



Ron Tucker, Author

The VAB is One of the Largest Buildings in the World

The Vehicle Assembly Building (VAB) is one of the largest buildings in the world. This is where the Space Shuttle first comes together as a complete vehicle. It was originally built for assembly and checkout of Apollo/Saturn vehicles and was later modified for the Space Shuttle program.

The VAB has two main areas--the Low Bay and the High Bay. The High Bays are the main part of the VAB when you look at it. The Eastern half of the High Bay is used to stack the Solid Rocket Boosters (SRB), mate the External Tank (ET) to the SRBs, and mate the Orbiter to the ET.

The Western half is used to receive and check out ETs and to provide a Safe Haven for a Space Shuttle in case of a roll back due to a hurricane. Also, part of the Western half is being modified to store an Orbiter. This will allow an Orbiter Processing Facility to accept another shuttle for processing. As the flight rates increase to support the International Space Station effort, this modification will be important to support NASA's aggressive flight manifest.

The Low Bay area is at the Southern half of the building and serves as a holding and processing area for the SRB for-



A completed flight element assembled in the VAB

ward assemblies and Ground Support Equipment. The upper floors of the low bay area house the Kennedy Space Center's main intranet and computer systems for data processing and data communication.



Comparisons:

Height: VAB - 525 ft. – Statue of Liberty - 305 ft.

Volume: VAB - 129,428,000 cu. ft. – Pentagon 77,025,000 cu. ft.

VAB equals 3.75 Empire State Building.

Interesting VAB Facts

The VAB covers 8 acres. It is 525 ft. high, 716 ft. long, 518 ft. wide. It encloses 129,428,000 cubic feet of space.

Flag and Bicentennial Emblem: Added in 1976, required 6,000 gallons of paint. The flag is 209 x 119 ft. in size. Each strip on the flag is as wide as one of the tour buses used to transport visitors around KSC.

Flag and NASA logo: The flag was repainted in September 1998; NASA logo was painted over the bicentennial emblem in September 1998. The total

paint that was used was approximately 700 gallons.

Weight of Steel: 98,590 tons.

Number of Steel Beams: 45,000

Number of Steel Bolts: 1 Million

Cubic Yards of Concrete: 65,000

Pilings: 4,225 open-end steel pipe piles, 16 inches in diameter were driven 160 ft. into bedrock.

Major Lifting Devices: There are two 250 and two 325 ton bridge cranes and 73 other pendant hoists throughout the Vehicle Assembly Building.

Assembling a Flight Element at the Kennedy Space Center

During Space Shuttle assembly inside of the VAB, Solid Rocket Booster segments are moved to the VAB from the nearby Rotation Processing and Surge Facility (RPSF). When the segments arrive in the VAB they are lifted to a Mobile Launcher Platform (MLP) in one of the Eastern side High Bays, the aft segment is bolted down to the MLP then the rest of the three segments are joined together to make a whole SRB. The same procedure is repeated on the other side to make two complete SRBs. The ET is brought to KSC by barge from Michoud, Louisiana. It is moved to the VAB from the turn basin, turned up on end, lifted up and stored in the Western High Bay for testing and checkout operations.

When the test and checkout operations

are finished and the SRB's are stacked on the Mobile Launcher, the ET is hoisted out of the checkout cell and moved over to the East High Bay to be bolted to the assembled SRBs. After the mating operation is complete, the Orbiter is towed to the VAB from the Orbiter Processing Facility (OPF). Once in the transfer aisle, the Orbiter is raised to a vertical position with large overhead cranes. When the Orbiter is hanging straight up and down, the smaller of the two cranes is disconnected and the other crane raises the Orbiter up and over a high cat walk, and then down next to the External Tank so they can be mated. (See photo below.)

When the Orbiter is mated to the External Tank, an end to end interface test is performed to make sure that all elements are properly connected and to be sure that the computers and electrical paths are correct before sending the entire assembly to the pad.

When the test is finished



A completed vehicle exits the Safe Haven Bay of the VAB

and everything has checked out correctly, the crawler-transporter is placed under the Mobile Launcher Platform, picks up the entire assembly, and moves the entire assembly to the Launch Pad.

Once the Flight Element arrives at the Launch Pad, it is connected to the Ground Support Equipment and a final test is done to ensure everything is A-OK for launch.



A view of the Orbiter being lowered into position for mating to the ET

Fun Questions

Q: How many Ping-Pong balls would it take to fill the VAB?

A: 250 Billion or 1/4 Trillion. That is 1000 times the population of the U.S.

Q: How many elephants could you pick up at one time with the VAB's 325 ton crane?

A: 105 full grown African elephants.

Q: How many gallons of water would it take to fill the VAB?

A: About 970,000,000 gallons or enough to fill 57,000 average sized swimming pools.

Q: Has it ever rained in the VAB?

A: Contrary to popular myth, it has never rained inside the enclosed VAB. It has rained inside if the large doors were open.