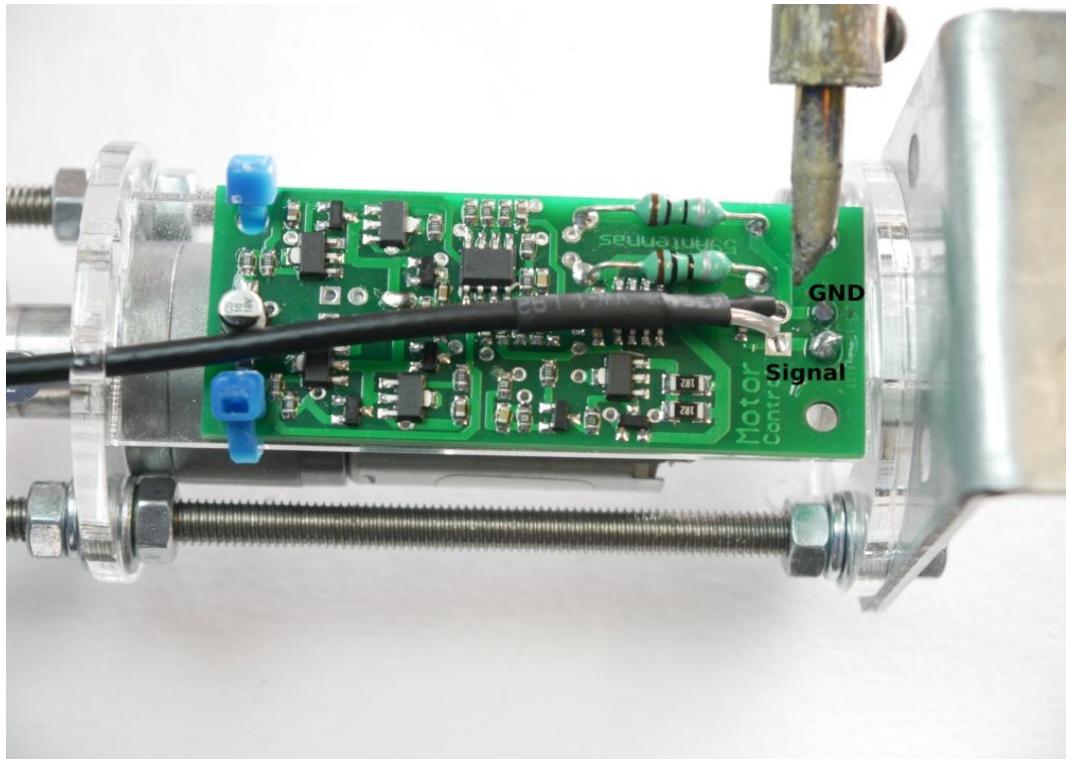
connection points



insert cable



solder cable to the motor controller board hot signal and shield GND



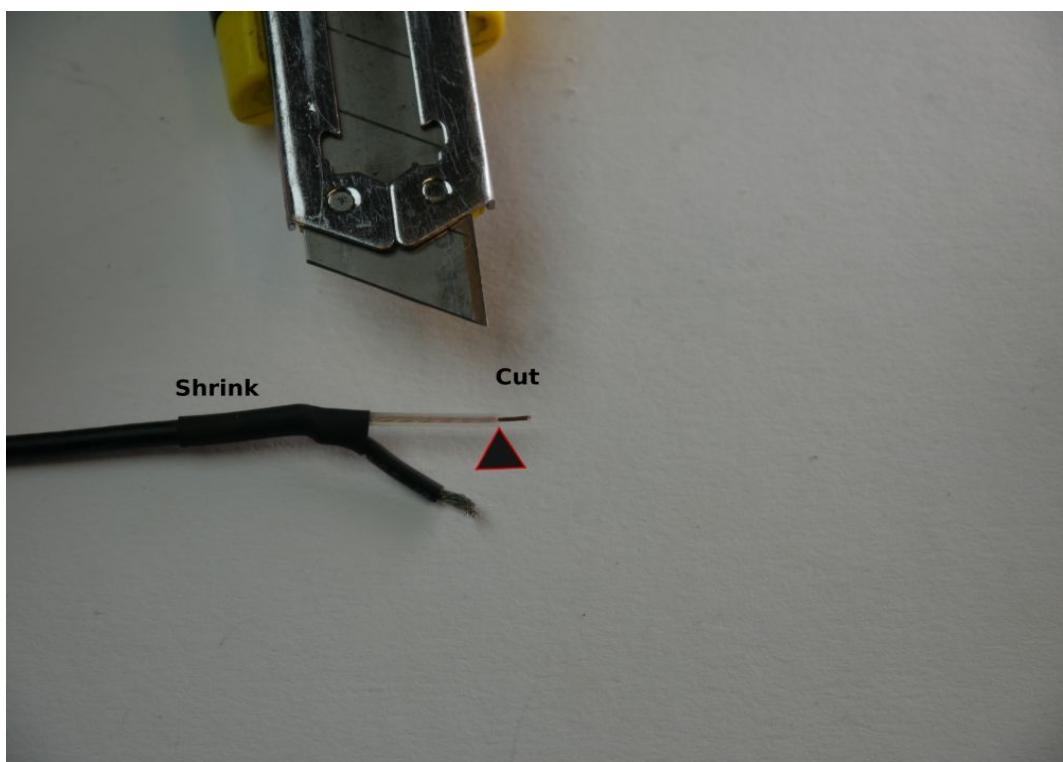
cut the outside jacket coax cable at apx. 2" (ca.5cm)



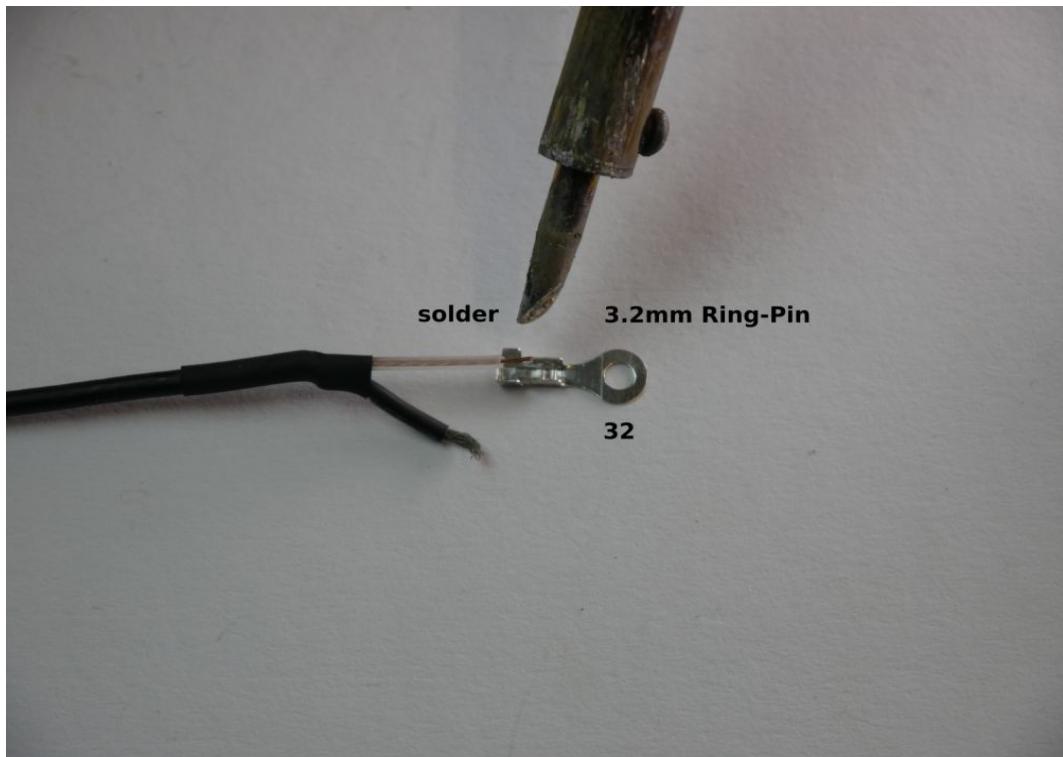
Install heatshrinkhose and shrink it



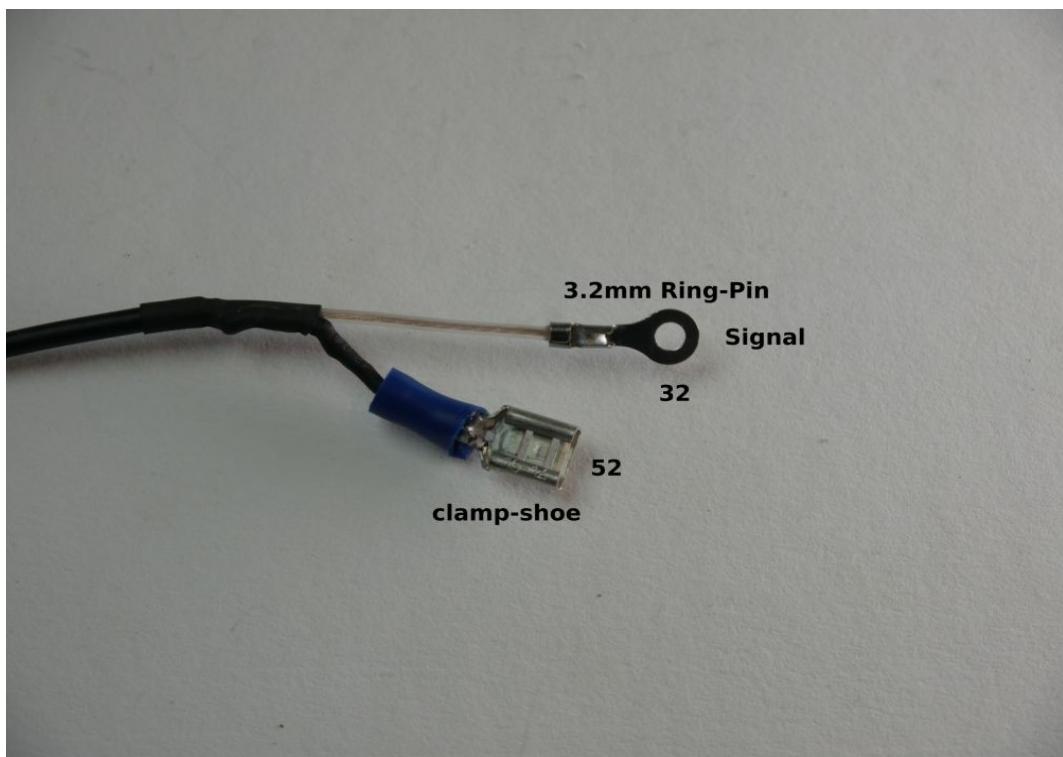
shrink and cut it



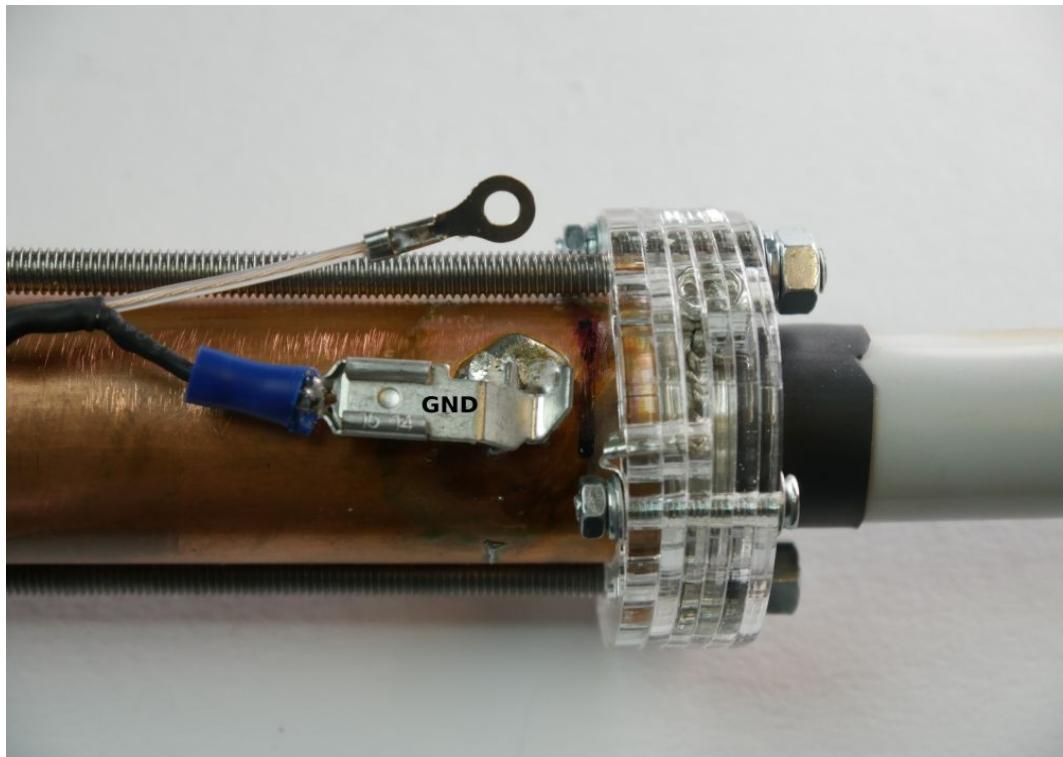
solder item 32 to cable



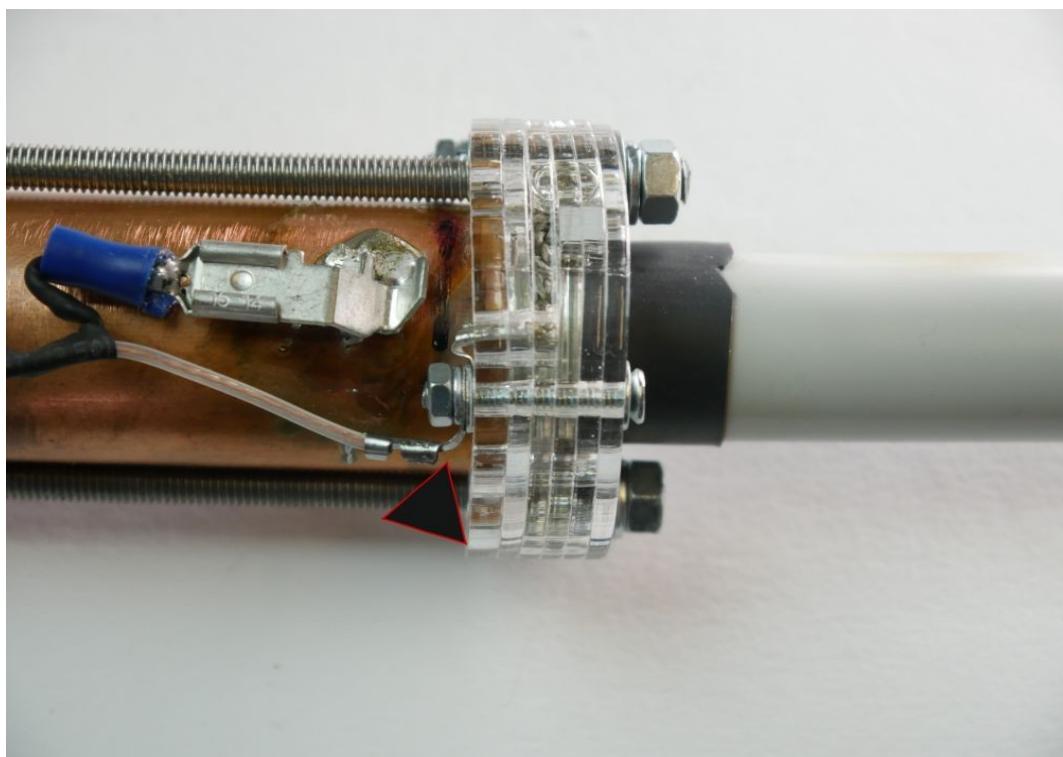
solder clamp-shoe 101



connect GND to the tube



connect hot signal to ballholder – a cap can make a DC/AC coupling – cap not include!



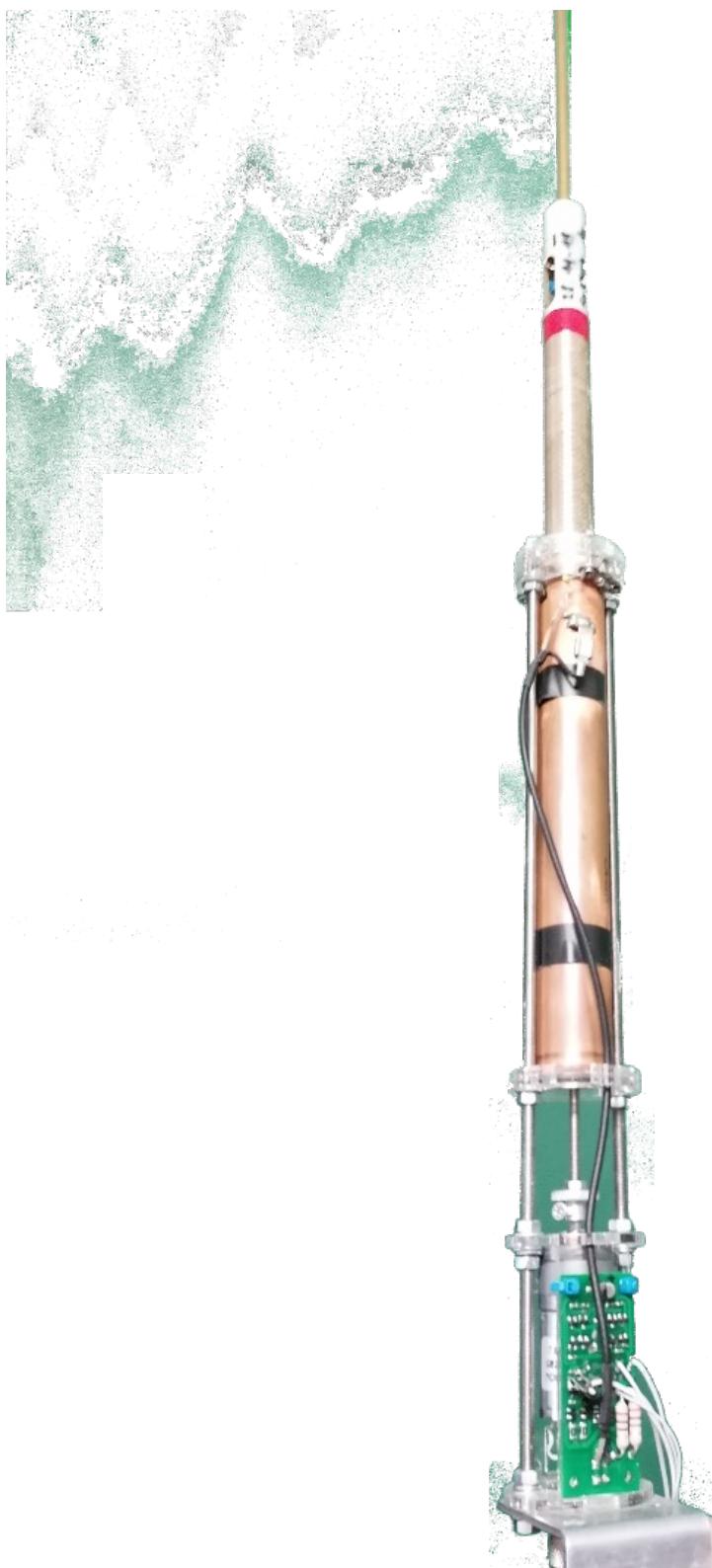
finish your automatic-motor-antenna

a lot of options are possible to made from your self ideas.

ATTENTION – only the hot pin is for the voltage control! don't change the polarity

+8Volt to the hot pin in the center of the connector will move down the coil

+10Volt till +12Volt to the hot pin center will move the antenna up - aprox. 160mA will consumed



Manual_en

Electrical connection is over a phantom power supply over a coil.

Injection from the power supply into the RF-coax cable as follows

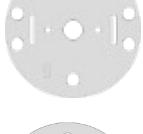
Operation-mode

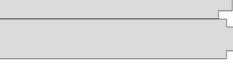
Voltage(Volt)		direction up/stop/down	current (mA)
+13,8V	Center pin	motor move up	~160mA
+10,5V	Center pin	motor move up	~160mA
+9V	Center pin	stopped	~3mA for test coax-c
+8V	Center pin	motor move down	~160mA
0V	GND shield Coax		

Option-end-switch

you can install also a endswitch and interupt the connection on the motor controll board.
the motor will run down and the end-switch turn the motor off – no current come over the motor.

Manual_en

Number	Item	Type	thick	pcs
1	 Item 1	Ballholder Ring Top	2mm	1pcs
2	 Item 2	Ballholder Ring Upper	2mm	1pcs
3	 Item 3	Ballholder Ring Middle	2mm	1pcs
4	 Item 4	Ballholder Ring Wireout	2mm	1pcs
5	 Item 5	Ballholder Ring Bottom	2mm	1pcs
6	 Item 6	Copper Tube TOP	3mm	1pcs
7	 Item 7	Copper Tube Holder Bottom & Item 13 Ring Tube Bottom Hole=6mm, Dia=25mm	3mm	1pcs
8	 Item 8	Copper Tube Bottom & Item 14 Ring Nut Holder Tube (4mm Nut)=dia 7,9mm; Diameter 17,5mm	3mm	1pcs
9	 Item 9	Motor Top	3mm	1pcs
10	 Item 10	Motor Bottom & Item 15 17,5mm Hole 6mm	3mm	1pcs
11	 Item 11	Motor Side1	2mm	

12		Item 12	Motor Side2	2mm
13		Item 13	Ring inside item 7 ; 25mm; Hole 6mm	3mm
14		Item 14	Ring inside Item 8 ; M4- Nut holder 17,5mm	3mm
15		Item 15	Ring inside item 10 ; 17,5mm top; Hole 6mm	3mm
16		Item 16	Emitter (Strahler) top 5,8mm/17,5mm	3mm
17		Item 17	Emitter (Strahler) middle 5,8mm/17,5mm	3mm
18		Item 18	Emitter (Strahler) bottom 4,4mm/17,5mm	3mm
19		Item 19	Side part Motor	3mm
20		Item 20	Side part Motor	3mm
21		Item 21	Top inner Stabilizer 17mm; Hole 4,2mm	3mm
22,23,24, 25,26,27, 28,29,30, 31,32,33		Item 22-33	Nut M5 DIN934 ISO4032 1g	5mm
34		Item 34	Ring-Pin 3,2mm	3,2mm
35		Item 35	Wattlet Wire	
36,37,38, 39,40,41, 42,43,44, 45 46,47,48, 49,50,51		Item 36-45	Flat-Washer 5,4mm DIN125	5,2mm
		Item 46-51	Spring-Ring 5mm DIN127	5,2mm
52		Item 52	Clamp-shoe	
53		Item 53	threaded rod 5mm	36cm
54		Item 54	threaded rod 5mm	36cm
55		Item 55	threaded rod 4mm transport	26cm
56		Item 56	Motor Clutch 22/12mm	4mm

57		Item 57	Motor-Controller Electronic	
58		Item 58	Gear DC-Motor 6V 24,5mm 69mm	
59,60		Item 59,60	Flat-Washer 3,2mm DIN125	3,2mm
61,62,63		Item 61,62,63	Skrew Flat-Heat cross 3.0x10mm DIN965	3mm
64		Item 64	Angle 90°	2,5mm
65,66,67		Item 65,66,67	Skrew Flat-Head Cross 3.0 Item 65,66,67 x 20mm DIN965	
68,69,70		Item 68,69,70	Spring-Ring 3,2mm	
71,72,73, 74,75,76		Item 71,72,73,74,75,76	Flat-Washer 3,2mm Couper-Tube 28mm/26mm inner	
77		Item 77	Item 78,79,80 M4 Nut 0,6g DIN934	M4
78,79,80		Item 78,79,80		
82,83		Item 82,83	Flat-Washer 4,3mm DIN125	4,4mm
86,87		Item 86,87	Spring-Ring 4mm DIN127	4,2mm
90		Item 90	Coil Silver coated 0,6mm/28cm/20mm Dia RF-Connector Jack	28cm
91		Item 91	Female front mount bulkhead RF connector solder 15,8mm inner, 15,8mm outer	15,9mm
92,93,94		Item 92,93,94	Item 92,93,94 M3 Hex-Nut DIN934	M3
95,96,97		Item 95,96,97	Metal-Ball 6mm 1pcs Brass & 2pcs Steel	6mm

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	Item 98,99,100	Spring 6mm	6,5x10m m
101		Item 101 Ring-Pin 3,2mm	3,2mm

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ig 99, 100

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onnection

59Antennas.com

DIY – Bausatz

Elektrische-Motor-Antenne

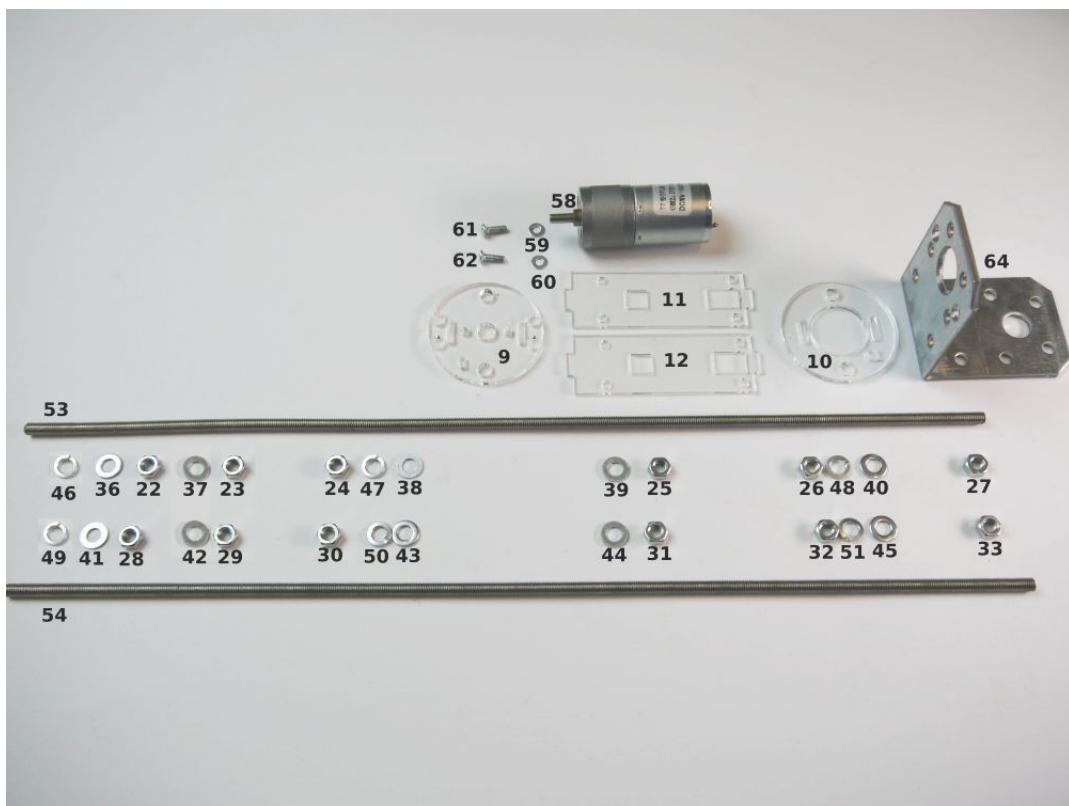
Danke für die Wahl des DIY-Kit (Do it Yourself) Bausatzes.

Überprüfen Sie zuerst ob alle Bauteile in der Box sind.

Die Liste ist am Ende dieser Beschreibung zum Ausdrucken.

dieser Bausatz ist nur für den Innenbereich – mit einem 50mm Grauen Plastikrohr ist eine Schutz

Legen Sie die Teile so wie im Bild auf und schrauben Sie diese zusammen.



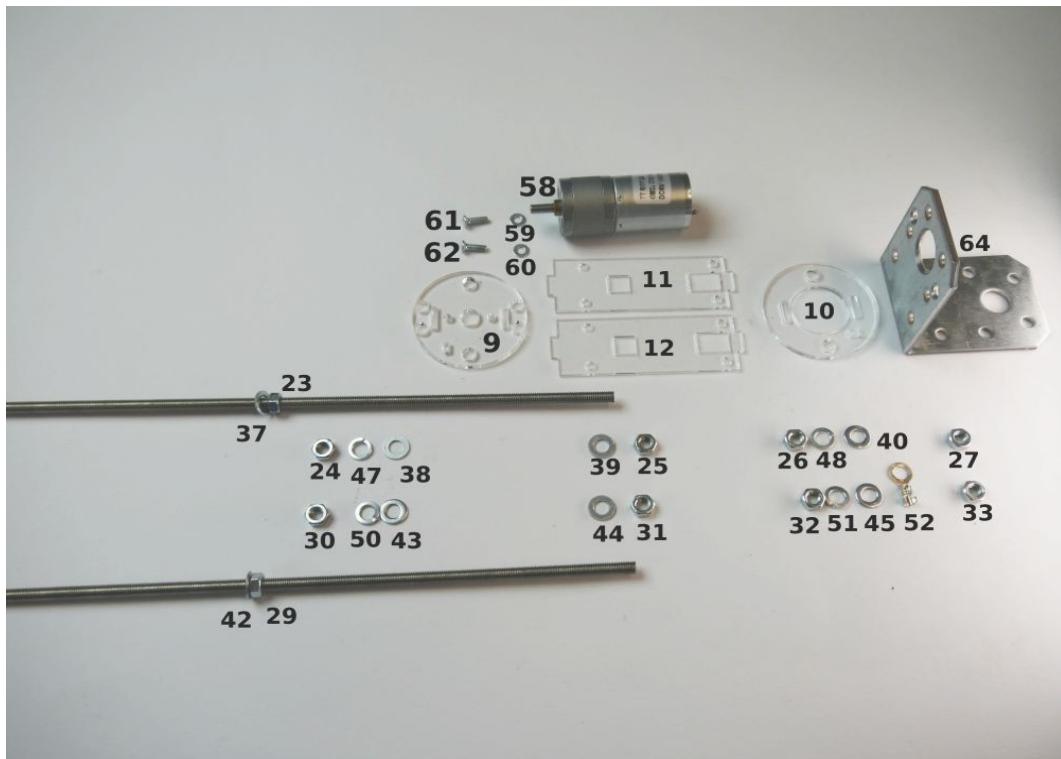
ACHTUNG!

- Lassen Sie keine kleinen Kinder mit dem DIY-Kit spielen! Bauteile können verschluckt werden!
- Geben Sie den DIY-Kit nicht in den Mikrowellenherd!
- Blicken Sie nicht in die Spitze von Metallteilen!

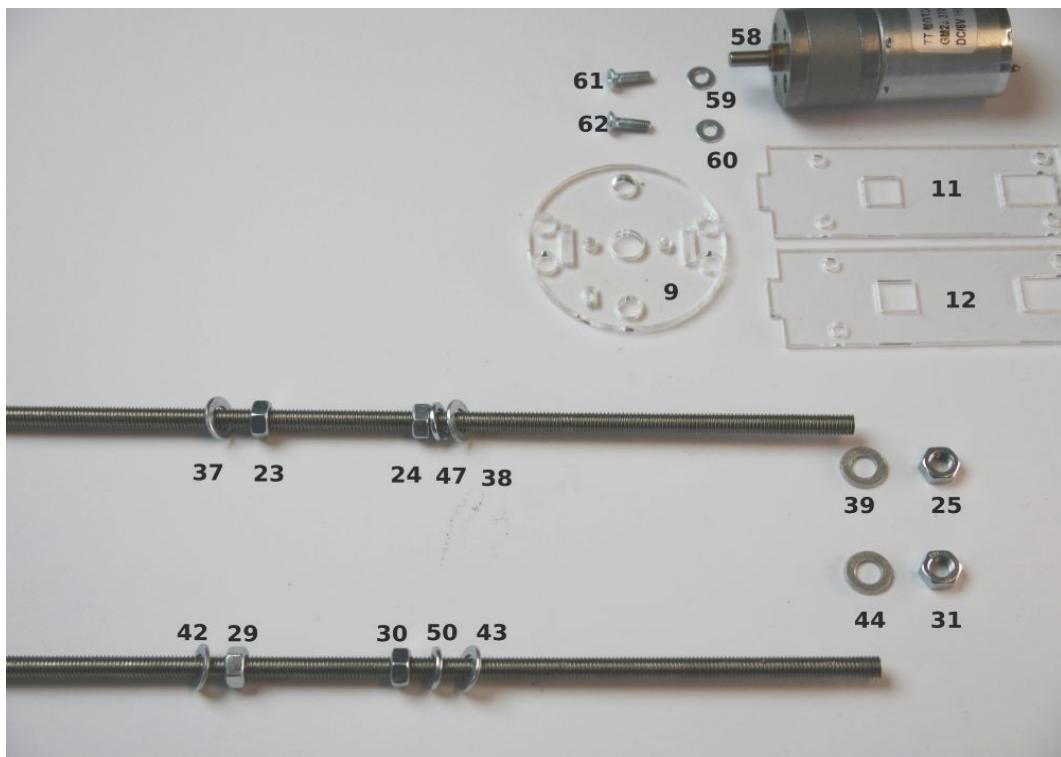
- Junge Leute können den DIY-Kit schon mit +14Jahren bauen.
- Haben Sie ein Auge auf Ihre Kinder wenn sie den DIY-Kit aufbauen.
- Motor Kontroller ist unter ROHS gelötet.
- Die Kontrol Spannung 8V, 9V und 11V ist am Strahler (Emitter)!

Manual_de

installiere Teil 37 23 42 29

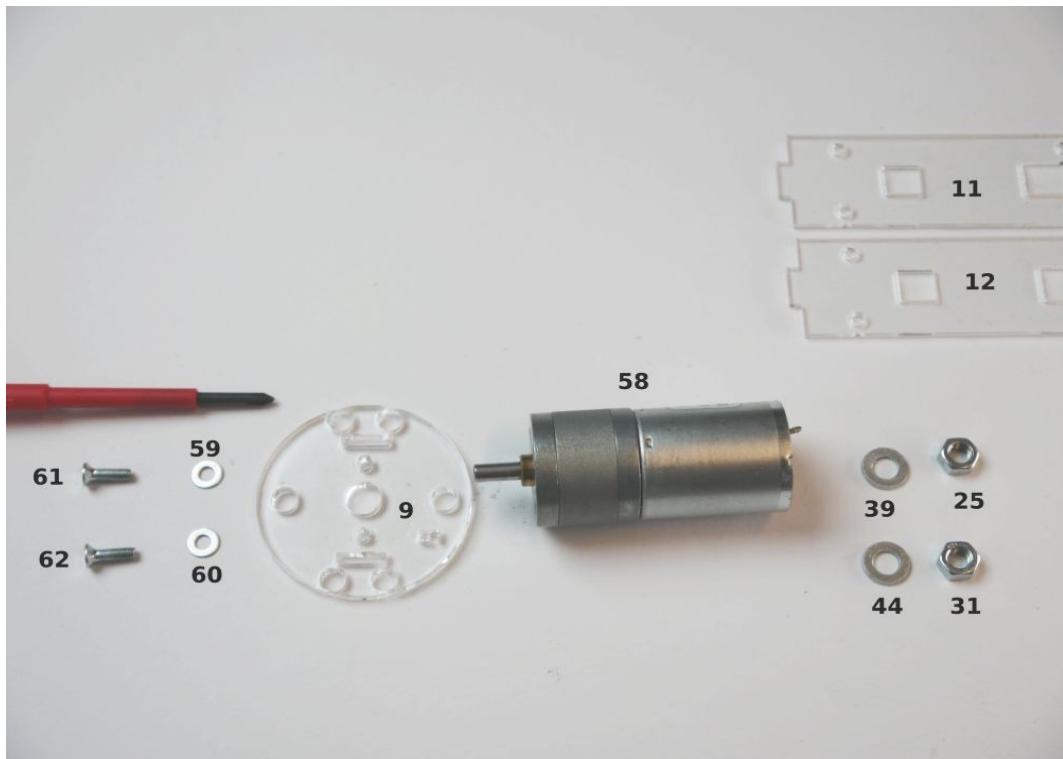


installiere Teil 24 47 38 30 50 43



Manual_de

installiere Teil 61 59 62 60 9 on 58

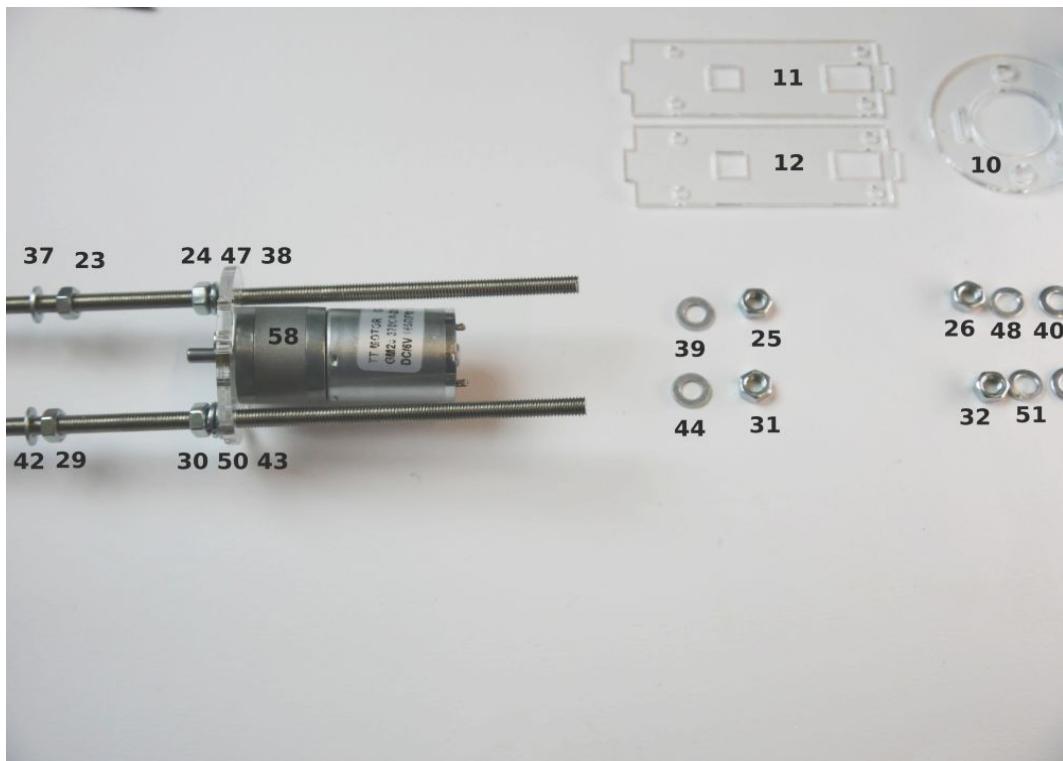


installiere den Motor

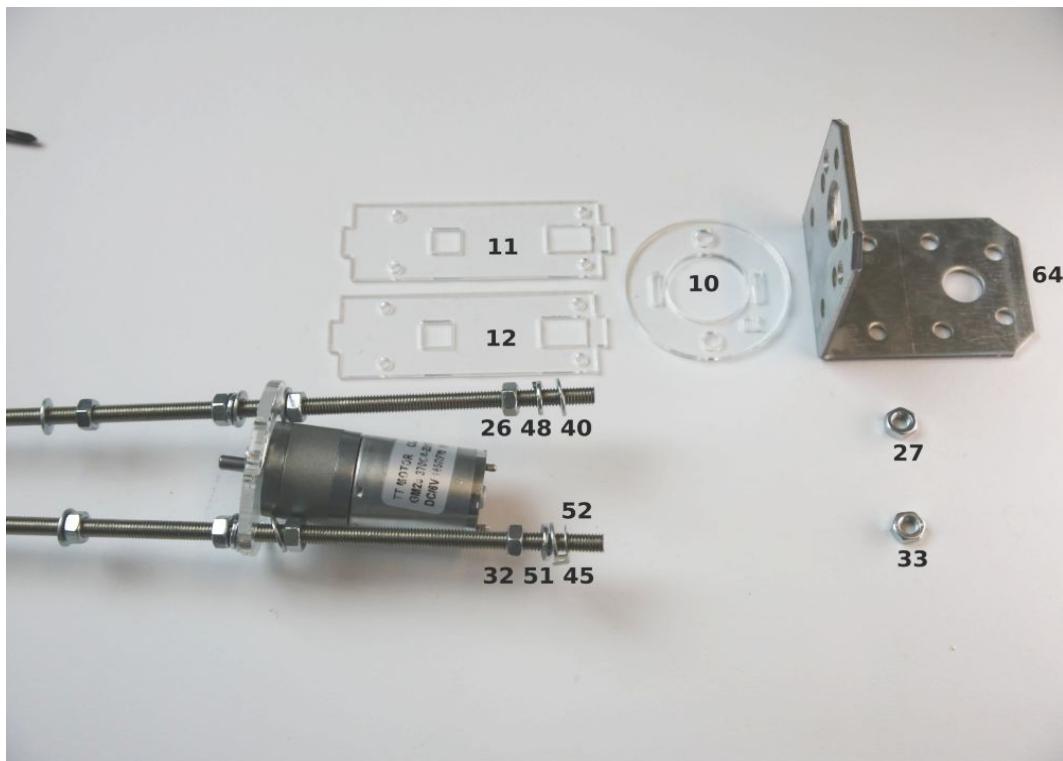


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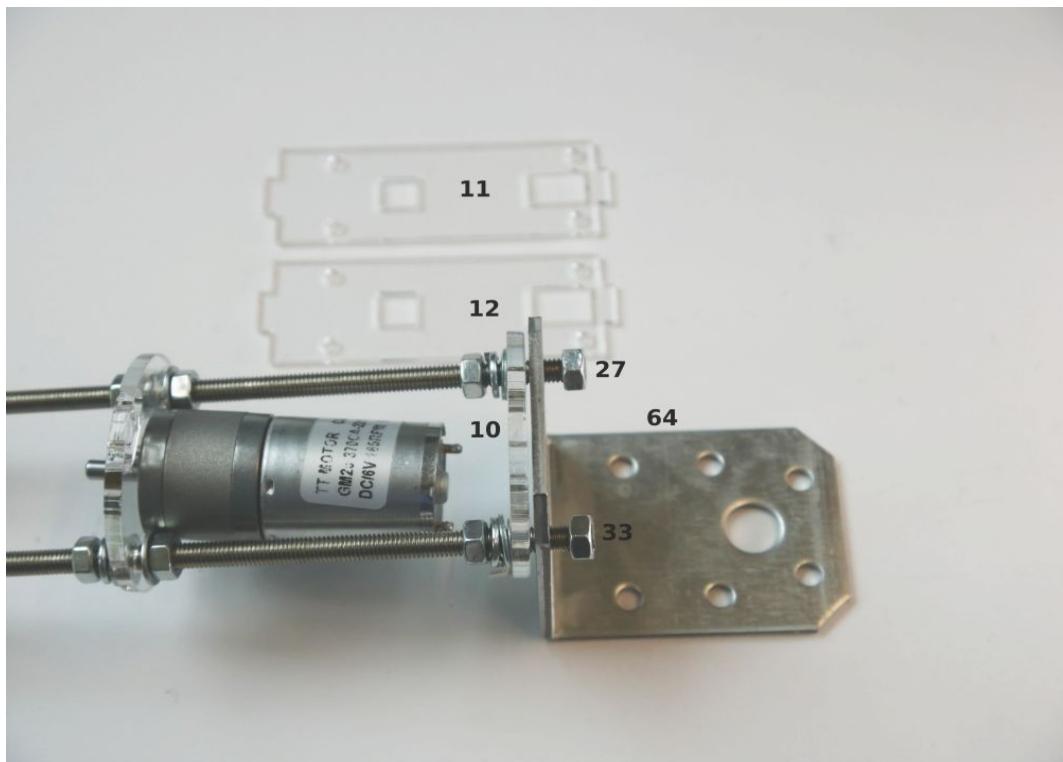
installiere den Motor 58 an der Gewindestange



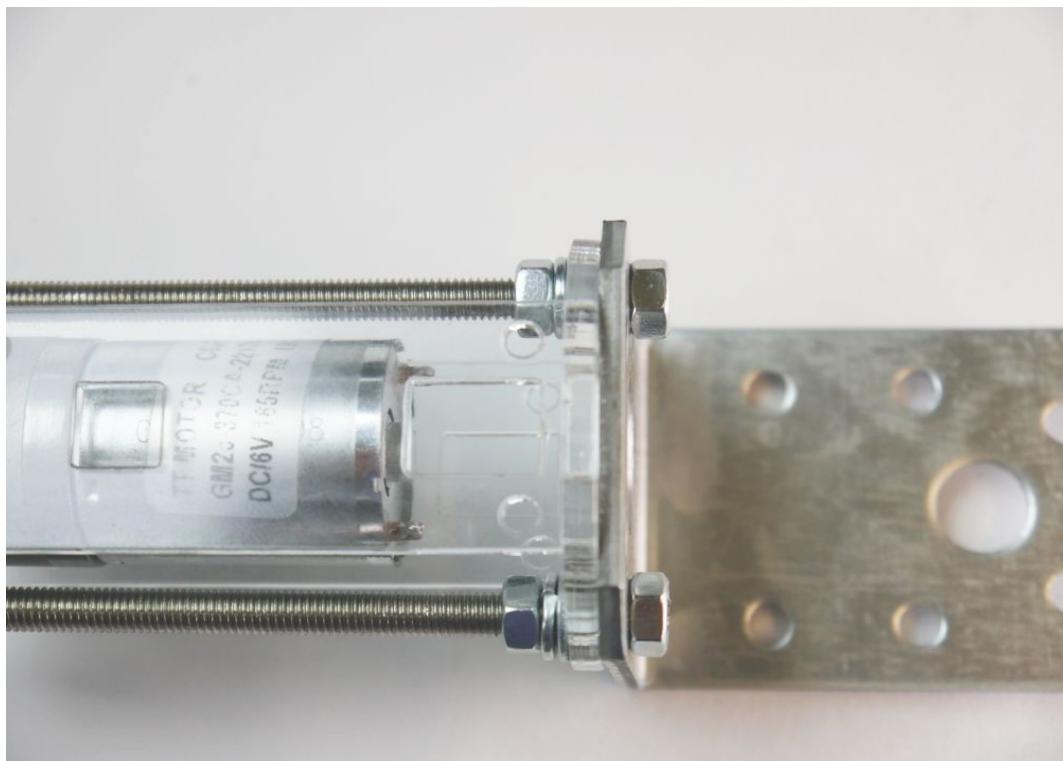
installiere Teil 26 48 40 32 51 45 52



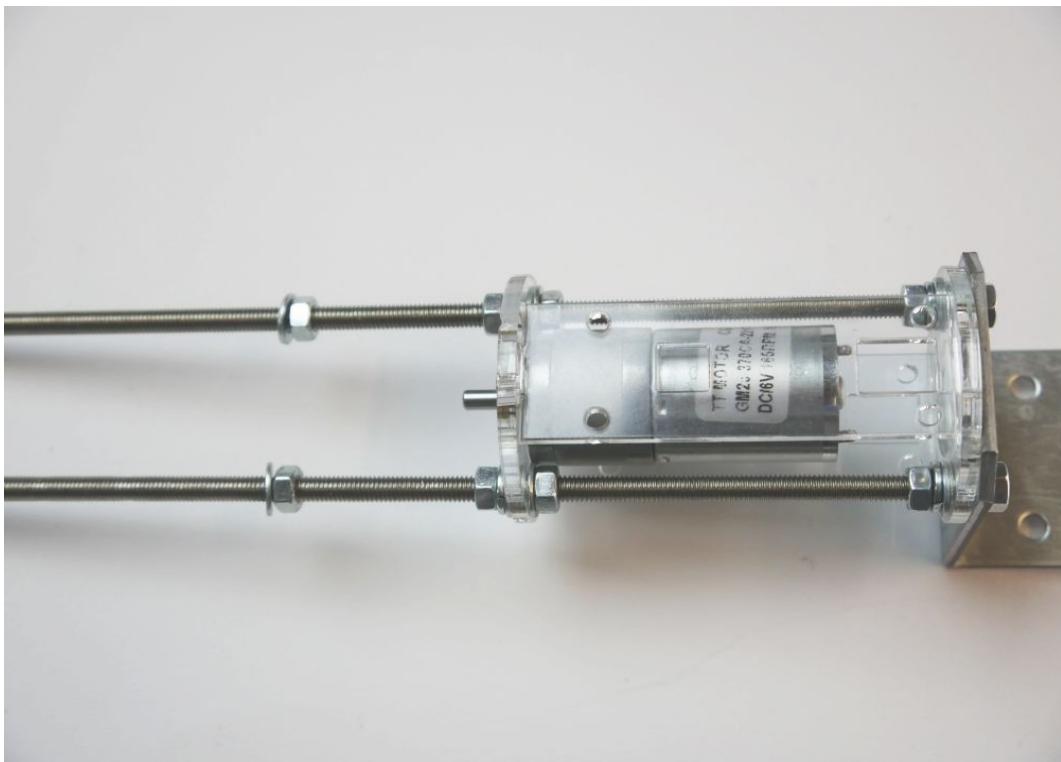
installiere Teil 10 64 27 33 11 12



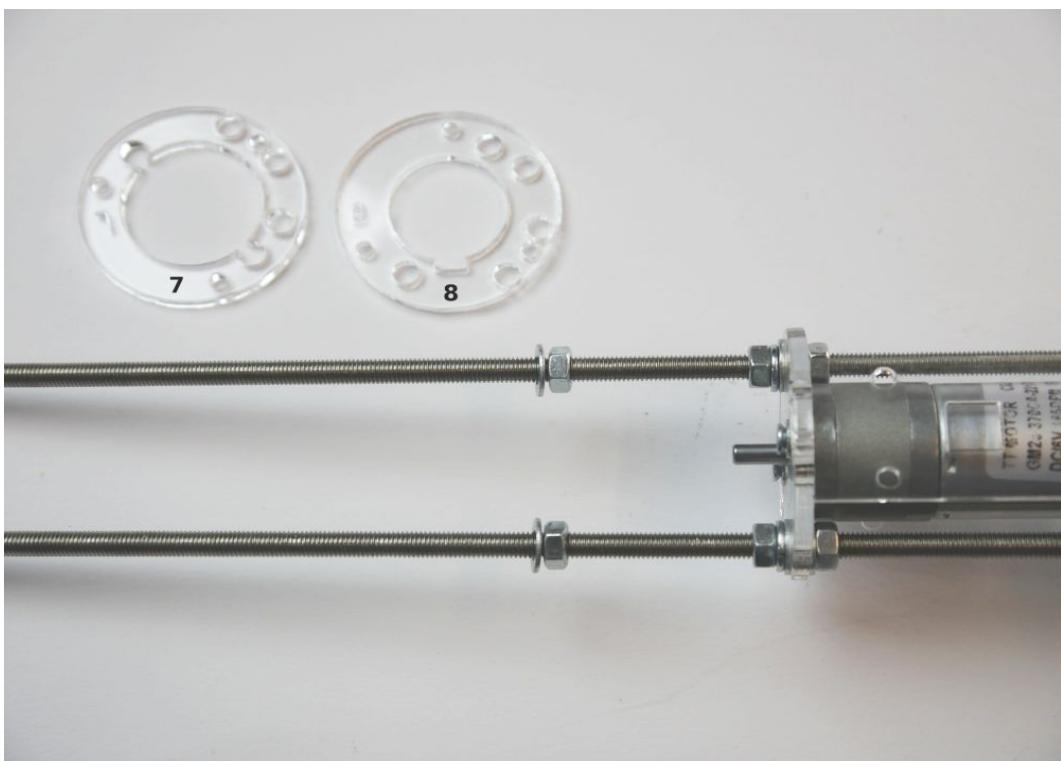
schraube die Mutter Handfest an.



schraube die Mutter Handfest an

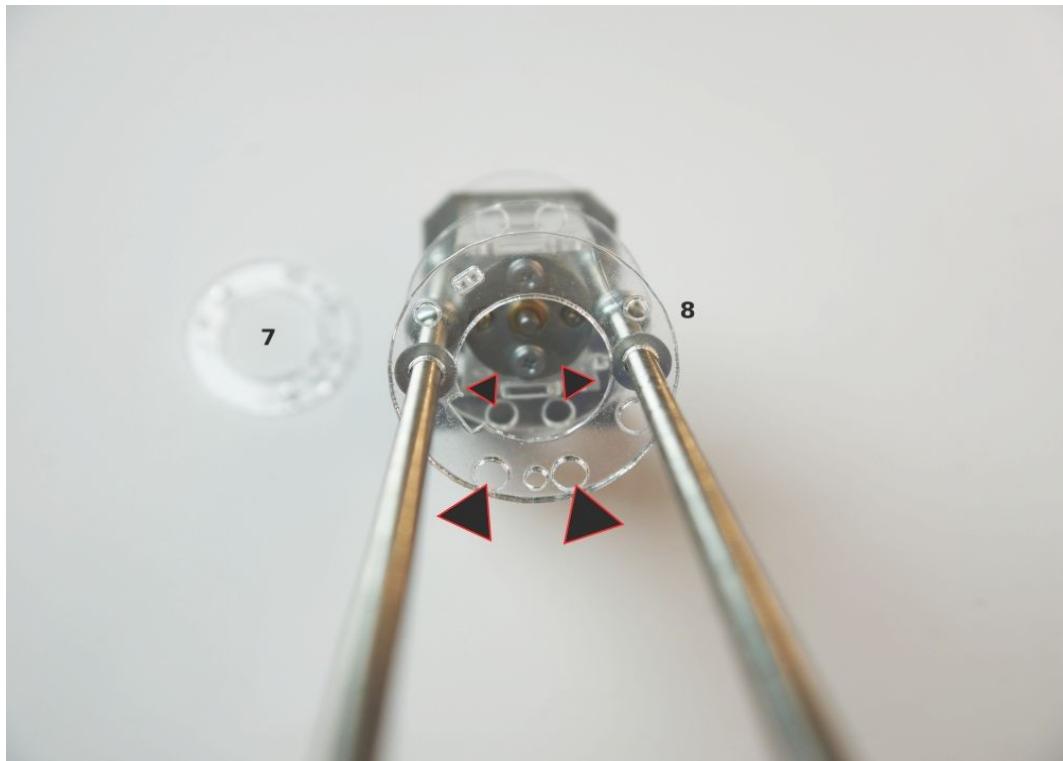


installiere Teil 7 8

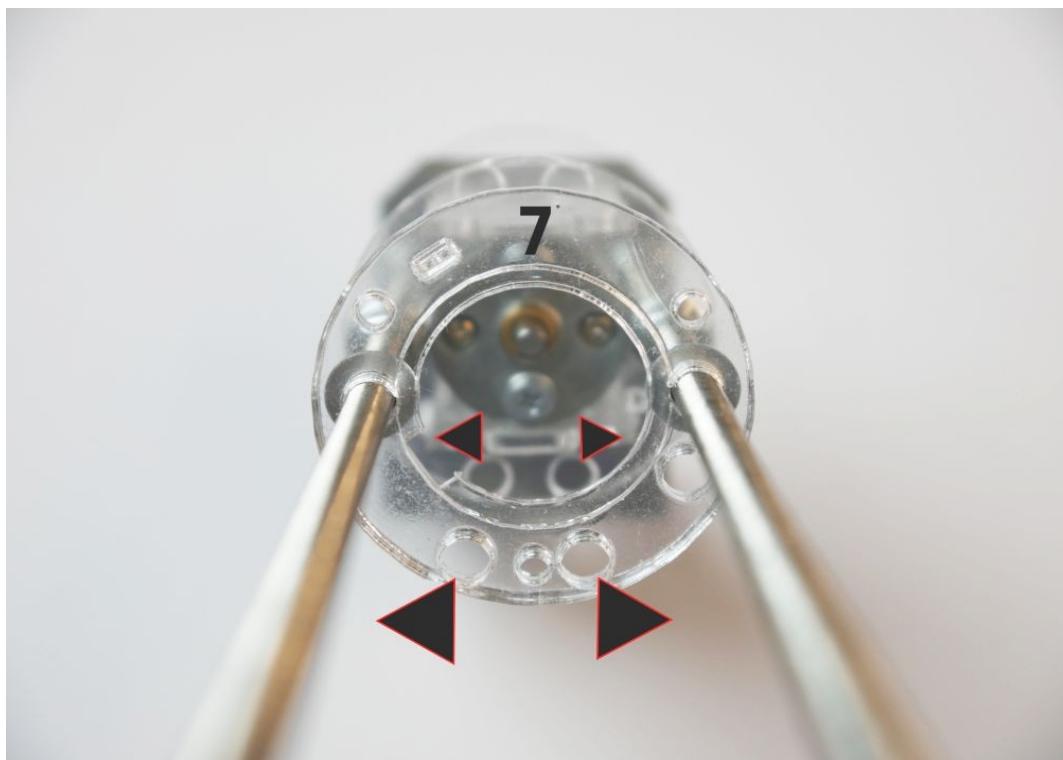


Manual_de

installiere Teil 8 Achtung die Löcher sollen auf der gleichen Seite sein. (Dreiecke)



installiere Teil 7 die Löcher sollen auf der gleichen Seite sein. (Dreiecke)



Manual_de

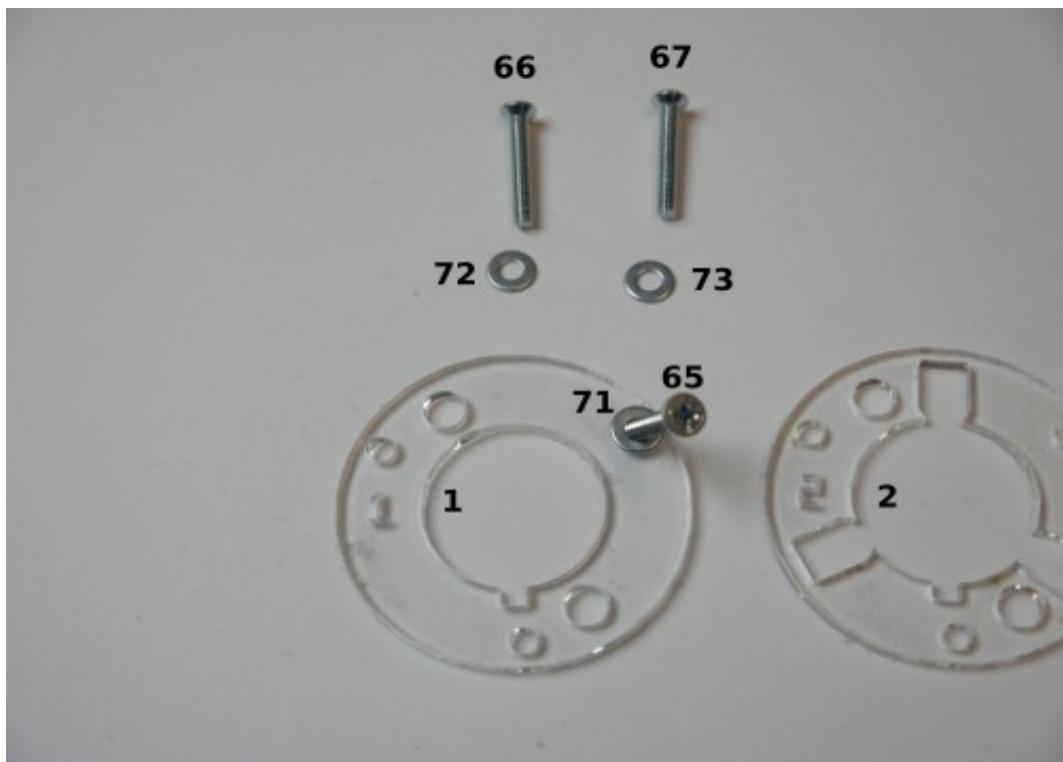
Ballring installiere Teil 1 2 3 4 5 6 – 1 ist oben bis Teil 6 ist unten



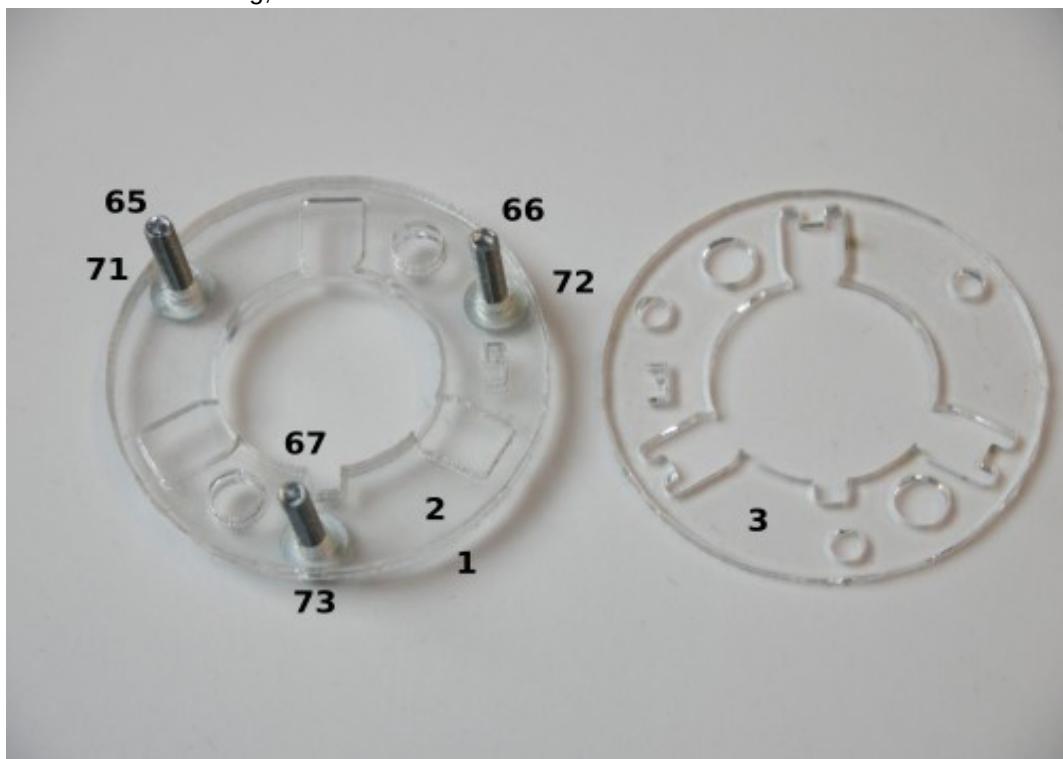
installiere Teil 65 66 67 68 69 70 71 72 73 74 75 76 92 93 94, 95 96 97(Messing)



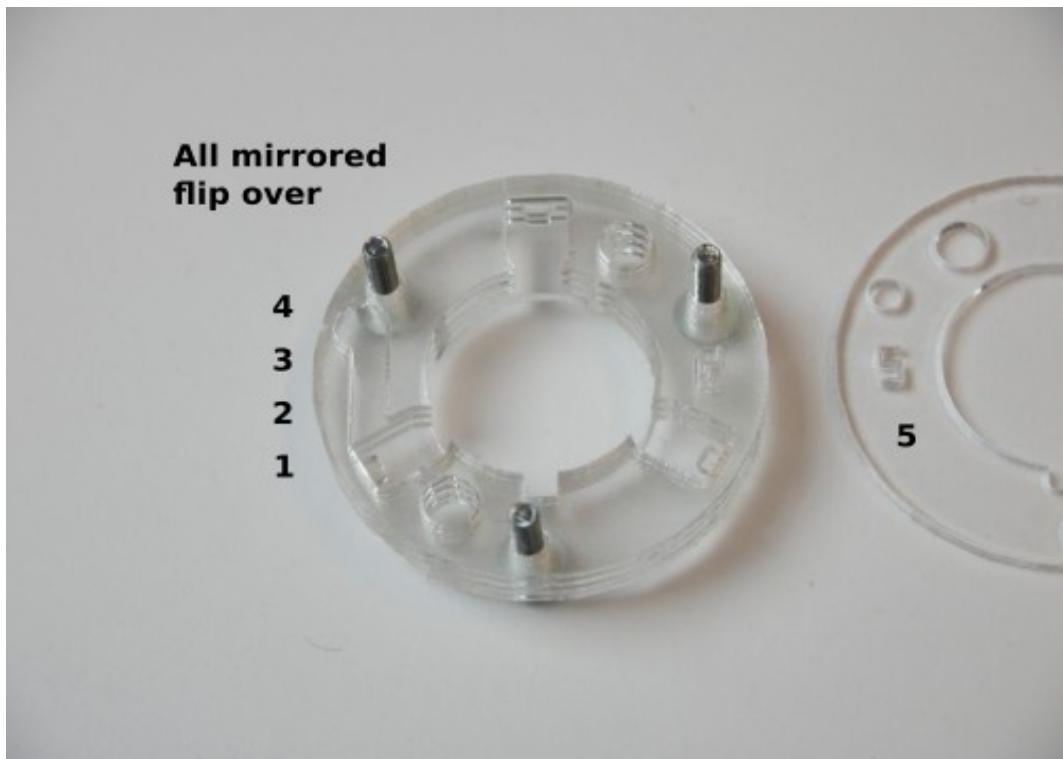
installiere Teil 65 in 71 dann in 1



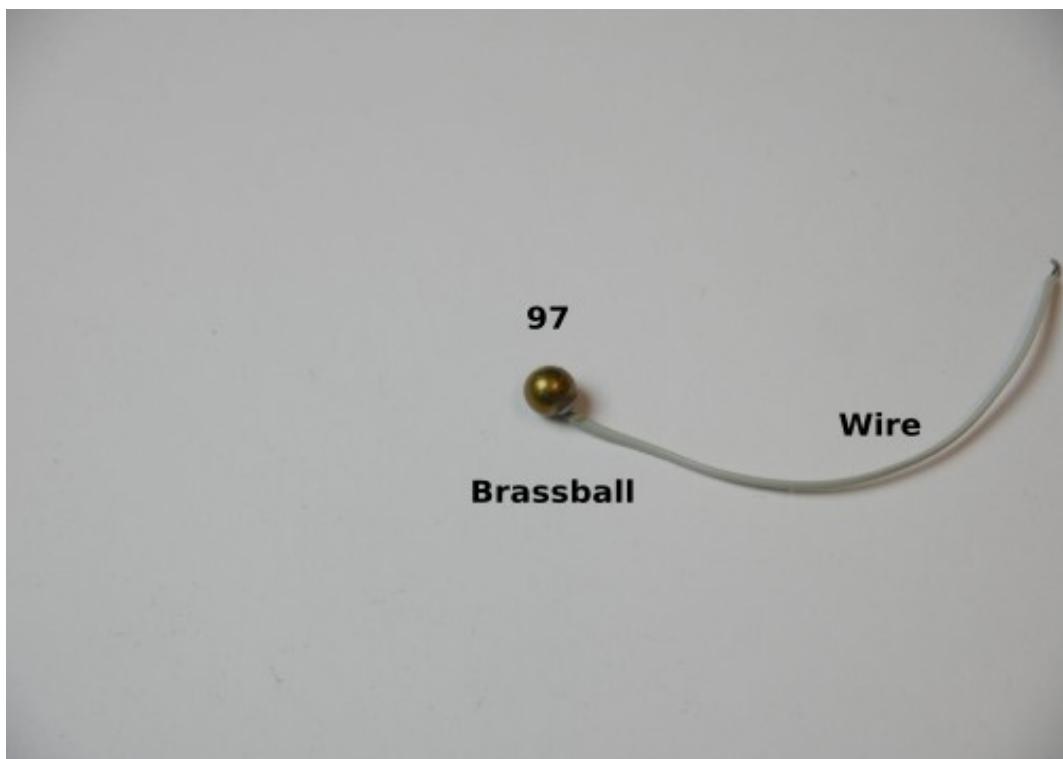
1 umdrehen (Rechts nach Links) ; 2 umdrehen und stapeln; stecke 73 in 67
und dann in den Ring; stecke 72 in 66



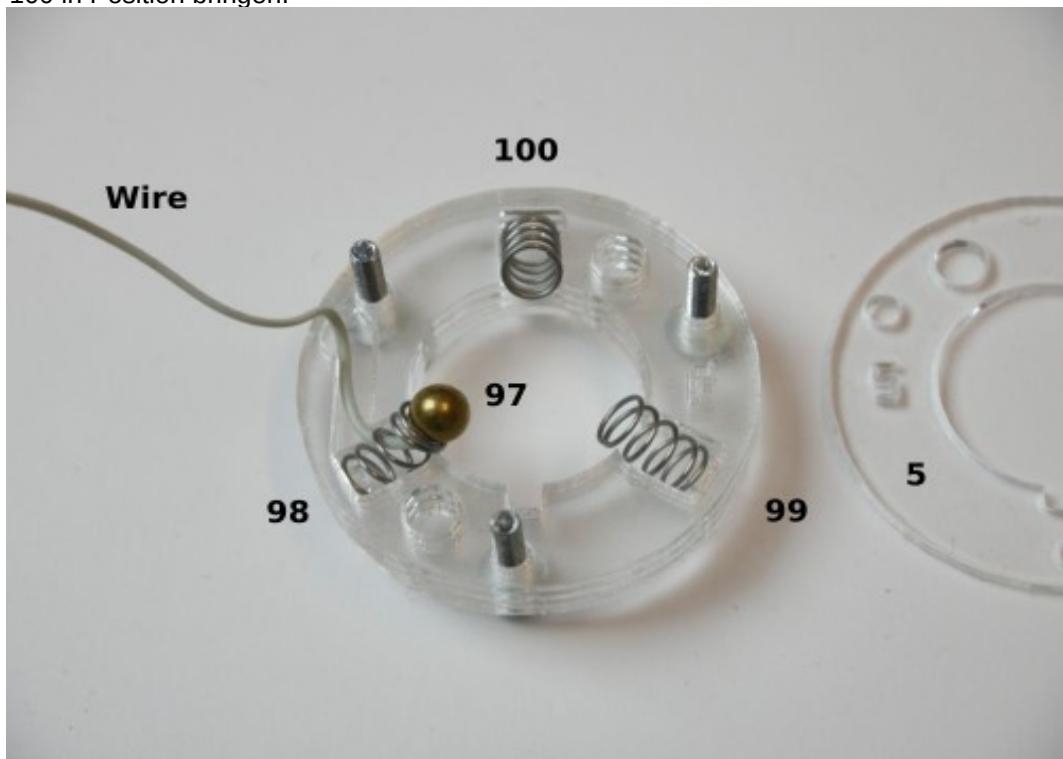
3 (Rechts nach Links) stapel 3 auf 2; 4 (R-nach-L) stapel auf 3



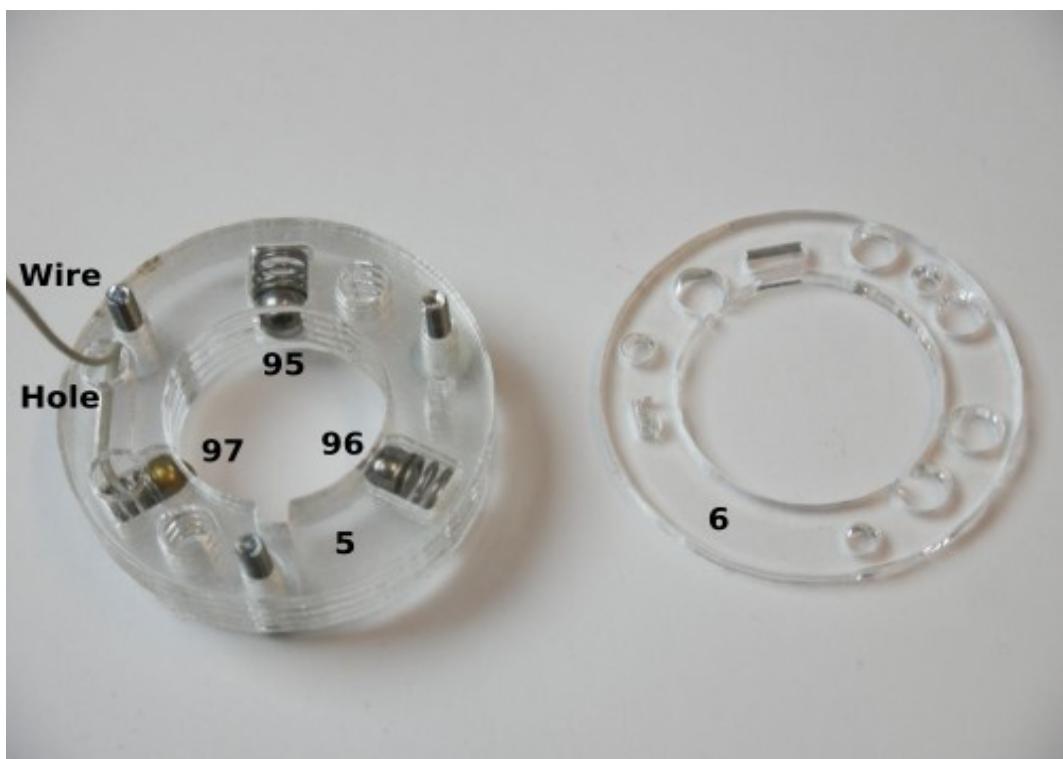
Lötkolben bitte eine Litze (flexibel) in 97 Messingkugel mit Loch anlöten HF-Verbindung zur Spule



Litze durch die Feder 98 durch fädeln und durch das Loch, Messing Kugel 97, Feder 99, 100 in Position bringen.

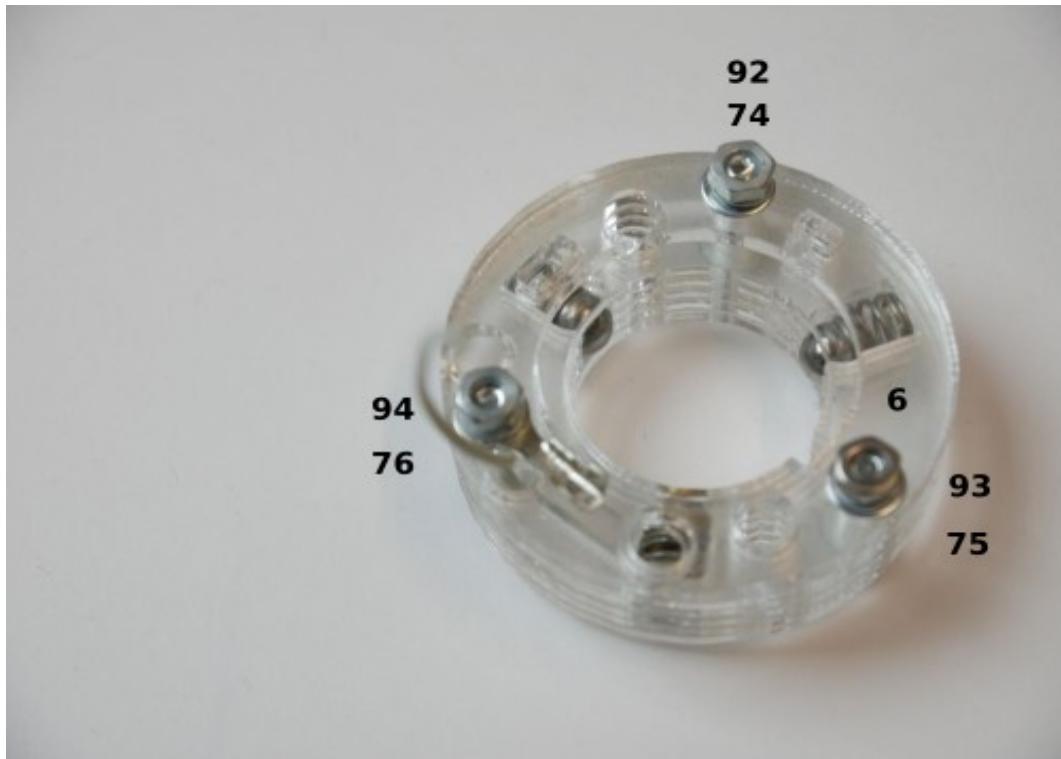


Kugel 95, 96(Silber) einspannen; 5 (Rechts nach Links) stapel auf 4 –
Litze muss durch das Loch von Teil 5

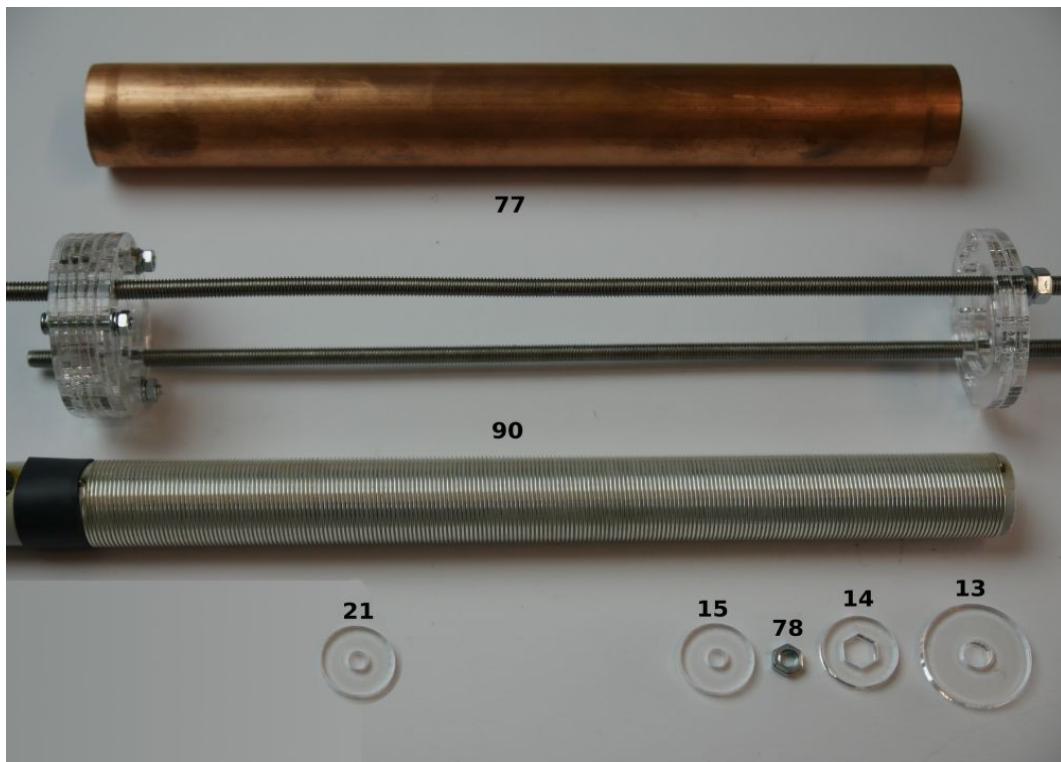


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installiere Teil 74 75 76 92 93 94 and 32 – lötet RF-Litze an 32



Spule 90 und Kupferhülse 77

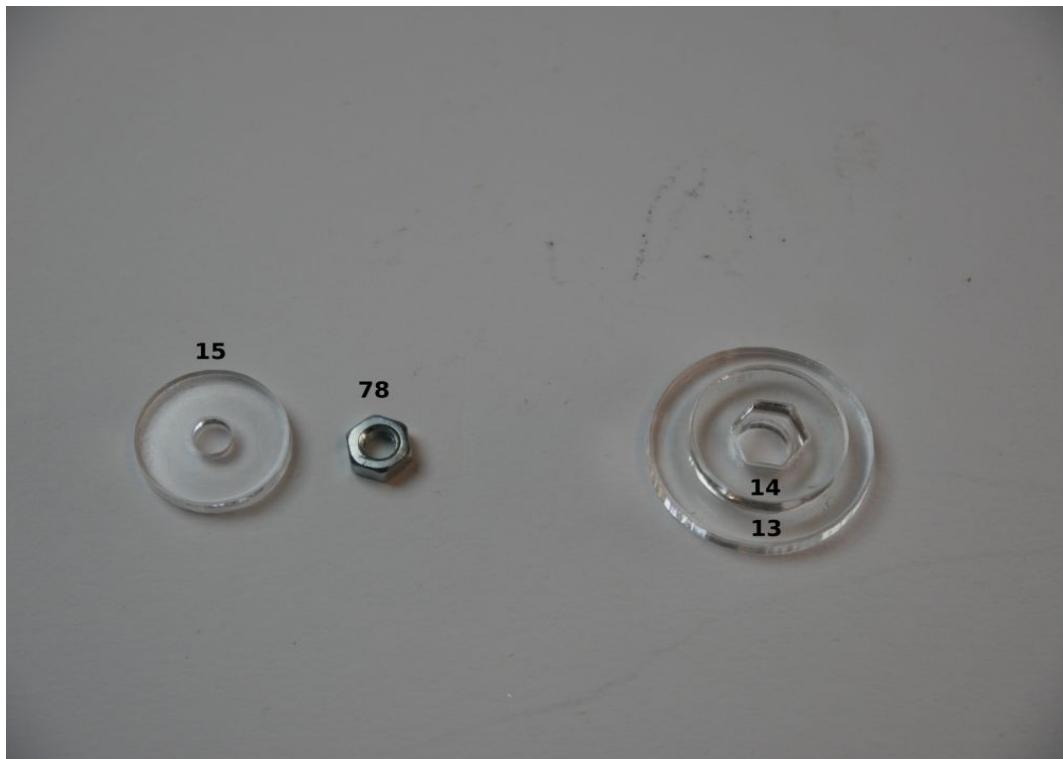


Manual_de

Spule unten Transport Ringe – sind meistens schon verklebt. Sonst verkleben (Zentrisch)



stapel 14 auf 13 zentrisch - das muss genau sein



Manual_de

positioniere die M5 Mutter in das Zentrum des Ausschnitts



stapel 15 auf 14



Manual_de

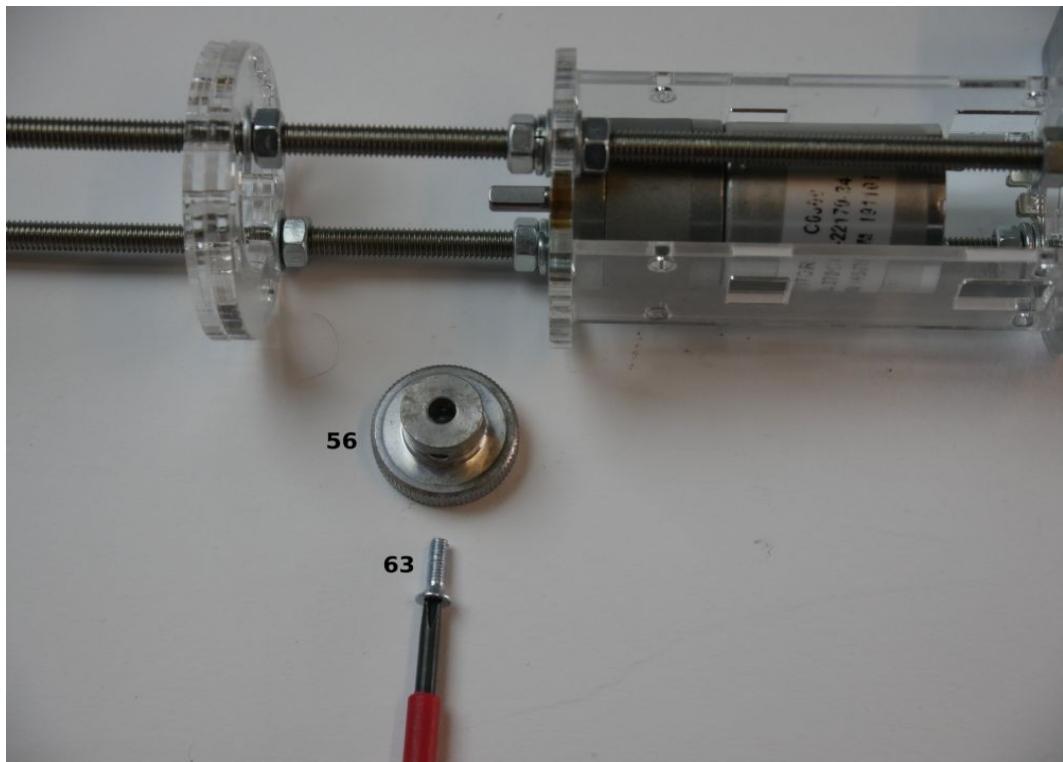
Methylenchlorid - Achtung das ist nicht inkludiert -
benötigen Sie aber auch nicht da der Zentrum Ring bereits geklebt ist.



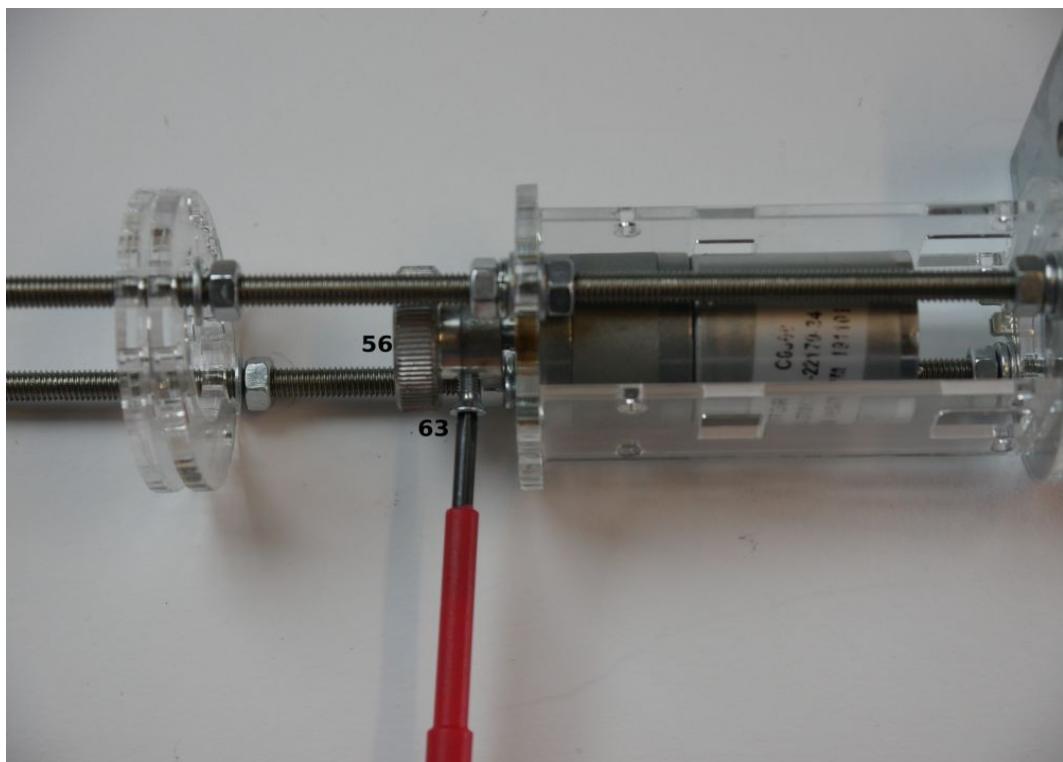
Kleben Sie den Zentrumsring (Transport) mit Methylenchlorid oder Acrylic-Kleber



installiere Teil Motor Verbindung 56 63

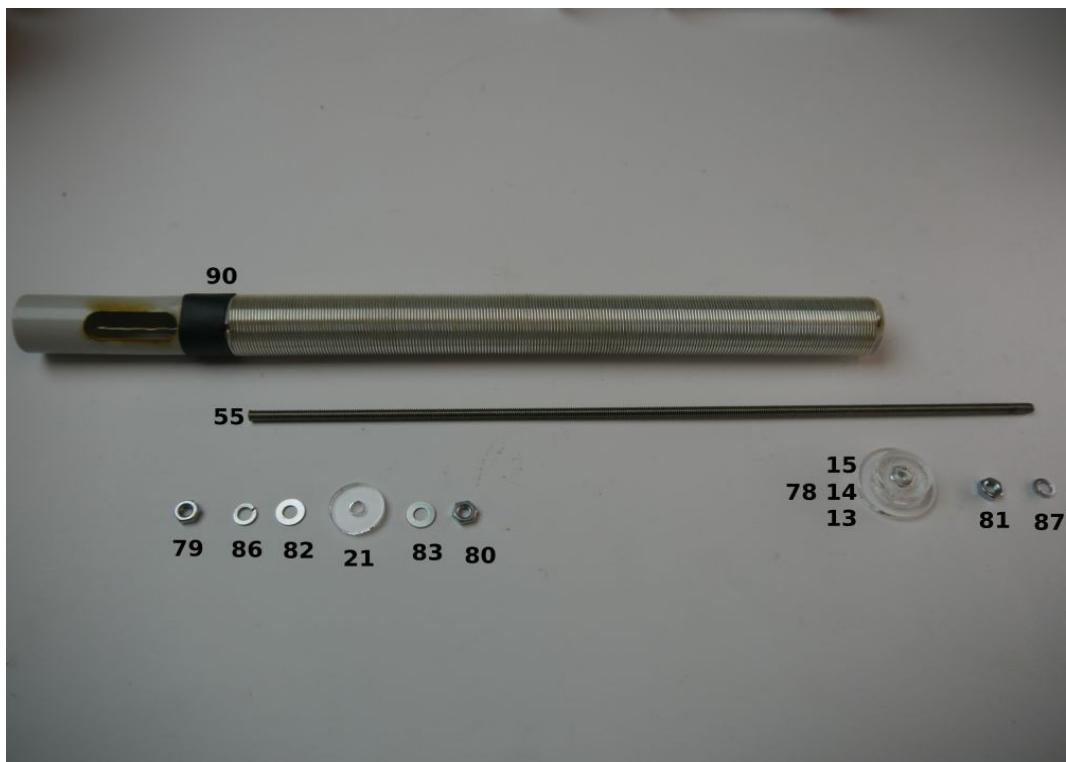


installiere Teil Motor-Verbinderung auf der Motor Achse



Manual_de

installiere Teil Stabilisator Oben auf der Gewindestange - Handfest anziehen und kleben - es darf nicht locker sein/werden!



installiere Teil 83 84

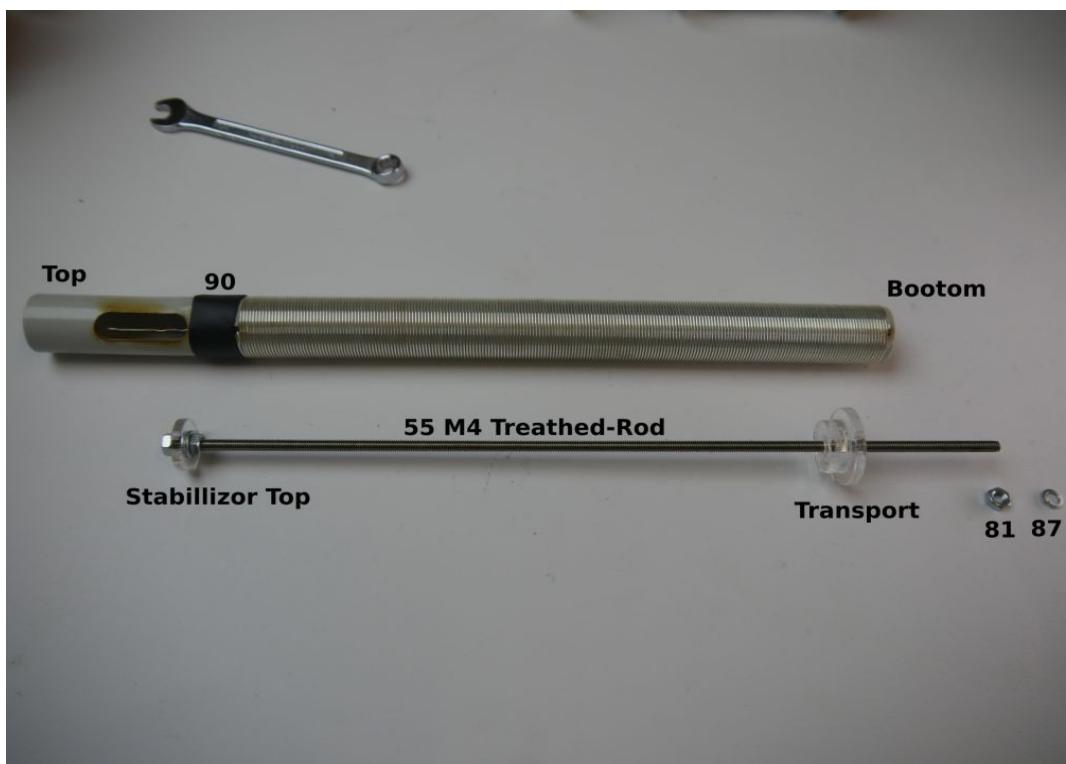


Manual_de

installiere Teil 79 86 82 21 Stabilisator Oben muss fest sein und am besten noch mit Sicherungskleber!

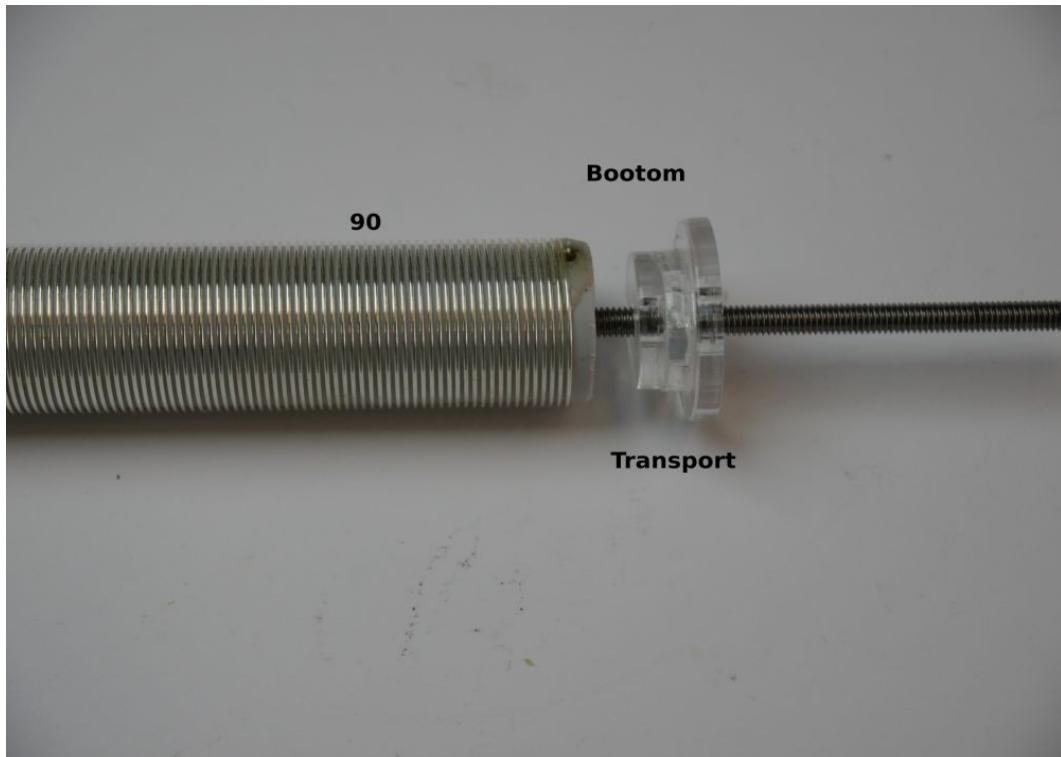


drehe Transport-Ring M4 auf die Mittel Gewindestange

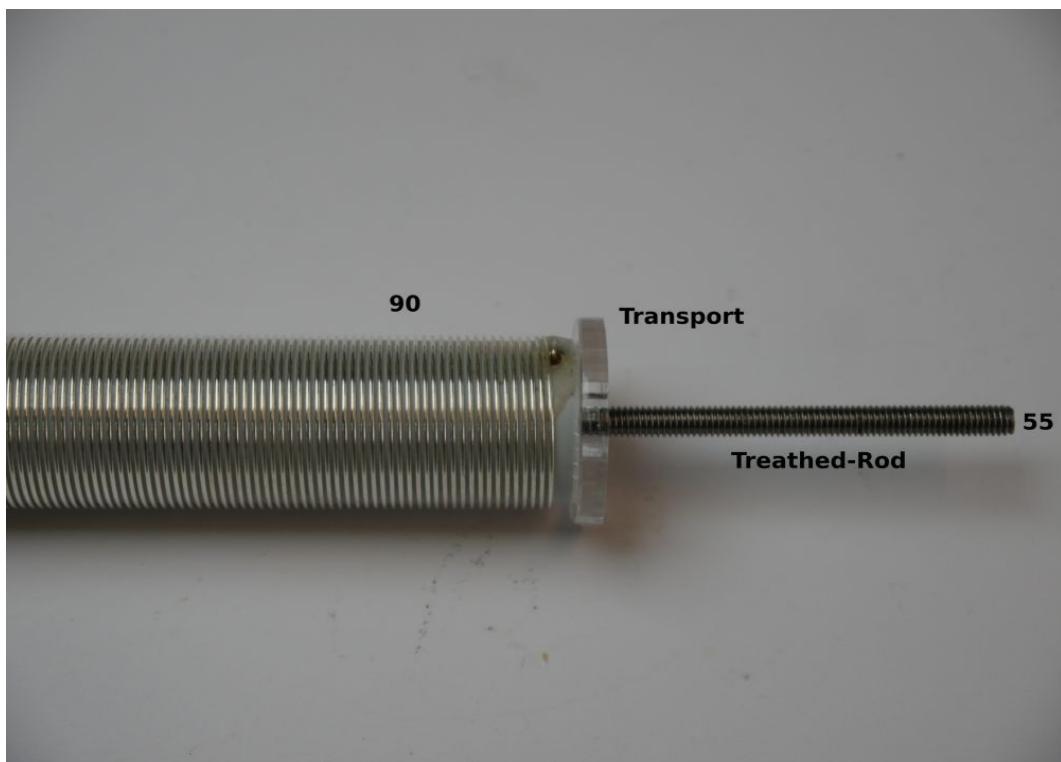


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presse den Transport-Ring in die Spule und fixiere es mit Kleber es muss gerade sein.



Klebe den Transport-Ring gerade in den Spulen Träger



installiere Teil 81 87



deinstallieren Sie den „Ballhead“ Kugelkopf und installieren Sie die Spule 90 mit der Mutter wird gekontert.

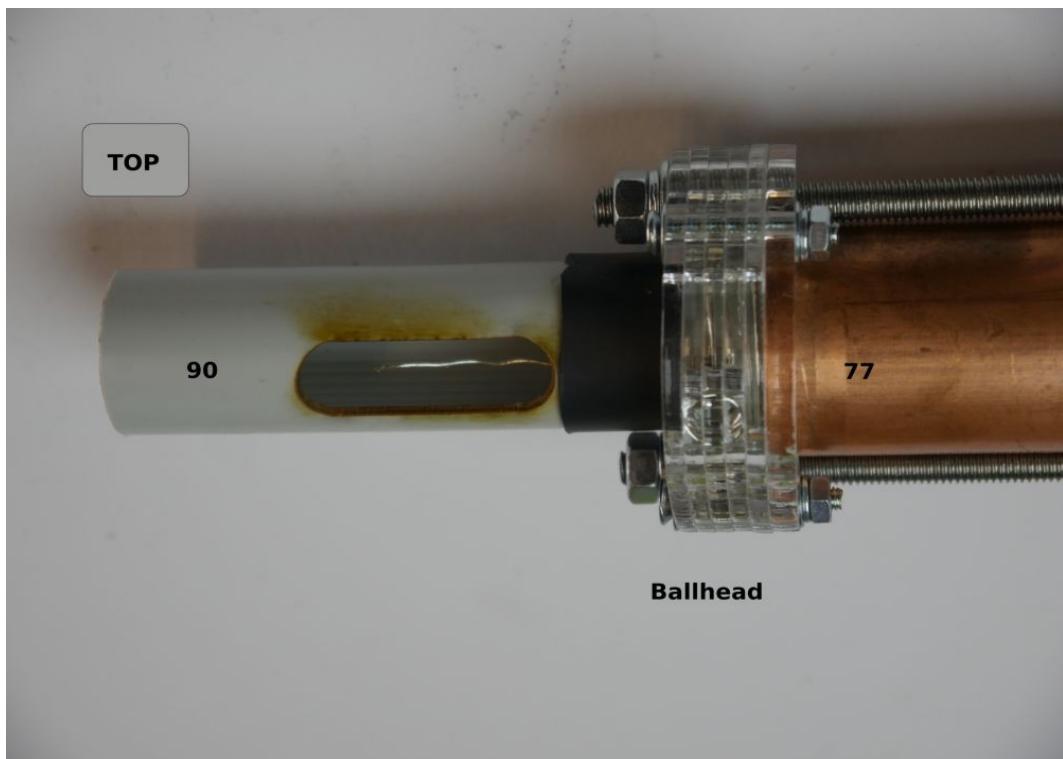


Manual_de

schieben Sie Teil 77 (Kupferhülse) über die Spule und montieren Sie den Kugelkopf „Ballhead“.

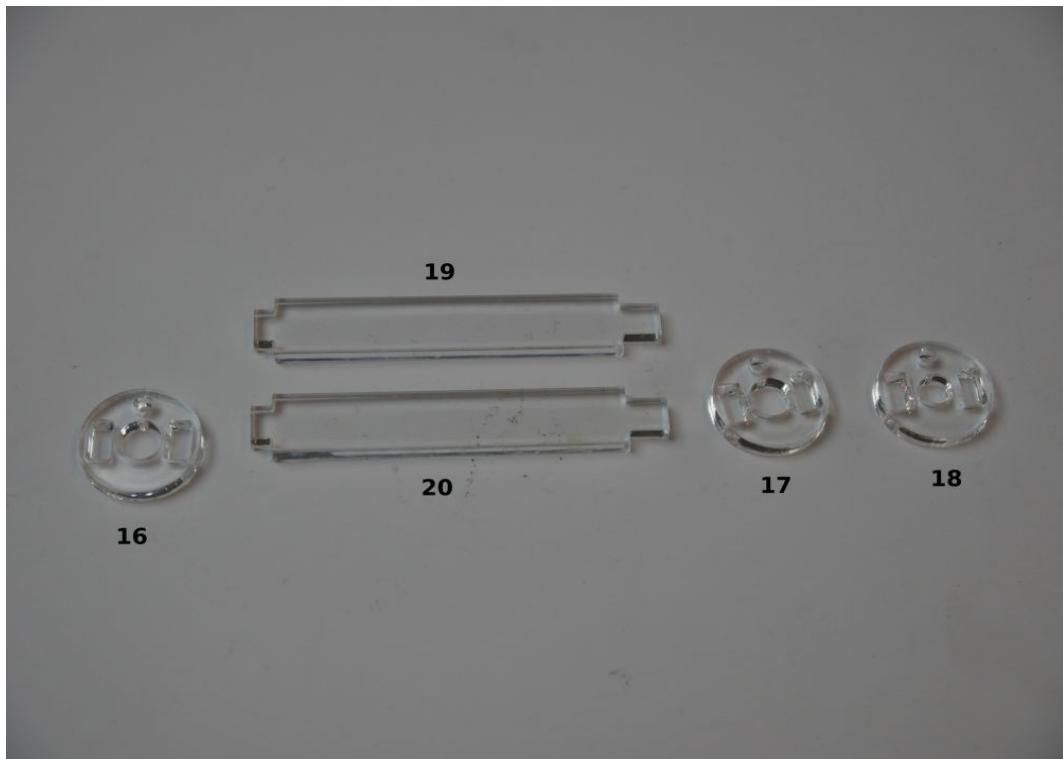


Sende Stab mit Kontakt Draht verbinden



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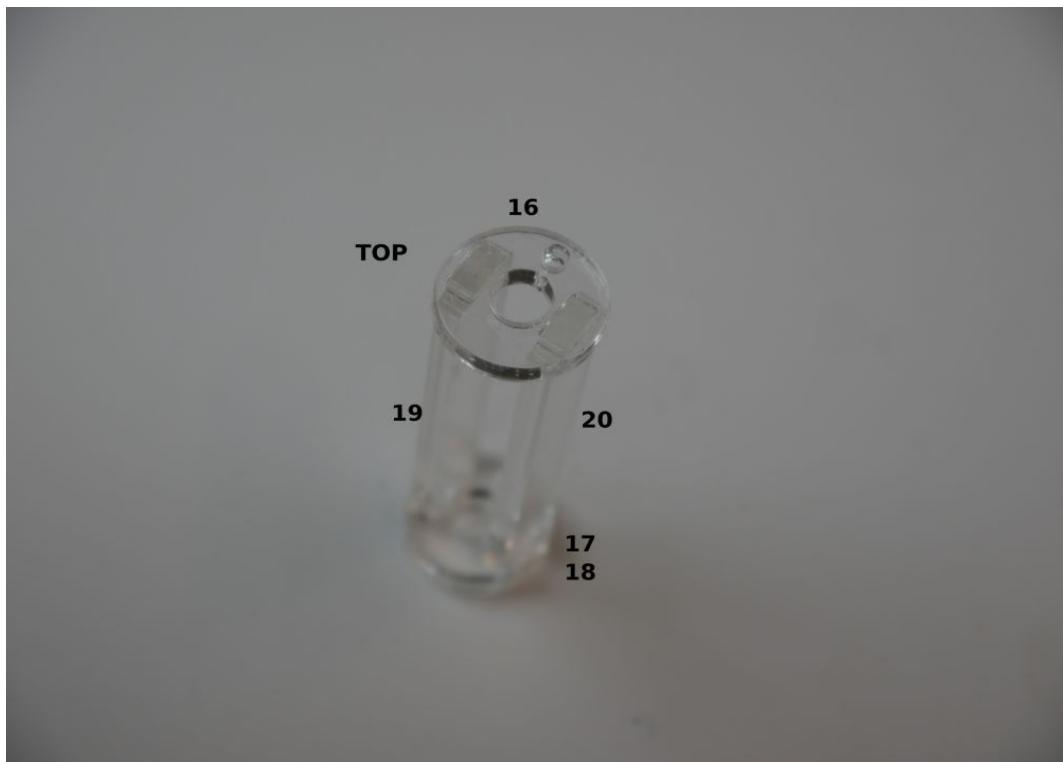
Teil 17, 18, 19, 20, 17 & 18 – sind bereits verklebt



installiere Teil 19 20 in 17 und 18 – falls sie noch nicht geklebt sind.



stapel 16 auf 19 & 20



Methylenchlorid Kleber – Achtung verwenden Sie eine Schutzbrille!

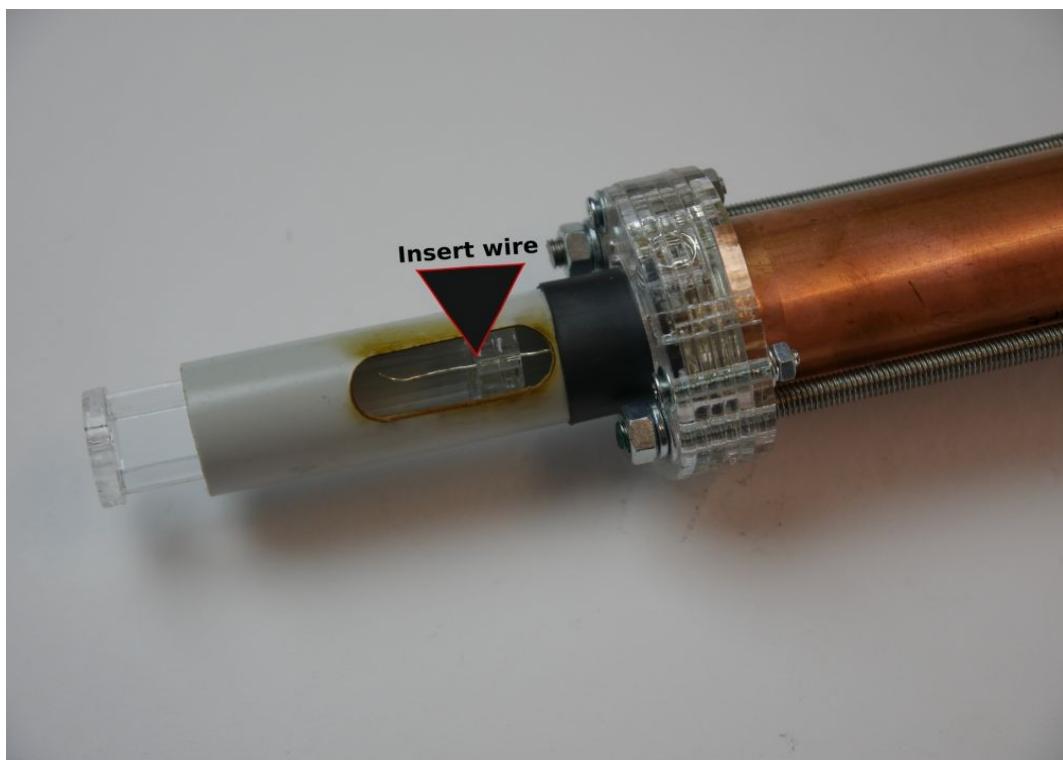


Manual_de

Schrumpfschrauch gehört auf die Oberseite der Spulenköpers wenn noch nicht installiert
Führen Sie den Strahlerhalter in den Spulenkörper ein.



Führe den Silver Draht in den Strahlerhalter durch das Loch.



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Stecke den Aluminium Stab in den Strahlerhalter.

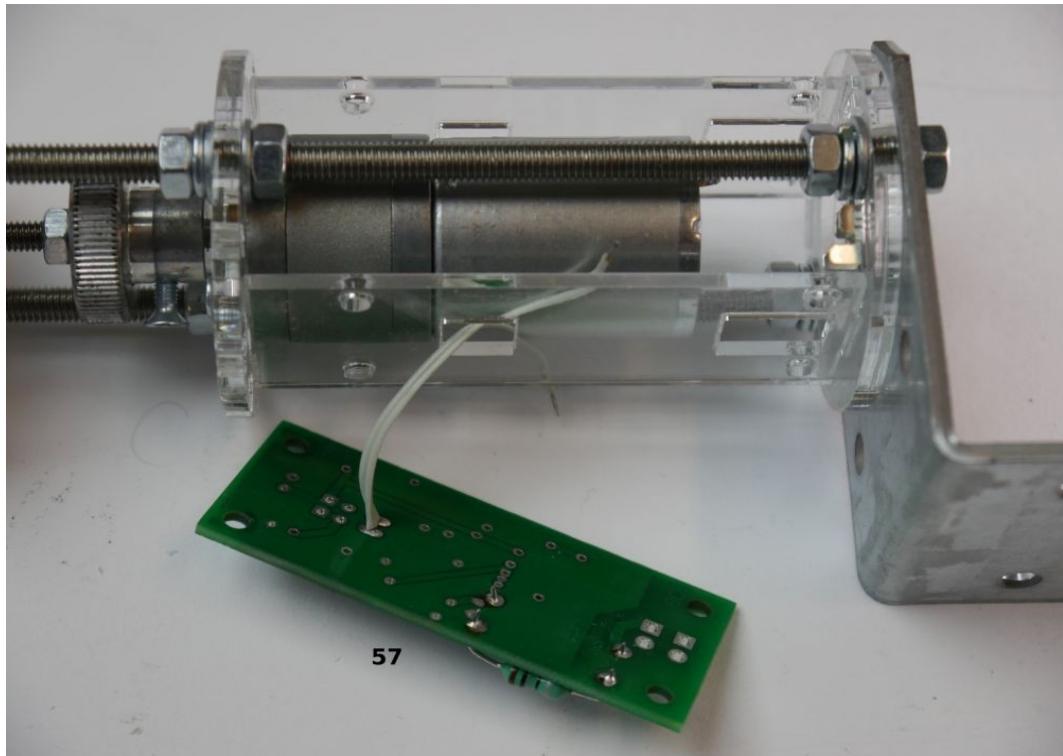


befestigen Sie den Silberdraht am Strahler mit einem Kabelbinder. Bei den neuen Strahlern ist ein Loch und dort wird der Silber Draht mit einer Schraube/Mutter befestigt.

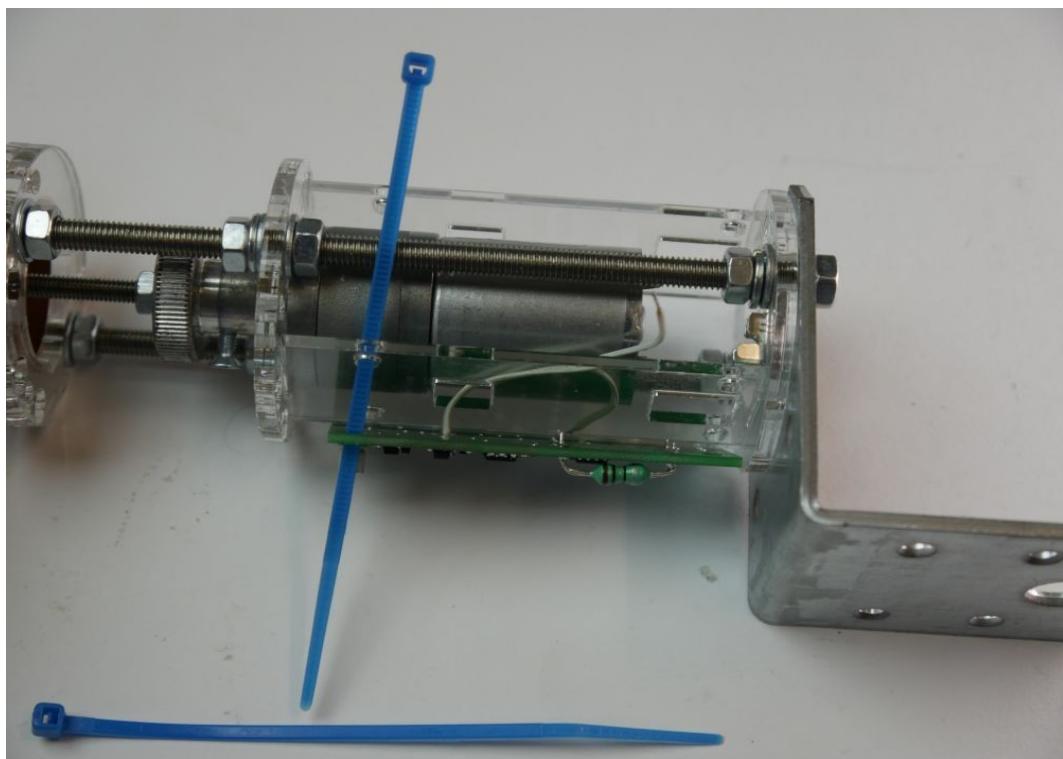


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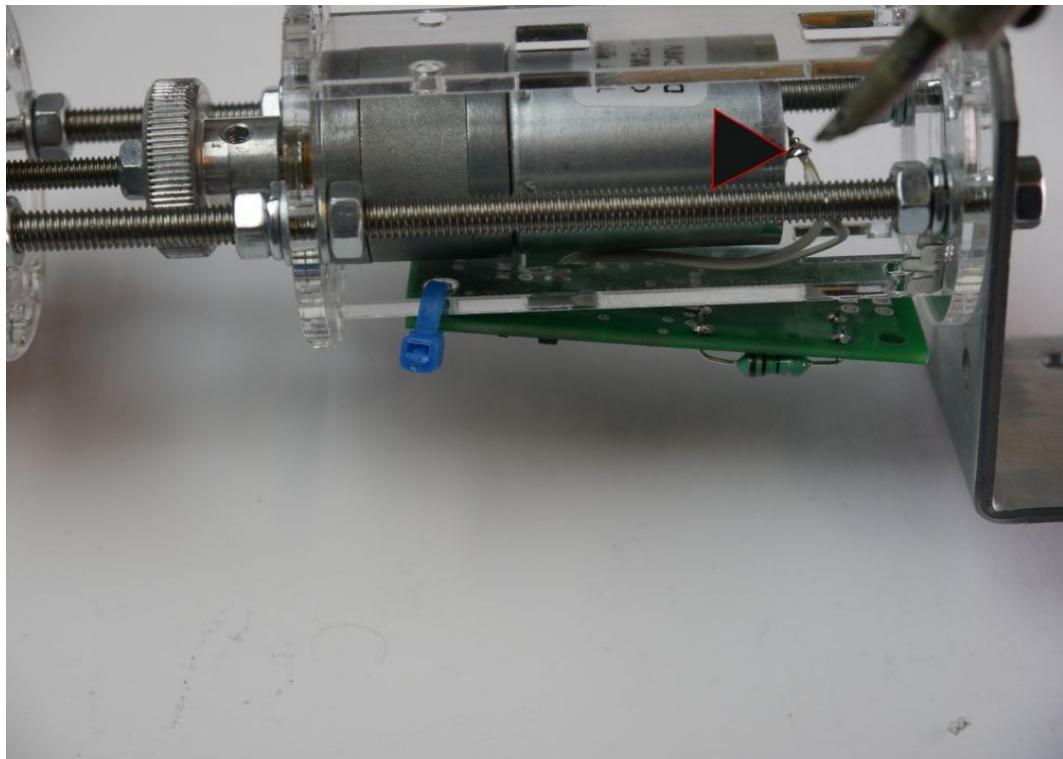
Installiere Motor Kontroller 57 mit Draht durch das Viereckloch so wie im Bild
Kontroller wird mit Kabelbinder befestigt.



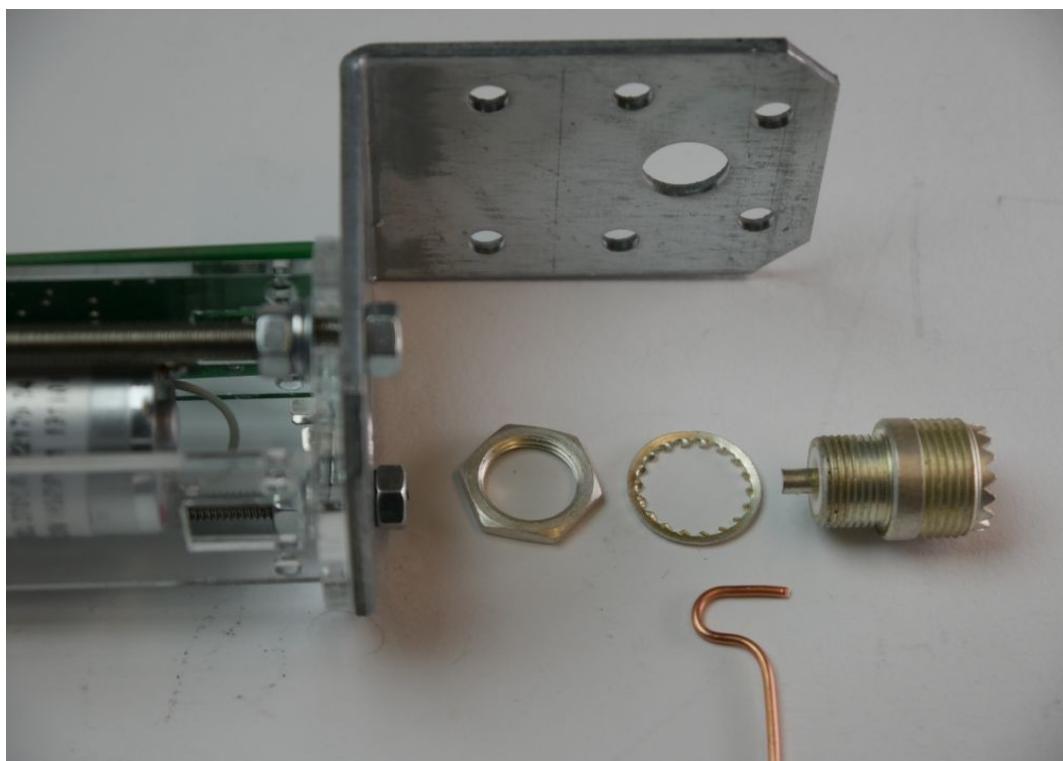
Motor Kontroller mit zwei Kabelbinder befestigen



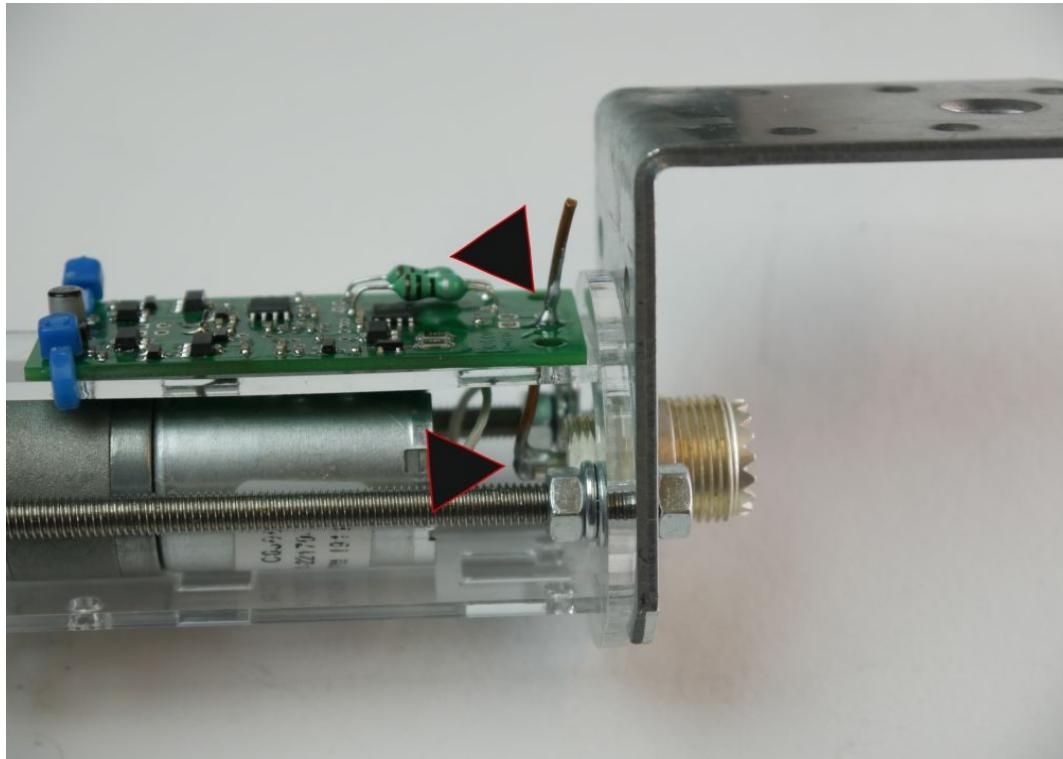
Löten Sie die Motorkabel an den Motor Pins Rot und Schwarz an.



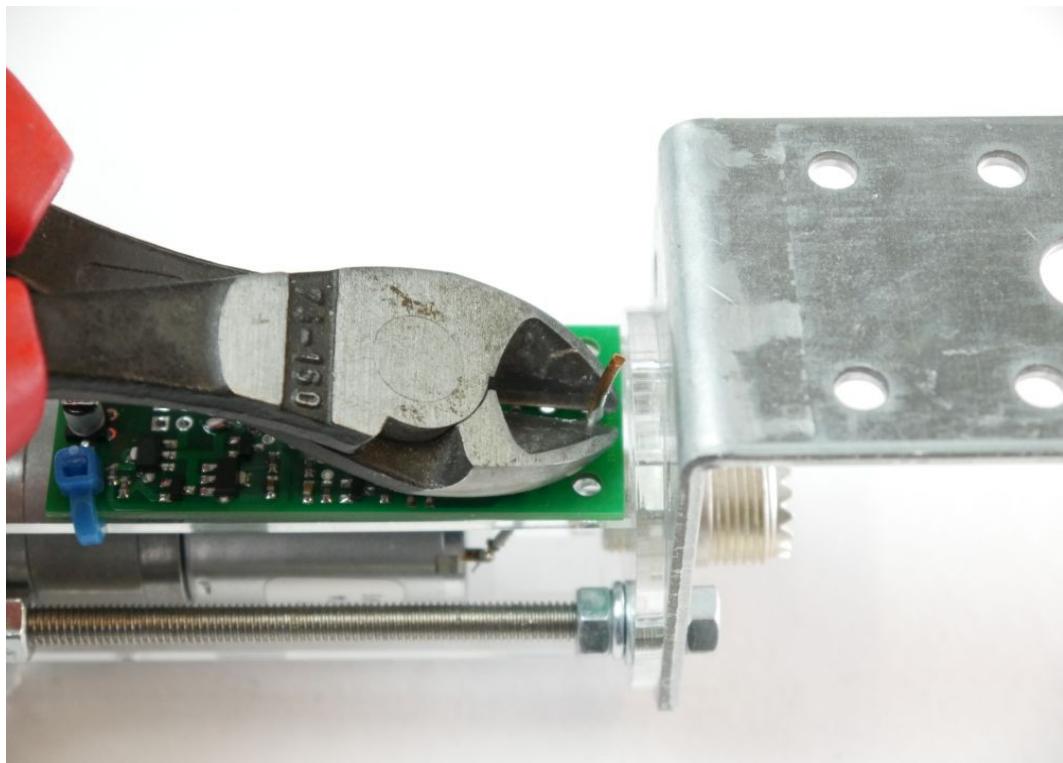
installiere Teil 91 - biege den Draht so wie im Bild denn das ist der Heiße Anschluss (HF-Signal).



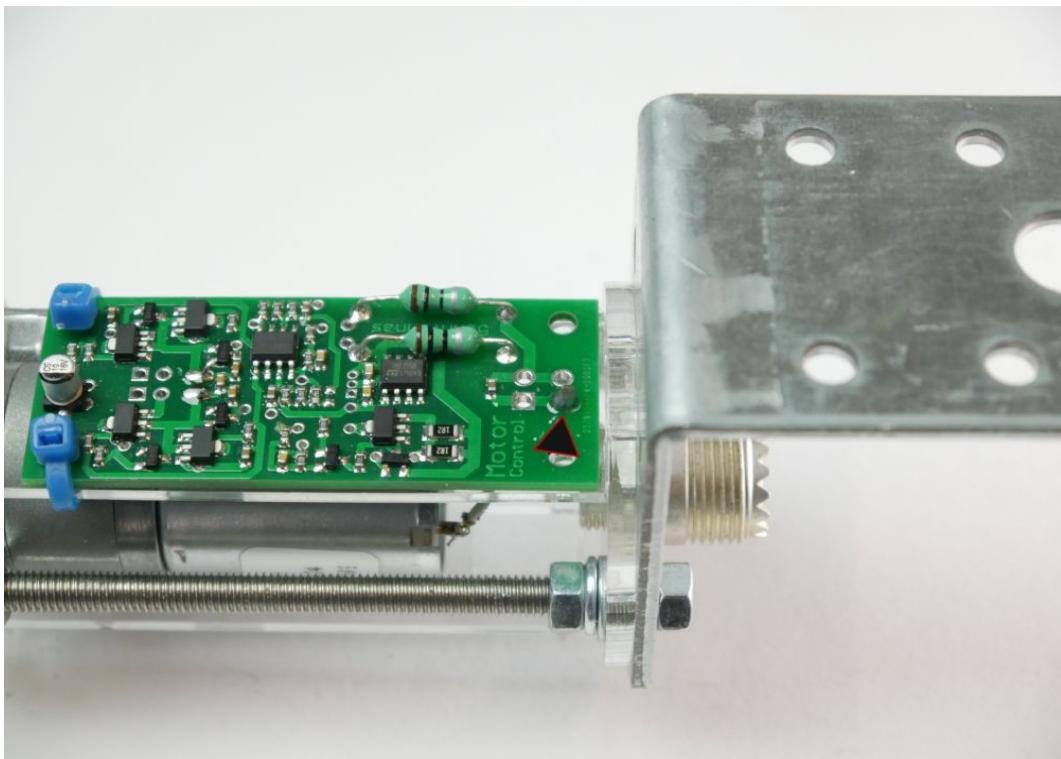
Löte den Mittel Pin HF-Buchse an den PCB VIERECKIGEN Pin an.



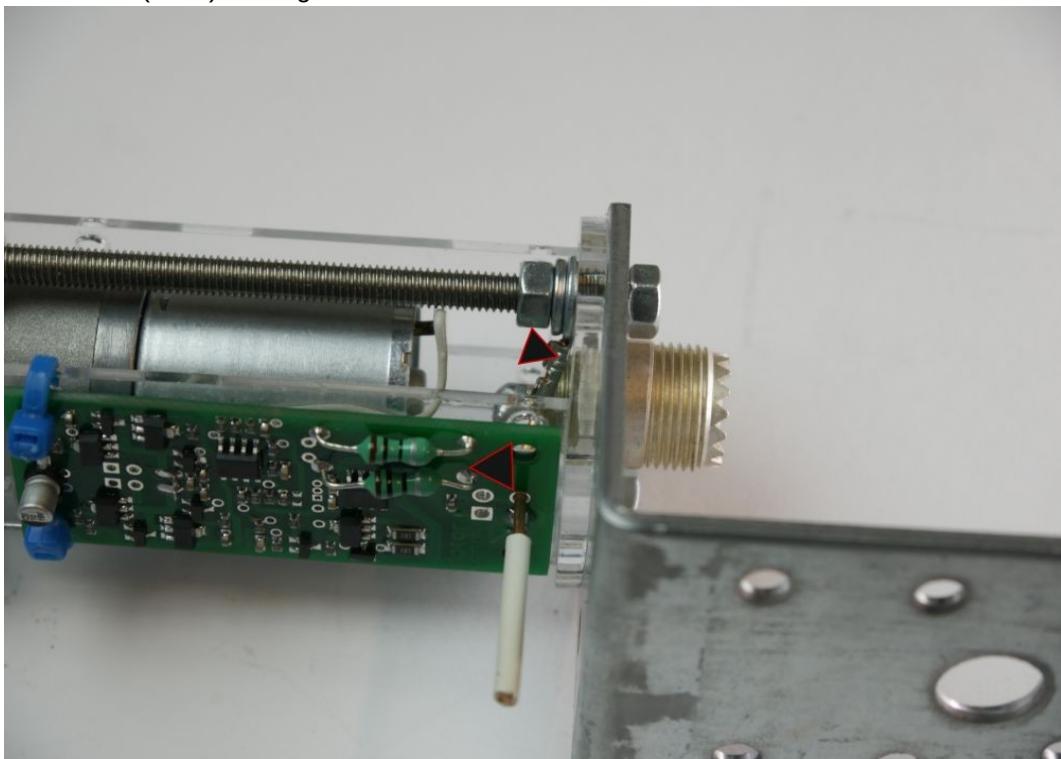
schneide den am VIERECK-Pin Überstehenden Draht mittels Seitenschneider ab.



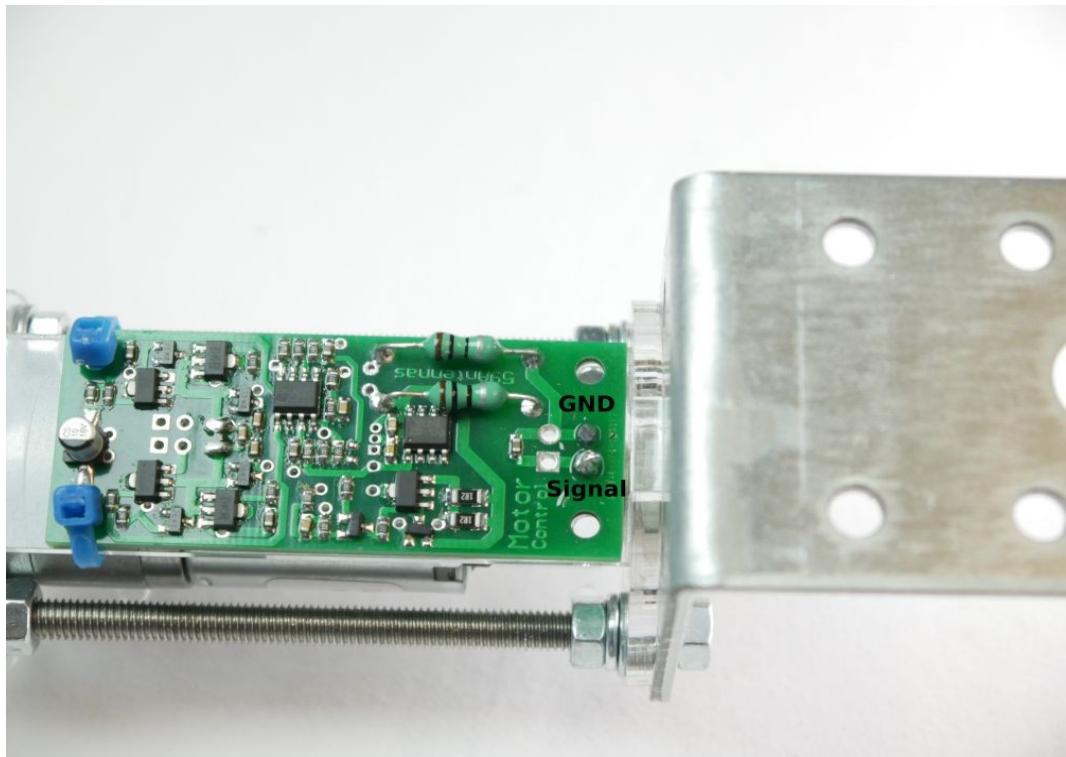
VIERECK-Pin



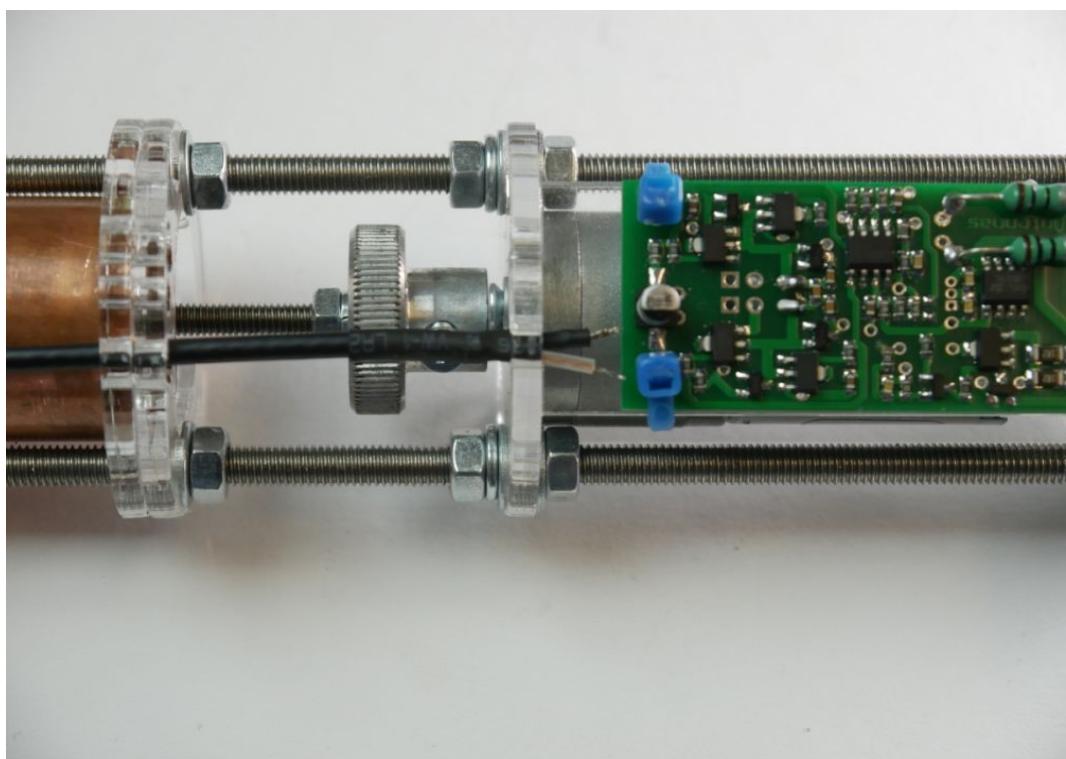
Löte den Ground (GND) mit einem Draht direkt am Ring der HF-Buchse an.
Die Masse (GND) muss gut verbunden sein!



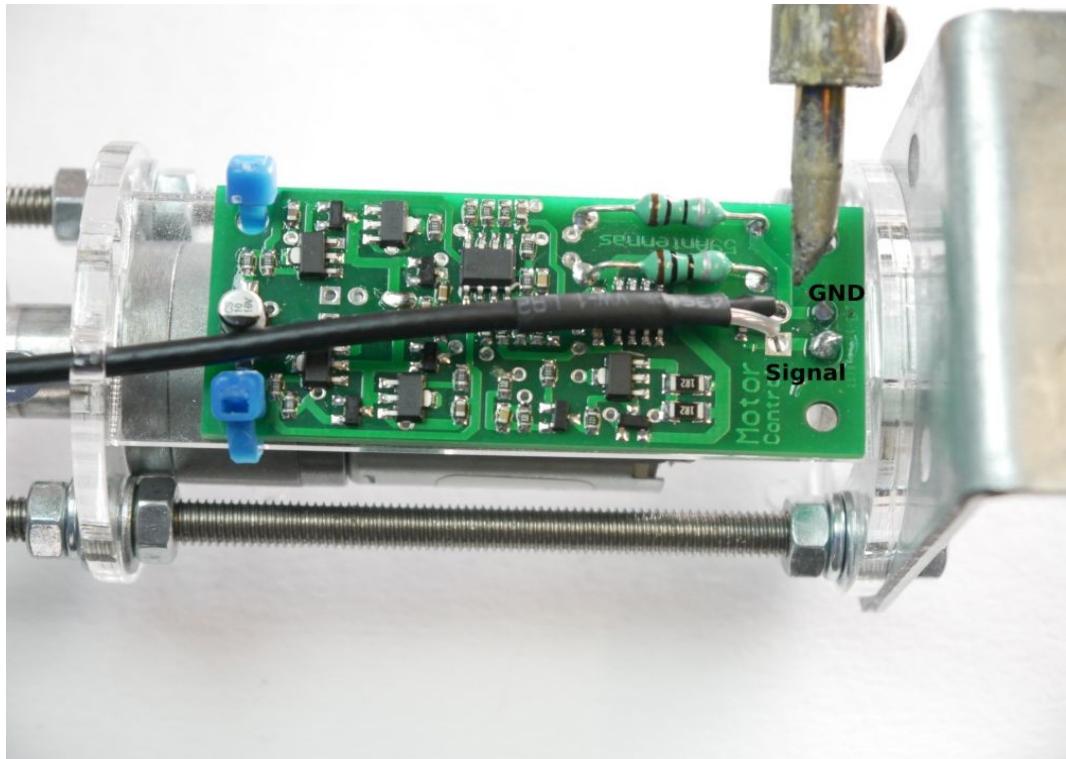
Verbindungs Punkte müssen so aussehen.



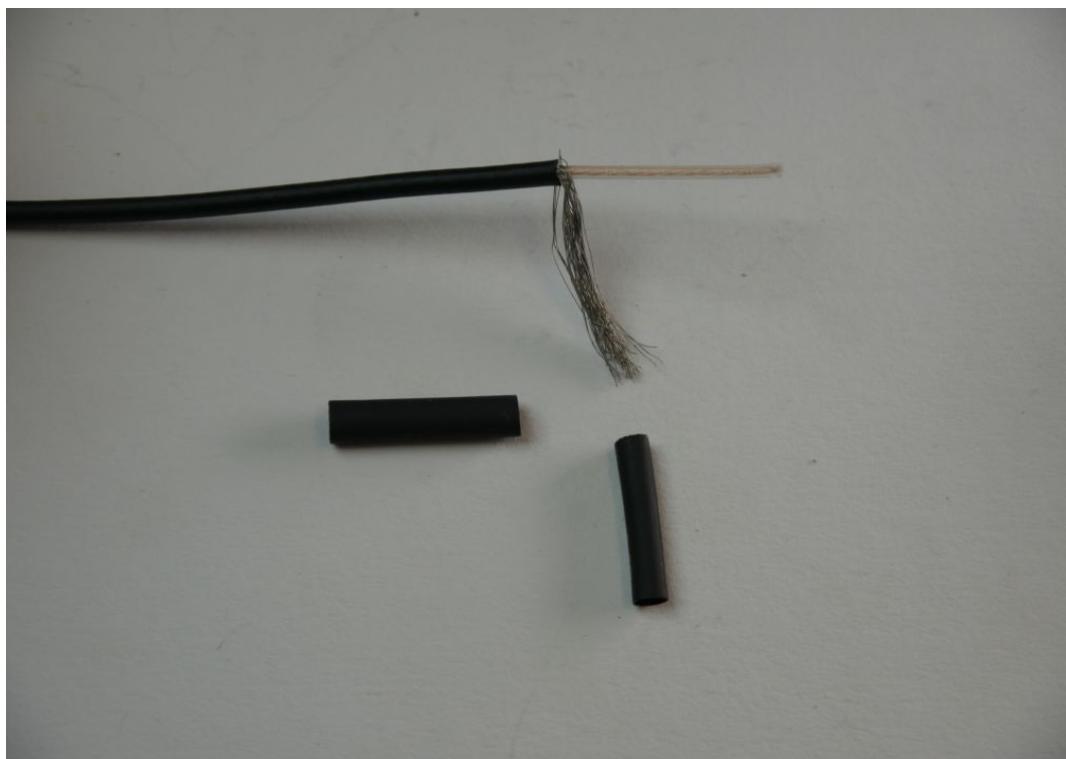
Fädel das Coax-Kabel durch die Löcher der Ringe durch.



Löte das Coax-Kabel so wie im Bild an - Viereck HF-Signal und Rund Masse (GND).



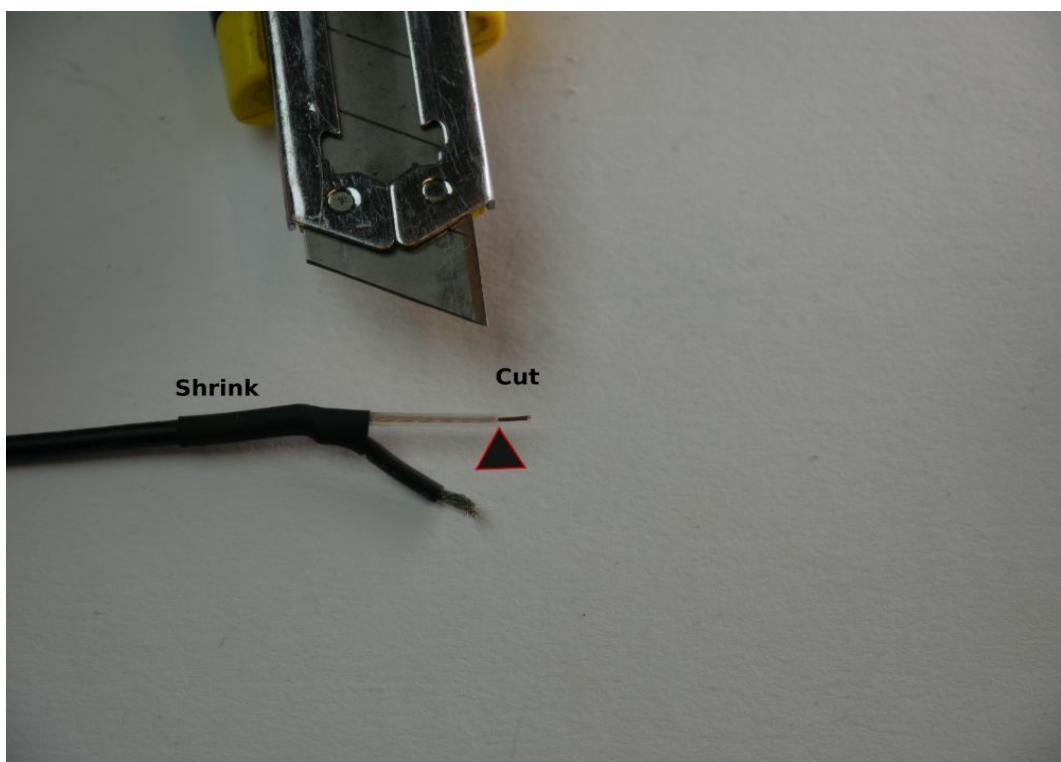
schneide die Ummantelung vom Coax-Kabel so wie im Bild (5cm) auf.



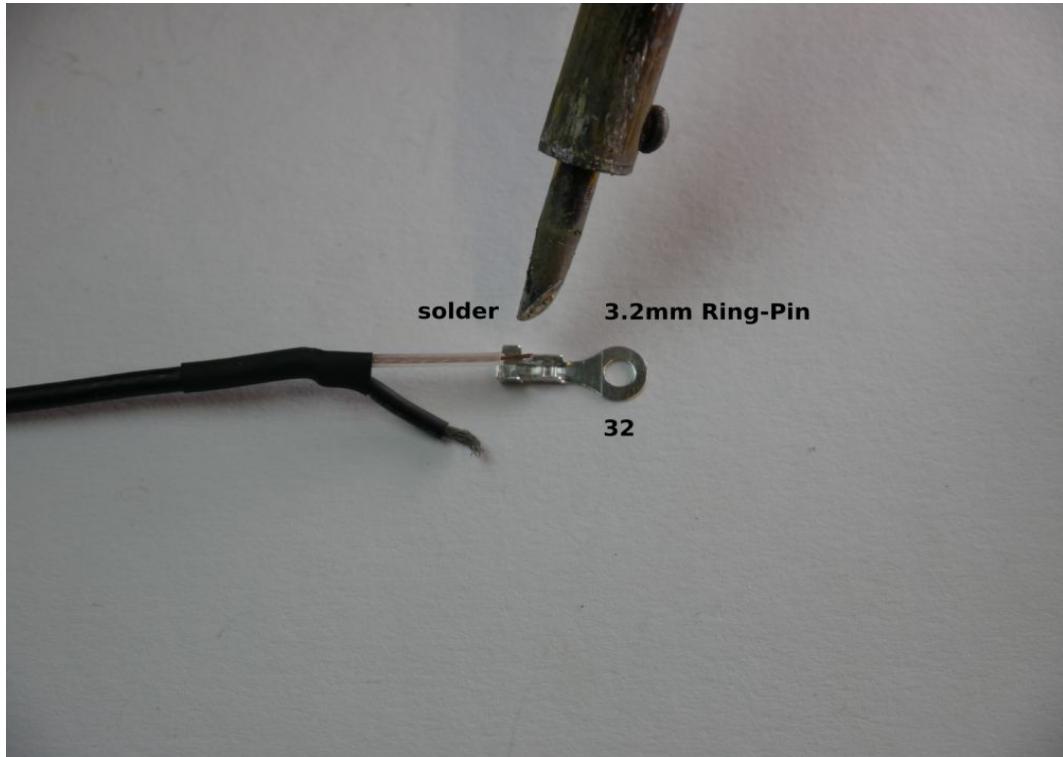
installiere den Schrumpf Schlauch und schrumpfe ihn mit Heißluft.



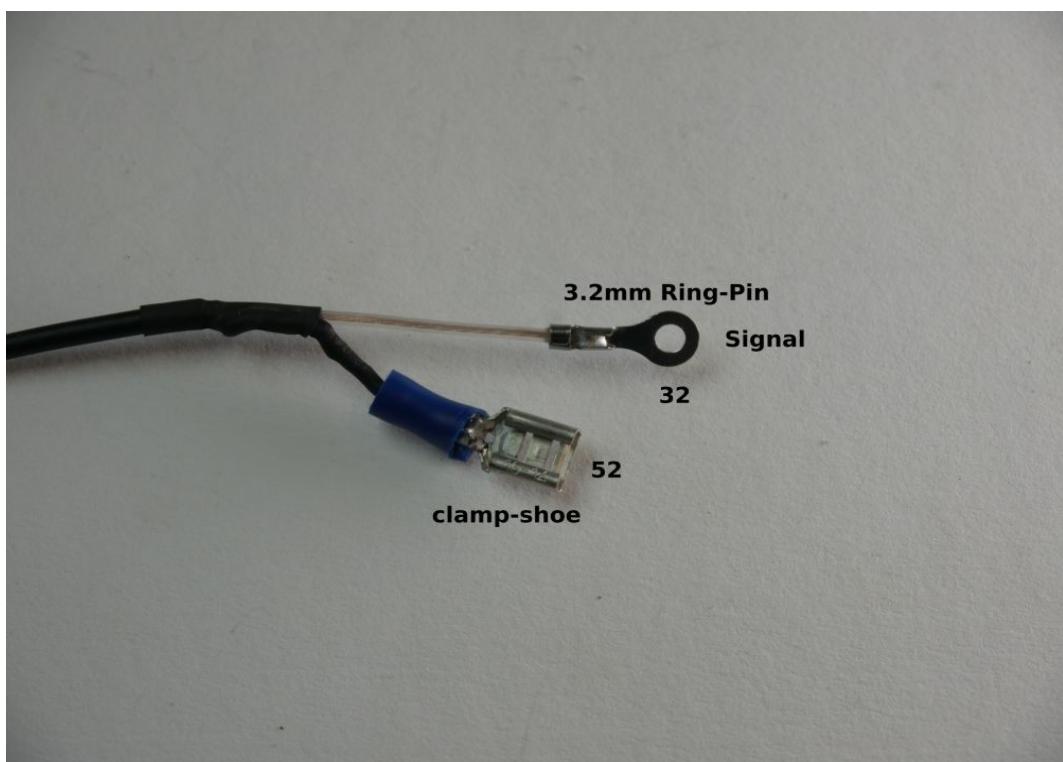
schneide den Innenteil auf so wie im Bild ca. 5mm



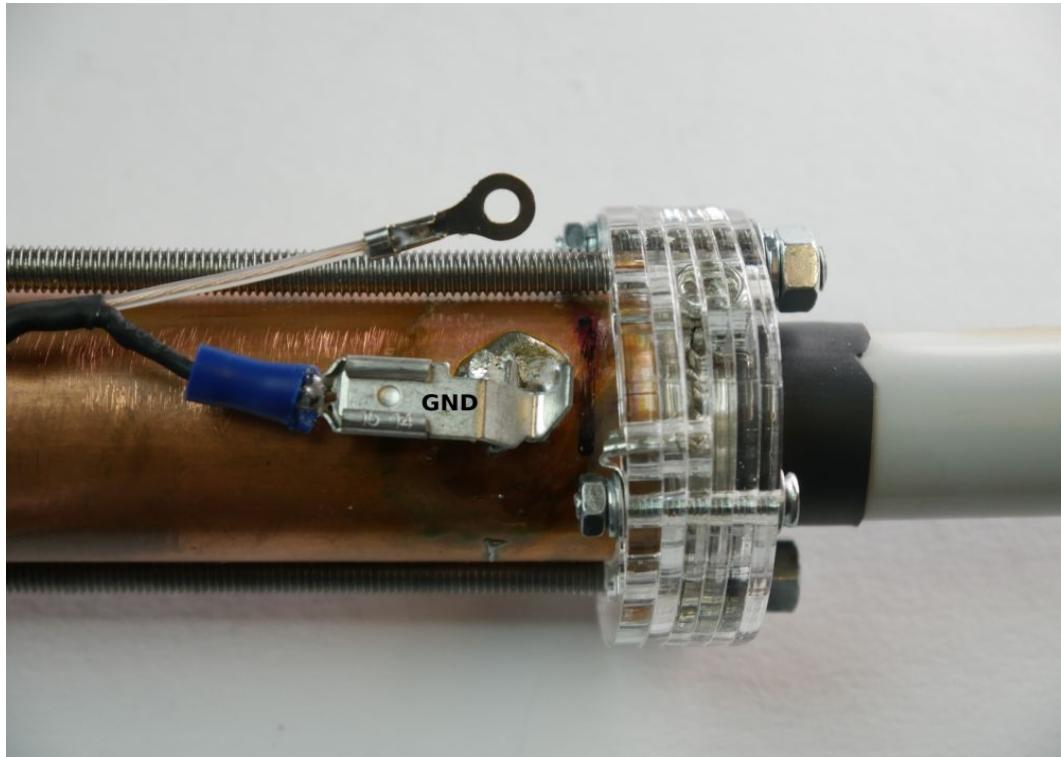
Löte den Teil 32 am Innenkabel an.



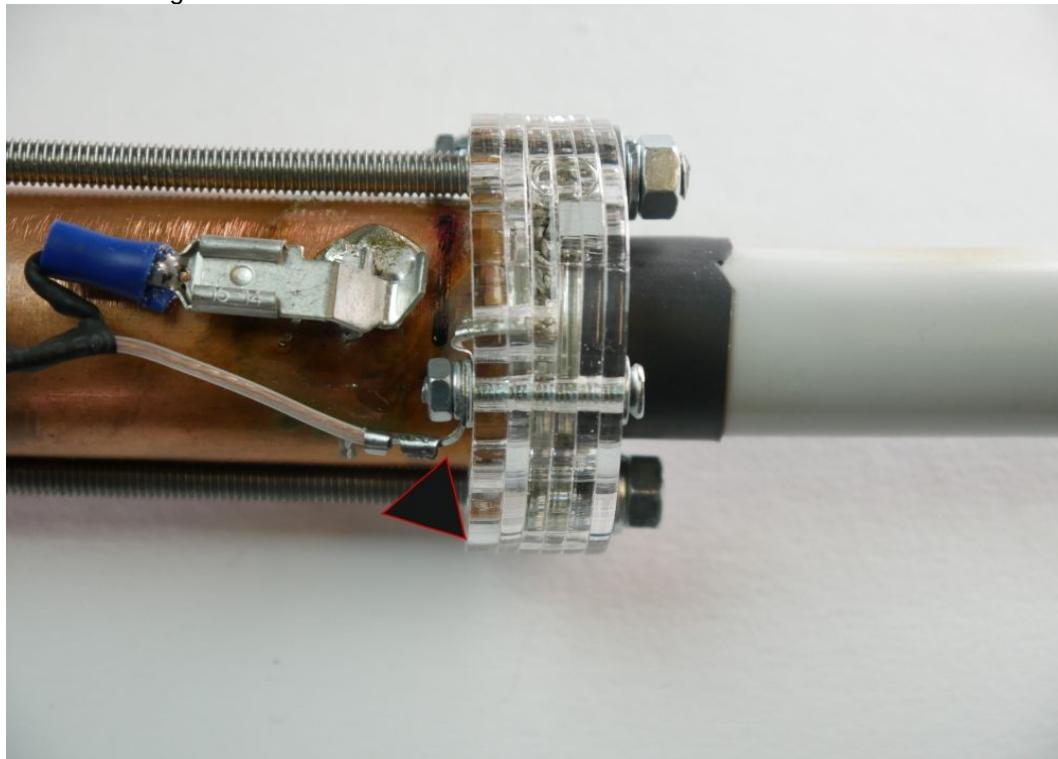
Löte oder krimpe den Klemm-Schuh 101 an der Masse (GND) an.



verbinde die Masse auf die Kupferröhre.



verbinde das HF-Kabel mit der Ballholder so das Signal übertragen wird. Es ist hier keine DC Isolation ein Kondensator können Sie nachrüsten wenn es stört das die Steuerspannung am Strahler anliegt.

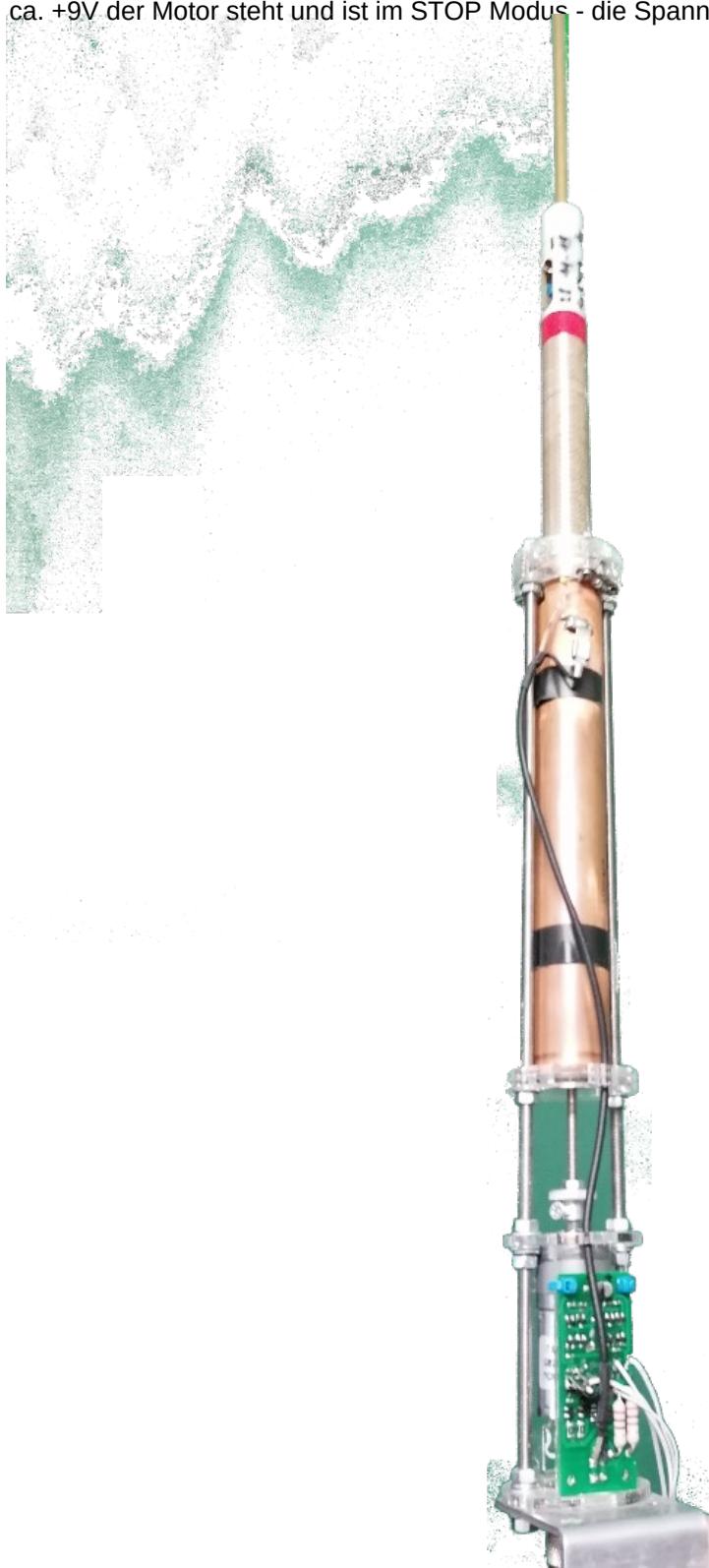


Beenden Sie den Aufbau der Motor-Antenne

Viele Optionen sind möglich z.B. man kann den Strahler mit einem Stab verlängern.

ACHTUNG - nur der Mittel-Pin ist für die Steuerung der Plus des Motors Achtung Polarität nicht v ca. +8V lässt den Motor nach unten fahren die Spule wird kürzer und die Frequenz steigt.

ca. +11Volt der Motor fährt nach oben die Spule wird länger und die Frequenz tiefer. - ca. 160m ca. +9V der Motor steht und ist im STOP Modus - die Spannung sollte anliegen da es die Referen



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Elektrische Verbindung über die Phantom Speisung auf der Spule!

 Injektion der Phantom Power in das Coax-Cable

 Operation-mode

Voltage(Volt)		direction up/stop/down	current (mA)
+13,8V	Center pin	motor move up	~160mA
+10,5V	Center pin	motor move up	~160mA
+9V	Center pin	stopped	~3mA for test coax-c
+8V	Center pin	motor move down	~160mA
0V	GND shield Coax		

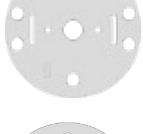
 Option-End-switch

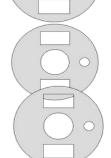
 man kann auch unterhalb einen End-Switch der wenn er gedrückt wird öffnet installieren

 Im Plan kann man nach lesen wo man die Unterbrechung macht für den End-Switch.

 Weiters gibt es auch ein Video in dem alles erklärt wird ich werde auch noch die Optionen
 für alle die Experimentieren wollen zeigen. Die Motor Antenne kann man an ein Fenster schrauben
 wenn man keine Kurzwellenmöglichkeit hat so wie ich – deshalb ist der DIY-Kit entstanden!

Manual_de

Number	Item	Type	thick	pcs
1	 Item 1	Ballholder Ring Top	2mm	1pcs
2	 Item 2	Ballholder Ring Upper	2mm	1pcs
3	 Item 3	Ballholder Ring Middle	2mm	1pcs
4	 Item 4	Ballholder Ring Wireout	2mm	1pcs
5	 Item 5	Ballholder Ring Bottom	2mm	1pcs
6	 Item 6	Copper Tube TOP	3mm	1pcs
7	 Item 7	Copper Tube Holder Bottom & Item 13 Ring Tube Bottom Hole=6mm, Dia=25mm	3mm	1pcs
8	 Item 8	Copper Tube Bottom & Item 14 Ring Nut Holder Tube (4mm Nut)=dia 7,9mm; Diameter 17,5mm	3mm	1pcs
9	 Item 9	Motor Top	3mm	1pcs
10	 Item 10	Motor Bottom & Item 15 17,5mm Hole 6mm	3mm	1pcs
11	 Item 11	Motor Side1	2mm	

12		Item 12	Motor Side2	2mm
13		Item 13	Ring inside item 7 ; 25mm; Hole 6mm	3mm
14		Item 14	Ring inside Item 8 ; M4- Nut holder 17,5mm	3mm
15		Item 15	Ring inside item 10 ; 17,5mm top; Hole 6mm	3mm
16		Item 16	Emitter (Strahler) top 5,8mm/17,5mm	3mm
17		Item 17	Emitter (Strahler) middle 5,8mm/17,5mm	3mm
18		Item 18	Emitter (Strahler) bottom 4,4mm/17,5mm	3mm
19		Item 19	Side part Motor	3mm
20		Item 20	Side part Motor	3mm
21		Item 21	Top inner Stabilizer 17mm; Hole 4,2mm	3mm
22,23,24, 25,26,27, 28,29,30, 31,32,33		Item 22-33	Nut M5 DIN934 ISO4032 1g	5mm
34		Item 34	Ring-Pin 3,2mm	3,2mm
35		Item 35	Wattlet Wire	
36,37,38, 39,40,41, 42,43,44, 45 46,47,48, 49,50,51		Item 36-45	Flat-Washer 5,4mm DIN125	5,2mm
		Item 46-51	Spring-Ring 5mm DIN127	5,2mm
52		Item 52	Clamp-shoe	
53		Item 53	threaded rod 5mm	36cm
54		Item 54	threaded rod 5mm	36cm
55		Item 55	threaded rod 4mm transport	26cm
56		Item 56	Motor Clutch 22/12mm	4mm

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57		Item 57	Motor-Controller Electronic	
58		Item 58	Gear DC-Motor 6V 24,5mm 69mm	
59,60		Item 59,60	Flat-Washer 3,2mm DIN125	3,2mm
61,62,63		Item 61,62,63	Skrew Flat-Heat cross 3.0x10mm DIN965	3mm
64		Item 64	Angle 90°	
65,66,67		Item 65,66,67	Skrew Flat-Head Cross 3.0 Item 65,66,67 x 20mm DIN965	
68,69,70		Item 68,69,70	Spring-Ring 3,2mm	
71,72,73, 74,75,76		Item 71,72,73,74,75,76	Flat-Washer 3,2mm Couper-Tube 28mm/26mm inner	
77		Item 77	Item 78,79,80 M4 Nut 0,6g DIN934	M4
82,83		Item 82,83	Flat-Washer 4,3mm DIN125	4,4mm
86,87		Item 86,87	Spring-Ring 4mm DIN127	4,2mm
90		Item 90	Coil Silver coated 0,6mm/28cm/20mm Dia Female front mount bulkhead RF connector solder 15,8mm inner, 15,8mm outer	28cm
91		Item 91	Item 92,93,94 M3 Hex-Nut DIN934 Metal-Ball 6mm 1pcs Brass	15,9mm
92,93,94		Item 92,93,94	M3	
95,96,97		Item 95,96,97	Item 95,96,97 & 2pcs Steel	6mm

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	Item 98,99,100	Spring 6mm	6,5x10m m
101 	Item 101	Ring-Pin 3,2mm	3,2mm

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Spring

F in Newton	$F(N) = d^2(mm) \cdot SM/D^3 (mm)$	Na	wire dia	Share modulus	Dia out
d in mm	Spring Force		d	SM SUS304	D outside mm
SM index	0,5 * 6,2 * 5		0,50	7000	6,20
D in mm	Feder aus Schachtel		0,50	7000	6,20
Na in turns	0,5 * 6,2 * 6		0,50	7000	6,20
	0,5 * 6,2 * 6,5		0,50	7000	6,20
	0,5 * 6,2 * 7		0,50	7000	6,20
	0,6 * 6,2 * 4,5		0,60	7000	6,20
	0,6 * 6,2 * 5		0,60	7000	6,20
	0,6 * 6,2 * 5,5		0,60	7000	6,20
	0,6 * 6,2 * 6		0,60	7000	6,20
	0,6 * 6,2 * 6,5		0,60	7000	6,20
	0,6 * 6,2 * 7		0,60	7000	6,20

Spring

Dia media	Na windings	Newton
D median	Na	Force
5,70	5,00	1,89
5,70	5,50	1,72
5,70	6,00	1,57
5,70	6,50	1,45
5,70	7,00	1,35
5,60	4,50	3,19
5,60	5,00	2,87
5,60	5,50	2,61
5,60	6,00	2,39
5,60	6,50	2,21
5,60	7,00	2,05