



UNIVERSITAT POLITÈCNICA DE CATALUNYA
BARCELONATECH

Escola Superior d'Enginyeries Industrial,
Aeroespacial i Audiovisual de Terrassa



Design of a launch system for a scientific fix wing UAV without undercarriage

Document:

Drawings

Author:

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Director /Co-director:

Montserrat Sánchez / Joan Montanyà

Degree:

Electrical + Mechanical Engineering Degree

Convocatòria:

Spring

FINAL DEGREE PROJECT

Drawings Index

Assembly Drawings

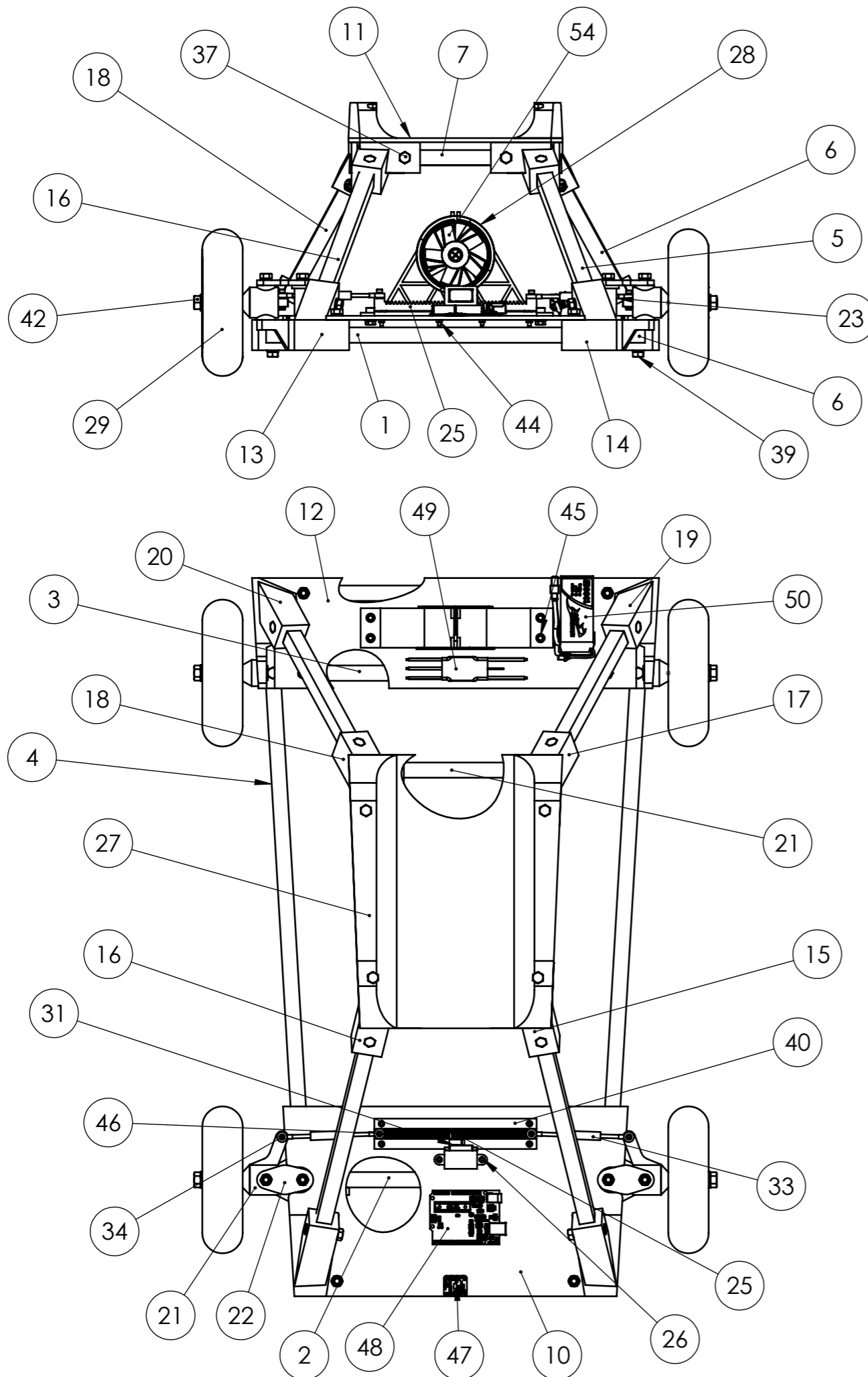
Drawing Name	Drawing Code
Material List	C1-00a
Exploded View	C1-00b

Standard Parts


Ball Bearings MR126ZZ DIN 625
Allen Bolt DIN 912 M3x0,5 L=10
Allen Bolt DIN 912 M5x0,5 L=12
Hexagon Head Bolt M6 x 30 DIN EN 24017
Hexagon Head Bolt M6 x 50 DIN EN 24017
Hexagon Head Bolt M8 x 160 DIN EN 24017
Hexagon Nuts DIN 934 M3
Hexagon Nuts DIN 6923 M5
Hexagon Nuts DIN 934 M6
Hexagon Nuts DIN 934 M8
Flat Washer DIN 125 – A 3.2
Flat Washer DIN 125 – A 6.3
Flat Washer DIN 125 – A 8.4

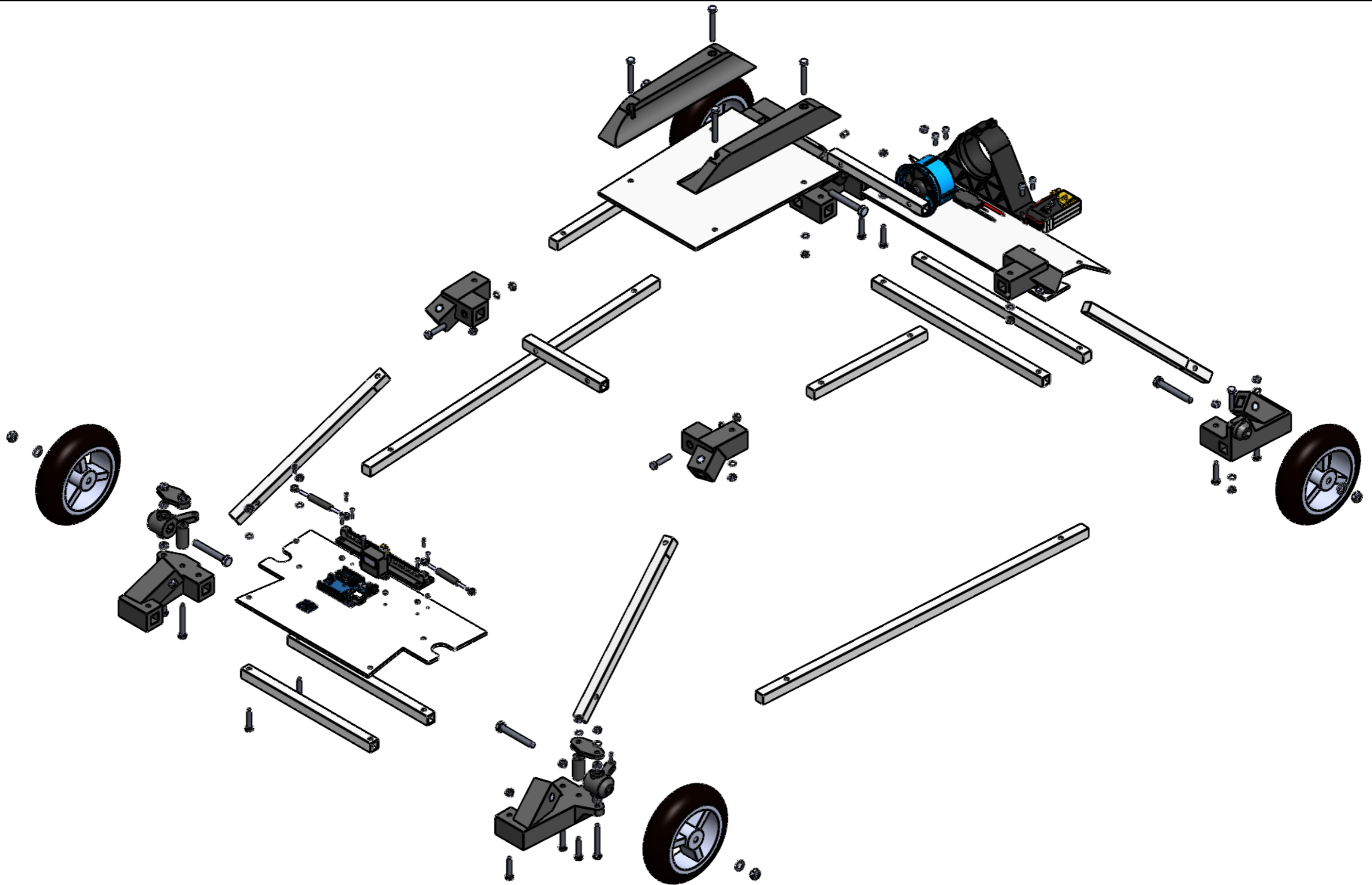
Non-Standard Parts


Drawing Name	Drawing Code
Bars	C1-01
Bases	C1-02
Joints 1,2	C1-03
Joints 3, 4, 5, 6	C1-04
Joints 7, 8	C1-05
Steering System	C1-06
Supports	C1-07



Nº	ELEMENT	MATERIAL	QUANTITY
1	Bar 1	Aluminum	1
2	Bar 2	Aluminum	1
3	Bar 3	Aluminum	2
4	Bar 4	Aluminum	2
5	Bar 5	Aluminum	2
6	Bar 6	Aluminum	2
7	Bar 7	Aluminum	1
8	Bar 8	Aluminum	1
9	Bar 9	Aluminum	2
10	Base 1	PMMA	1
11	Base 2	PMMA	1
12	Base 3	PMMA	1
13	Joint 1	PETG	1
14	Joint 2	PETG	1
15	Joint 3	PETG	1
16	Joint 4	PETG	1
17	Joint 5	PETG	1
18	Joint 6	PETG	1
19	Joint 7	PETG	1
20	Joint 8	PETG	1
21	Steering 1	PETG	2
22	Steering 2	PETG	2
23	Steering 3	PETG	2
24	Rack	PETG	1
25	Pinion	PETG	1
26	Servo Support	PETG	1
27	UAV Support	PETG	2
28	Ducted Fan Support	PETG	1
29	Wheel	Rubber	4
30	Gasket_12x6x4	Stainless Steel	4
31	Tower-Pro-MG90S	Stainless Steel	1
32	din_en_24017_m8x60	Stainless Steel	4
33	DollyV10_Steering-Bar	Steel	2
34	din_912-m3x0_5-10-8_8	Stainless Steel	4
35	07210-103	Stainless Steel	4
36	din125-1-a_3_2-140_hv	Stainless Steel	2
37	din_en_24017_m6x30	Stainless Steel	23
38	din_433-2_6_4_300_hv	Stainless Steel	29
39	tuerca_din934_m6-6	Stainless Steel	30
40	din_912-m3x0_5-12-8_8	Stainless Steel	6
41	din125-1-a_8_4-140_hv	Stainless Steel	4
42	tuerca_din934_m8-6	Stainless Steel	4
43	din_en_24017_m6x50	Stainless Steel	7
44	07210-03	Stainless Steel	6
45	din_912-m5x0_8-12-8_8	Stainless Steel	4
46	tuerca_din_6923-m5x0_8-8	Stainless Steel	4
47	LSM303DLHC - Pins + Text	-	1
48	arduino uno	-	1
62	Ducted Fan	-	1
49	30A ESC	-	1
50	tattu 1300MHa 3s LiPo	-	1

 Escola Superior d'Enginyeries Industrial, Aeroespacial i Audiovisual de Terrassa ESEIAAT	Project name:	DOLLY	A3	Name:	Surroca Garcia, Aleix		
	Drawing name:	Material List			Est.sup.UNE 1037 / Tol.gral.ISO 2768-m / Tol.geom.ISO 2768-2-K		
	Drawing code:	C1-00a	Scale:	1 : 5	Date:	09/06	Calification:

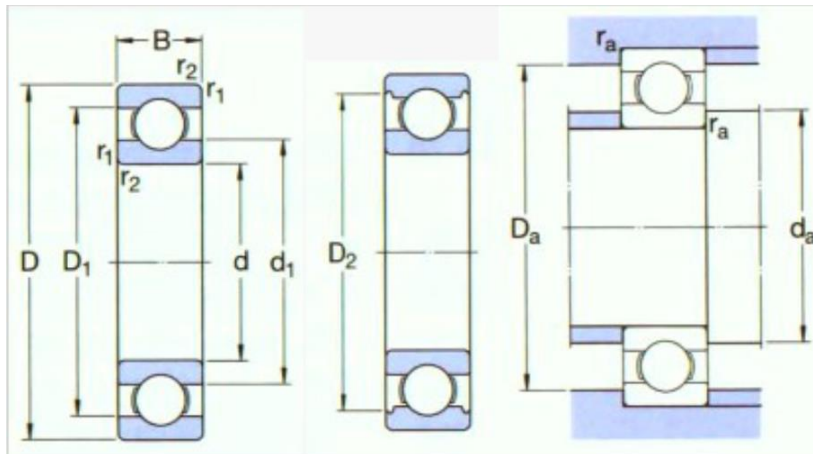


 Escola Superior d'Enginyeries Industrial, Aeroespacial i Audiovisual de Terrassa ESEIAAT	Project name:	DOLLY	A3	Name : Surroca Garcia, Aleix		
	Electrical + Mechanical Degree	Drawing name:	Exploded View		Est.sup.UNE 1037 / Tol.gral.ISO 2768-m / Tol.geom.ISO 2768-2-K	
	Drawing code:	C1-00b	1 : 5	09/06	Calification:	

Standard Parts

Ball Bearings MR126ZZ DIN 625

Product specifications	
Material	Chrome-plated Steel 52100
Brand	Fushibearing
Reference	Mr126ZZ
Rule	DIN 625



Principal dimensions (mm)

d :	6
D :	12
B :	3
B1 :	4
r(min) :	0.2

Allen Bolt DIN 912 M3x0,5 L=10

Rule	DIN 912
Designation	Allen Bolt DIN 912 – M3x0,5 – 10 – 8,8
Reference	DIN 912 – dM3 x p 0,5 – l10 – 8,8
Material	Steel

Allen Bolt DIN 912 M5x0,5 L=12

Rule	DIN 912
Designation	Allen Bolt DIN 912 – M5x0,5 – 12 – 8,8
Reference	DIN 912 – dM5 x p 0,5 – l12 – 8,8
Material	Steel

Hexagon Head Bolt M6 x 30 DIN EN 24017

Rule	DIN EN 24017
Designation	Hexagon Head Bolt DIN EN 24017 – M6 x 30
Reference	DIN EN 24017 – d M6 x l30
Material	Steel

Hexagon Head Bolt M6 x 50 DIN EN 24017

Rule	DIN EN 24017
Designation	Hexagon Head Bolt DIN EN 24017 – M6 x 50
Reference	DIN EN 24017 – d M6 x l50
Material	Steel

Hexagon Head Bolt M8 x I60 DIN EN 24017

Rule	DIN EN 24017
Designation	Hexagon Head Bolt DIN EN 24017 – M8 x 60
Reference	DIN EN 24017 – d M8 x I60
Material	Steel

Hexagon Nuts DIN 934 M3

Rule	DIN 934
Designation	Hexagon Nut DIN 934 – M3
Reference	07210-103
Material	Stainless Steel

Hexagon Nuts DIN 934 M6

Rule	DIN 934
Designation	Hexagon Nut DIN 934 – M6
Reference	DIN 934 . M6-6
Material	Stainless Steel

Hexagon Nuts DIN 934 M8

Rule	DIN 934
Designation	Hexagon Nut DIN 934 – M8
Reference	DIN 934 . M8-6
Material	Stainless Steel

Hexagon Nuts DIN 6923 M5

Rule	DIN 6923
Designation	Hexagon Nut DIN 6923 – M5
Reference	DIN 934 . M5-6
Material	Stainless Steel

Flat Washer DIN 125 – A 3.2

Rule	DIN 125-1
Designation	Flat Washer DIN 125-1- A 3.2
Material	Stainless Steel

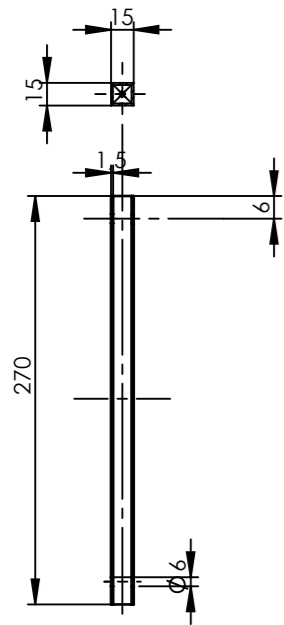
Flat Washer DIN 125 – A 6.3

Rule	DIN 125-1
Designation	Flat Washer DIN 125-1- A 6.3
Material	Stainless Steel

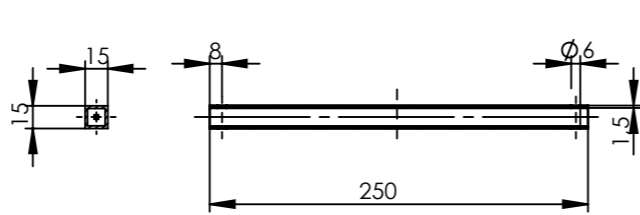
Flat Washer DIN 125 – A 8.4

Rule	DIN 125-1
Designation	Flat Washer DIN 125-1- A 8.4
Material	Stainless Steel

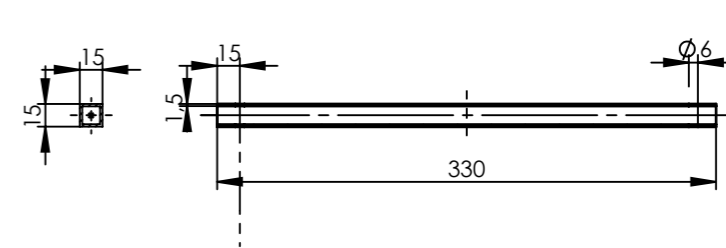
02 - Bar 2 $\nabla N8$



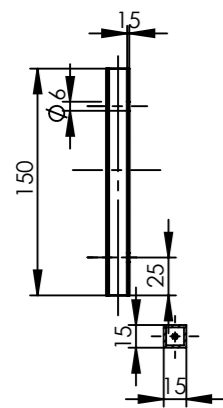
01 - Bar 1 $\nabla N8$



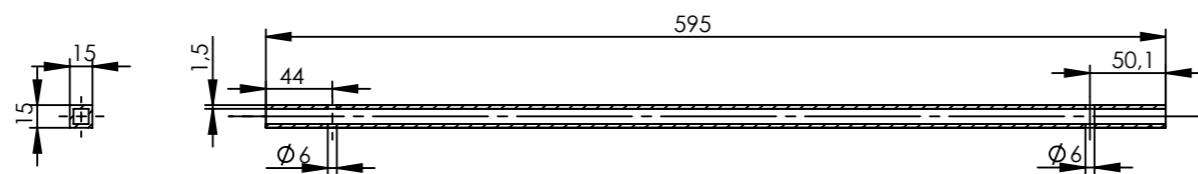
03 - Bar 3 $\nabla N8$



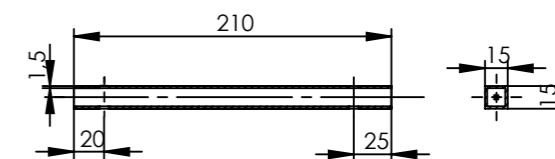
05 - Bar 5 $\nabla N8$



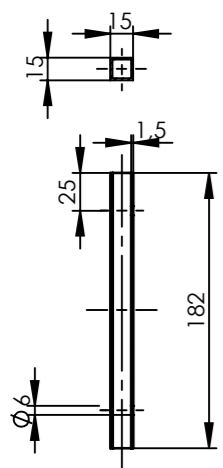
04 - Bar 4 $\nabla N8$



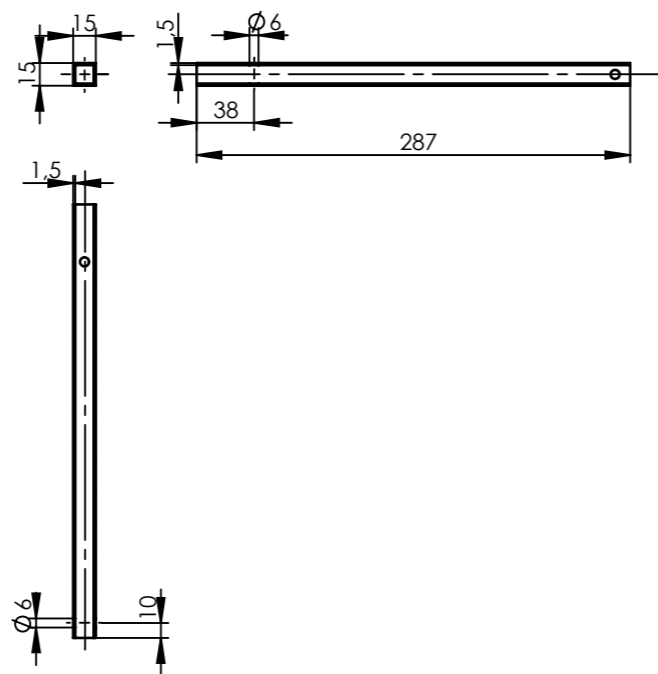
07 - Bar 7 $\nabla N8$



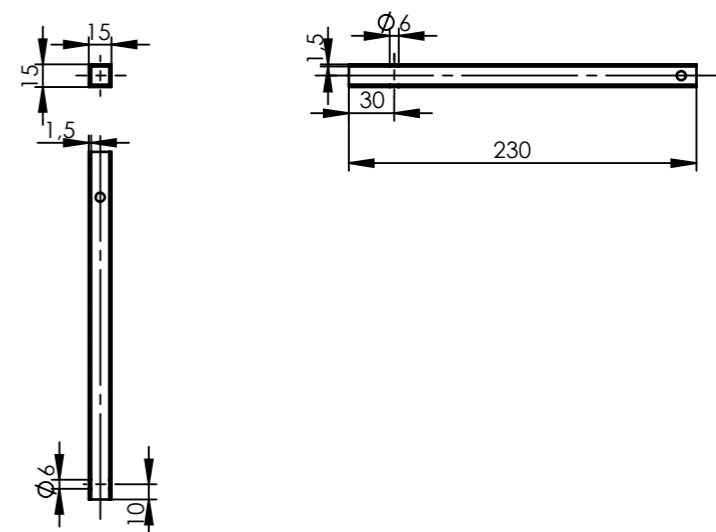
06 - Bar 6 $\nabla N8$




08 - Bar 8 $\nabla N8$

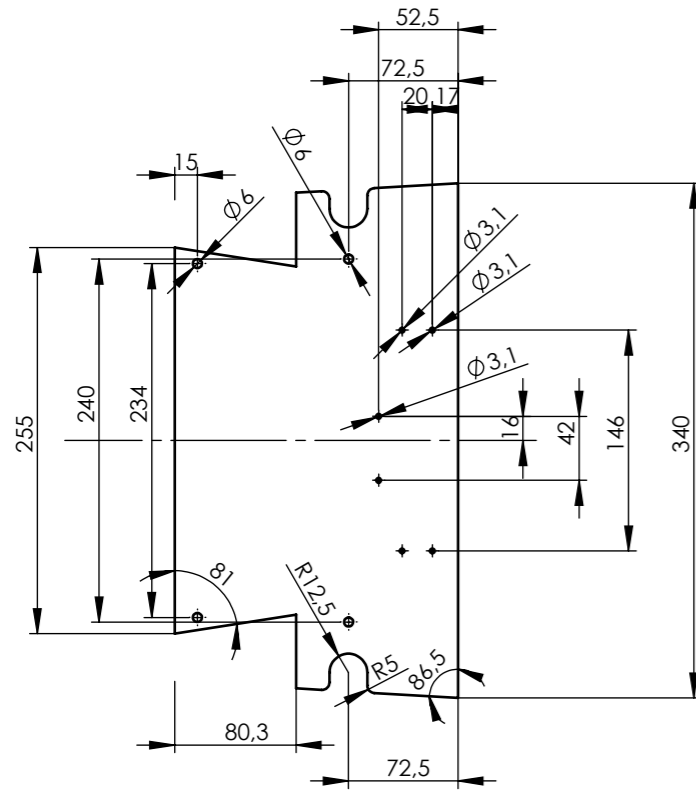
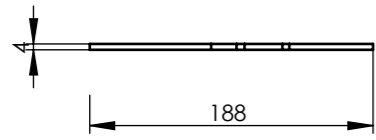


09 - Bar 9 $\nabla N8$

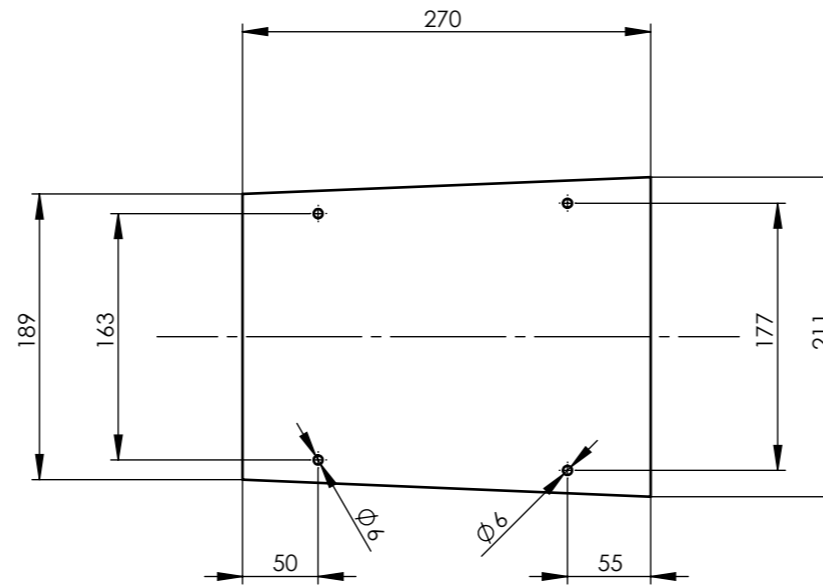
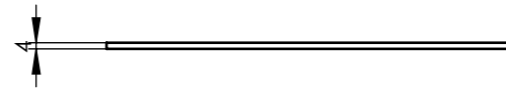


 Escola Superior d'Enginyeries Industrial, Aeroespacial i Audiovisual de Terrassa ESEIAAT	Project name:	DOLLY	A3	Name :		Surroca Garcia, Aleix	
	Electrical + Mechanical Degree	Drawing name:	Bars		Est.sup.UNE 1037 / Tol.gral.ISO 2768-m / Tol.geom.ISO 2768-2-K		
	Drawing code:	C1-01		Scale:	1 : 10	Date:	06/09
						Calification:	

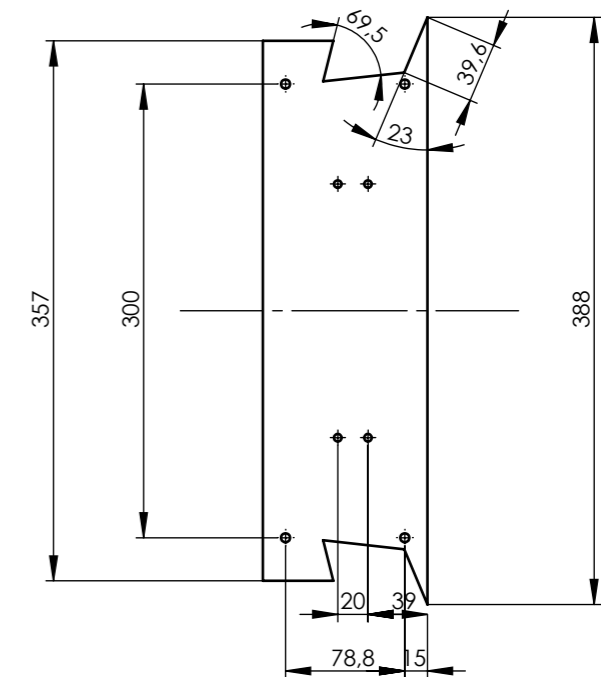
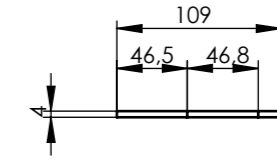
10 - Base 1 $\nabla N8$




11 - Base 2 $\nabla N8$



12 - Base 3 $\nabla N8$

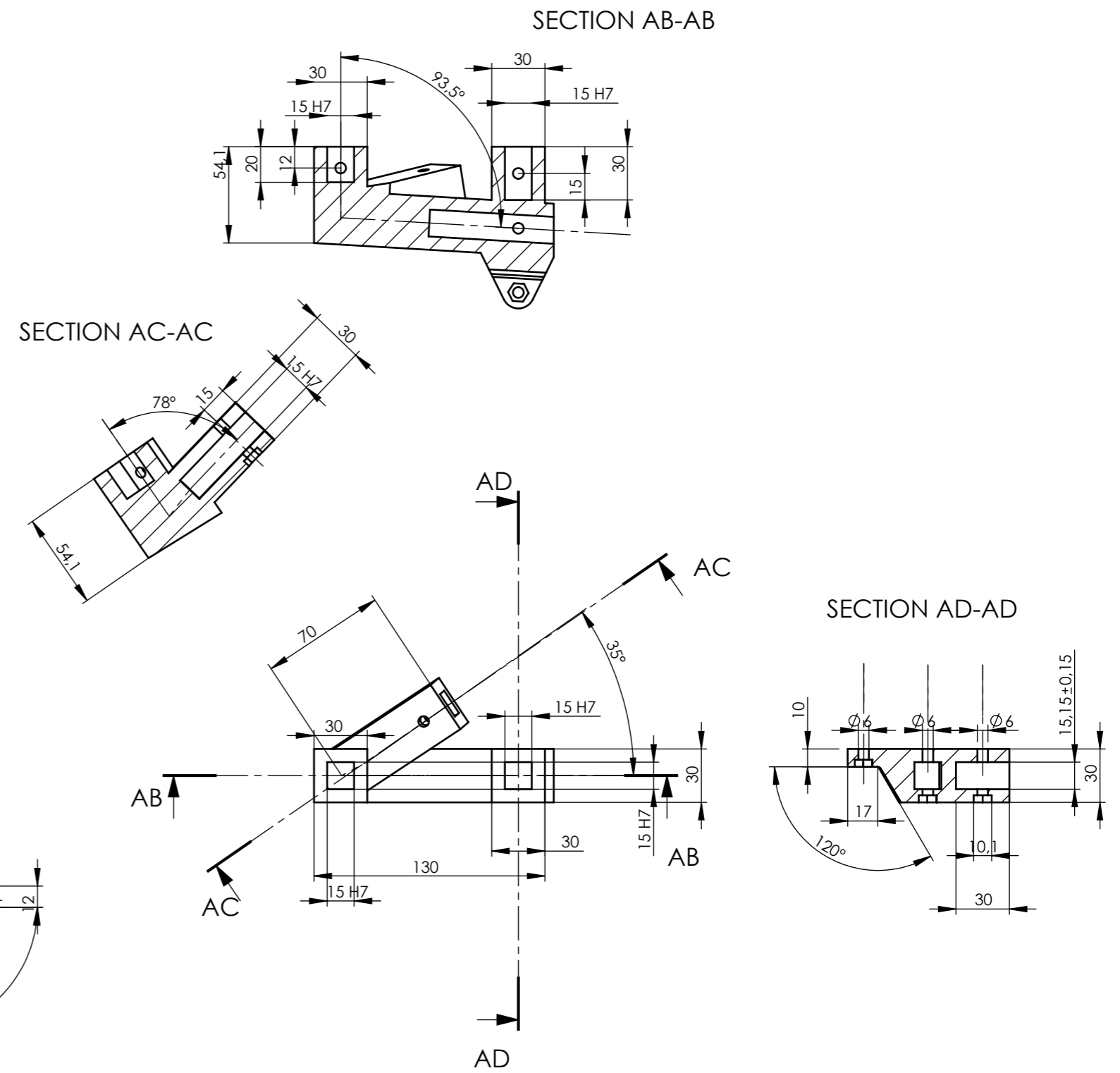
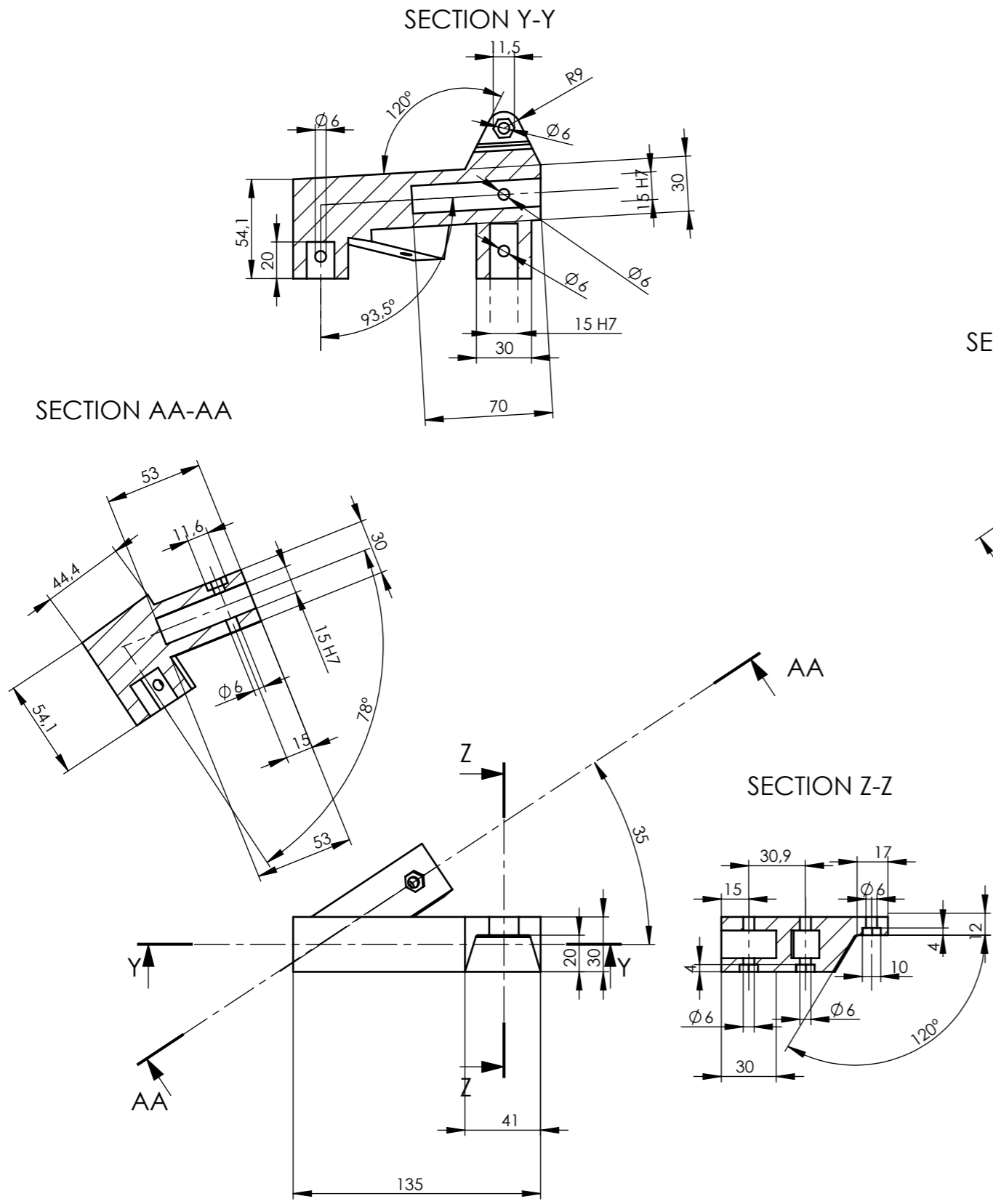



NOTE: All holes through

 Escola Superior d'Enginyeries Industrial, Aeroespacial i Audiovisual de Terrassa ESEIAAT	Project name:	Dolly for UAV take-off		A3	Name : Surroca Garcia, Aleix	
	Electrical + Mechanical Degree	Drawing name:	PMMA BASES		Est.sup.UNE 1037 / Tol.gral.ISO 2768-m / Tol.geom.ISO 2768-2-K	
	Drawing code:	C1-02		Scale:	1 : 5	Date: 08/06
						Calification:

13 - Joint 1 ✓

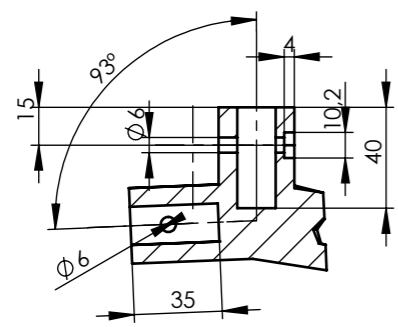
14 - Joint 2 ✓



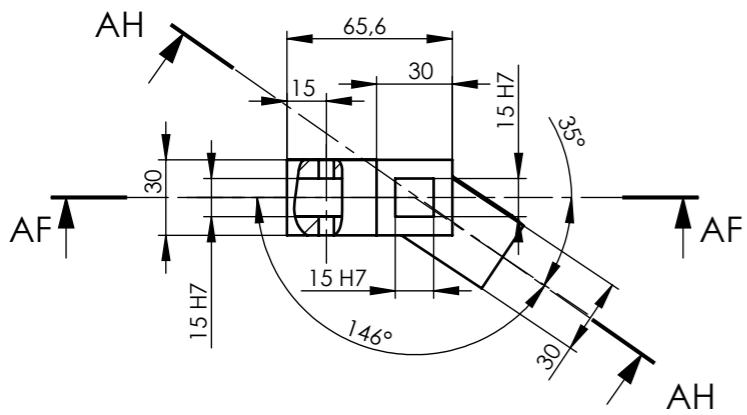
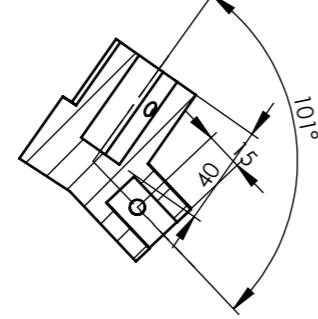
 Escola Superior d'Enginyeries Industrial, Aeroespacial i Audiovisual de Terrassa ESEIAAT	Project name:	DOLLY	A3	Name:	Surroca Garcia, Aleix		
	Electrical + Mechanical Degree	Drawing name:	Joints: 1, 2		Est.sup.UNE 1037 / Tol.gral.ISO 2768-m / Tol.geom.ISO 2768-2-K		
	Drawing code:	C1-03		Scale:	1 : 5	Date:	09/06

15 - Joint 3

SECTION AF-AF

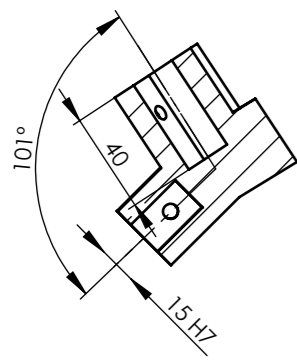


SECTION AH-AH

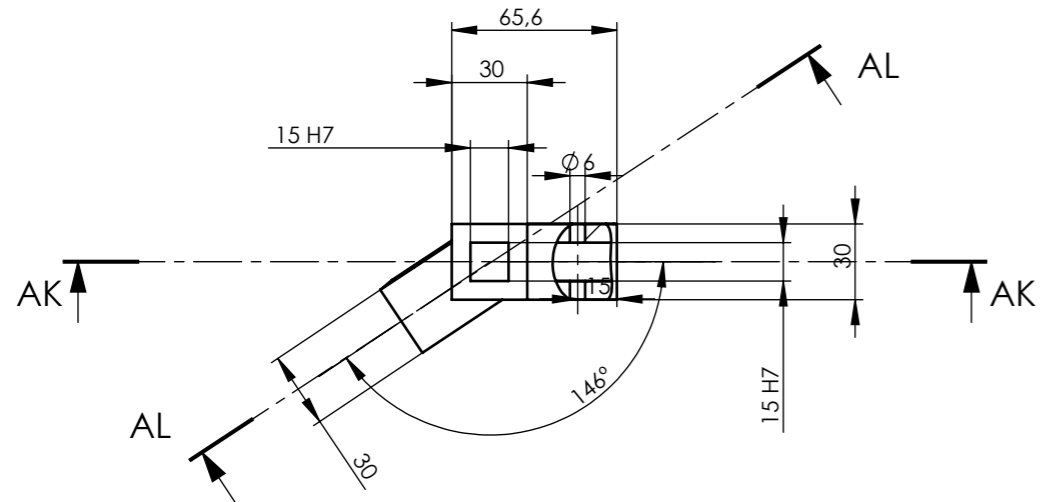
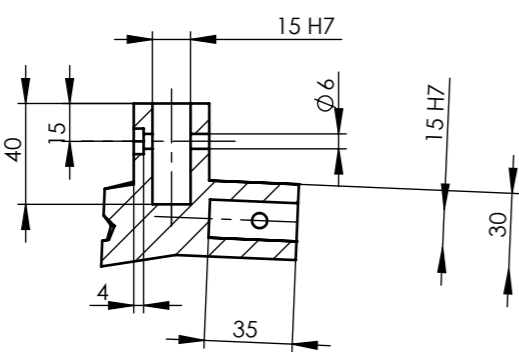


16 - Joint 4

SECTION AL-AL

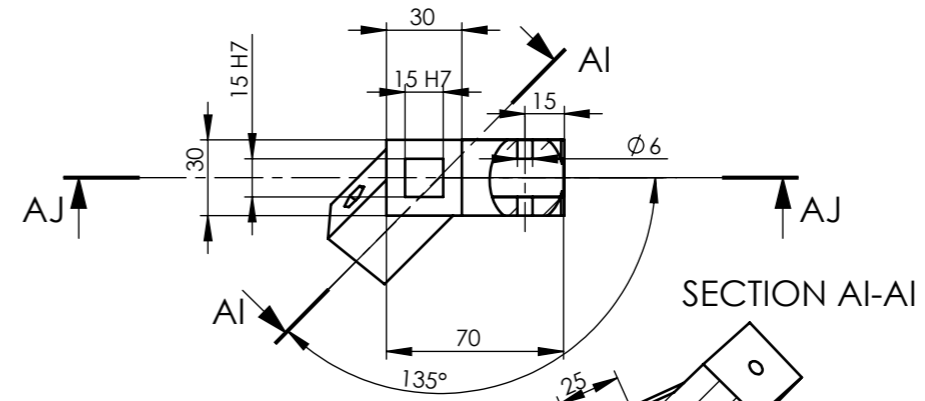
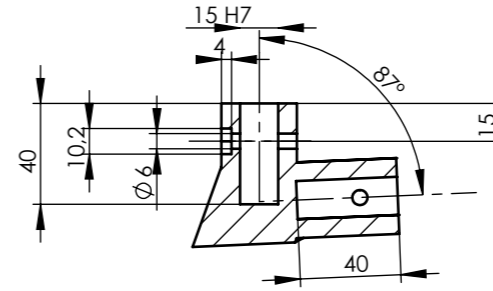


SECTION AK-AK



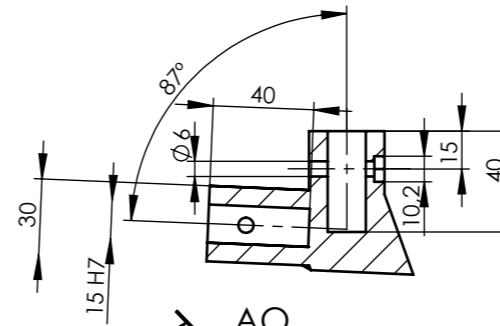
17 - Joint 5

SECTION AJ-AJ

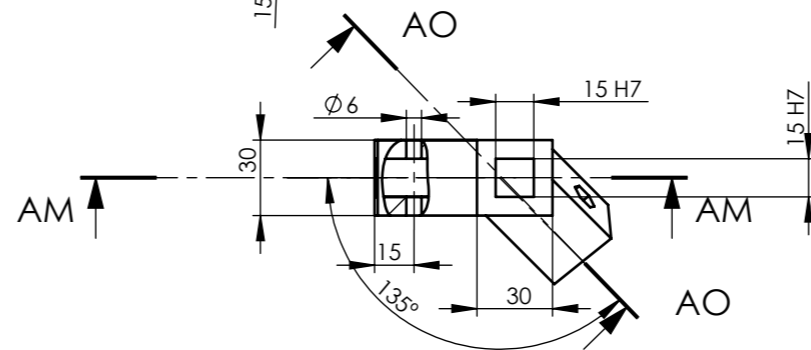
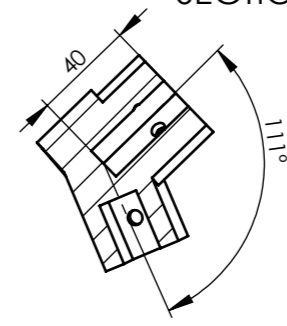



18 - Joint 6

SECTION AM-AM

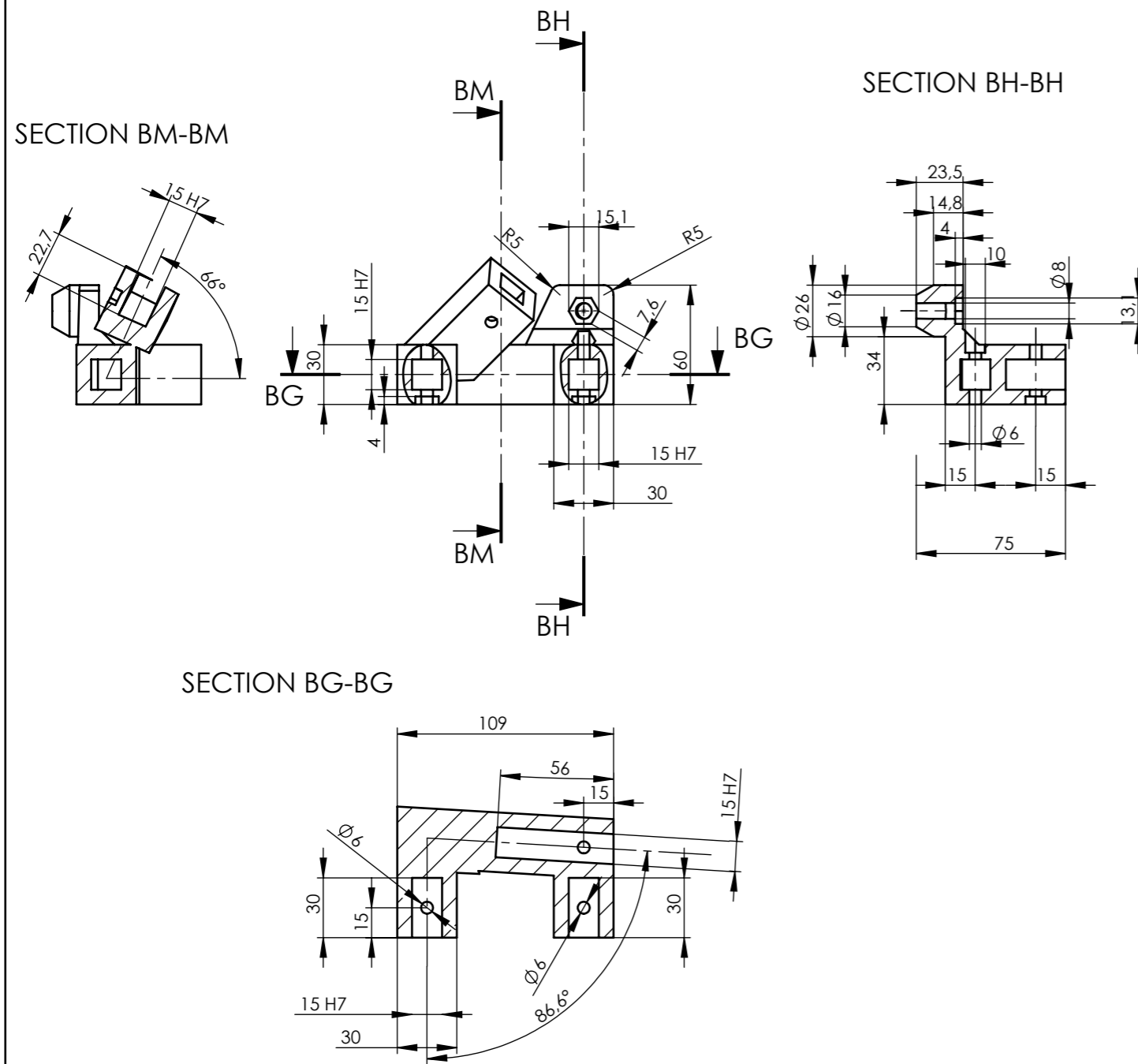


SECTION AO-AO

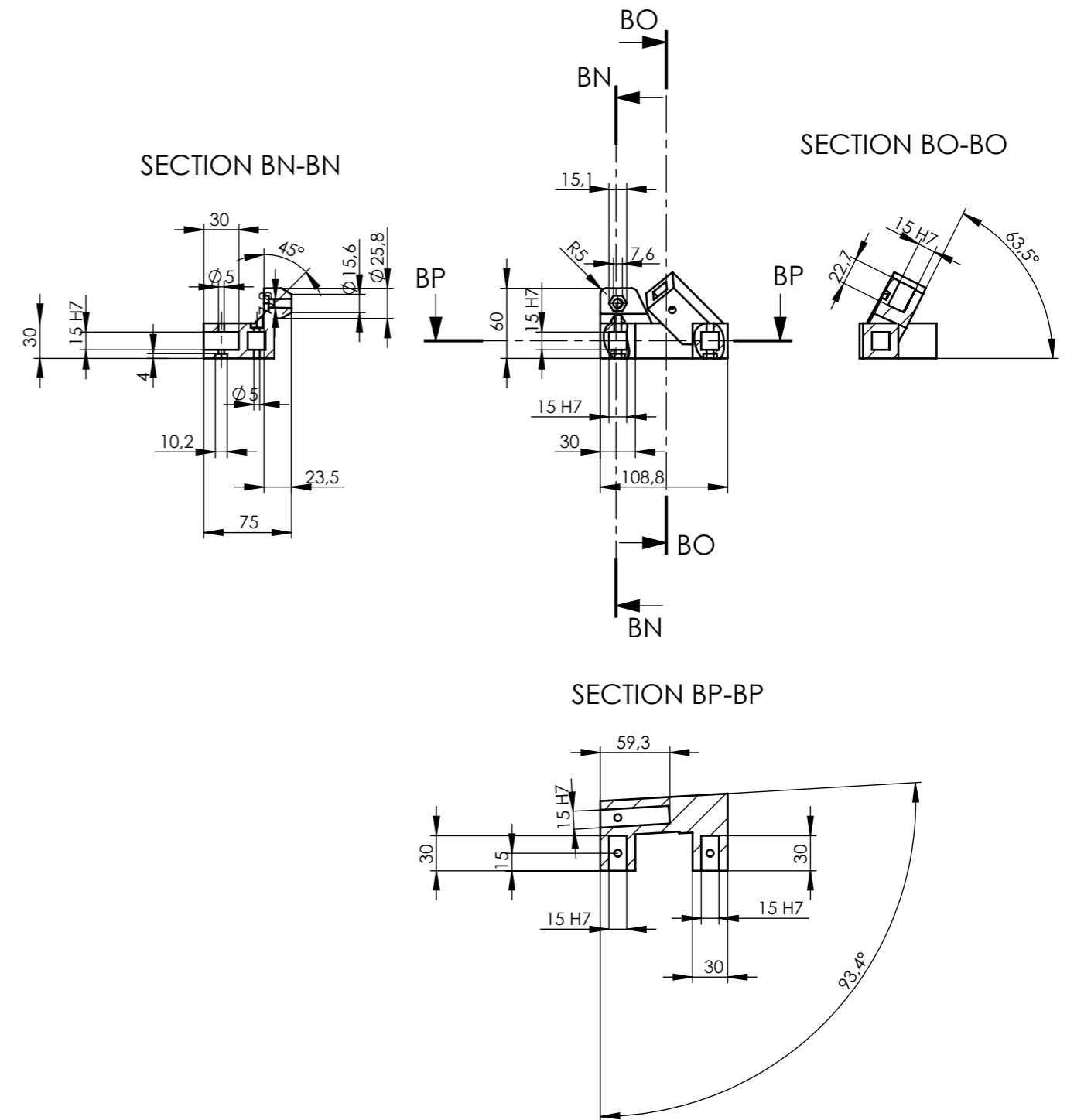



 Escola Superior d'Enginyeries Industrial, Aeroespacial i Audiovisual de Terrassa ESEIAAT	Project name:	DOLLY	A3	Name:	Surroca Garcia, Aleix		
	Electrical + Mechanical Degree	Drawing name:	Joints: 3, 4, 5, 6		Est.sup.UNE 1037 / Tol.gral.ISO 2768-m / Tol.geom.ISO 2768-2-K		
	Drawing code:	C1-04		Scale:	1 : 5	Date:	09/06

19 - Joint 7 ✓



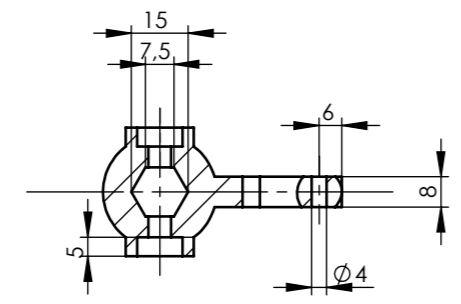
20 - Joint 8 ✓



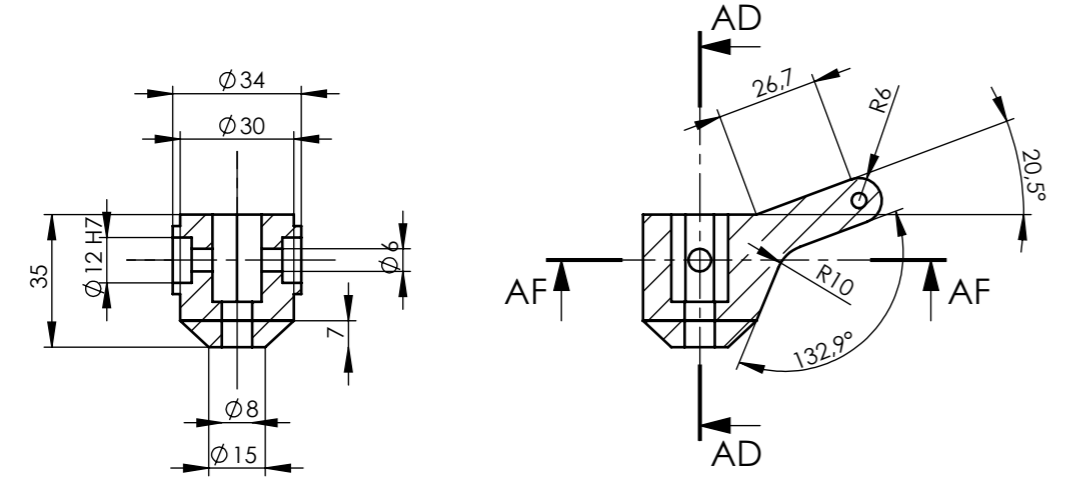
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	Drawing code:	C1-05		Scale:	Date:	Calification:
Electrical + Mechanical Degree				1 : 5	09/06	

21 - Steering 1 ✓

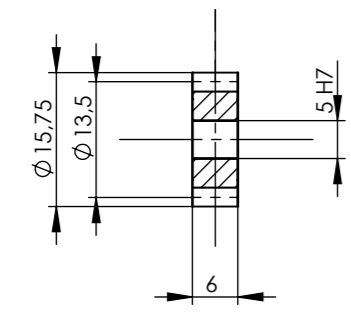
SECTION AF-AF



SECTION AD-AD

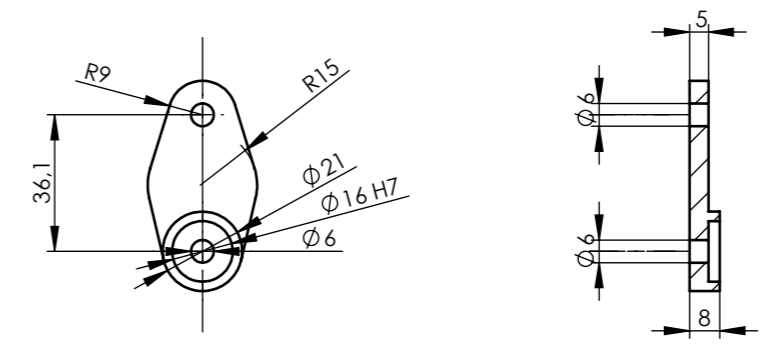


25 - Pinion ✓ Scale 1:1

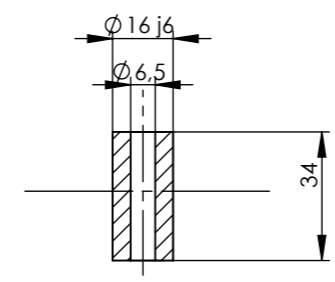


Spur Gear Data	
Module	1,125
Tooth Number	12
Pressure Angle	20°
Primitive Diameter	13,5
Exterior Diameter	15,75
Tooth Height	5,06
Primitive Pitch	3,53

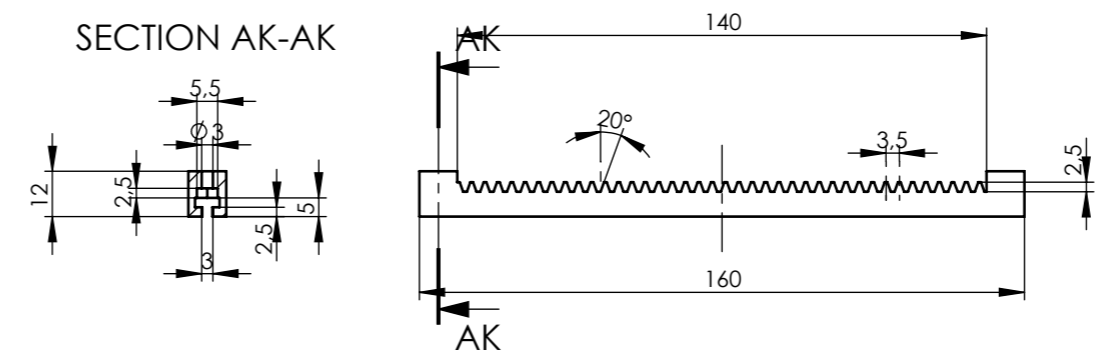
22 - Steering 2 ✓



23 - Steering 3 ✓



24 - Rack ✓

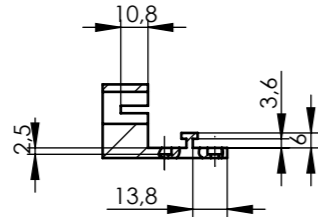


Rack Data	
Module	1,125
Tooth per Centimeter	3
Pressure Angle	20°
Addendum	1,125
Deddendum	1,4
Tooth Height	2,53
Lenght	140

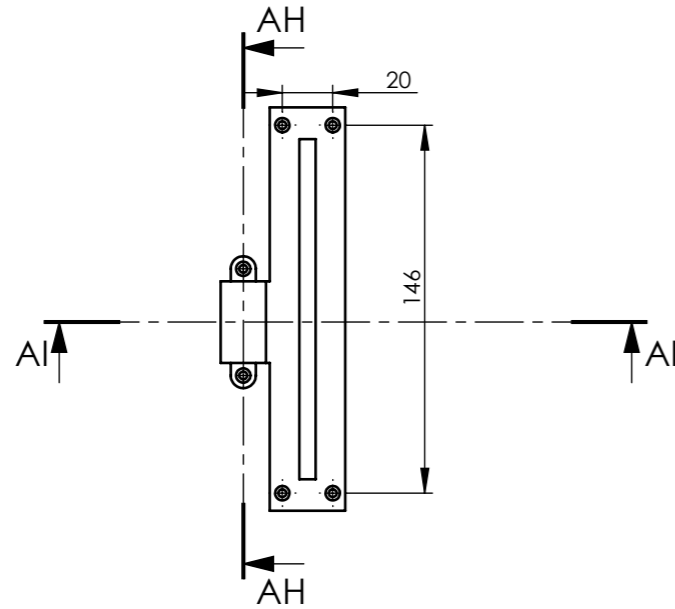
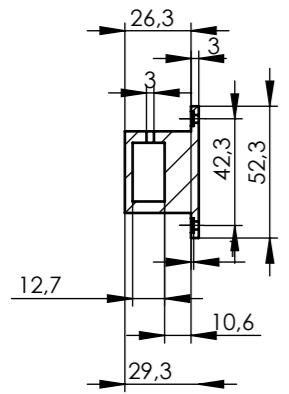
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	Electrical + Mechanical Degree	Drawing name:	Steering System		Est.sup.UNE 1037 / Tol.gral.ISO 2768-m / Tol.geom.ISO 2768-2-K		
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26 - Servo Support

SECTION AI-AI

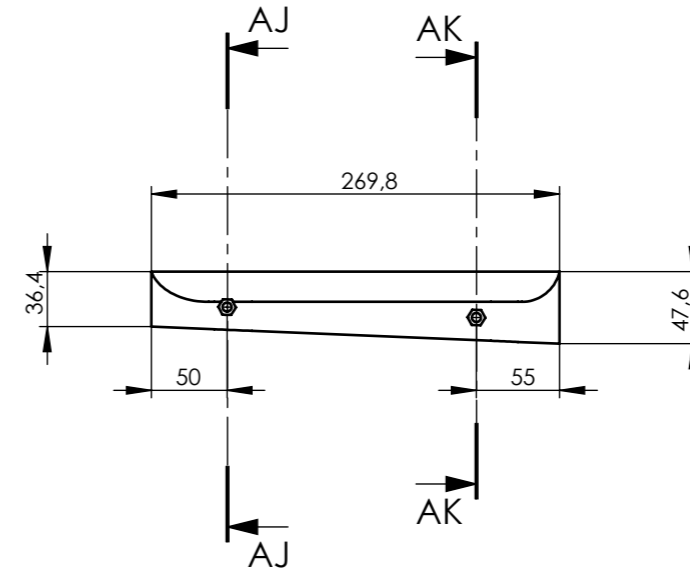
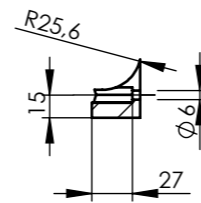


SECTION AH-AH

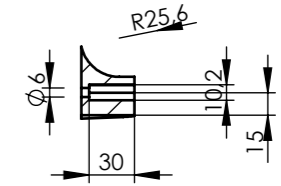


27 - UAV Support

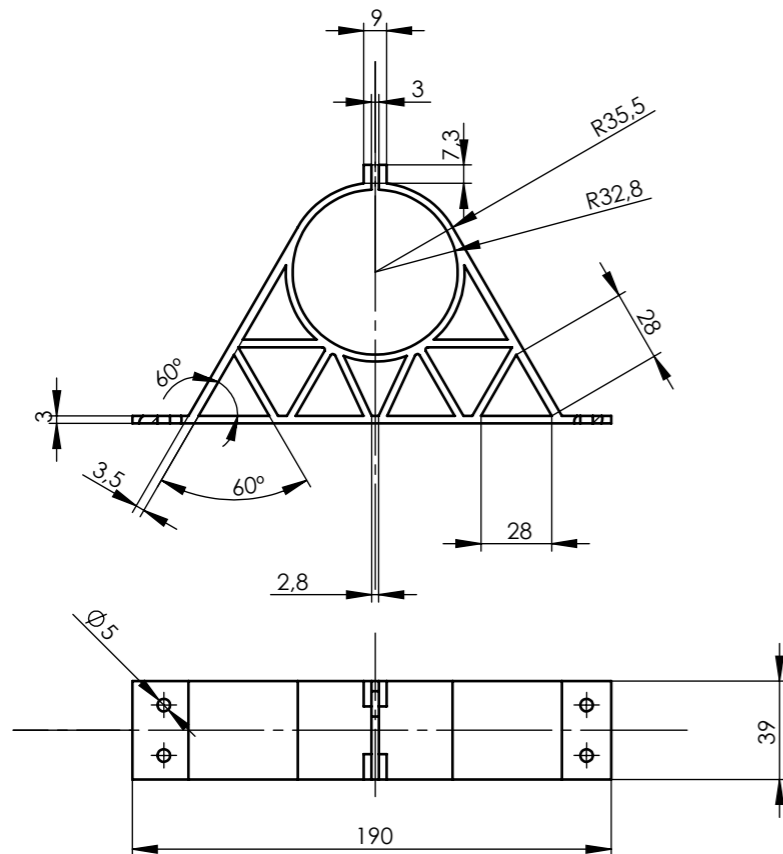
SECTION AJ-AJ




SECTION AK-AK



28 - Ducted Fan Support



 Escola Superior d'Enginyeries Industrial, Aeroespacial i Audiovisual de Terrassa ESEIAAT	Project name:	DOLLY	A3	Name : Surroca Garcia, Aleix		
	Electrical + Mechanical Degree	Drawing name:	Supports		Est.sup.UNE 1037 / Tol.gral.ISO 2768-m / Tol.geom.ISO 2768-2-K	
	Drawing code:	C1-07	1 : 3	Date:	09/06	Calification: