Automatic Leveling Low-Cost Camera: Combat Cam

Vide Omnes

Project Description

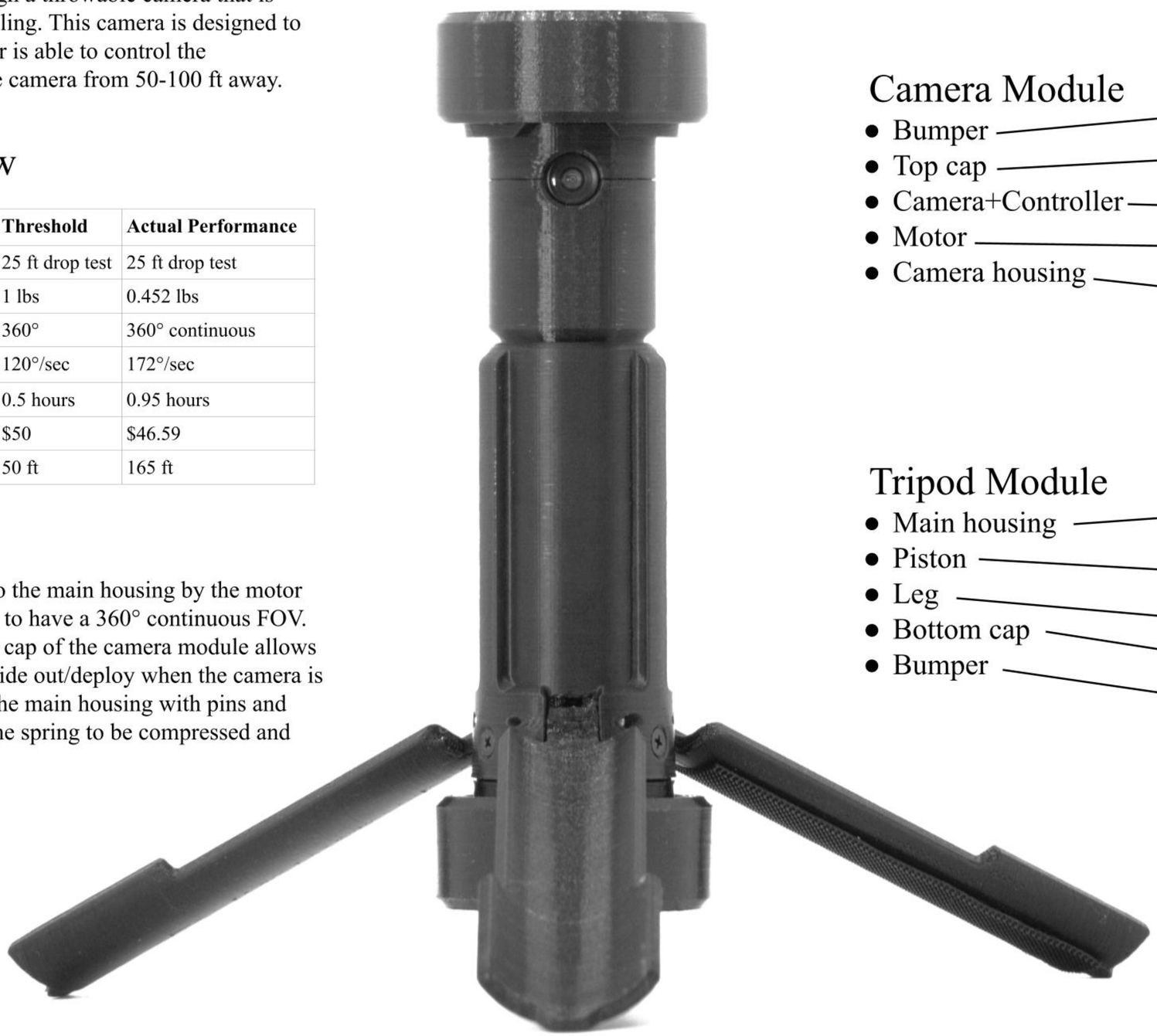
The goal of this project is to design a throwable camera that is low-cost/disposable and self-leveling. This camera is designed to connect to a phone where the user is able to control the deployment and movement of the camera from 50-100 ft away.

Performance Review

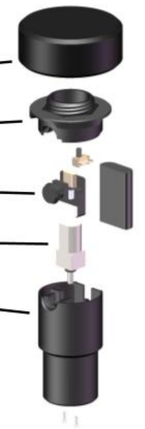
Requirements	Target	Threshold	Actual Performance
Durability	30 ft drop test	25 ft drop test	25 ft drop test
Weight	0.5 lbs	1 lbs	0.452 lbs
FOV	360° continuous	360°	360° continuous
Turn Rate of Camera	180°/sec	120°/sec	172°/sec
Battery Life	1 hour	0.5 hours	0.95 hours
Device Cost	$30	$50	$46.59
Range	100-150 ft	50 ft	165 ft

Design Description

The camera module is connected to the main housing by the motor shaft. This allows the Combat cam to have a 360° continuous FOV. The locking mechanism on the top cap of the camera module allows the legs to lock into place and to slide out/deploy when the camera is turned. The legs are connected to the main housing with pins and screws. These connections allow the spring to be compressed and the legs to pivot.



Camera Module



- Bumper
- Top cap
- Camera+Controller
- Motor
- Camera housing

Tripod Module

- Main housing
- Piston
- Leg
- Bottom cap
- Bumper

Conclusion

The design of the Combat Cam meets the primary thresholds and some of the targets given in the performance review table. The most pertinent recommendation for future work (What's to Come) is the use of an aluminum frame. This aluminum upgrade would strengthen the Combat Cam, increasing impact resistance, and serve to increase heat dissipation from the camera module.

What's to Come:

- Infrared/Thermal vision
- Sound transmission
- Object/Person recognition
- Self-destruct
- Extended range
- Aircraft deployment
- Gps location
- Aluminum frame
- Grenade launcher deployment

Lessons Learned:

- 3D prints not meant to be thrown
- Early failure is good
- Document everything in the moment
- Try lots of ideas (more than one solution)

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