

A Certificate of Shuttle Knowledge

— 20 FACTS ABOUT THE SHUTTLE AND THE POSTERS —

1. Enormous cost: the ship alone, one billion dollars.
2. Enormous size: the centre tank is 8 (Eight) m in diameter. Lying down it is high as a 3 story apartment.
3. Enormous power: enough power to lift 6 loaded Boeing 747's straight up. In 8 minutes S.S. Columbia is pushed to 27,000 km h.
4. Enormous heat: the grey tiles seen at nose and wing edges handle temperatures of 1400° C. (A barbeque grill sizzles your steak at 125° C.)
5. Windshields are 3 panes thick.
6. Fuel lines are 42 cm diameter. The flow rate empties a back yard swim pool in 25 sec.
7. White pole atop gantry is a lightning mast. (Barely surviving in first blast-off photo.)
8. "Mad - hat" pipes rising from the pad spray out tons and tons of water in seconds: — which makes all the steam, — and cools the heat, — and muffles the sound, — and saves all the windows from breaking 20 km away...
9. At take-off, upon count "Zero", there is a 6 sec. test of the main engines. At the 6 sec. point the 2 booster rockets are ignited. These reach full power in ½ sec; explosive bolts holding down the ship are then broken and the assembly roars upwards.
10. If there is an emergency during start-up, pilots can unbuckle their belts, run along the ramps, grab into a basket and ride down a Slide Wire (in photo) at 88 km hr. to a bunker under the ground ½ km away. They can begin this escape only until the 3rd sec. of test firing: the 4th sec. is too late.
11. Visible in the 3 take-off photos: brightness from the exhaust outshines the sun on the water; ship begins its roll-over to fly on its back; the column of exhaust roiling to earth is over 300 m long. The photos were taken from 7 km away; the white specks along the road are people who have run up to see better. If a flight problem threatens the half million people below, a Range Safety Control officer can destroy the ship in an instant, with no warning to the crew. (On the other hand the crew, sensing such danger, can use ejection seats without asking. Once the ship has arced out over the ocean there is a built-in delay to the destruction procedure.) In their flight, the pilots contend with 2000 various switches, read-outs, and indicators—three times as many as enroute to the moon.
12. Sleeping, reading, resting will take place in perforated bags strapped and bolted to the walls. Earplugs shut out the erratic firing of the orbital rockets.
13. In regular use, shuttle will orbit with 5-7 persons aboard. They will work and fly in a shirt sleeve environment and need little advance space training. A total of 3 persons will be awake and on duty at all times.
14. A long mechanical arm will lift out and retrieve experiments and satellites. It has been designed and built in Canada at Canadian expense. (100 million dollars. — Further ones will be sold at 25 million each).
15. The most unasked—unanswered question is about Toiletry in Space. The Shuttle has an Ultra Toilet, complete with Seat Belt. A strong flow of air draws material down into a 1500 rpm fan that slings everything into container side-walls. The lid closes tightly after use, and the contents are exposed to the vacuum of space where they quickly dry out and freeze. For urine, a flow of air pulls through a hose that has a contoured cup at the entry end; it is used equally by men and women aboard.
16. First duty in orbit is to open the huge cargo doors so the radiators inside can dissipate heat. Failure of the doors to open means the ship must soon return to earth. Failure to close properly would result in a calamitous re-entry.
17. During return to earth, the shuttle slows its speed by making S curves, much as a skier downhill. It is able to land 1900 km on either side of its intended site.
18. The "Max. Q" phenomena has been neatly offset with a hollow core design in the solid boosters; the "Twang effect" has been lessened with more tons of water from the mad-hats.
19. One third of the flights scheduled ahead are for Military uses. By 1986 there will be 3-4 flights per month, rising from California as well as Florida.
20. The USSR plans a re-useable ship to fly in 1985. By then, this Aging SS Columbia, reuseable 50-100 times, will have well-nigh worn out.

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