

Morphological Chart

<u>Function/ Component</u>	<u>Ideas</u>					
Air Supply	single tank	multiple tanks	carbon fiber tank	different gases	on board compressor	
Jumping	air musclces	springs and air musclces	cable tendons	air muscles on joints	air muscles in parallel	
Landing	spring	spring + damper	sensor driven air release	material damping foot		
Electrical source	lithium Ion	solar power	9V lead acid	NiMH 2000 mAH	12V lead acid	
Controller	push button w/ delay	tethered control	wifi/RF	bluetooth	app for phone	
Transport	handles	detachable handles	hand cart	no modifications,		
Base	frame	machined plate	frame and plate			
Base Material	carbon fiber	alloy	aluminum plate	steel	plastics plate, aluminum tube	plastics
Leg Material	composite tubing	aluminum tubing	aluminum	steel	plastics	
Joint Material	plastics	aluminum	steel			
Air Muscle Location	joints	body	joints and body			
Housing Cover	nothing	rapid prototyping	fiber glass	carbon fiber		
Microcontroller	stamp	arduino	microchip	PLC	Labview wireless DAQ	
Landing Action	land on rear	land on front	land on both			

Concept Generation

Component	Cheap	Baseline	Light Weight	Sturdy	Group Opinion
Air Supply	single tank	single tank	carbon fiber tank	multiple tanks	single tank
Electrical source	NiMH 2000 mAh	NiMH 2000 mAh	lithium ion	lithium ion	NiMH 2000 mAh
Controller	push button w/ delay	push button w/ delay	tethered control	tethered control	push button w/ delay
Transport	no handles	no handles	no handles	handles	no handle
Base	plate	frame and plate	frame	frame and plate	frame and plate
Base Material	plastics	aluminum	carbon fiber	steel	plastics plate, aluminum tube
Leg Material	plastics	aluminum	composit tubing	steel	aluminum
Joint Material	plastics	aluminum	plastics	steel	plastics
Housing Cover	none	fiber glass	none	carbon fiber	rapid prototyping

Pugh Chart

Selection Criteria		Weight	A		B		C		D		E	
			Cheap		Baseline		Light Weight		Sturdy		Group Opinion	
			Rating	Weighted Score	Rating	Weighted Score	Rating	Weighted Score	Rating	Weighted Score	Rating	Weighted Score
cost	+/-	3	1	3	DATUM	-1	-3	-1	-3	0	0	
technical risk	+/-	3	0	0		0	0	-1	-3	0	0	
portability	+/-	2	0	0		1	2	-1	-2	1	2	
land safely without damage	+/-	1	-1	-1		1	1	1	1	1	1	
air capacity	+/-	2	0	0		1	2	2	4	2	4	
reuses available parts	yes/no	3	1	3		-1	-3	-1	-3	1	3	
weight	+/-	3	1	3		1	3	-1	-3	1	3	
Total Score			8		0		2		-9		13	
Rank			2		4		3		5		1	