

IPRO 317: VOTL FOR THE MASSES



Overview

IPRO 317 serves to develop an affordable mainstream, personal aircraft solution to the masses and to research other applications of such an aircraft.

Our model, the Volar, is a Vertical Take-off and Landing (VTOL) aircraft and would have the capacity to transport one or two individuals. The full-scale project would provide a solution to crowded highways and streets through an aircraft that is easy to use and at a cost that is comparable to an automobile. The micro-scale project would cater to the need of a small, mobile aircraft that could carry small cargo such as a voice recorder or camera.

Testing & Construction

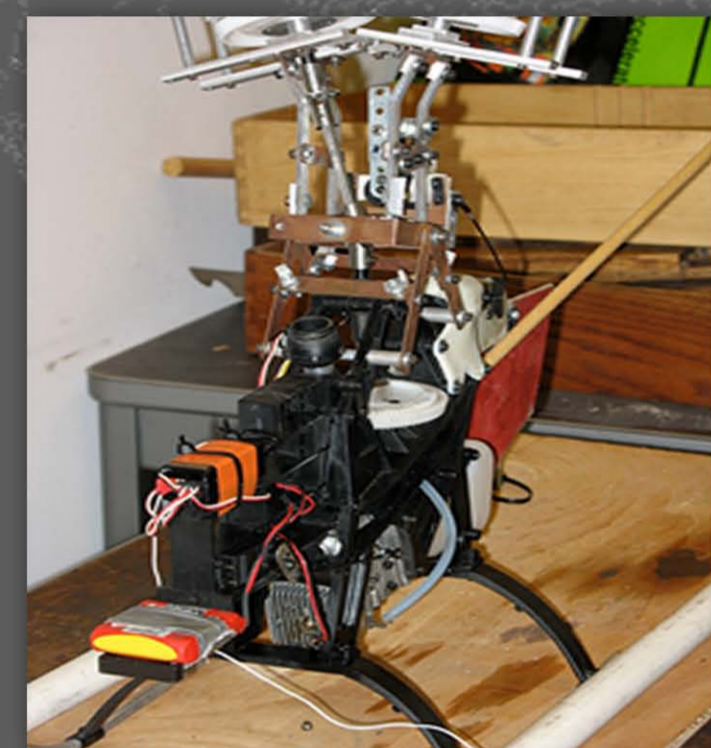


Trouble-shooted and resolved problems from previous semester, including:

- gimbal mechanism range of motion
- poor gasket sealing
- unstable radio communication
- ability to emergency kill engine

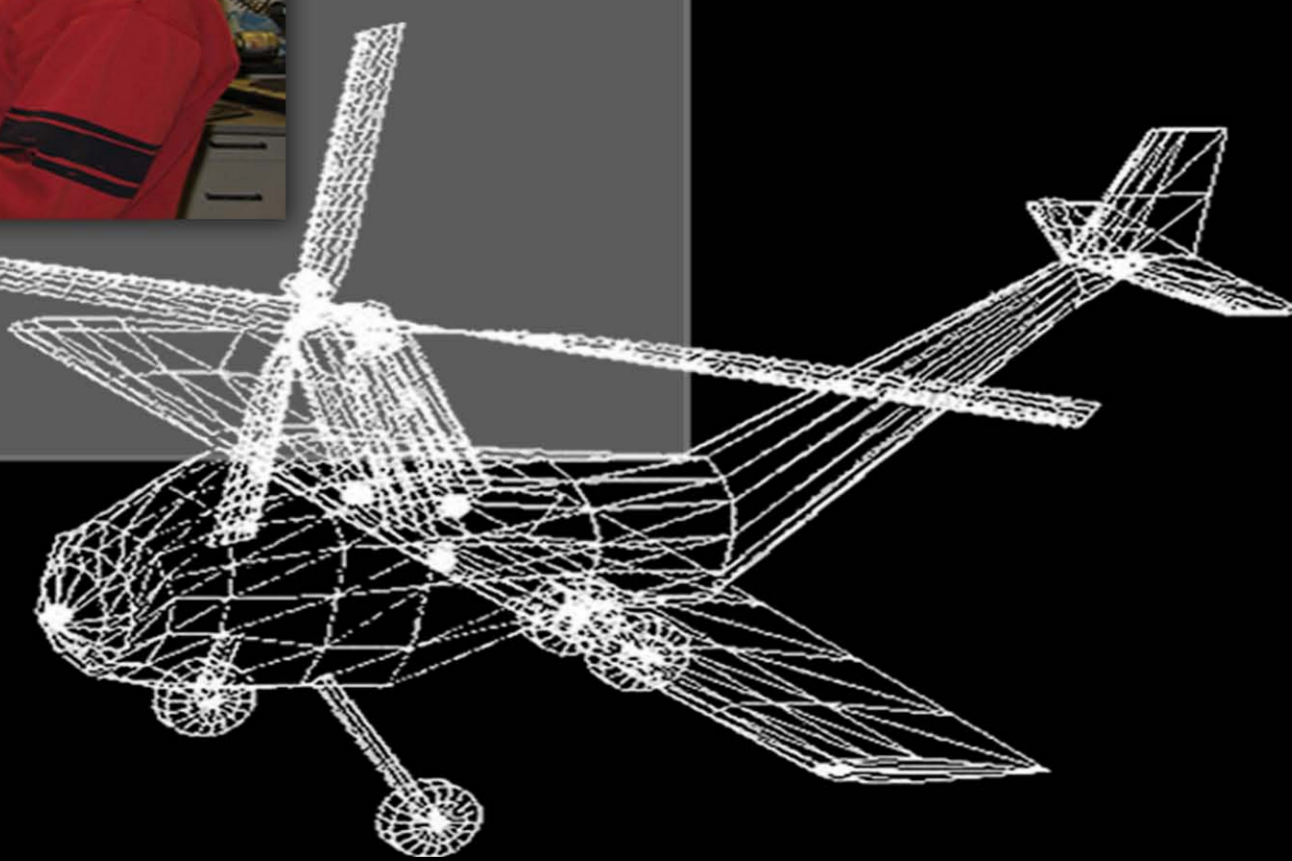


Constructed testing apparatus to facilitate hover, forward, side-side, and pitch tests



Troubleshooted problems that came up during testing, including:

- unsecure parts
- additional muffler problems
- inability of VTOL to hover



Micro scale model



The micro-scale would feature a twin engine, is light-weight, and simple in design.

Applications:

- Military or government spy plane
- Disaster site search
- Law enforcement

Features:

- twin engine provides redundancy in case of mechanical failure or provides extra power when needed
- vertical stabilizers provide left/right motion
- wings provide additional lift and better fuel efficiency
- light weight total design weighs only 2.7 lbs

Specifications:

Item	Specification
Body length	1.8 ft
Body length w/rotors	2.4 ft
Body length w/ wings	1.8 ft
Body length w/ wings & rotors	2.6 ft
Total height	1.3 ft
Horizontal speed	30 mph
Propeller radius	1 ft
Lift Coefficient	0.8
Drag Coefficient	0.069
Lift/ Drag	5.1
Max Engine rpm	3600 rpm
Max Rotor rpm	6923 rpm
Engine hp	0.3 hp
Total weight	2.7 lb

Prototype



The prototype features a twin rotor, a 10,000 rpm combustion engine, and a fully-moveable gimbal mechanism.

Applications:

- Mass commuter transportation vehicle
- Recreational vehicle
- Alternate transportation method

Features:

- twin rotor dual blades are interlocked to cancel rotational inertia
- gimbal mechanism forward and side-to-side motion allow versatile motion of plane
- wings carry majority of lift for plane during flight
- compact design allows for maneuverability and mass use

Specifications:

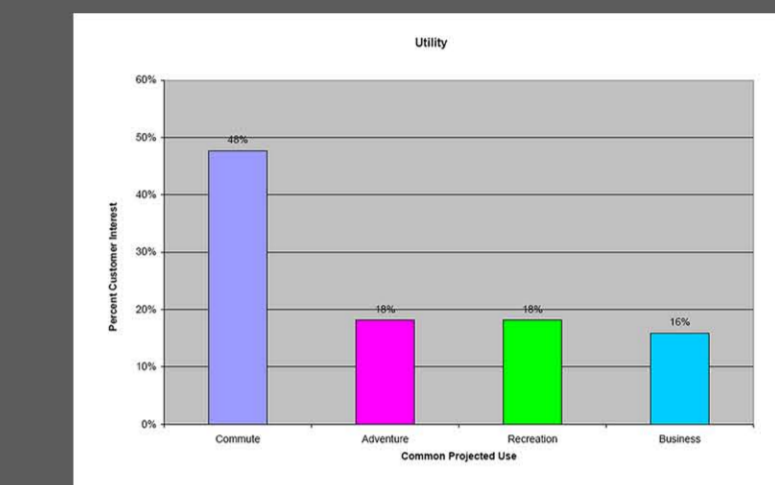
Item	Specification
Wing span	2.04 ft
Fuselage length	3 ft
Propeller radius	2 ft
Engine	1.8 hp
Empty weight	9 lb

Actual Size Specifications:

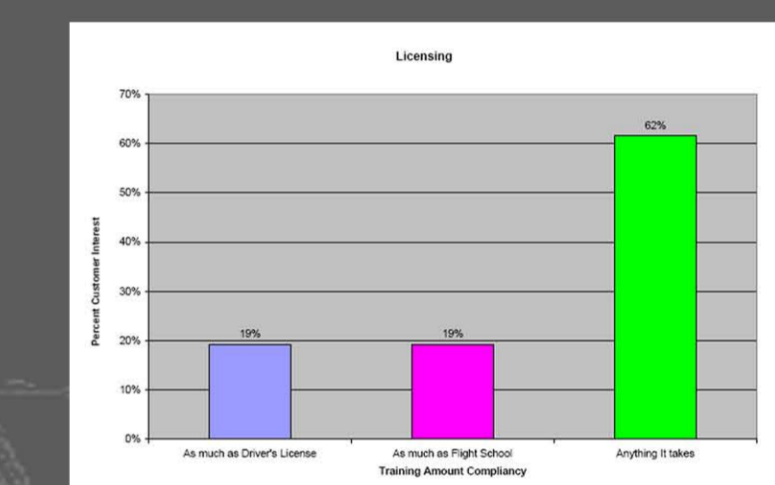
Item	Specification
Wing span	22 ft
Fuselage length	15 ft
Propeller radius	10.6 ft
Engine	140 hp
Empty weight	8500 lb

Frequently Asked Questions

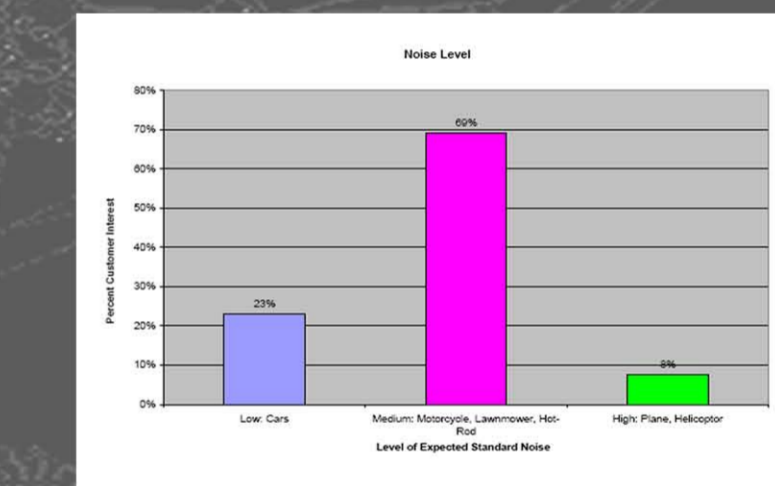
How would you most likely use your flying vehicle?



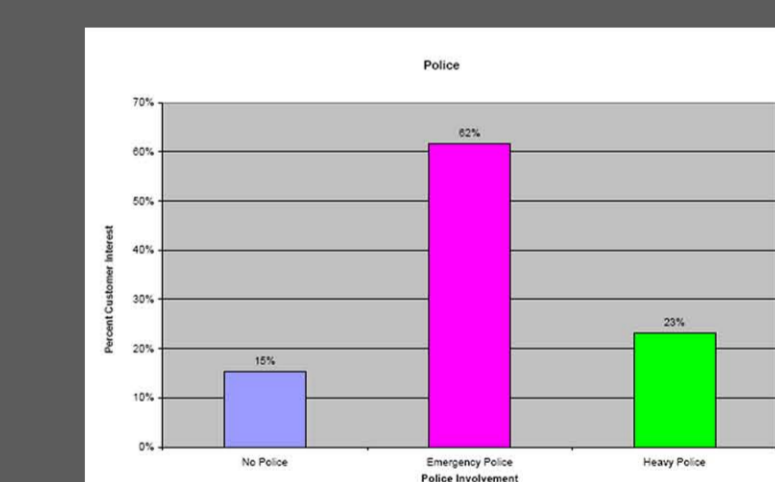
How much training would you be willing to partake in to become certified to fly (license)?



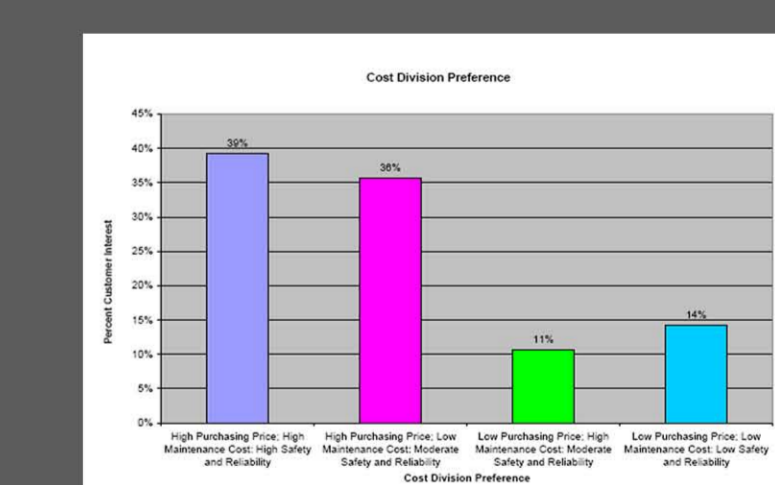
Realistically, what noise range would you expect small personal flying cars to fall in?



Knowing there could be many of these in the air, how involved would you want the police?



Which of the following would you most likely prefer?



If you knew that a lot of these would be in the air, would you still be interested in purchasing one?

