

23rd Annual Student Design Competition
2-Place Turbine Training Helicopter



ANKA



**ISTANBUL TECHNICAL
UNIVERSITY (ITU)**

**FACULTY OF AERONAUTICS AND
ASTRONAUTICS**

GRADUATE STUDENTS DESIGN TEAM

summary

- Team Members
- ANKA's design features and characteristics
- General Layout of ANKA



Team Members

- Faculty Advisor: **Prof. Dr. Süleyman Tolun**
- **Utku Türkyılmaz** (Graduate Student)
- **Hasan İbaçoğlu** (Graduate Student)
- **Sedat Süssler** (Graduate Student)
- **Hakan Yeşilel** (Graduate Student)
- **Resul Açıkyol** (Graduate Student)
- **Serhat Yılmaz** (Graduate Student)
- **Evren Öner** (Graduate Student)
- **Ali Özel** (Graduate Student)
- **Murat Bronz** (Graduate Student)

Team Members

- **(All student members are in FACULTY OF AERONAUTICS AND ASTRONAUTICS, ITU)**
- **This is a new entrant for ITU in AHS student design competition**

ANKA's design features and characteristics

- Performance Data

Cruise Speed (with Maximum Continuous Power at Sea Level)	110 knot	203,72 km/hr
Forward Speed for Minimum Power	50,68 knot	87,17 km/hr
Speed for Maximum Range	69,87 knot	129,4 km/hr
Maximum Cruise Speed (with Take-off Power at Sea Level)	115 knot	212,98 km/hr
HOGE Ceiling	10960 feet	3340,60 m
Maximum Rate of Climb	2788,71 feet/min	850 m/min
Maximum Range	193,77 nm	358,86 km
Maximum Endurance	3,70 hours	3,70 hours

ANKA's design features and characteristics

- **Vehicle Dimensions**

Fuselage Length	6.8098	m	22.343	ft
Overall Length (Rotors Turning)	8.5516	m	28.058	ft
Height to Rotor Head	2.4863	m	8.1576	ft
Fuselage Width	1.7574	m	5.7661	ft
Tail Rotor Arm	4.263	m	13.987	ft
Horizontal Tail Surface Arm	3.6388	m	11.939	ft
Horizontal Tail Surface Area	0.30727	m ²	3.3077	ft ²
Vertical Tail Surface Arm	4.3262	m	14.194	ft
Vertical Tail Average Chord	0.21344	m	0.70031	ft
Fuselage Length	6.8098	m	22.343	ft
Overall Length (Rotors Turning)	8.5516	m	28.058	ft
Height to Rotor Head	2.4863	m	8.1576	ft
Width Over the Landing Gear	1.7574	m	5.7661	ft
Normal Fuel Capacity (Maximum Fuel Capacity)	148 (185)	lt	39,095 (48,87)	gallons

ANKA's design features and characteristics

- Weights and Engine Ratings

Empty Weight	398.36	kg	878.42	lb
Gross Weight	712.57	kg	1571.2	lb
Payload (Crew + Baggage)	200	kg	441	lb
Fuel Weight	114.22	kg	251.8	lb

Number of Engines	1	PSFC (lb/hp-h)
Power (Take-off)	188.53 hp	0.6
Power (Maximum Continuous)	173.7 hp	0.598
Power (Hover) (6000 ft)	125.4 hp	0.634
Power (Cruise) (6000 ft)	152.4 hp	0.596

ANKA's design features and characteristics

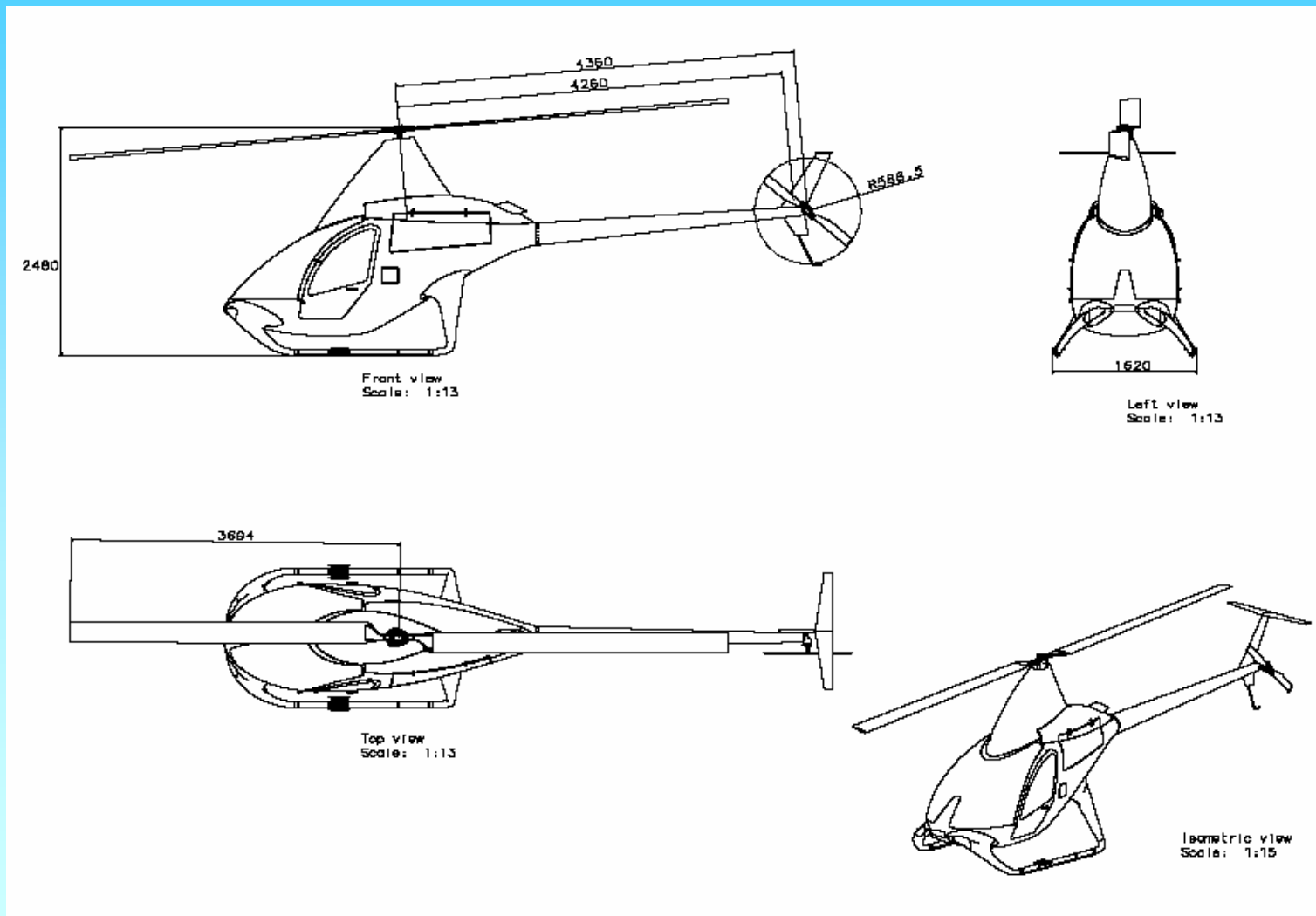
- Sizing

Specific Fuel Consumption	0.6 (0.63 for hover)		lb/hp.hr
Disc Loading	16.619	kg/m ²	3.4041 lb/ft ²

Number of Main Rotor Blades	2		2	
Main Rotor Diameter	7.3887	m	24.242	ft
Main Rotor Chord	0.22707	m	0.74502	ft
Tip Speed of Main Rotor	197.08	m/sec	646.63	ft/sec
Main Rotor Solidity	0.03913		0.03913	
Main Rotor Angular Velocity	509.28	rpm	509.28	rpm

Number of Tail Rotor Blades	2		2	
Tail Rotor Diameter	1.1775	m	3.8633	ft
Tail Rotor Chord	0.097773	m	0.32079	ft
Tip Speed of Tail Rotor	187.19	m/sec	614.16	ft/sec
Tail Rotor Solidity	0.10572		0.10572	
Tail Rotor Angular Velocity	3035.3	rpm	3035.3	rpm

General Layout of ANKA



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