

# HISTORIC AMERICAN ENGINEERING RECORD

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SPACE TRANSPORTATION SYSTEM, ORBITER DISCOVERY  
(OV-103)  
Johnson Space Center, 2101 NASA Parkway  
Houston  
Harris County  
Texas

HAER TX-116-A

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Jet Lowe, photographer, 2012

- TX-116-A-1                      Oblique view of the Orbiter Discovery from an elevated platform in the Vehicle Assembly Building at NASA's Kennedy Space Center. Note the Forward Reaction Control System (RCS) Module from the forward section and the Orbiter Maneuvering System (OMS)/RCS pods from the aft section have been removed. Ground support equipment called Strongbacks are attached to the payload bay doors and the Flight Deck windows have been covered by ground support equipment. Also note the scale figure standing by the Orbiter.
- TX-116-A-2                      Port side view of the Orbiter Discovery from an elevated platform in the Vehicle Assembly Building at NASA's Kennedy Space Center. Note the ground support hardware known as Strongbacks attached to the payload bay doors, the crew access hatch below the name Discovery on the forward section of the Orbiter and the removed Orbiter Maneuvering System/Reaction Control System pod from the aft (tai) section.
- TX-116-A-3                      Detail view of the forward section, port side, of the Orbiter Discovery from an elevated platform in the Vehicle Assembly Building at NASA's Kennedy Space Center. Note the removal of the Forward Reaction Control System Module from the nose section, the ground-support window covers and the strongback attached to the payload bay door.

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- TX-116-A-4 Detail view of the aft section, port side, of the Orbiter Discovery from an elevated platform in the Vehicle Assembly Building at NASA's Kennedy Space Center. Note the removed Orbiter Maneuvering System/Reaction Control System pod from the base of the vertical stabilizer the strongback ground-support equipment attached to the payload bay door. This view is also a good view of the leading edge and top surface of the Orbiter wing.
- TX-116-A-5 Oblique view of the Orbiter Discovery from ground level in the Vehicle Assembly Building at NASA's Kennedy Space Center. Note that the Forward Reaction Control System Module has been removed from the forward section. The void left behind by the removal of the reaction control system has been sealed with a clear flexible barrier and kept under positive pressure to reduce the contaminant infiltration potential.
- TX-116-A-6 Front view of the Orbiter Discovery from an elevated platform in the Vehicle Assembly Building at NASA's Kennedy Space Center.
- TX-116-A-7 View of the forward section, port side, of the Orbiter Discovery at ground level in the Vehicle Assembly Building at NASA's Kennedy Space Center. Note the exposed panels for systems access during ground support and vehicle turn-around processes.
- TX-116-A-8 Oblique view at ground level looking at the aft and port side of the Orbiter Discovery in the Vehicle Assembly Building at NASA's Kennedy Space Center. Note that the Orbiter Maneuvering System/Reaction Control System pods and the Shuttle Main Engines are removed in this image.
- TX-116-A-9 Close up oblique view aft, port side of the Orbiter Discovery in the Vehicle Assembly Building at NASA's Kennedy Space Center. This view shows a close up of the elevons and underside of the port wing. On the aft fuselage in the approximate center rift of the image is the T-0 umbilical panels.

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- TX-116-A-10 Close up view under the Orbiter Discovery in the Vehicle Assembly Building at NASA's Kennedy Space Center. The view is under the port wing looking forward toward the main fuselage showing a detail of the landing gear and landing gear door. This view also shows the patterns of worn and replaced High-temperature Reusable Surface Insulation tiles.
- TX-116-A-11 General view of the aft section of the Orbiter Discovery in the Vehicle Assembly Building at NASA's Kennedy Space Center. Note the main engines and Orbiter Maneuvering System/Reaction Control System pods are removed in this photo. The flexible hoses protruding from the starboard aft section are to control temperature, humidity and pressure in the orbiter's void spaces during its down time.
- TX-116-A-12 Close up detail of the underside of the Orbiter Discovery in the Vehicle Assembly Building at NASA's Kennedy Space Center. This view is from underneath the aft section looking forward. It is a close-up view of the High-temperature Reusable Surface Insulation tiles showing the wear patterns from the heat of reentry, consequential replacement of worn and damaged tiles. The wear and replacement patterns are unique to each Orbiter which can serve as their particular "fingerprint".
- TX-116-A-13 General view of the aft, starboard section of the Orbiter Discovery in the Vehicle Assembly Building at NASA's Kennedy Space Center. Note the main engines and Orbiter Maneuvering System/Reaction Control System pods are removed in this photo. The flexible hoses protruding from the starboard aft section are to control temperature, humidity and pressure in the orbiter's void spaces during its down time.
- TX-116-A-14 General view looking aft along the starboard side of the Orbiter Discovery in the Vehicle Assembly Building at NASA's Kennedy Space Center. This view shows a close up view of the reinforced carbon-carbon leading edge of the Orbiter wing.

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- TX-116-A-15 Close-up oblique view of the forward and starboard sides of the Orbiter Discovery in the Vehicle Assembly Building at NASA's Kennedy Space Center. The view shows the void created by the removal of the Forward Reaction Control System Module. The void has a clear flexible covering to maintain positive pressure in the void to minimize foreign object contamination possibilities in the orbiter.
- TX-116-A-16 Close-up view of the forward and starboard sides of the Orbiter Discovery in the Vehicle Assembly Building at NASA's Kennedy Space Center. The view shows the void created by the removal of the Forward Reaction Control System Module. The void has a clear flexible covering to maintain positive pressure in the void to minimize foreign object contamination possibilities in the orbiter.
- TX-116-A-17 Close-up view of the reinforced carbon-carbon nose on the forward section of the Orbiter Discovery's in the Vehicle Assembly Building at NASA's Kennedy Space Center.
- TX-116-A-18 Close-up view of the upper exterior of the forward fuselage of the Orbiter Discovery in the Orbiter Processing Facility at NASA's Kennedy Space Center. The view show a detail of the flight deck windows with protective covers installed to protect the window surfaces during processing.
- TX-116-A-19 Interior view of the Flight Deck looking forward, the Commander's seat and controls are on the left and the pilot's seat and controls are on the right of the view. Note that the flight deck windows have protective covers over them in this view. This images can be digitally stitched with image HAER No. TX -116-A-20 to expand the view to include the overhead control panels of the flight deck. This view was taken in the Orbiter Processing Facility at the Kennedy Space Center.

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- TX-116-A-20 Detail view of the interior of the flight deck looking forward showing the overhead control panels. Note that the flight deck windows have protective covers over them in this view. This images can be digitally stitched with image HAER No. TX-116-A-19 to expand the view to include the Commander and Pilot positions during ascent and reentry and landing. This view was taken in the Orbiter Processing Facility at the Kennedy Space Center.
- TX-116-A-21 Detail view of the flight deck looking aft. The aft viewing windows are uncovered in this view and look out towards the payload bay. The overhead viewing windows have exterior covers in place in this view. The aft flight deck contains displays and controls for executing maneuvers for rendezvous, docking, payload deployment and retrieval, payload monitoring and the remote manipulator arm controls. Payload bay doors are also operated from this location. This view was taken in the Orbiter Processing Facility at the Kennedy Space Center.
- TX-116-A-22 General view of the mid-deck area looking forward and starboard. On the far left of the images are the avionics equipment bays. During missions the forward avionics bays would be fronted by lockers for mission equipment and the flight crew's personal equipment. Sleep stations would be located along the far wall if the orbiter was in a flight ready configuration. The hose and ladder on the right side of the image are pieces of ground support equipment. The hose is part of the climate control apparatus used while orbiters are being processed. The ladder is used to access the inter-deck passage, leading to the flight deck, while the orbiter is in 1g (earth's gravity). This view was taken in the Orbiter Processing Facility at the Kennedy Space Center.

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- TX-116-A-23            General view of the mid-deck looking aft and port. In this view you can clearly see the crew access hatch and the airlock hatch. The hose and ladder in the image are pieces of ground support equipment. The hose is part of the climate control apparatus used while orbiters are being processed. The ladder is used to access the inter-deck passage, leading to the flight deck, while the orbiter is in 1g (earth's gravity). A careful observer will notice a void in the wall near the base of the access ladder, this is the Waste Management Compartment with the Waste Management System, i.e. Space Potty, removed. This view was taken in the Orbiter Processing Facility at the Kennedy Space Center.
- TX-116-A-24            Close-up view of the nose and landing gear on the forward section of the Orbiter Discovery in the Orbiter Processing Facility at Kennedy Space Center. The Orbiter is being supported by jack stands in the left and right portion of the view. The jack stands attach to the Orbiter at the four hoist attach points, two located on the forward fuselage and two on the aft fuselage. Note the access platforms that surround and nearly touch the orbiter.
- TX-116-A-25            Close-up view of the reinforced carbon-carbon nose of the Orbiter Discovery from the service platform in the Orbiter Processing Facility at Kennedy Space Center. Note the clear protective shield around the nose cap, and the reflective insulation protecting the Crew Compartment bulkhead and orbiter structure in the void created by the removal of the Forward Reaction Control Module.
- TX-116-A-26            Close-up view of the reflective insulation protecting the Crew Compartment bulkhead, orbiter structure and landing gear housing in the void created by the removal of the Forward Reaction Control System Module from the forward section of the Orbiter Discovery. This image was taken from the service platform in the Orbiter Processing Facility at Kennedy Space Center.

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- TX-116-A-27      Detail View looking at the protected structure and landing gear housing in the void created by the removal of the Forward Reaction Control System Module from the forward section of the Orbiter Discovery. This view was taken from the service platform in the Orbiter Processing Facility at Kennedy Space Center.
- TX-116-A-28      View looking aft along the starboard side of the mid-fuselage of the Orbiter Discovery. This view shows the wing profile as it intersects with the fuselage. Also note in the foreground the panels protecting the Reinforced Carbon-Carbon leading edge of the wing. This view was taken from the service platform in the Orbiter Processing Facility at Kennedy Space Center.
- TX-116-A-29      Detail view looking aft along the starboard side of the Orbiter Discovery where the forward section meets the mid-fuselage. Note the head of the jack stand and its mechanism to connect to the one of the forward hoist attach points of the orbiter. Also note the support structure of the service platforms. This view was taken from the service platform in the Orbiter Processing Facility at Kennedy Space Center.
- TX-116-A-30      Close-up detail of the jack-stand head and the attach mechanism connection to the hoist attach point on the starboard forward fuselage of the Orbiter Discovery. Note the profile of the wing intersection with the fuselage and the payload bay door in an open position with the strongback support structure attached. This view was taken from a service platform in the Orbiter Processing Facility at Kennedy Space Center.
- TX-116-A-31      Close-up detail of the payload bay door with the strongback support attached. This view was taken from a service platform in the Orbiter Processing Facility at Kennedy Space Center.

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TX-116-A-32            General view looking aft from the starboard side of the Orbiter Discovery looking into the payload bay and the bulkhead of the aft fuselage. Note that the Orbiter Boom Sensor System is still attached while the Remote Manipulator System has been removed. Also note the suspended protective panels and walkways in place to protect the interior surfaces of the payload bay doors while in their open position. This view was taken from a service platform in the Orbiter Processing Facility at Kennedy Space Center.

TX-116-A-33            General view looking forward from the starboard side of the Orbiter Discovery looking into the payload bay and the bulkhead of the forward fuselage with the airlock. The docking ring and airlock hatches have been removed from the airlock prior to this photo being taken. Note that the Orbiter Boom Sensor System is still attached while the Remote Manipulator System has been removed. Also note the suspended protective panels and walkways in place to protect the interior surfaces of the payload bay doors while in their open position. This view was taken from a service platform in the Orbiter Processing Facility at Kennedy Space Center.

TX-116-A-34            Close-up view looking aft from the starboard side of the Orbiter Discovery looking into the payload bay and the bulkhead of the aft fuselage. Note the vertical stabilizer protruding slightly from beyond the clear sheeting used to keep positive pressure in the mid-fuselage and payload bay area during servicing. Note that the Orbiter Boom Sensor System is still attached while the Remote Manipulator System has been removed. Also note the suspended protective panels and walkways in place to protect the interior surfaces of the payload bay doors while in their open position. This view was taken from a service platform in the Orbiter Processing Facility at Kennedy Space Center.

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- TX-116-A-35            Close-up view from the starboard side looking towards the port side of the Orbiter Discovery looking at the airlock and payload bay. The docking ring has been removed from the airlock prior to this photo being taken. Note that the Orbiter Boom Sensor System is still attached while the Remote Manipulator System has been removed. Also note the suspended protective panels and walkways in place to protect the interior surfaces of the payload bay doors while in their open position. This view was taken from a service platform in the Orbiter Processing Facility at Kennedy Space Center.
- TX-116-A-36            General view from inside the payload bay of the Orbiter Discovery approximately along its centerline looking aft towards the bulkhead of the aft fuselage. Note panels and insulation removed for access to the orbiter's subsystems for inspection and post-mission processing. This photo was taken during the processing of the Orbiter Discovery after its final mission and in preparation for its transition to the National Air and Space Museum. This view was taken in the Orbiter Processing Facility at Kennedy Space Center.
- TX-116-A-37            General view from inside the payload bay of the Orbiter Discovery approximately along its centerline looking forward toward the bulkhead of the forward fuselage. Note the panels and insulation removed for access to the orbiter's subsystems for inspection and post-mission processing. Also note the airlock and the beam-truss attach structure supporting it and attaching it to the payload bay sill longerons. In this view the docking ring and airlock hatches have been removed. This photo was taken during the processing of the Orbiter Discovery after its final mission and in preparation for its transition to the National Air and Space Museum. This view was taken in the Orbiter Processing Facility at Kennedy Space Center.

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Detail view of the vertical stabilizer of the Orbiter Discovery showing the thermal protection system components with the white Advanced Flexible Reusable Surface Insulation (AFSI) Blanket and the black High-temperature Reusable Surface Insulation (HRSI) tiles along the outer edges . The marks seen on the HRSI tiles are injection point marks and holes for the application of waterproofing material. This view also a good detailed view of the two-piece rudder which is used to control the yaw position of orbiter on approach and landing in earth's atmosphere and upon landing the two-piece rudder splays open to both sides of the stabilizer to act as an air brake to help slow the craft to a stop. This view was taken from a service platform in the Orbiter Processing Facility at Kennedy Space Center.

TX-116-A-39

Detail view of the leading and top edge of the vertical stabilizer of the Orbiter Discovery showing the thermal protection system components with the white Advanced Flexible Reusable Surface Insulation (AFRSI) blanket and the black High-temperature Reusable Surface Insulation (HRSI) tiles along the outer edges. The marks seen on the HRSI tiles are injection point marks and holes for the application of waterproofing material. This view was taken from a service platform in the Orbiter Processing Facility at Kennedy Space Center.

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- TX-116-A-40 Detail view of the vertical stabilizer of the Orbiter Discovery looking at the two-piece rudder which is used to control the yaw position of orbiter on approach and landing in earth's atmosphere and upon landing the two-piece rudder splays open to both sides of the stabilizer to act as an air brake to help slow the craft to a stop. Note the thermal protection system components with the white Advanced Flexible Reusable Surface Insulation Blanket and the black High-temperature Reusable Surface Insulation tiles along the outer edges (HRSI tiles). The marks seen on the HRSI tiles are injection point marks and holes for the application of waterproofing material. This view was taken from a service platform in the Orbiter Processing Facility at Kennedy Space Center.
- TX-116-A-41 Detail view of the lower portion of the vertical stabilizer of the Orbiter Discovery. The section below the rudder, often referred to as the "stinger", is used to house the orbiter drag chute assembly. The system consisted of a mortar deployed pilot chute, the main drag chute, a controller assembly and an attach/jettison mechanism. This system was a modification to the original design of the Orbiter Discovery to safely reduce the roll to stop distance without adversely affecting the vehicle handling qualities. This view was taken from a service platform in the Orbiter Processing Facility at Kennedy Space Center.

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- TX-116-A-42 Close-up view of the aft fuselage of the Orbiter Discovery looking at the thrust structure that supports the Space Shuttle Main Engines (SSMEs). In this view, SSME number two position is on the left and SSME number three position is on the right. The thrust structure transfers the forces produce by the engines into and through the airframe of the orbiter. The thrust structure includes the SSMEs load reaction truss structure, engine interface fittings and the hydraulic-actuator support structure. The propellant feed lines are the plugged and capped orifices within the engine bays. Note that SSME position two is rotated ninety degrees from position three and one. This was needed to enable enough clearance for the engines to fit and gimbal. Note in engine bay three is a clear view of the actuators that control the gambling of that engine. This view was taken from a service platform in the Orbiter Processing Facility at Kennedy Space Center.
- TX-116-A-43 Detail view in engine bay three in the the aft fuselage of the Orbiter Discovery. This view shows the engine interface fittings and the hydraulic-actuator support structure. The propellant feed lines are the large plugged and capped orifices. Note the handwritten references on the thrust plate in proximity to the actuators that read E3 Pitch and E3 Yaw. This view was taken from a service platform in the Orbiter Processing Facility at Kennedy Space Center.
- TX-116-A-44 Close-up view of the aft fuselage of the Orbiter Discovery on the starboard side looking forward. This view is of the attach surface for the Orbiter Maneuvering System/Reaction Control System (OMS/RCS) Pod. The OMS/RCS pods are removed for processing and reconditioning at another facility. This view was taken from a service platform in the Orbiter Processing Facility at Kennedy Space Center.

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TX-116-A-45

General view of the underside of the Orbiter Discovery on the port side looking toward the starboard side and slightly forward. Note the landing gear assemblies, the jack stands attached to the External Tank (ET) attach points in on the Orbiter/ET propellant interface plate and the black High-Temperature Reusable Surface Insulation. The varying degrees of darkness of the tiles is due to the age of the tiles, the more recently replaced tiles are darker than the older tiles. The pattern created by the tile replacement is unique to each orbiter and becomes their "fingerprint". This view was taken in the Orbiter Processing Facility at Kennedy Space Center.

TX-116-A-46

Overall view of the Orbiter Servicing Structure within the Orbiter Processing Facility at Kennedy Space Center. Can you see any hint of the Orbiter Discovery? It is in there.

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Photographic Operations Group - Johnson Space Center, photographer, 2012

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| TX-116-A-47 | General view of the "top" side of the Orbiter Discovery as it is being hoisted in a vertical position in the transfer aisle of the Vehicle Assembly Building at Kennedy Space Center   |
| TX-116-A-48 | View of the forward fuselage and the reinforced carbon-carbon nose of the Orbiter Discovery looking aft while mounted atop the 76-wheeled orbiter transfer system as it is being rolled from the Orbiter Processing Facility to the Vehicle Assembly Building at Kennedy Space Center. |
| TX-116-A-49 | An oblique view of the forward fuselage and port side of the Orbiter Discovery while mounted atop the 76-wheeled orbiter transfer system as it is being rolled from the Orbiter Processing Facility to the Vehicle Assembly Building at Kennedy Space Center.                          |
| TX-116-A-50 | The port side view of the Orbiter Discovery while mounted atop the 76-wheeled orbiter transfer system as it is being rolled from the Orbiter Processing Facility to the Vehicle Assembly Building at Kennedy Space Center.   |

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- TX-116-A-51            Close-up oblique view of the aft fuselage of the Orbiter Discovery looking forward and starboard as the last Space Shuttle Main Engine is being removed, it can be seen on the right side of the image frame. Note that one of the Orbiter Maneuvering System/ Reaction Control System has been removed while one of them remains. Also note that the body flap, below the engine positions has a protective covering to prevent damage to the High-temperature Reusable Surface Insulation tiles. This image was taken inside the Orbiter Processing Facility at Kennedy Space Center.
- TX-116-A-52            Close-up oblique view of the aft fuselage of the Orbiter Discovery looking forward and starboard with the Space Shuttle Main Engines (SSME) and Orbiter Maneuvering System/Reaction Control System pods still in place. However, the heat shields have been removed from the SSMEs providing a good view toward the interior of the aft fuselage. This image was taken inside the Orbiter Processing Facility at Kennedy Space Center.
- TX-116-A-53            Close-up oblique view of the aft fuselage of the Orbiter Discovery looking forward and starboard with the Space Shuttle Main Engines (SSME) and Orbiter Maneuvering System/Reaction Control System pods removed. The openings for the SSMEs have been covered with a flexible barrier to create a positive pressure envelope inside of the aft fuselage. This image was taken inside the Orbiter Processing Facility at Kennedy Space Center.
- TX-116-A-54            Close-up view of the aft fuselage looking forward along the approximate centerline of the Orbiter Discovery looking at the expansion nozzles of the Space Shuttle Main Engines (SSME) and the Orbiter Maneuvering System. Also in the view is the orbiter's body flap with a protective covering over the High-temperature Reusable Surface Insulation tiles on the surface facing the SSMEs. This image was taken inside the Orbiter Processing Facility at Kennedy Space Center.

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- TX-116-A-55 Close-up oblique view of the aft fuselage of the Orbiter Discovery looking forward and port as the last Space Shuttle Main Engine is being removed, it can be seen on the left side of the image frame. Note that one of the Orbiter Maneuvering System/ Reaction Control System has been removed while one of them remains. Also note that the body flap, below the engine positions has a protective covering to prevent damage to the High-temperature Reusable Surface Insulation tiles. This image was taken inside the Orbiter Processing Facility at Kennedy Space Center.
- TX-116-A-56 Close-up oblique view of the aft fuselage of the Orbiter Discovery looking forward and port with the Space Shuttle Main Engines (SSME) and Orbiter Maneuvering System/Reaction Control System pods still in place. However, the heat shields have been removed from the SSMEs providing a good view toward the interior of the aft fuselage. This image was taken inside the Orbiter Processing Facility at Kennedy Space Center.
- TX-116-A-57 The starboard side view of the Orbiter Discovery while mounted atop the 76-wheeled orbiter transfer system as it is being rolled from the Orbiter Processing Facility to the Vehicle Assembly Building at Kennedy Space Center.
- TX-116-A-58 An oblique view of the forward fuselage and starboard side of the Orbiter Discovery while mounted atop the 76-wheeled orbiter transfer system as it is being rolled from the Orbiter Processing Facility to the Vehicle Assembly Building at Kennedy Space Center.
- TX-116-A-59 General view of the "bottom" side of the Orbiter Discovery as it is being hoisted in a vertical position in the transfer aisle of the Vehicle Assembly Building at Kennedy Space Center

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- TX-116-A-60 Close-up view of the Reinforced Carbon-Carbon nose cap on the front fuselage of the Orbiter Discovery. Note the 76-wheeled orbiter transfer system attached to the orbiter at the forward attach point, the same attach point used to mount the orbiter onto the External Tank. This view was taken at Kennedy Space Center.
- TX-116-A-61 Close-up view of the exterior of the starboard side of the forward fuselage of the Orbiter Discovery looking at the forward facing observation windows of the flight deck. Note the High-temperature Reusable Surface Insulation (HRSI) surrounding the window openings, the Low-temperature Reusable Surface Insulation (LRSI) immediately beyond the HRSI tiles and the Advanced Flexible Reusable Surface Insulation blankets just beyond the LRSI tiles. The holes in the tiles are injection points for the application of waterproofing material. The windows are composed of redundant pressure window panes of thermal glass. This image was taken from a service platform in the Orbiter Processing Facility at Kennedy Space Center
- TX-116-A-62 Close-up view of the underside of the forward fuselage of the Orbiter Discovery looking at the nose landing-gear and into the landing-gear well. The vehicle is elevated and supported by jack stands attached to the hoist attach points and the rear External Tank attach points on the propellant disconnect plate assemblies. This photo was taken inside the Orbiter Processing Facility at Kennedy Space Center.
- TX-116-A-63 Close-up view of the Orbiter Discovery as it is suspended vertically by the hoist in the transfer aisle of the Vehicle Assembly Building at Kennedy Space Center. This view is a detail of the starboard wing of the orbiter. Note the Reinforced Carbon-Carbon panels on the leading edge of the wing, the elevons and the elevon seal panels on the wing's trailing edge.

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- TX-116-A-64 Detail view of the underside of a elevon on the port side wing of the Orbiter Discovery. Note the wear and replacement patterns of the High-temperature Reusable Surface Insulation tiles. This image was taken inside of the Orbiter Processing Facility at Kennedy Space Center.
- TX-116-A-65 General view of the Orbiter Discovery mated to the External Tank and Solid Rocket Booster assembly in the Vehicle Assembly Building at Kennedy Space Center
- TX-116-A-66 General view of the Orbiter Discovery in the Orbiter Processing Facility at Kennedy Space Center showing the payload bay doors open exposing the heat-dissipating radiator panels located on the inside of the payload bay doors. Also in the view is the boom portion of the boom sensor system deployed as part of the return to flight procedures after STS-107 to inspect the orbiter's thermal protection system. The Remote Manipulator System, the "Canadarm", and the airlock are seen in the background of the image.
- TX-116-A-67 Close up view of the Orbiter Discovery in the Orbiter Processing Facility at Kennedy Space Center. The view is a detail of the aft, starboard landing gear and a general view of the Thermal Protection System tiles around the landing-gear housing.
- TX-116-A-68 Detail view of a starboard Orbiter Maneuvering and Reaction Control Systems pod, removed from the orbiter and in it's carrier/transport vehicle at Kennedy Space Center.
- TX-116-A-69 Detail view of the "underside" of the Orbiter Maneuvering/Reaction Control Systems pod looking at the two spherical propellant tanks for the Reaction Control System, and the elongated propellant tanks for the Orbiter Maneuvering System. This view was taken at Kennedy Space Center.

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- TX-116-A-70 Detail view of the starboard side of the aft fuselage of the Orbiter Discovery in the Orbiter Processing Facility at Kennedy Space Center with the Orbiter Maneuvering/Reaction Control Systems Pod removed and exposing the insulating foil used to protect the orbiter structure from the heat generated by the maneuvering and reaction control engines. Also note in the view that the aft fuselage access door has been removed and also note the ground support equipment attached to the T-0 umbilical plate in the lower left of the view.
- TX-116-A-71 Detail view of the port side of the aft fuselage of the Orbiter Discovery in the transfer aisle of the Vehicle Assembly Building at Kennedy Space Center with a lifting frame attached to the aft attach points of the orbiter. In this view, the Orbiter Maneuvering/Reaction Control Systems pod is in place. Also note the darker-colored trapezoidal aft fuselage access door and the T-0 umbilical panel to its right in the view.
- TX-116-A-72 Detail view of the vertical stabilizer of the Orbiter Discovery as it sits at Launch Complex 39 A at Kennedy Space Center being prepared for its launch.
- TX-116-A-73 Detail view of the underside of the Body Flap of the Orbiter Discovery as it is being rotated into a vertical position in the Vehicle Assembly Building at Kennedy Space Center.
- TX-116-A-74 Detail view of the External Tank to Orbiter liquid-hydrogen interface panel as the Orbiter Discovery is being tested and prepped at the Vehicle Assembly Building at Kennedy Space Center.
- TX-116-A-75 General view of the flight deck of the Orbiter Discovery looking forward from behind the commander's seat looking towards the pilot's station. Note the numerous Velcro pads located throughout the crew compartment, used to secure frequently used items when in zero gravity. This image was taken at Kennedy Space Center.

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- TX-116-A-76 General view of the flight deck of the Orbiter Discovery looking from a low angle up and aft from approximately behind the commander's station. In the view you can see the overhead aft observation windows, the payload operations work area and in this view the payload bay observation windows have protective covers on them. This view was taken at Kennedy Space Center.
- TX-116-A-77 General view of the flight deck of the Orbiter Discovery looking forward along the approximate center line of the orbiter at the center console. The Multifunction Electronic Display System (MEDS) is evident in the mid-ground center of this image, this system was a major upgrade from the previous analog display system. The commander's station is on the port side or left in this view and the pilot's station is on the starboard side or right in this view. Not the grab bar in the upper center of the image which was primarily used for commander and pilot ingress with the orbiter in a vertical position on the launch pad. Also note that the forward observation windows have protective covers over them. This image was taken at Kennedy Space Center.
- TX-116-A-78 General view of the flight deck of the orbiter Discovery looking forward and overhead at the overhead instrumentation and control panels. This view was taken at Kennedy Space Center.
- TX-116-A-79 Close up view of the pair of Rudder Pedals in the Commander's Station on the Flight Deck of the Orbiter Discovery. The rudder pedals command orbiter acceleration in yaw by positioning the rudder during atmospheric flight. However, because the flight control software automatically performs turn coordination during banking maneuvers, the rudder pedals are not operationally used during glided flight. It is not until after touchdown that the crew uses them for nose wheel steering during rollout. Depressing the upper portion of the rudder pedals provides braking. Differential braking may also be used for directional control during rollout. This view was taken at Johnson Space Center.

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TX-116-A-80 Close up view of the Commander's Seat on the Flight Deck of the Orbiter Discovery. Toward the right of the view and in front of the seat is the commander's Rotational Hand Controller. The pilot station has an identical controller. These control the acceleration in the roll pitch and yaw directions via the reaction control system and/or the orbiter maneuvering system while outside of Earth's atmosphere or via the orbiter's aerosurfaces while in Earth's atmosphere when the atmospheric density permits the surfaces to be effective. There are a number of switches on the controller, most notably a trigger switch which is a push-to-talk switch for voice communication and a large button on top of the controller which is a switch to engage the backup flight system. This view was taken at Kennedy Space Center.

TX-116-A-81 Close up view of the center console on the flight deck of the Orbiter Discovery showing the console's instrumentation and controls. The commanders station is located to the left in this view and the pilot's station is to the right in the view. The handle and lever located on the right side of the center console and towards its front is one of a pair, the commander has one on the left of his seat in his station, of Speed Brake/Thrust Controllers. These are dual purpose controllers. During ascent the controller can be use to throttle the main engines and during entry the controllers can be used to control aerodynamic drag by opening or closing the orbiter's speed brake.

TX-116-A-82 Close up view of the Commander's Seat on the Flight Deck of the Orbiter Discovery. It appears the Orbiter is in the roll out / launch pad configuration. A protective cover is over the Rotational Hand Controller to protect it during the commander's ingress. Most notable in this view are the Speed Brake/Thrust Controller in the center right in this view and the Translational Hand Controller in the center top of the view. This image was taken at Kennedy Space Center.

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- TX-116-A-83 Close-up view of the Pilot's Seat on the Flight Deck of the Orbiter Discovery. It appears the Orbiter is in the roll out / launch pad configuration. A protective cover is over the Rotational Hand Controller to protect it during the pilot's ingress. Control panels R1 and R2 are prominent in this view. Panel R1 has switches for control and maintenance of on-board cryogenics for the fuel cells among other functions and panel R2 has switches and controls for the Auxiliary Power Units, ET umbilical doors as well as other operational controls. Note the portable fire extinguisher in the lower right corner of the image. This photograph was taken at Kennedy Space Center.
- TX-116-A-84 Close-up view of the aft flight deck of the Orbiter Discovery looking at the aft center control panels A6, A7, A8, A12, A13, A14, A16 and A17. This View was taken at Kennedy Space Center.
- TX-116-A-85 General view of the aft Flight Deck looking at the mission specialist seats directly behind and to the side of the commander and pilot's seats. These seats are removed, packed and stowed during on-orbit activities. This image was taken at Kennedy Space Center.
- TX-116-A-86 General view of the mid deck of the Orbiter Discovery during pre-launch preparations. Note the payload and mission specialists seats. The seats are removed packed and stowed during on-orbit activities. Also note the black panels in the right of the image, they are protective panels used for preparation of the orbiter and astronaut ingress while the orbiter is in its vertical launch position. This image was taken at Kennedy Space Center.
- TX-116-A-87 General view of the mid-deck of the Orbiter Discovery while in the Orbiter Processing Facility at Kennedy Space Center. The view is looking through the air lock and into the payload bay. In the foreground note the ladders and access hatches to the flight deck and the ground support panels used to protect the floors.

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- TX-116-A-88 Close-up view of the starboard side of the crew compartment mid-deck of the Orbiter Discovery. This is a close up view of the galley for meal preparations. In the center right of the image is stowage lockers that are designated to store meals for the mission. This photograph was taken at Kennedy Space Center.
- TX-116-A-89 Detail view of the Waste Management System, the space potty, onboard the Orbiter Discovery. It is located on the aft wall on the port side of the mid deck of the orbiter. This photograph was taken at Kennedy Space Center.
- TX-116-A-90 Close-up view of the mid deck aft wall of the Orbiter Discovery showing a mission specific configuration of stowage lockers within the modular system designed for maximum flexibility. This photograph was taken at Kennedy Space Center.
- TX-116-A-91 Detail view of the starboard mid deck wall of the Orbiter Discovery showing Operational Sleeping Bags attached horizontally to the wall for the crew sleep period. If it is required as part of a mission's manifest a four-tiered rigid sleep station can be installed. This photograph was taken at Kennedy Space Center.
- TX-116-A-92 General view of the forward wall of the mid deck of the Orbiter Discovery. In this view a majority of wall panels have been removed to reveal the avionics bays in the interstitial space between the mid deck forward wall and the forward bulkhead of the pressurized crew compartment. This photograph was taken at Kennedy Space Center.
- TX-116-A-93 General view looking aft along the port side of the Orbiter Discovery into its payload bay. Note the Remote Manipulator System, Canadarm, in the foreground mounted on the port side longeron. The Remote Sensor Arm is mounted on the opposite, starboard, longeron. Also note the airlock and the protective covering over the docking mechanism. This image was taken in the Orbiter Processing Facility at Kennedy Space Center.

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- TX-116-A-94            General view looking forward along the centerline of the Orbiter Discovery looking into the payload bay. This view shows the external airlock and the beam-truss attach structure supporting it and attaching it to the payload bay sill longerons. Also note the protective covering over the docking mechanism on top of the airlock assembly. This external airlock configuration was for mating to the International Space Station. This photograph was taken in the Orbiter Processing Facility at Kennedy Space Center.
- TX-116-A-95            General View looking forward along the centerline of the Orbiter Discovery looking into the payload bay with a payload in the process of being secured into place. This photograph was taken in the Orbiter Processing Facility at Kennedy Space Center.
- TX-116-A-96            Close-up view of the payload bay side of the aft crew compartment bulkhead of the Orbiter Discovery. Showing the airlock, the beam-truss attach structure supporting it and its attach points to the payload bay sill longerons. This photograph was taken in the Orbiter Processing Facility at Kennedy Space Center.
- TX-116-A-97            Close-up view of the payload bay side of the aft fuselage bulkhead of the Orbiter Discovery. This image has a detailed portions of the Remote Manipulator System and the Orbiter Maneuvering System/Reaction Control System Pods. This photograph wa taken in the Orbiter Processing Facility at Kennedy Space Center.
- TX-116-A-98            Close-up view looking forward along the centerline of the Orbiter Discovery looking into the payload bay. This view is a close-up view of the external airlock and the beam-truss attach structure supporting it and attaching it to the payload bay sill longerons. Also note the protective covering over the docking mechanism on top of the airlock assembly. This external airlock configuration was for mating to the International Space Station. This photograph was taken in the Orbiter Processing Facility at Kennedy Space Cente

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- TX-116-A-99 Interior view of the external airlock of the Orbiter Discovery. In the lower portion of the image is the Aft Hatch and in the upper portion the image is the Upper Hatch. This photograph was taken in the Orbiter Processing Facility at the Kennedy Space Center.
- TX-116-A-100 Exterior view looking down through the approximate centerline of the upper hatch and docking ring on the external airlock on the Orbiter Discovery. This photograph was take in the Orbiter Processing Facility at the Kennedy Space Center.
- TX-116-A-101 General view looking aft from the starboard side of the mid fuselage of the Orbiter Discovery. This view has a close-up view of the remote sensor boom and its retention mechanisms at its attach points to the starboard longeron. This photograph was taken in the Orbiter Processing Facility at the Kennedy Space Center.
- TX-116-A-102 Detail view of the port side of the payload bay of the Orbiter Discovery. This view shows Remote Manipulator System, Canadarm, sensors in the center of the image and a close-up view of a small segment of the orbiter's radiator panel. This photograph was taken in the Orbiter Processing Facility at the Kennedy Space Center.
- TX-116-A-103 Detailed view inside the aft fuselage of the Orbiter Discovery showing the network of supply, distribution and feed lines to deliver fuel, oxidizer and other vital gasses and fluids to the Space Shuttle Main Engines (SSMEs). This photograph was taken in the Orbiter Processing Facility at the Kennedy Space Center.
- TX-116-A-104 Close-up view of a Space Shuttle Main Engine (SSME) installed in position number one on the Orbiter Discovery. A ground-support mobile platform is in place below the engine to assist in technicians with the installation of the engine. This Photograph was taken in the Orbiter Processing Facility at the Kennedy Space Center.

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- TX-116-A-105            General view of the aft fuselage of the Orbiter Discovery looking forward showing Space Shuttle Main Engines (SSMEs) installed in positions one and three and an SSME on the process of being installed in position two. This photograph was taken in the Orbiter Processing Facility at the Kennedy Space Center.
- TX-116-A-106            General view from outside the Orbiter Processing Facility at the Kennedy Space Center with the bay doors open as the Orbiter Discovery is atop the transport vehicle prepared to be moved over to the Vehicle Assembly Building.
- TX-116-A-107            General view of the exterior of the Vehicle Assembly Building (VAB) at the Kennedy Space Center. The view is of the two Solid Rocket Boosters stacked and assembled on the Mobile Launch Platform (MLP) passing through the sliding doors of the VAB. Note in the approximate lower quarter of the image, toward the right-hand side, on the MLP there is a person standing to give a sense of scale.
- TX-116-A-108            General View of the interior of the Vehicle Assembly Building at the Kennedy Space Center showing an External Tank being hoisted to be transferred to and mated with the Solid Rocket Boosters which had been previously stacked and assembled on the Mobile Launch Platform
- TX-116-A-109            General view of the interior of the Vehicle Assembly Building showing the External Tank and the Solid Rocket Boosters in the process of being mated. Note the platforms extending and surrounding the components at the critical connection points to assist technicians with the mating process.
- TX-116-A-110            General view of the interior of the Vehicle Assembly Building showing the External Tank mated to the Solid Rocket Boosters awaiting the arrival and mating of the Orbiter Discovery.
- TX-116-A-111            General view taken in the transfer aisle in the Vehicle Assembly Building at the Kennedy Space Center looking at the Orbiter Discovery as it is being prepared to be hoisted, moved and mated to the External Tank/Solid Rocket Booster Assembly.

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- TX-116-A-112 General view taken in the transfer aisle of the Vehicle Assembly Building at the Kennedy Space Center looking at the Orbiter Discovery hoisted, rotated to a vertical position and moving to an assembly bay to be mated to the External Tank/Solid Rocket Booster assembly.
- TX-116-A-113 General view taken inside of an assembly bay of the Vehicle Assembly Building at the Kennedy Space Center. This view shows the Orbiter Discovery being lowered into position in preparation for being mated to the External Tank/Solid Rocket Booster assembly on the Mobile Launch Platform.
- TX-116-A-114 General view from the Rotating Service Structure looking at the Fixed Service Structure and the Orbiter Discovery at the Launch Pad at Kennedy Space Center as preparations are being made for launch.
- TX-116-A-115 General view from the Launch Pad at Kennedy Space Center looking at the Rotating Service Structure, the Fixed Service Structure and the Mobile Launch Platform with the Shuttle Stack Assembly atop and being prepared for launch.
- TX-116-A-116 Close-up view of the External Tank and Solid Rocket Boosters at the Launch Pad at Kennedy Space Center. Note the Hydrogen Vent Arm extending out from the Fixed Service Structure at attached to the Intertank segment of the External Tank.
- TX-116-A-117 General view of the Orbiter Discovery on runway 33 at Kennedy Space Center shortly after landing. The orbiter is processed and prepared for being towed to the Orbiter Processing Facility for continued post flight processing and pre flight preparations for its next mission.
- TX-116-A-118 General view of the starboard side of the Orbiter Discovery as it sits on runway 33 at the Kennedy Space Center undergoing post flight processing and preparations for towing back to the Orbiter Processing Facility.

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- TX-116-A-119            General view of runway 33 at the Kennedy Space Center looking at the ground support equipment and the aft and starboard side of the Orbiter Discovery as the orbiter is undergoing post flight processing and preparations to be towed to the Orbiter Processing Facility.
- TX-116-A-120            General view of runway 33 at the Kennedy Space Center looking at the ground support equipment and the aft and port side of the Orbiter Discovery as the orbiter is undergoing post flight processing and preparations to be towed to the Orbiter Processing Facility.
- TX-116-A-121            General view of runway 33 at the Kennedy Space Center looking at the ground support equipment and the port side of the Orbiter Discovery as the orbiter is undergoing post flight processing and preparations to be towed to the Orbiter Processing Facility.