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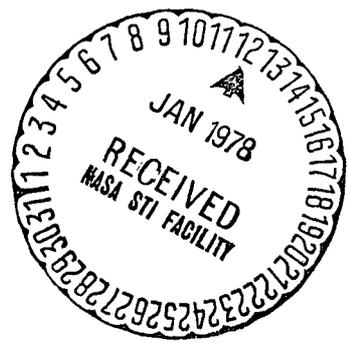
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KENNEDY CENTER FACILITIES BEING READIED FOR SHUTTLE'S DEBUT

Next fall, more than three years after the last Saturn rocket clawed skyward from Launch Complex 39 at NASA's Kennedy Space Center, Fla., the characteristic hustle and bustle of manned space flight once again will dominate the scene.

It will begin next October when Orbiter 102, fresh from the assembly line in California, glides piggyback into Kennedy Center atop its 747 carrier aircraft. The stubby, delta-winged craft -- designed to rumble into orbit like a rocket, maneuver beyond the atmosphere like a spaceship and return to Earth and land on a runway like an airplane -- will be the first of its kind to test the rigors of space flight.

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Mailed:
December 20, 1977

In November and December, the remainder of the Space Shuttle flight kit -- Orbiter main engines, External Tank and Solid Rocket Booster motors (SRBs) -- will arrive at Kennedy Center. Along with the Orbiter, they will enter the test, assembly and checkout pipeline which will culminate in a scheduled launch from Complex 39's Pad A in March of the following year.

After completion of six development flights, including four landings at NASA's Dryden Flight Research Center at Edwards, Calif., the Space Shuttle will commence operational missions from the Kennedy Center in May 1980. Kennedy Center was selected in 1972 as the primary launch and landing site for Shuttle operations.

Construction of new facilities and modifications to existing ones are proceeding on schedule at Kennedy Center to support the Shuttle's debut.

The Orbiter Landing Facility, where the Shuttle Orbiter will land on its return to Earth, was completed last August. Supporting facilities such as the Mate-Demate Device, to off-load the Orbiter from its 747 carrier aircraft, and the Microwave Landing System, to guide the Orbiter to an automatic landing, will be completed in April 1978.

Meteorological sites to support landing operations were completed in November of this year.

One of the world's longest concrete runways, the Orbiter Landing Facility is 4.5 kilometers (15,000 feet) long, 91 meters (300 feet) wide and has a 300-m (1,000-ft.) safety overrun at each end. The facility is located northwest of the Vehicle Assembly Building (VAB).

The Orbiter Processing Facility, located adjacent to the VAB and connected to the landing facility by a 3.2-km (2-mi.) towway, is essentially completed except for the installation of some remaining stands and systems expected to be in place by April. The two-bay structure will serve as an aircraft "hangar". It is here, in a "clean room" environment, that ordnance and residual fuels will be rendered safe, flight and landing systems will be refurbished and payloads will be removed and installed.

The Orbiter Landing Facility and the Orbiter Processing Facility are the only new facilities required to support Shuttle operations at Kennedy Center. The remaining Shuttle preparations consist of modifications to existing facilities originally designed and built to support the Apollo lunar landing missions.

Saturn Mobile Launcher 1, stripped of its umbilical tower and sporting three openings to permit exhaust gases from the Orbiter's main engines and solid rockets to escape during liftoff, is now being equipped with piping and cabling systems. It will be moved into High Bay 3 of the VAB in January where it will undergo further activation.

Modifications are currently underway on Mobile Launcher 2. Basic reconfiguration work will be finished in the last quarter of 1978. Installation of internal systems will continue into 1979.

The VAB, which once housed Apollo-Saturn V moon rockets, also is getting a facelift. High Bays 1 and 3 will be used to stack and integrate the Shuttle's flight components.

Modifications, consisting primarily of piping, cabling, work platforms and various electrical and pneumatic systems, are essentially completed in High Bay 3. Modifications to High Bay 1 will be finished in the third quarter of 1978.

The External Tank, which will carry the fuel to power the Orbiter's main engines, and the SRBs, which will give the Orbiter the added kick to get into space, will be stored in High Bays 2 and 4.

Modifications there, to be completed in the first quarter of 1978, include the addition of heavy cranes and railroad spurs to haul in the SRBs.

The VAB's low bay is being reconfigured to serve as a refurbishment site for portions of the SRBs. Modifications, which include the installation of small cranes, will be completed in January.

Firing Rooms 1 and 2 of the Launch Control Center, "brain" of the complex, are being outfitted with the highly automated Launch Processing System (LPS) developed for Shuttle checkout and launch.

Basic modifications to both firing rooms have been completed, with the exception of the Uninterrupted Power System which will be ready in the first quarter of 1978.

The LPS consoles and associated equipment are in place in Firing Room 2, software integration is completed and the entire system has been turned over to the user for refinement. Firing Room 1 software integration is currently in process with a targeted completion date of Feb. 15.

The Shuttle LPS system will require only about one-tenth of the manpower needed for Apollo -- 45 as compared to 450. Final countdown for a Shuttle launch will require only about two and one-half hours instead of the 28 hours needed for the final countdown of an Apollo-Saturn V vehicle.

Basic modifications to Pad A of Launch Complex 39, site of Shuttle launches, will be completed by the second quarter of 1978. Major changes include a fixed Shuttle Service Access Tower, a water sound suppression system to protect Shuttle crews and payloads from acoustical damage during liftoff and a Payload Changeout Room (PCR) which provides the capability of loading and unloading payloads at the launch pad.

The PCR is a "white room" structure mounted on a semi-circular track extending from the Shuttle Service and Access Tower. It is retracted along its track to its park site prior to launch.

Modifications to transform Pad B from Saturn to Shuttle operations are expected to begin in the second quarter of 1978.

The ponderous Crawler-Transporters (CTs), the huge tracked vehicles previously used to cart Apollo-Saturn V flight hardware around the complex, will be refurbished and readied to carry the assembled Space Shuttle and its mobile launch platform between the VAB and Complex 39's two launch pads.

Modifications consist mainly of replacing outdated electrical items and upgrading reliability to meet today's state-of-the-art. Work on CT-1 will be completed by December 1978, on CT-2 by the end of 1979.

In addition to Shuttle preparations underway at Launch Complex 39, modifications are proceeding, or scheduled, on facilities in the Kennedy Center Industrial Area. They are:

- Hypergol Maintenance Facility -- to be used for off-line refurbishment, retest and checkout of the Orbiter's aft propulsion system and forward reaction control system after each mission. These systems use highly toxic hypergolic propellants which ignite on contact with each other.

Structural changes to the facility were completed in mid-1977. Site activation work currently is in progress.

- Operations and Checkout Building -- the high bay and checkout areas, which once accommodated Apollo spacecraft before they were mated to the launch vehicle, are being reshaped to handle the European Space Agency's scientific workshop, Spacelab, expected to be a frequent "passenger" aboard the Shuttle Orbiter. Work in these areas will be completed in the third quarter of 1978.

- Parachute Facility -- being modified to handle the large parachutes that will lower the Shuttle's spent solid rocket motors to a safe landing in the Atlantic minutes after liftoff.

Each of the Shuttle's two solid rocket motors is equipped with a pilot chute, a drogue chute and three main chutes. The mains are each 35 m (115 ft.) in diameter and weigh 680 kg (1,500 lb.).

The facility will be equipped to wash, dry, store and package the parachutes for reuse. Work, here, is scheduled for completion in the third quarter of 1978.

- Spacecraft Assembly and Encapsulation Facility (SAEF-1) -- to be modified and redesignated as the Vertical Processing Facility (VPF) which will permit the checkout, processing and integration of Shuttle vertical payloads and cargoes prior to installation in the Shuttle Orbiter at the launch pad.

Vertical payloads include, but are not limited to, the Interim Upper Stage (IUS), Spinning Solid Upper Stages (SSUS) and the Teleoperator Vehicles. These flight elements, to be carried aloft by the Shuttle Orbiter, will be utilized to place payloads into high-Earth orbits and planetary trajectories which cannot be accomplished by the Shuttle vehicle.

Transformation of SAEF-1 into the VPF will begin approximately the second quarter of 1978, with an operational readiness date of July 1, 1979.

Only one structure on Cape Canaveral Air Force Station will be modified to support Shuttle operations. Hangar AF will be transformed into a Solid Rocket Booster Recovery and Disassembly Facility. It will serve as a receiving and disassembly site for the reusable SRBs after their retrieval from the ocean following Shuttle launches. Modifications, which will begin in January and be completed in the last quarter of next year, will include a barge slip at the rear of the building.

The eventual cost of construction, modification work and ground support equipment to support Space Shuttle operations at Kennedy Center will be approximately \$700-800 million.