

# **T1B Program**

## **SpaceShip 2 / WhiteKnight 2**



**Marc J. Zeitlin**

**May 28<sup>th</sup>, 2011**

**4:30 PM – 6:00 PM**

**Dining Hall – Columbia Airport Campground**

# Acknowledgments

- All images and videos provided by Virgin Galactic
- All information is publicly available on VG website
- Thanks to all Scaled, The Spaceship Company (TSC) and VG contributors to the T1B program

# What Will I Talk About?

- *Who Am I?*
- *Scaled's Space Program* - *T1B*
- *Mothership* - *WK2*
- *Spaceship* - *SS2*
- *Mating WK2 / SS2*
- *Rocket Motor* - *RM2*
- *Spaceport New Mexico*
- *Videos*
- *Questions and Answer (ANY topic)*

# Who The Heck Am I?

- Biography/Resume<sup>c</sup> - <http://www.mdzeitlin.com/Marc/bio.html>
- Built Quickie Q2
- Built COZY MKIV #386, N83MZ with ~750 flying hours
- Started / Administer Unofficial COZY Builders Web Page and COZY Mailing List (~640 members)
- Currently provide Official COZY MKIV Support for COZY builders/flyers through Aircraft Spruce and Specialty
- Work for Scaled Composites as Mechanical Engineer/Manager – Currently Lead Project Engineer for SS2 Rocket Motor (RM2) Design/Development/Testing

# Scaled's Space Program - T1B

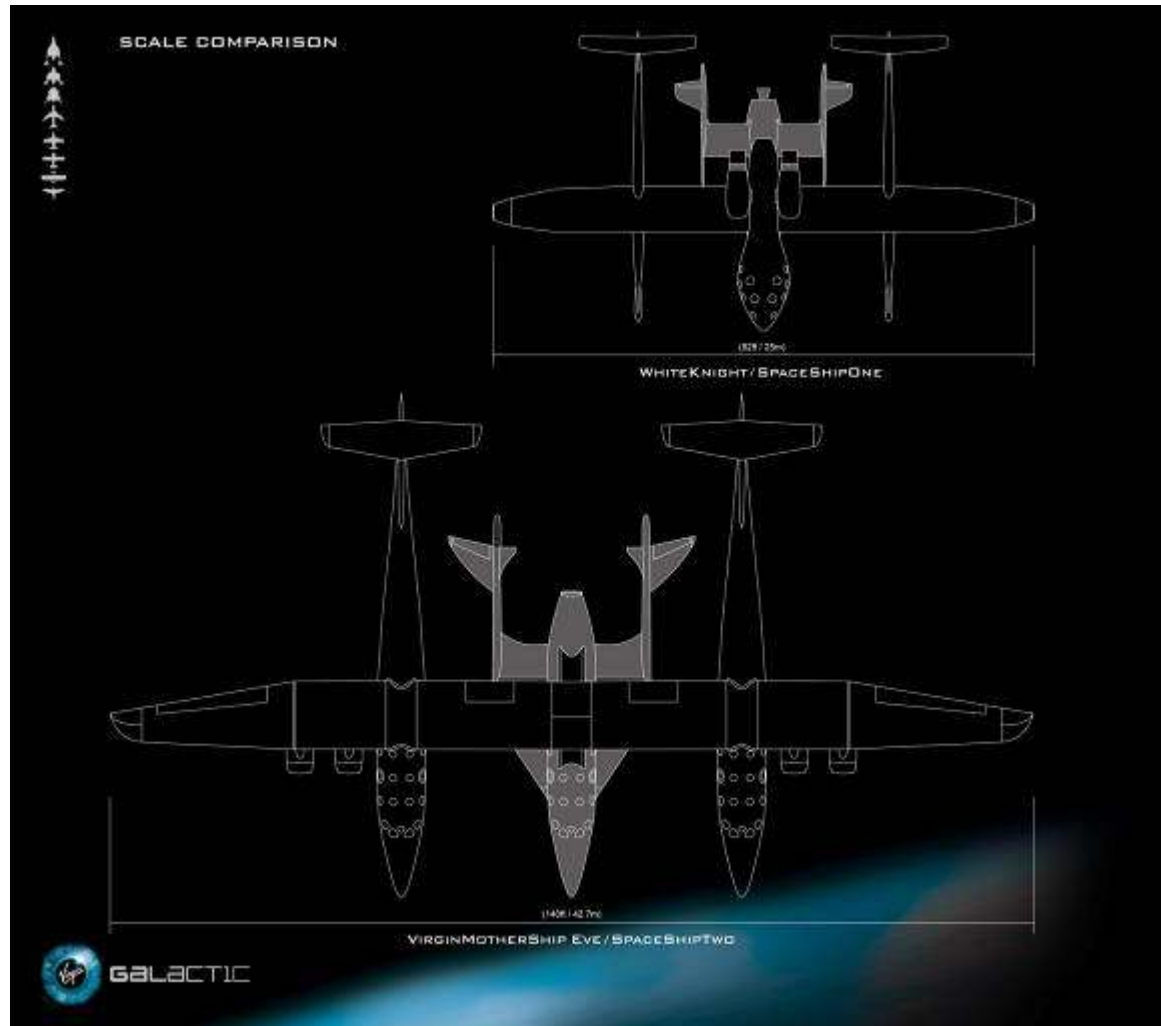
- Developing follow-on Space System similar to Tier 1 SS1/WK1/RM1 system which won \$10M X-Prize in 2004
- Funded by Virgin Galactic – part of Richard Branson's family of companies
- Object is Sub-Orbital flights only – ***not*** capable of orbital insertion
- R&D program to develop 6 passenger “Space” capable (100 km altitude or more) spaceship
- Started program in 2005
- End date?



# Scaled's Space Program - T1B

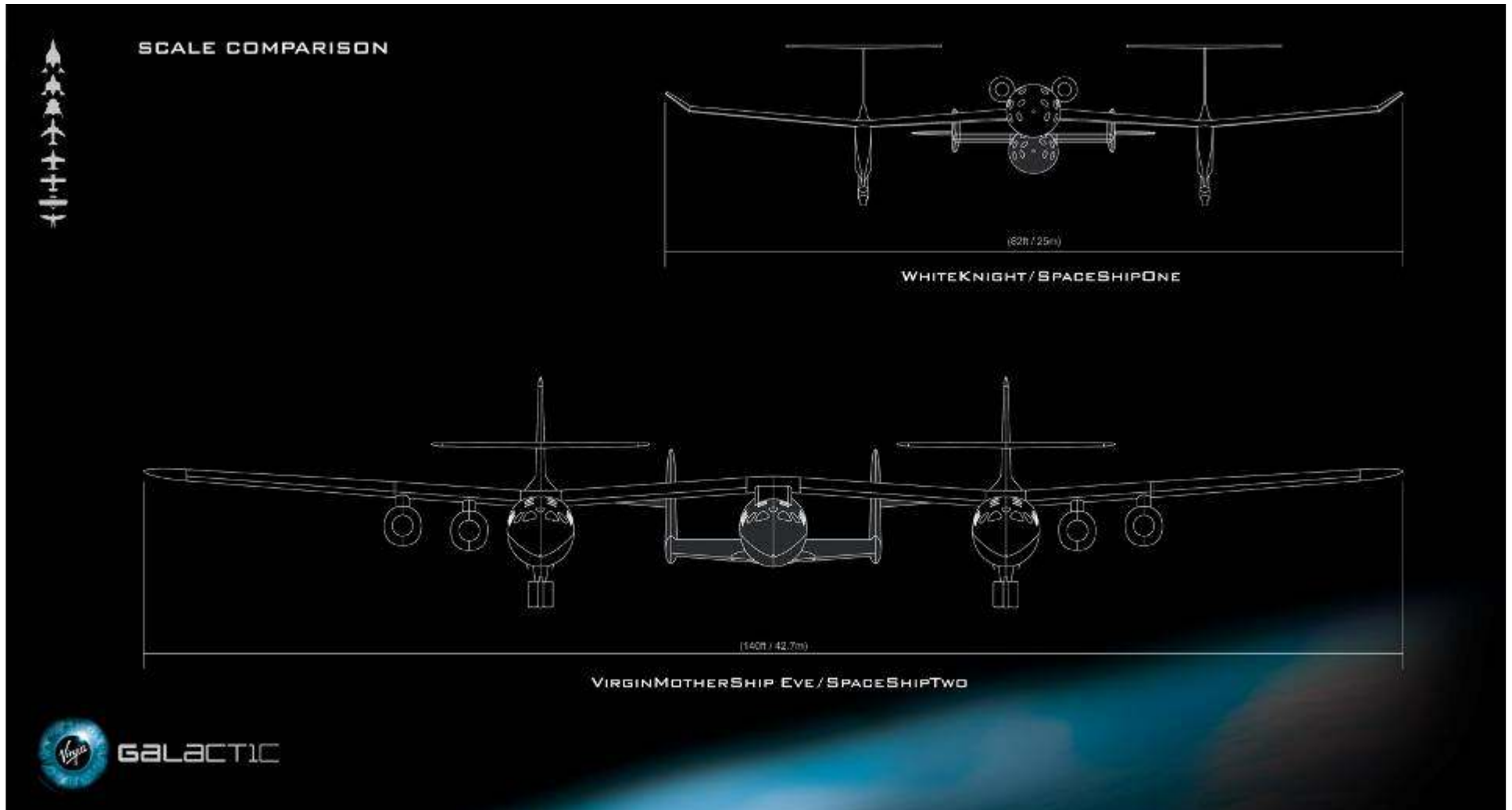


# Scaled's Space Program - T1B





# Scaled's Space Program - T1B



# Mothership - WhiteKnight 2 (WK2)



WK2 Under Construction



# Mothership - WhiteKnight 2 (WK2)

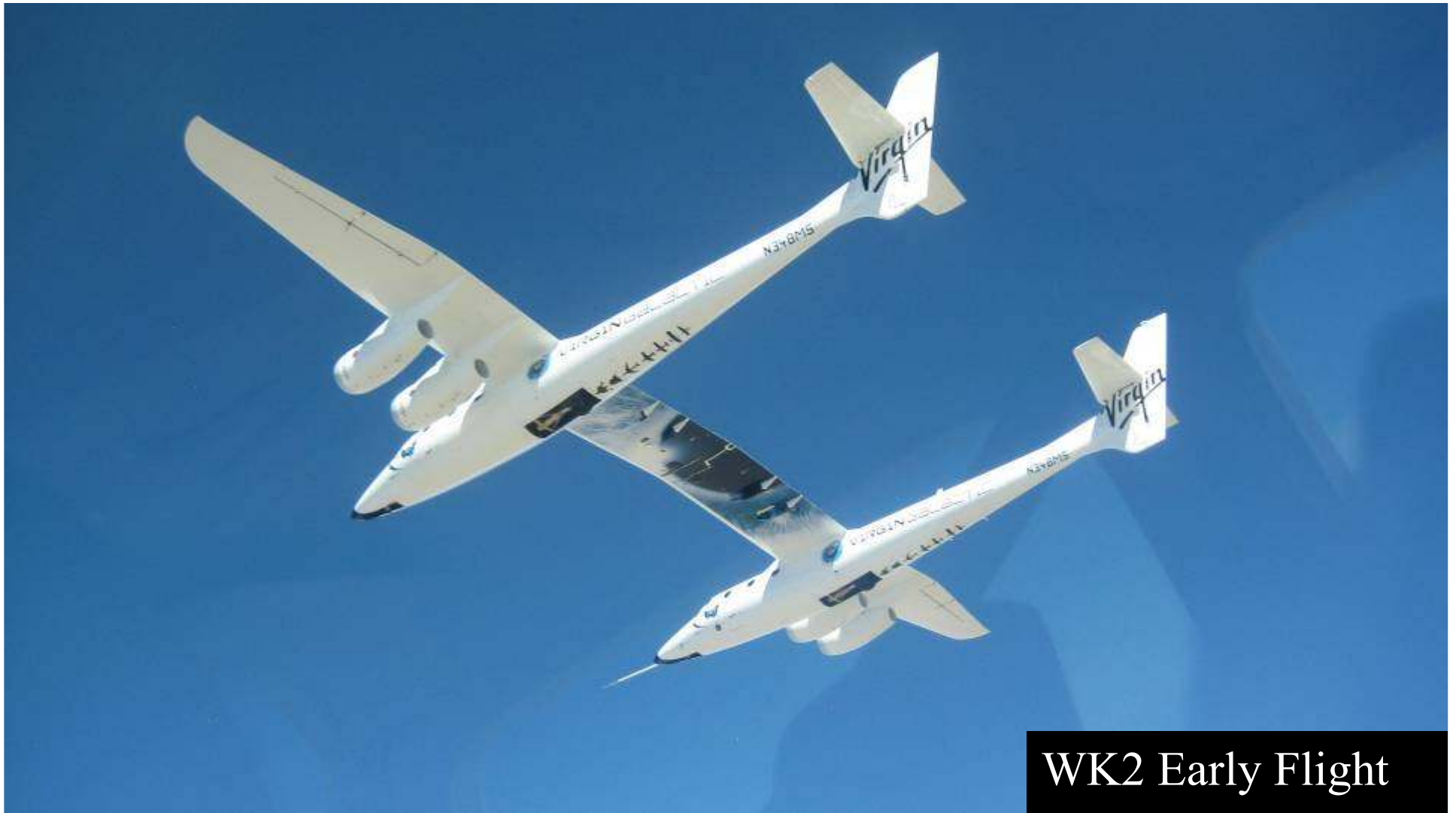


May 28th, 2011

Columbia - 2011 T1B Discussion

Page 11

# Mothership - WhiteKnight 2 (WK2)



**WK2 Early Flight**



# Mothership - WhiteKnight 2 (WK2)



May 28th, 2011

Columbia - 2011 T1B Discussion

Page 13

# Mothership - WhiteKnight 2 (WK2)



WK2 Pull-up - from FTE Seat

# Mothership - WhiteKnight 2 (WK2)



# SpaceShip 2 (SS2)



SS2 Under Construction



# SpaceShip 2 (SS2)

SS2 Nose Skid Testing



May 28th, 2011

Columbia - 2011 T1B Discussion

Page 17

# SpaceShip 2 (SS2)



May 28th, 2011

Columbia - 2011 T1B Discussion

Page 18

# SpaceShip 2 (SS2)



May 28th, 2011

Columbia - 2011 T1B Discussion

Page 19



# Spaceship - Mothership



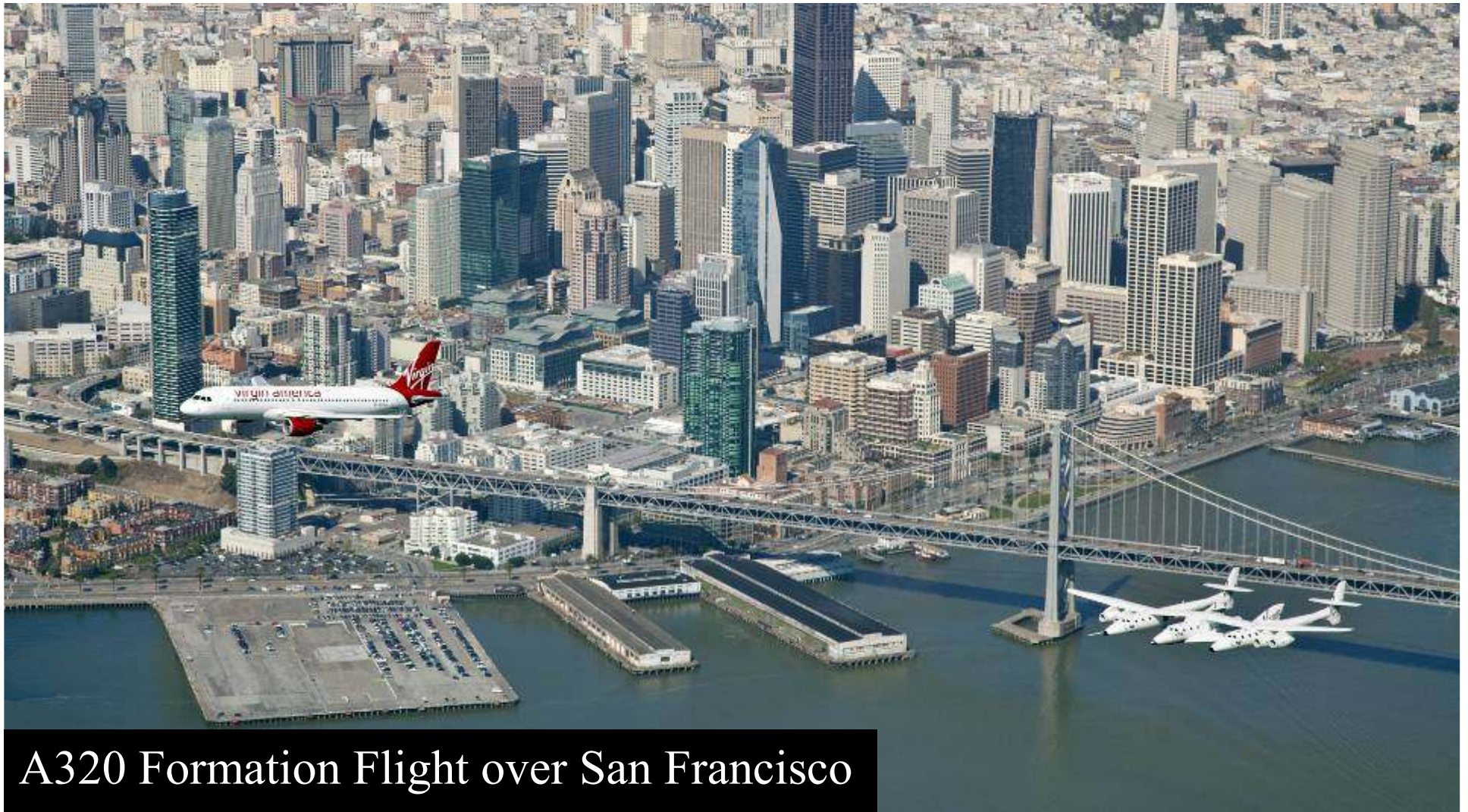
WK2/SS2 Mated Fly-By

May 28th, 2011

Columbia - 2011 T1B Discussion

Page 20

# Spaceship - Mothership



A320 Formation Flight over San Francisco

May 28th, 2011

Columbia - 2011 T1B Discussion

Page 21



# SpaceShip 2 (SS2)



SS2 First Glide Flight Briefing

# SpaceShip 2 (SS2)



May 28th, 2011

Columbia - 2011 T1B Discussion

Page 23

# SpaceShip 2 (SS2)



SS2 First Glide - ~15K ft. From Chase Plane



# SpaceShip 2 (SS2)



SS2 – Turning Base From Chase Plane

# SpaceShip 2 (SS2)



SS2 Turning Final From Chase Plane

May 28th, 2011

Columbia - 2011 T1B Discussion

Page 26

# SpaceShip 2 (SS2)



SS2 Post First Glide Group Picture

May 28th, 2011

Columbia - 2011 T1B Discussion

Page 27

# SpaceShip 2 (SS2)



SS2 Fourth Glide Flight – Water Ballast Dump



# Rocket Motor 2 (RM2)



May 28th, 2011

Columbia - 2011 T1B Discussion

Page 29

# Spaceport New Mexico



May 28th, 2011

Columbia - 2011 T1B Discussion

Page 30



# Spaceport New Mexico



May 28th, 2011

Columbia - 2011 T1B Discussion

Page 31

# Spaceport New Mexico



Artist's Rendition of Completed Spaceport Facility



# Videos

- [Early Rocket Motor Firing](#)
- [First Captive Carry \(SS2/WK2 Mated\) Flight](#)
- [First SS2 Glide Flight](#)
- [First SS2 Feather Flight](#)

# Questions? (& Answers)

- My Email: [marc\\_zeitlin@alum.mit.edu](mailto:marc_zeitlin@alum.mit.edu)
- Website: <http://www.cozybuilders.org/>
- Scaled Website: <http://scaled.com/>
- Virgin Galactic Website: <http://www.virgingalactic.com>
- Scaled is hiring engineers! See me if interested
  
- What's the point?
- Why sub-orbital only?
- How can I buy a ticket?
- Other....