Operational Expectations

FAA-NASA Crashworthiness Workshop
October 9, 2020

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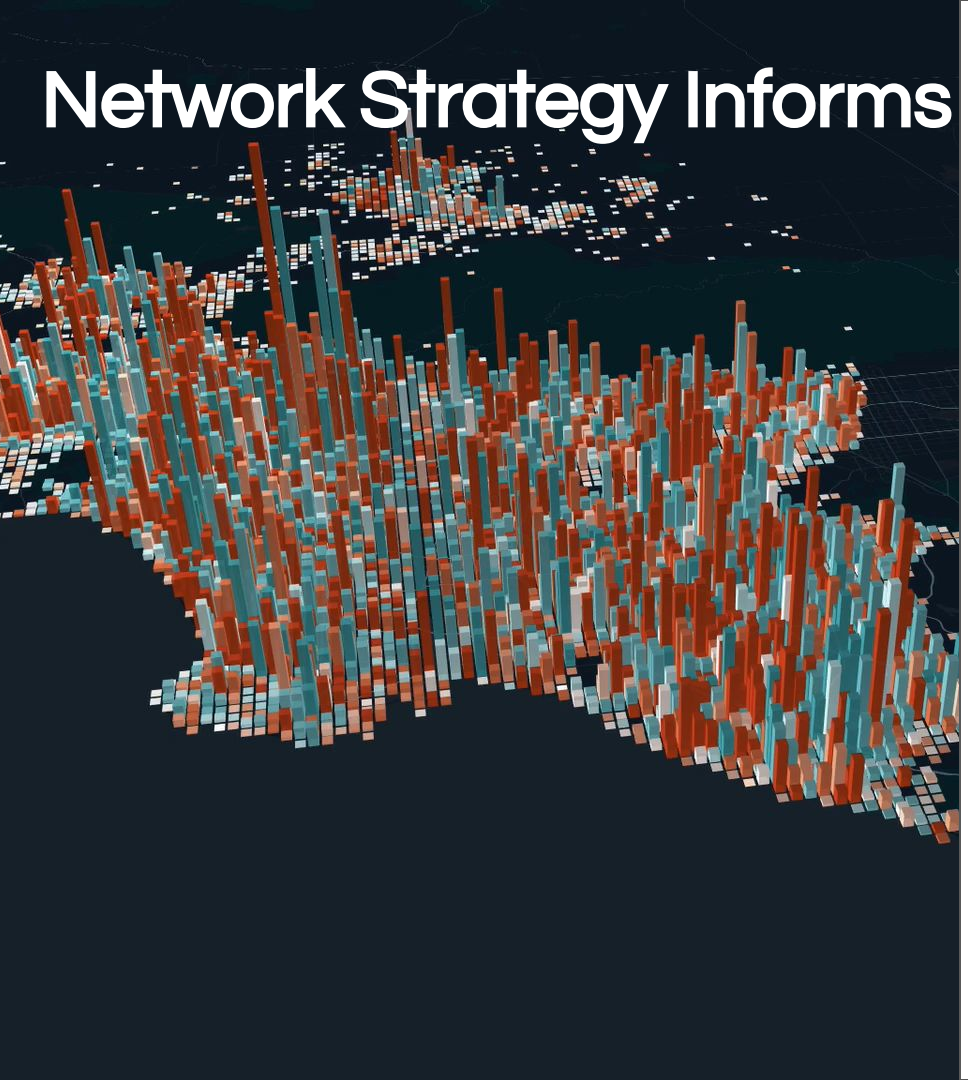
Uber Elevate

Multimodal Aerial Ridesharing

Network Strategy Informs Systems Requirements



Speed	150	Miles per hour at cruise
Payload	1+4	Pilot + Passengers
Range	60	Miles of max flight range
Quiet	-15 dB	Noise improvement over helicopters
Electric	3.5x	Efficient over traditional turbines
Reliability	2k	Flight hours per year


BELL


BOEING
Aurora
BOEING


EMBRAER X


HYUNDAI


JAUNT
AIR MOBILITY


JOBY
AVIATION


Overair


PIPISTREL


Uber

Rotorcraft Takeoff Performance

27.51 Takeoff

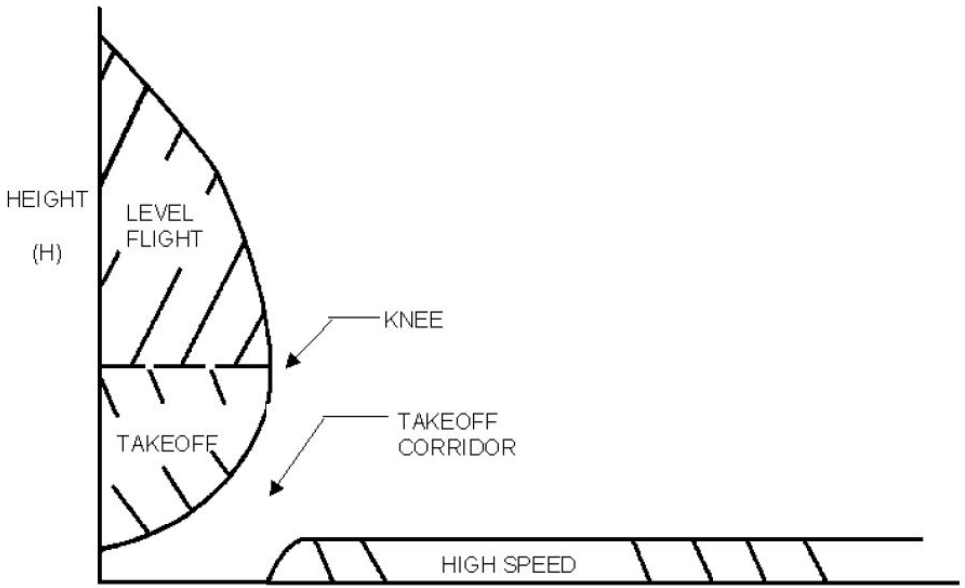
Takeoffs must be made in such a manner that a landing can be made safely at any point along the flight path in the event of an engine failure.

27.75 Landing

The rotorcraft must be controllable and have good handling qualities at appropriate approach and landing speeds, and, whether single or multi engine, be capable of being landed safely following complete power failure.

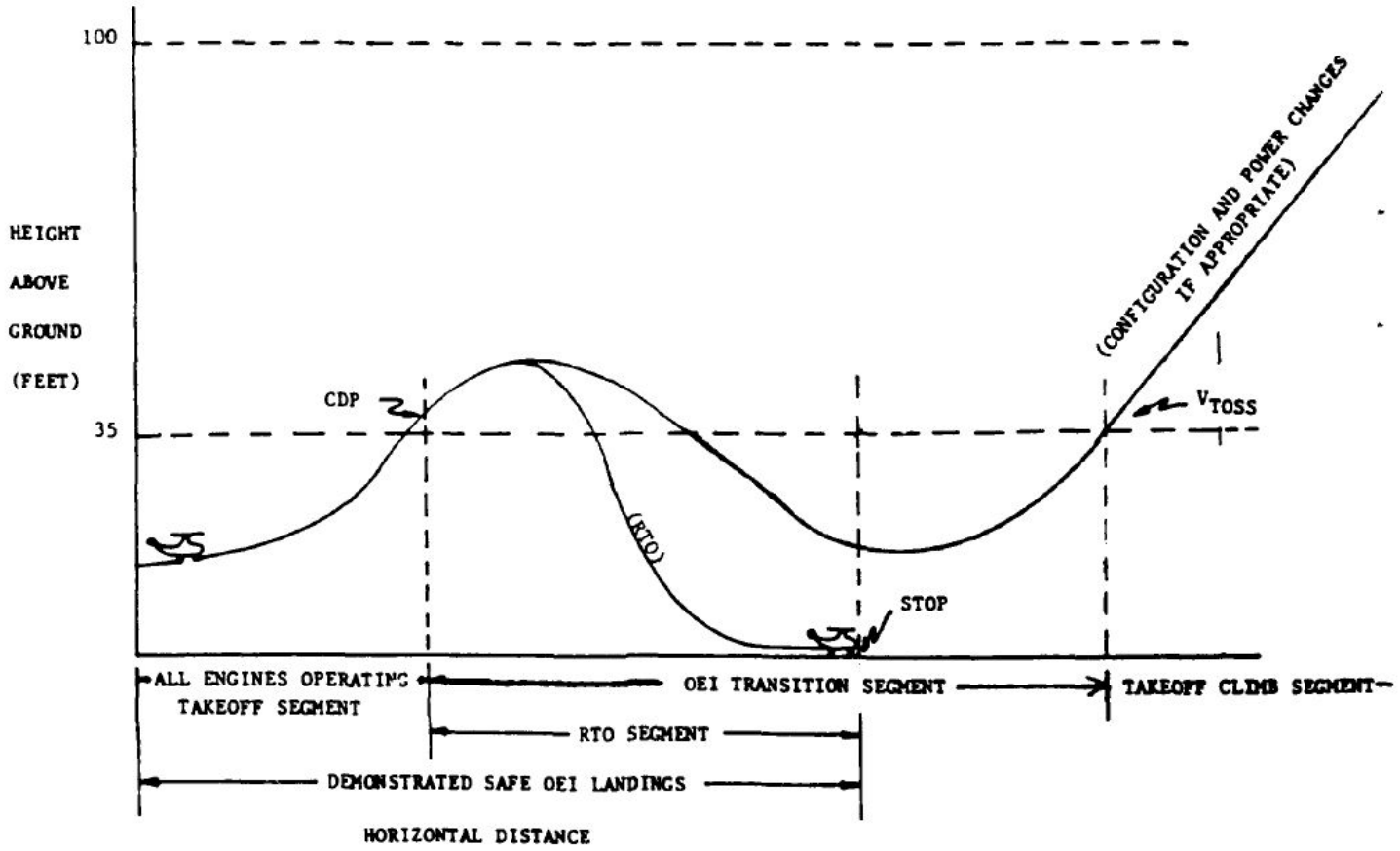
27.87 Limiting height-speed envelopes

Conditions of height and speed from which safe landings cannot be made in the event of a power failure must be identified.

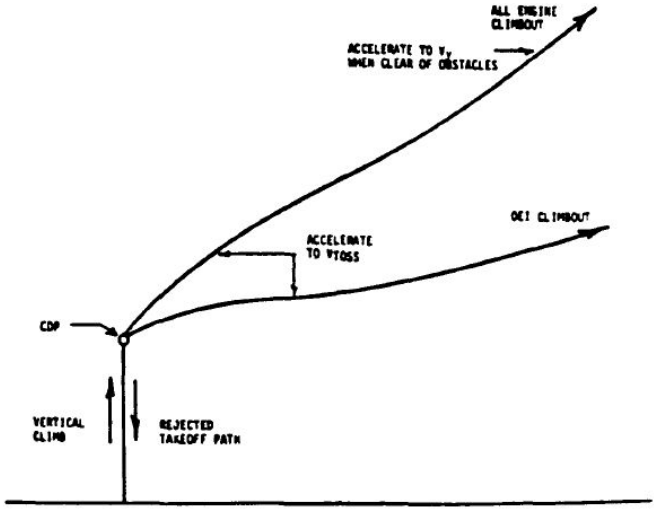


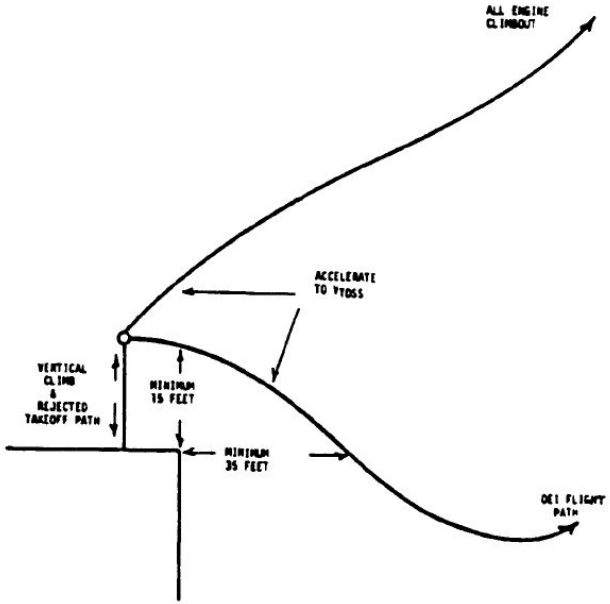
Category A Performance

Multi-engine and system isolation features capable of operations using take-off and landing data scheduled under a critical engine failure concept which **assures adequate designated surface area and adequate performance capability for continued safe flight or safe rejected take-off.**

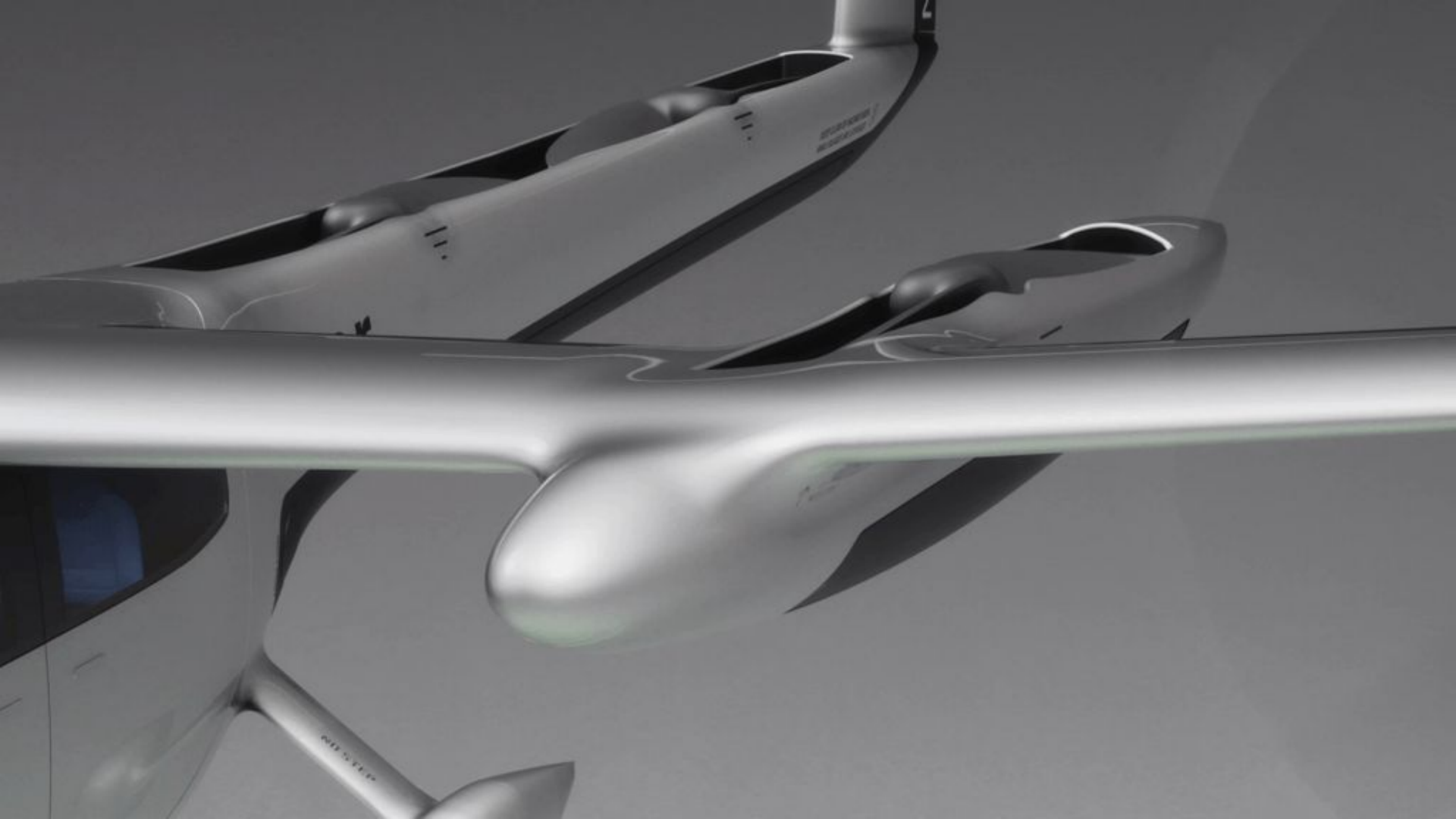

100
HEIGHT
ABOVE
GROUND
(FEET)
35
CDP
(RTO)
STOP
(CONFIGURATION AND POWER CHANGES
IF APPROPRIATE)
V_{TOSS}
ALL ENGINES OPERATING
TAKEOFF SEGMENT
OEI TRANSITION SEGMENT
TAKEOFF CLIMB SEGMENT
RTO SEGMENT
DEMONSTRATED SAFE OEI LANDINGS
HORIZONTAL DISTANCE

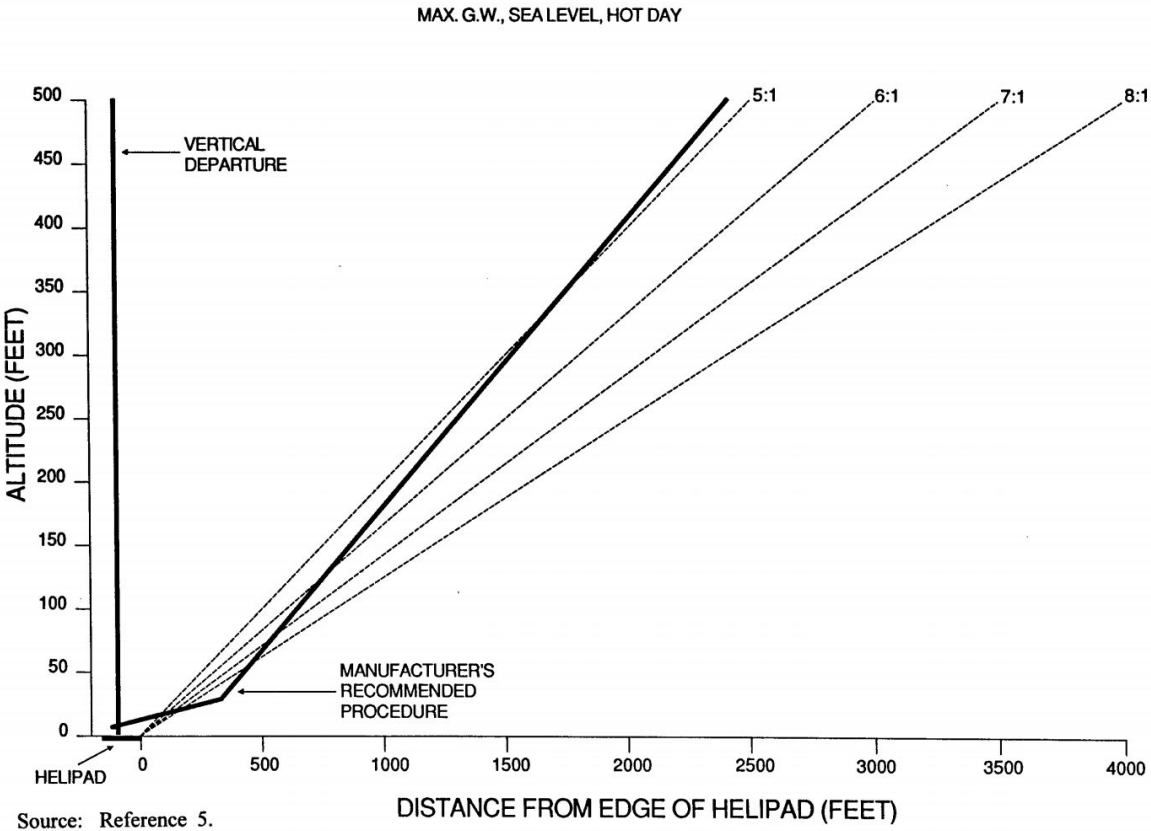
Uber


ALL ENGINE CLIMBOUT
ACCELERATE TO V_y WHEN CLEAR OF OBSTACLES
OEI CLIMBOUT
ACCELERATE TO V_{TOSS}
CDP
VERTICAL CLIMB
REJECTED TAKEOFF PATH


ALL ENGINE CLIMBOUT
ACCELERATE TO V_{TOSS}
VERTICAL CLIMB & REJECTED TAKEOFF PATH
MINIMUM 15 FEET
MINIMUM 35 FEET
OEI FLIGHT PATH

Uber





Source: Reference 5.

FIGURE 15 AS 355 F DEPARTURE PROFILES

Aircraft with Limiting H/V Envelopes

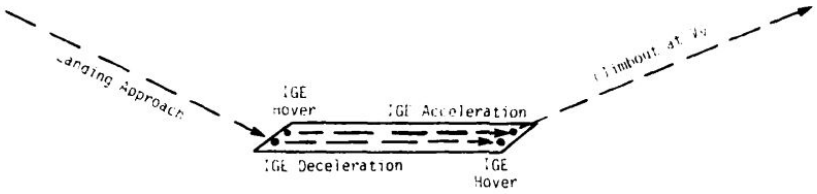


Figure 2A. Horizontal Flight Profile.

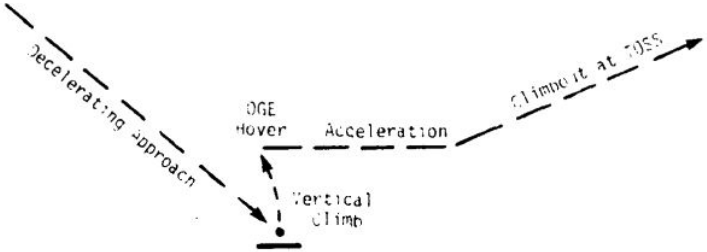


Figure 2C. Vertical Flight Profile.

Aircraft without Limiting H/V Envelopes

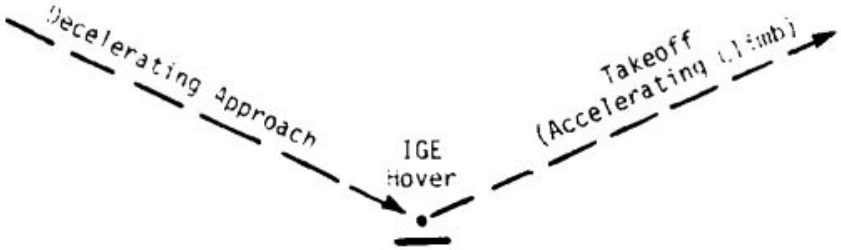


Figure 2B. Direct Flight Profile.

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