NARRATOR: It takes hundreds of controllers to orchestrate a space shuttle launch. Their office on launch day

is one of the most unique work places in the world: a firing room at NASA's Kennedy Space Center in Florida.

The firing room serves as the nerve center on launch day.

LEINBACH: KSC Safety/Mission Assurance?

VOICE: KSC Safety/Mission Assurance is go, Mike.

LEINBACH: Thank you, Mark.

NARRATOR: Behind consoles, wearing headsets and checking off countdown milestones in thick binders,

launch specialists monitor the space shuttle as it stands at the launch pad three miles away.

From the firing room, they also send commands to the spacecraft,

talk to the astronauts and communicate with dozens of other teams,

from rescuers near the launch pad to mission controllers in Houston.

A successful countdown and launch requires the team to complete more than 1,600 steps, in order.

The checklist is contained in part of the eight-volume set of shuttle launch documentation.
Covering almost 8,000 pages, the books also contain contingency plans for handling launch scrubs or emergencies.

LEINBACH: Range Weather?

KATHY WINTERS: Weather is green on all constraints, winds are from three feet five degrees, 18 to 25.

LEINBACH: OK, thank you Kathy.

NARRATOR: Keeping track of the countdown as a whole are the shuttle launch director and the NASA test directors, or NTDs.

They sit in the front of the firing room at consoles on risers.

The orbiter test conductors share the second row with the NTDs.

In the back of the firing room, facing the two-story window looking out at the pads, are a series of horseshoe-shaped cabinets. Systems specialists sit there.

They have a deep knowledge of the inner workings of the space shuttle.

If a problem crops up, they are the ones who would bring it to the attention of the people in the front of the room.

The specialists also would be called on to come up with solutions to allow a safe liftoff and present them to the launch team.

NASA built space for four firing rooms on the upper floors of the Launch Control Center at Kennedy during the Apollo program.
Each one is dominated by the angled panes of glass that let controllers inside see the spacecraft on the pad and during the first minutes of ascent.

When the first space shuttle mission launched on April 12, 1981, controllers in Firing Room 1 had the primary responsibility for the liftoff.

The firing room recently was renamed the Young-Crippen Firing Room for that first crew.

Firing Rooms 2 and 3 also were equipped and staffed.

Shuttle launches require two active firing rooms: one as the primary and one with senior engineering and management personnel teams. A third firing room is capable of stepping in.

Firing Room 4, which had been a conference room during much of the shuttle program, was remodeled and opened in 2005 to give the launch team more room and modern computers.

The computers are used to constantly monitor the shuttle's myriad of systems.

Simply put, they can pick up minute changes in a system's status before a human could detect it. Late in the launch countdown, the computers run the countdown completely through a set of software called the ground launch sequencer.

HOBAGUH: We're ready to go.
LEINBACH: Thank you very much, Scorch. Much appreciate that. NTD, with that, you are cleared to launch Atlantis.

STEVE PAYNE: Copy, clear to launch.

NARRATOR: The launch control team can intervene to hold a countdown if they see something they don't like,

but otherwise it is the software that retracts the orbiter access arm,

the gaseous oxygen vent hood and commands the space shuttle's three main engines to ignite.

LEINBACH: Beautiful sight!