00:00:00,820 --> 00:00:01,229
Chris Ferguson, Commander, STS-135: The magic of the space shuttle is just its enormity, it's huge and it flies up and back and there will be no parallel like that, I think, for 100 years.

00:00:01,229 --> 00:00:04,400
Bob Crippen, Pilot, STS-1: I think the shuttle has been one of the most marvelous vehicles that has ever gone into space or done anything.

00:00:04,400 --> 00:00:11,410
Bob Sieck, Former Shuttle Launch Director: You can imagine the early spacecraft, barely the size of a desk for one or two astronauts, now the spacecraft is the size of an airliner.

00:00:11,410 --> 00:00:14,160
Wayne Bingham, United Space Alliance: When you saw it, you thought, 'How can something like this fly?' You've got all these tiles on the bottom of it and it was like bricks, if you want to look at it that way.

00:00:14,160 --> 00:00:18,429
NARRATOR: There was never a spacecraft like it. As large as a DC-9 airliner, but strong enough to withstand the vacuum of space...

00:00:33,189 --> 00:00:36,909
this fly?' You've got all these tiles on the bottom of it and it was like bricks,

00:00:36,909 --> 00:00:39,619
if you want to look at it that way.

00:00:39,619 --> 00:00:44,130
NARRATOR: There was never a spacecraft like it. As large as a DC-9 airliner,

00:00:47,310 --> 00:00:52,840
big enough to carry huge satellites and built to be reused dozens of times.

00:00:52,840 --> 00:00:57,450
And it had wings, just like the imagined spaceships science fiction writers designed
for their fantastic tales of adventure.

SEICK: And the sophistication of that, again compared to the earlier vehicles,

was difficult to get accustomed to, particularly since we were making the

transition from the era of wires and switches and meters to digital and computers.

WAYNE BINGHAM: When STS-1 came in, it was a totally new vehicle.

A lot of work left to be done on it. We still had to do hydraulic lines in the aft,

APU lines in the aft. It had well over thousands of tile to go do yet to put on the spacecraft.

The timeframe as far as getting the overall integrated schedule,

it was really hard and difficult on a lot of people. Pretty much three shifts a day,

round the clock, seven days a week, 365 days a year.

NARRATOR: NASA built five shuttles to go into space, naming them after ships of

exploration in previous generations:

Columbia, Challenger, Discovery, Atlantis and Endeavour.

They were larger than any other spacecraft, capable of carrying 25 tons in its
Another difference with previous spacecraft: shuttles could bring large payloads back, giving scientists a chance to see their experiments' results firsthand.

The shuttles also carried more people on a single flight than ever before. The shuttle flew crews of eight. The previous record was three.

Shuttle astronauts also looked different than the fliers of previous programs. Women and minorities would be seen working in space throughout the shuttle program.

Astronauts ranging in age to John Glenn's 77 made their way into space on shuttles.

Scientists have used the space shuttle as a platform to study our own planet, life and materials science, our solar system... and the universe itself.

Perhaps its most famous accomplishment is NASA's Hubble Space Telescope, which has dazzled us for more than 20 years with discoveries wrapped up in unimaginable beauty.

Five teams of astronauts worked on the observatory as it orbited Earth, giving life and...
Mike Coats, Three-time Shuttle Astronaut: Servicing the Hubble Space Telescope is one of the
space shuttle's finest accomplishments. We've had several servicing missions. They saved the Hubble Space Telescope on the very first mission, if you will, that we've extended the life of the Hubble Space Telescope so many years and the things we've learned from the Hubble and from the other telescopes up there, is just astounding nowadays.

NARRATOR: These accomplishments did not come about without struggles. Accidents struck the shuttle program twice, each time provoking new introspection in the agency. Challenger broke up 73 seconds into flight on January 28, 1986. Columbia, returning to Earth following a successful scientific mission, succumbed to the forces of re-entry and was lost over Texas and Louisiana on February 1, 2003. Each shuttle had seven astronauts on board.

Barbara Morgan, Educator Astronaut: We could have shut the program down after Challenger. We could have shut the program down after Columbia. We could have stuck our heads in the sand and let the future happen however it was going to
happen. But we didn't. We decided to figure out what went wrong --

more importantly than that, figure out what we did wrong --

fix it to the best of our ability, and keep the doors open for our young people

and keep that future open.

LAUNCH COMMENTATOR: T-10 seconds, go for main engine start . . . seven, six, five . . .

three engines up and burning . . . three, two, one and liftoff of space shuttle Discovery

beginning America's new journey to the moon, Mars and beyond.

And the vehicle has cleared the tower.

NARRATOR: Astronauts flew shuttles back into space following each accident to

fulfill missions and to honor the legacy of exploration.

As the program evolved, shuttle missions grew in complexity.

Ground teams and astronauts gained new experience in activities like spacewalking,

using robotics, and capturing and deploying satellites.

The next big change in the program came in 1995 when the shuttle fleet focused on a new
destination in orbit.

Discovery performed a flyby with the Russian space station Mir,

then Atlantis docked with the outpost a couple months later to begin a string of shuttle visits bringing supplies and new astronauts to take turns living in space for months at a time, far longer than any American had done before.

In 1998, NASA began a mission that would take more than 10 years and 36 shuttle flights to complete. It would push the astronauts, space workers and the shuttles farther than before.

Together with 15 other nations, NASA began construction of the largest spacecraft in history, the International Space Station.

Bob Cabana commanded the first construction mission, STS-88, in December 1998.

Bob Cabana, Four-time Shuttle Astronaut: To know what we were laying the groundwork for and to have it go as smoothly as it did from start to finish, that was a unique flight and a very rewarding opportunity.

NARRATOR: Astronauts born in Japan, Canada, the United Kingdom,
Australia and all over Europe carried their nations' flags into space.

Chris Hadfield Astronaut, Canadian Space Agency: Yeah, we're all international astronauts.

It's a worldwide program. It's the International Space Station.

And I think that's one of the great legacies of the shuttle also is that,

that it allowed the world to come together and build our first great outpost in space.

Astronauts moved into the International Space Station in 2000,

and spaceflight success was redefined again.

Now of course sort of the pinnacle of an astronaut career is to go live on the space station.

Working in crews of two, three and six as the station grew, the astronauts

performed experiments, learned how to refine station systems and

acclimated themselves to the world of weightlessness.

We had bedrooms, we had laboratory, we had windows to take pictures out of.

It was a fully functioning laboratory, so it was just an awesome place to live.
You get used to zero-g, and then you get used to sort of the daily operations,

what you have to do every day. Talk to the ground, find some time to have your meals

and call your family and write your e-mails to your friends.

I found it very easy to adapt to living in space and I really enjoyed it a lot.

Crews also took on in-orbit repairs -- including to the shuttle itself and the International Space Station.

The last flight of the storied Space Shuttle Program, STS-135, will carry tons of equipment and supplies to the ISS, leaving the orbiting laboratory well-stocked for another decade of research in orbit.

Four astronauts will perform the mission, working with the space station's six residents to unload the supplies during much of the 12-day mission.

All four are veteran fliers, commanded by Chris Ferguson. Doug Hurley will be the pilot and Sandy Magnus and Rex Walheim are the mission specialists.

Chris Ferguson: We kept the scope of the mission fairly compact, you know, it's an MPLM resupply, logistics mission. There's one EVA, but that spacewalk is being done by the space
station crew, so the scope is a little bit smaller as a result.

NARRATOR: Because this is the final shuttle mission, its patch would carry extra meaning.

The wife of Mission Specialist Rex Walheim came up with the design.

Rex Walheim, Mission Specialist, STS-135: Well, we wanted to make it a celebration,

we wanted to make it a happy patch that really encompasses the kind of history of the Space Shuttle Program. So in some respects it mirrors a little bit the STS-1 patch with the full shuttle on there and we wanted to also honor the whole NASA/contractor team, the whole team that has made the space shuttle possible and we did that by putting a portion of the NASA emblem in the middle with the swoosh on there and then we also wanted to signify that it as the last mission. We did that with the omega.

NARRATOR: After 134 missions, the shuttle program has pushed the boundaries of what was possible for people to accomplish in space.

Mike Leinbach, Shuttle Launch Director: The space program since its early days has been really something to point at as a piece of history, American history, and space shuttle for the last
30 years has been the way we get American astronauts on to orbit and international astronauts with us. So it will be remembered as this part of American spaceflight history.

Sandy Magnus, Mission Specialist, STS-135: To have a vehicle like the shuttle that launches as a rocket, lands as a heavy glider, and does all the different kind of functions on orbit that it has over the years, I think it's going to stand in the annals of history as a very unique, versatile, kind of a one-of-a-kind vehicle.

Doug Hurley, Pilot, STS-135: The Hubble Space Telescope, the space station, I mean, just tremendous accomplishments. You know a winged vehicle that is able to come back to a runway developed in the 70s, I mean, it's just a tremendous technological feat even now.

I don't think we're going to see a vehicle like it in the near future. And I'm just proud that I was one very small part of it.

Rick Mastracchio, Three-time Shuttle Astronaut: I think people are going to look back on the space shuttle and think it was one of the most incredible vehicles built by mankind.
It will be a long time before we see another vehicle nearly as capable as the space shuttle.

FERGUSON: It'll be remembered, I think, for its pioneering, for its aerospace and just the magnitude of the program. And the fact that it served the world for 30 years and built the International Space Station will be really what everybody remembers.