B-70 PROGRAM REVIEW AUG '66
NA66-858

T. PANOPALIS
COLLECTION

FORWARD FUSELAGE

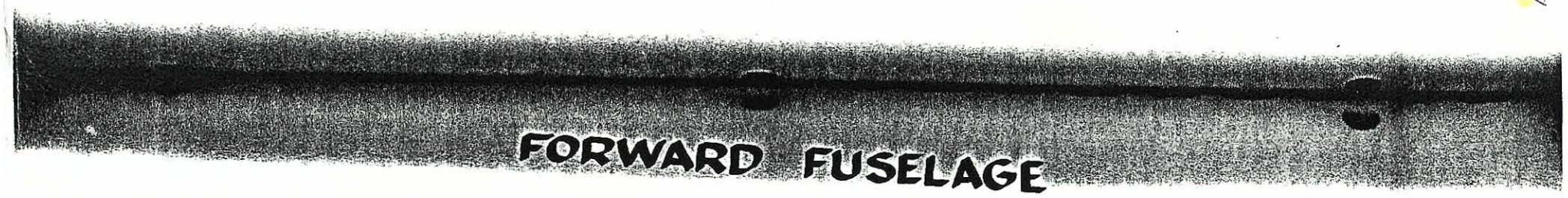
The forward fuselage is made up of three sections: the nose, the crew compartment, and the electronic equipment bay. The nose section, which houses the radar search antenna and the stellar inertial platform, is unpressurized. The basic structure of the nose section is of conventional sheet metal skins supported by sheet metal frames and machined longerons all made from 6Al-4V titanium. The upper portion of the nose contains a large PH15-7Mo honeycomb movable windshield ramp and a movable windshield assembly. The lower portion of the nose contains a large glass-reinforced polyester removable radome bolted to the nose so that it becomes an integral part of the nose structure.

The environmentally controlled and pressurized crew compartment and the electronic equipment bay are also conventional structure with sheet metal skins supported by sheet metal frames made of titanium. The longerons in the crew section are machined from titanium extrusions. However, where the horizontal actuators attach to the lower shoulder longeron, stiffness requirements dictate the use of H-11 longerons. Likewise, in order to produce maximum vertical bending stiffness for the forward fuselage, the longerons in the electronic equipment bay are machined from H-11 bar stock. The large bow frame in the crew compartment that supports the windshield and crew windows is fabricated from 6Al-4V titanium bar.

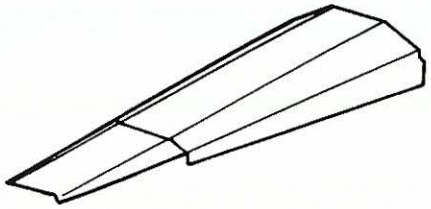
The crew compartment contains the ejection hatches and the crew entrance door, each of which is constructed from titanium sheet metal elements with H-11 attachment fittings. The escape capsules at the crew stations are fabricated from bonded aluminum honeycomb panels.

Assembly fabrication of the forward fuselage is accomplished by riveting. In areas of low and moderate loads driven A-286 rivets are used; in high load areas, H-11 Hi-Lok rivets are used.

B-70 PROGRAM REVIEW
AUG 66 NA66-858



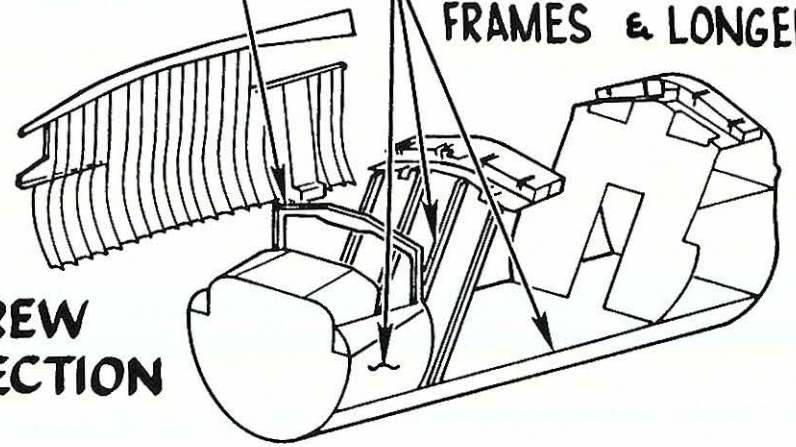
FORWARD FUSELAGE



STEEL HONEYCOMB
MOVABLE WINDSHIELD
RAMP

TITANIUM WINDSHIELD
BOW FRAME

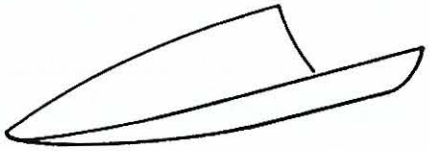
TITANIUM SKIN,
FRAMES & LONGERONS



CREW
SECTION

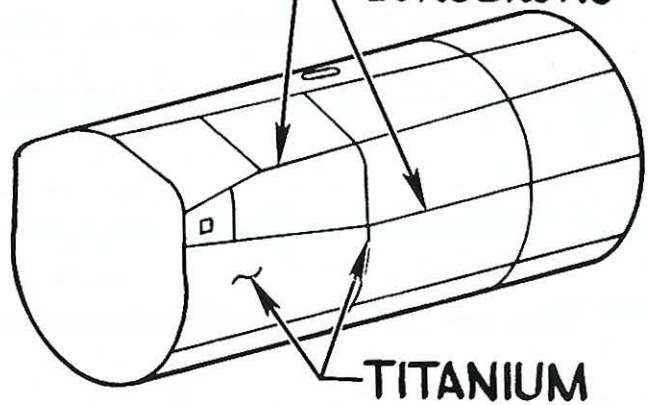
NOSE
SECTION

TITANIUM SKIN,
FRAMES & LONGERONS



PLASTIC RADOME

ELECTRONIC
EQUIPMENT
BAY
SECTION



H-11 STEEL
LONGERONS

TITANIUM
SKIN & FRAMES

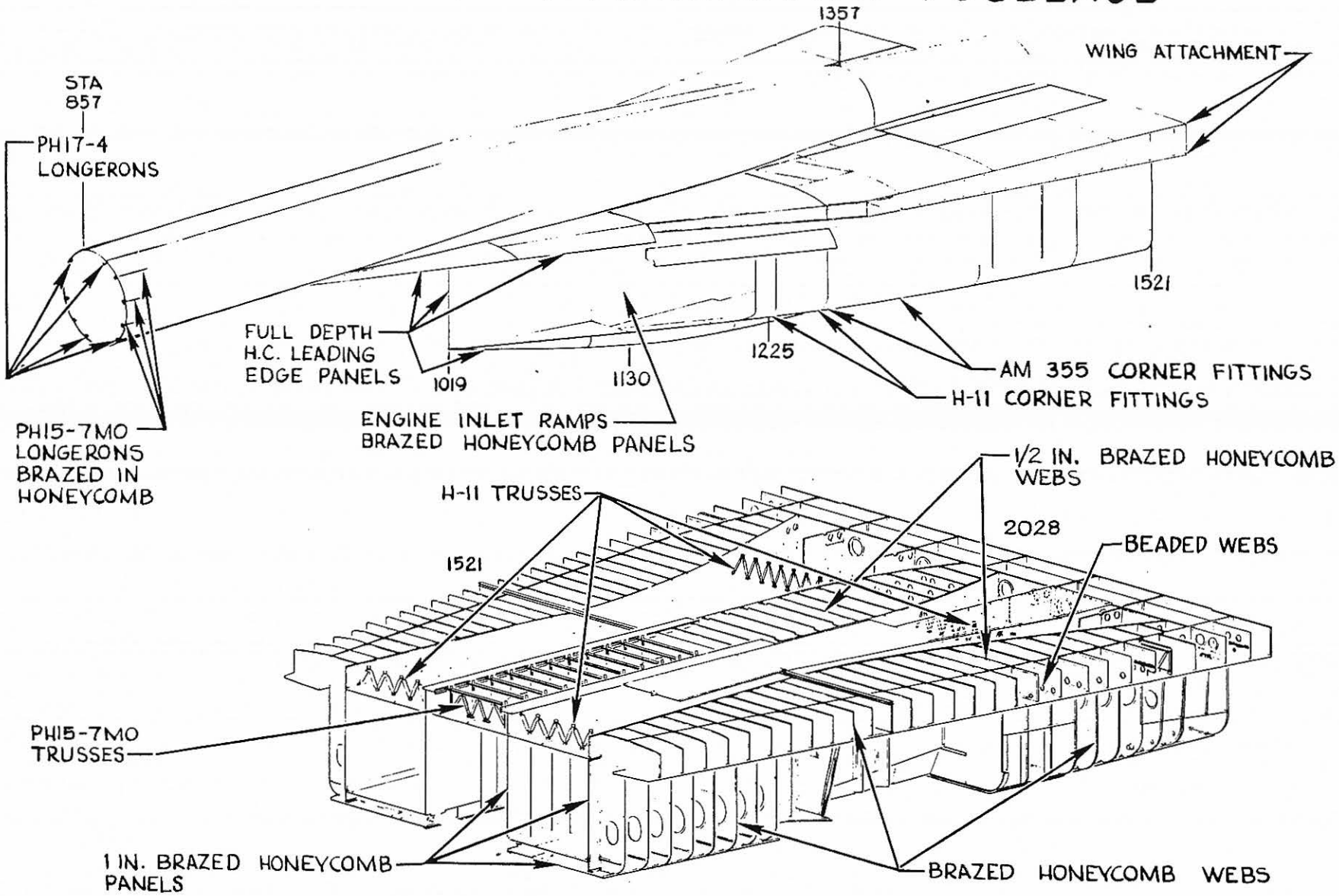
WSS-33-0287A

INTERMEDIATE FUSELAGE

The basic structure of the intermediate fuselage consists of PH15-7Mo steel brazed honeycomb panels used to form the moldline skin, the duct walls, the frames, and bulkheads. Large tubular truss members made from PH15-7 and H-11 support the mold line panels over the BLC ducts and the engine intake air duct and are intended to provide the least restriction to air flow in the BLC ducts.

The forward section of the intermediate fuselage distributes the concentrated longeron loads from the forward fuselage into the honeycomb panels, redistributes the loads from one circular shell to the lower fuselage structure, supports the fuel in the upper forward tanks, and provides the ramps for the engine air intake ducts supporting the transient pressures associated with the duct operation. The aft section of the intermediate fuselage provides attachment for the wing structure and serves as the carry-through structure for the wing, provides the duct for the engine air intake with its associated pressures, supports the fuel in the aft fuel tanks, and distributes the concentrated landing gear loads and the associated fore and aft bending.

FWD & AFT INTERMEDIATE FUSELAGE



WSS-33-0288A

XB-70 STRUCTURAL MATERIALS

This diagram graphically illustrates the regions where the basically different types of structure are used in the airframe.

The forward fuselage is fabricated from conventional skin and longeron construction, utilizing titanium skin and framing members. Longerons are either titanium or H-11 steel (when dictated by stiffness requirements). The radome in the nose is a one-piece polyester phenolic shell.

The main body of the integrated wing and fuselage structure is fabricated from PH15-7Mo stainless steel honeycomb.

The aft fuselage which embodies the engine section is fabricated using conventional skin, frames, shear webs, and longerons. In this area all the frames and longerons are H-11 steel with titanium skin coverings. The shear webs which separate each engine compartment are constructed from Rene 41 because of the extreme elevated thermal conditions.

AFT FUSELAGE STRUCTURE

The aft fuselage structure is conventional consisting of titanium skins, H-11 steel frames and longerons and Rene' 41 internal structure.

The primary loads are imposed by the wing and vertical tail and consequently are in the cross-ship direction. The frame caps are made from H-11 steel, due to the high intensity of axial loads and the high temperature from the engines. For maximum shear efficiency the frame webs are 4Al-3Mo-1V chem-milled titanium sheet. An integrally machined H-11 steel fitting is used to transmit loads from the PH15-7Mo steel honeycomb wing cover skins to the side fuselage frames. The lower fuselage frames are fabricated as one piece H-11 steel "I" beam section, because of the high stresses resulting from their restricted depth.

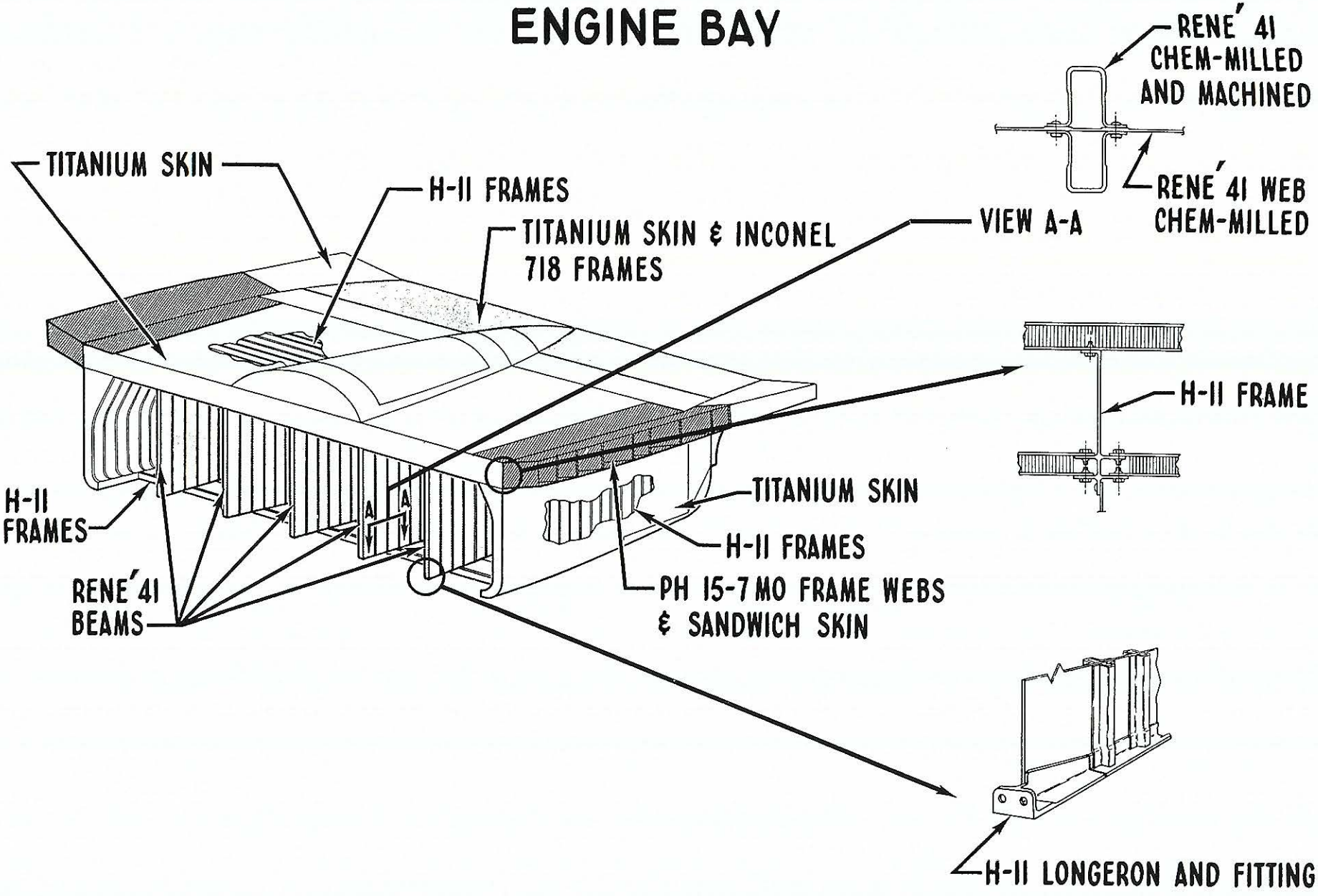
The wing stub structure is PH15-7Mo steel honeycomb sandwich, supported by transverse vertical webs. H-11 Jo-Bolts attach the cover skins to the fuselage frames.

The fuselage moldline covering consists of chem-milled 4Al-3Mo-1V and 6Al-4V titanium skins. These materials are used due to their high strength-to-weight ratios at temperature. These skins are attached by conventional A286 rivets.

The engine divider beams are composed of chem-milled Rene' 41 webs supported by vertical Rene' 41 hat sections placed back to back. These parts are subjected to maximum temperature of 1100°F (from engine heating) which necessitates the use of heat resistant material. This structure reacts engine loads as well as overall fuselage loads.

Longitudinal axial loads in the fuselage are carried by longerons located along the upper and lower edges of the engine divider beams. Again, due to the high intensity of the axial loads and the high temperatures, H-11 steel is used for minimum weight.

FUSELAGE
ENGINE BAY



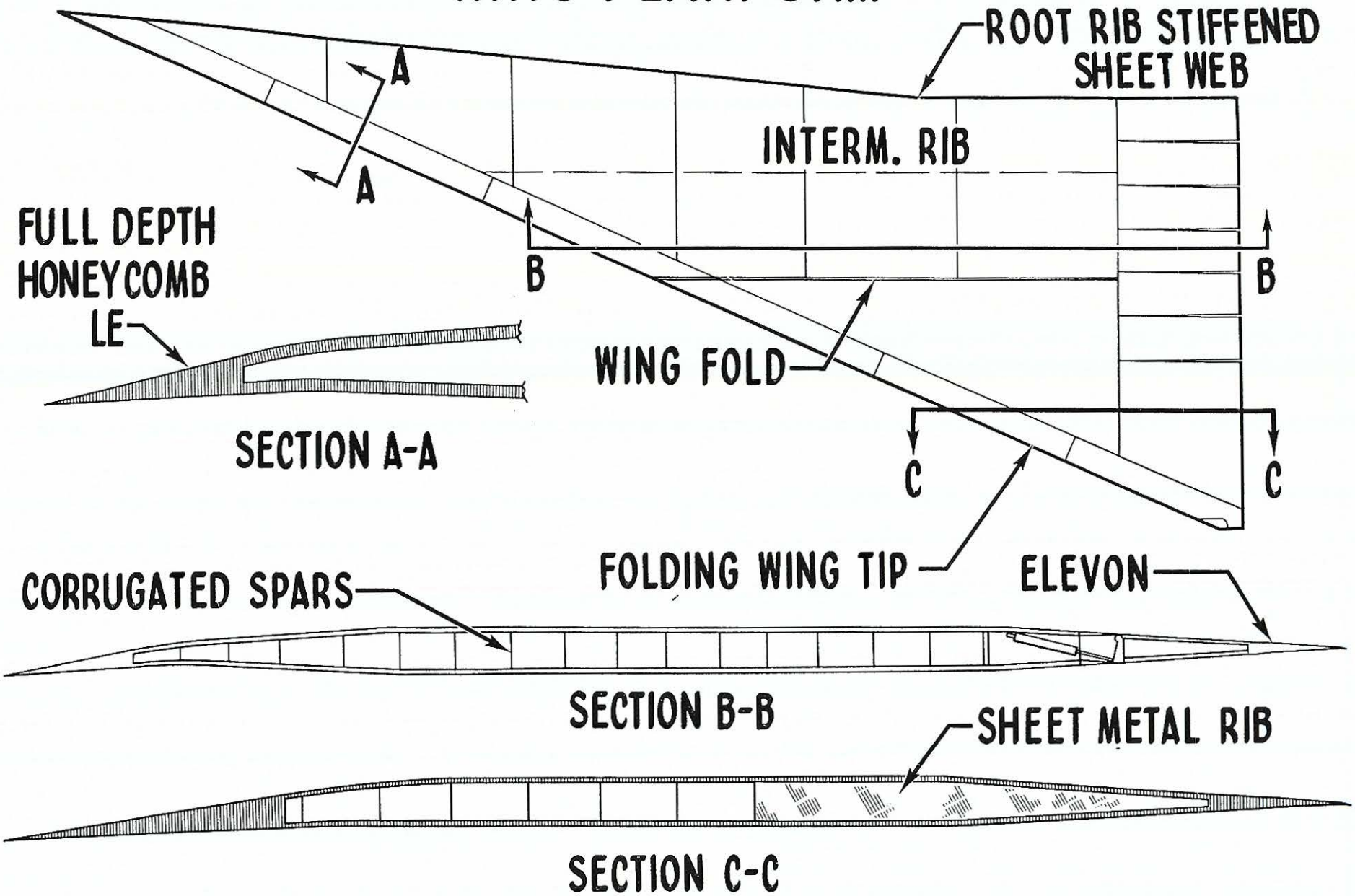
WSS-33-6831B

DESCRIPTION OF WING

The XB-70 wind is a multi-spar structure with honeycomb cover panels. The cover panels are fabricated by brazing PH15-7Mo steel face sheets to a one-inch deep PH15-7Mo steel honeycomb core. The face sheet gages vary from 0.008 to 0.065. The leading edge is of full depth honeycomb construction. The attachment of the leading edge to the wing is accomplished by mechanically fastening the face sheets to the flanges of the front spar. The spars are PH15-7 steel sine wave corrugations and are attached to the cover panels by fusion welding. The spars have an average spacing of 19 inches. There are three ribs in the wing, namely, a fold rib, root rib, and an intermediate rib located approximately midway between the fold rib and root rib. The ribs are constructed of PH15-7Mo steel and consist of a flat sheet stiffened by corrugated sheet.

The wing folding tip consists of similar type construction of 3/4-inch deep honeycomb and 12-inch spar spacing.

WING PLANFORM



WSS-33-6823B

HORIZONTAL STABILIZER

The horizontal stabilizer is a multispar thick skin box structure supported by two pivot bearings mounted in the fuselage bulkhead at fuselage station 605 and by two hydraulic actuators. The actuators are provided with an interconnect linkage to assure simultaneous operation.

The flap is supported by eight hinge fittings extending aft of the stabilizer rear beam.

The horizontal stabilizer skins are made up of heavy 6Al-4Ti plates, which are primarily dictated by aerodynamic stiffness requirements, spliced along the main box forward beam and at the centerline splice.

The main box has 10 beams which are continuous from root rib to tip rib. The most forward and most aft of which are flat web 4130 steel and the intermediate beams are burn-through corrugated titanium. Flat burn-through titanium web intercostals are located between each pair of beams ahead of the flap hinge fittings.

The forward box has flat web titanium ribs, located ahead of the main box intercostal, continuous from the main box forward beam to the leading edge wedge, and has burn-through corrugated web titanium intercostals spaced 3.32 inches apart between ribs.

The center section box has four beams which are continuous from the spindle beam to the splice located approximately at the ship centerline. The forward and aft of these beams are flat web 4130 steel and the intermediate beams are burn-through corrugated web titanium.

The main box root rib and the spindle beam are machined from 17-4 steel, and welded together at five spanwise webs.

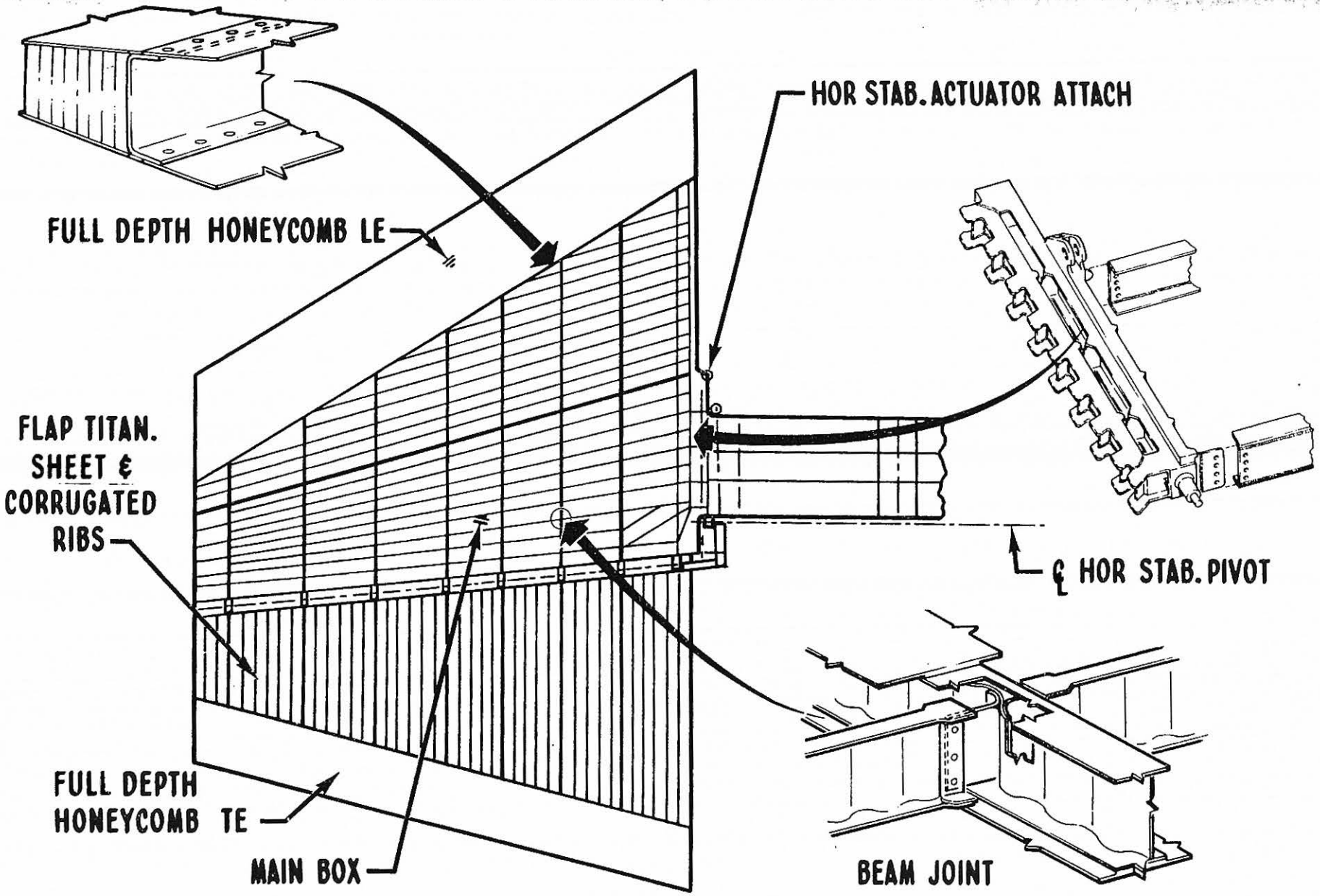
The flap main box is made up of titanium skins, corrugated ribs, corrugated web intercostals

HORIZONTAL STABILIZER (CONTINUED)

between hinge fittings, and a machined beam. The thickness of the skin and the multirib construction are dictated by panel flutter requirements and the necessity to prevent skin buckling during high-speed cruise.

Both the horizontal stabilizer leading edge and the flap trailing edge are full depth brazed PH15-7Mo stainless steel honeycomb wedges. All final box assembly work is accomplished with mechanical fastening.

HORIZONTAL STABILIZER



WSS-33-6826

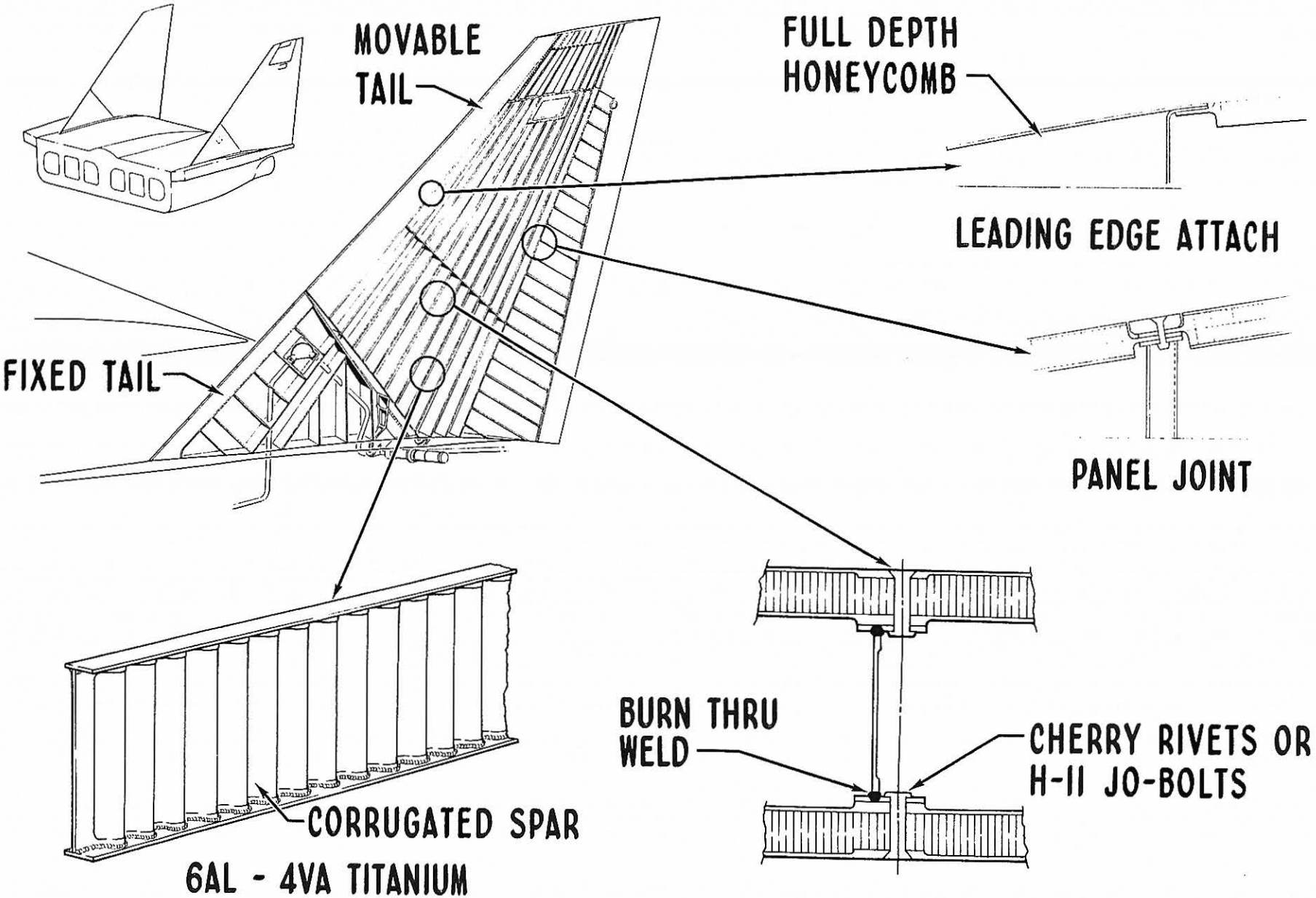
VERTICAL STABILIZER

The main box of the vertical stabilizer is made up of PH15-7Mo brazed steel honeycomb panels supported by multiple spars. The panel face sheets are chem-milled to provide pads at the attachments to the spars and face sheet thickness taper from hinge line to the tip. The honeycomb panel thickness also tapers from the hinge line to the tip. All the spars are corrugated 6Al-4V titanium with burn-through type welded caps. The cover panels are attached to the spars by mechanical fasteners, using A-286 hard stem cherry rivets and H-11 Jo-Bolts.

The aft box is made up of PH15-7Mo honeycomb panels supported by multiple ribs. The webs are corrugated 6Al-4V titanium and attachments are A-286 hard stem cherry rivets.

The leading and trailing edges are of full depth brazed PH15-7Mo steel honeycomb and closed out with PH15-7Mo steel channel section spars. The leading edge is attached to the main box honeycomb panel edge members by H-11 screws and the trailing edge is attached to the aft box by A-286 hard stem cherry rivets.

The actuator arm is fabricated from PH15-7Mo steel and is fusion welded to the main box panel edge members.


MOVABLE TAIL
FULL DEPTH HONEYCOMB
LEADING EDGE ATTACH
FIXED TAIL
PANEL JOINT
BURN THRU WELD
CHERRY RIVETS OR H-11 JO-BOLTS
CORRUGATED SPAR
6AL - 4VA TITANIUM

WSS-33-6827A

STRUCTURAL TEST PROGRAM
MAJOR SPECIMENS

The major specimens of the structural test program covered all the primary structural areas of the air vehicle. There were seven fuselage specimens covering approximately one-half of the pressurized crew section with the fixed windshield panels, escape hatches, and crew entry door; a 100-inch diameter cylinder representative of the electronic equipment bay; two longeron to honeycomb panel joint specimens representative of the transition region from the conventional forward fuselage to the honeycomb cylindrical tank structure; two upper, forward intermediate fuselage half cylinder honeycomb tank specimens; an aft intermediate fuselage specimen representative of the air intake duct section that extended entirely across the fuselage including simulated wing boxes on each side; and an aft fuselage specimen which was a structurally complete portion of the engine compartment approximately 140 inches long and the full width of the fuselage with representative wing boxes on each side.

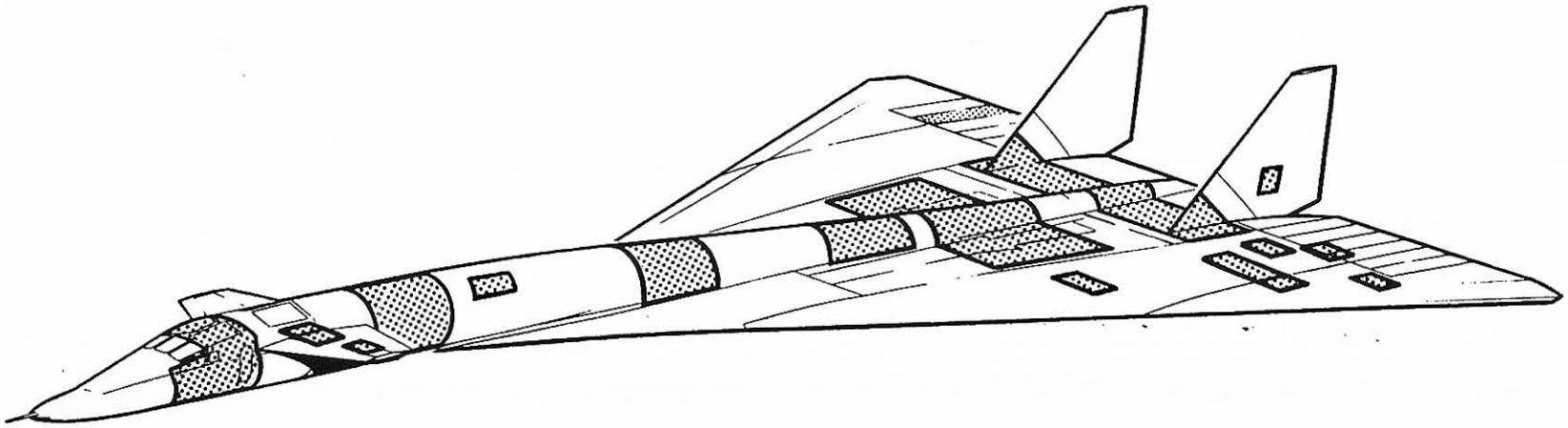
There were three structural box specimens composed of honeycomb panel covers and corrugated spars representative of three critical loading areas in the inboard fixed wing. A fourth wing box representative of the aft highly loaded region of the outboard folding wingtip structure was also tested. Another specimen included the wingtip fold joint with its back-up honeycomb support structure on each side of the joint.

The control surface specimens included two horizontal stabilizer structural boxes, one vertical stabilizer main box specimen, and a structurally complete typical elevon.

In general, the four wing boxes were tested to verify their ultimate strength under biaxial loading conditions. The wing folding tip joint was tested to obtain experimental stiffness measurements as well as to obtain the ultimate bending strength. The control surface structural boxes were tested to failure to ascertain their strength in bending.

All of the fuselage specimens had extensive testing programs associated with them. In each case, several critical loading or environmental conditions were tested to provide the assurance that each particular part of the fuselage was structurally adequate.

MAJOR STRUCTURAL TEST SPECIMENS



TSP63-7469 B

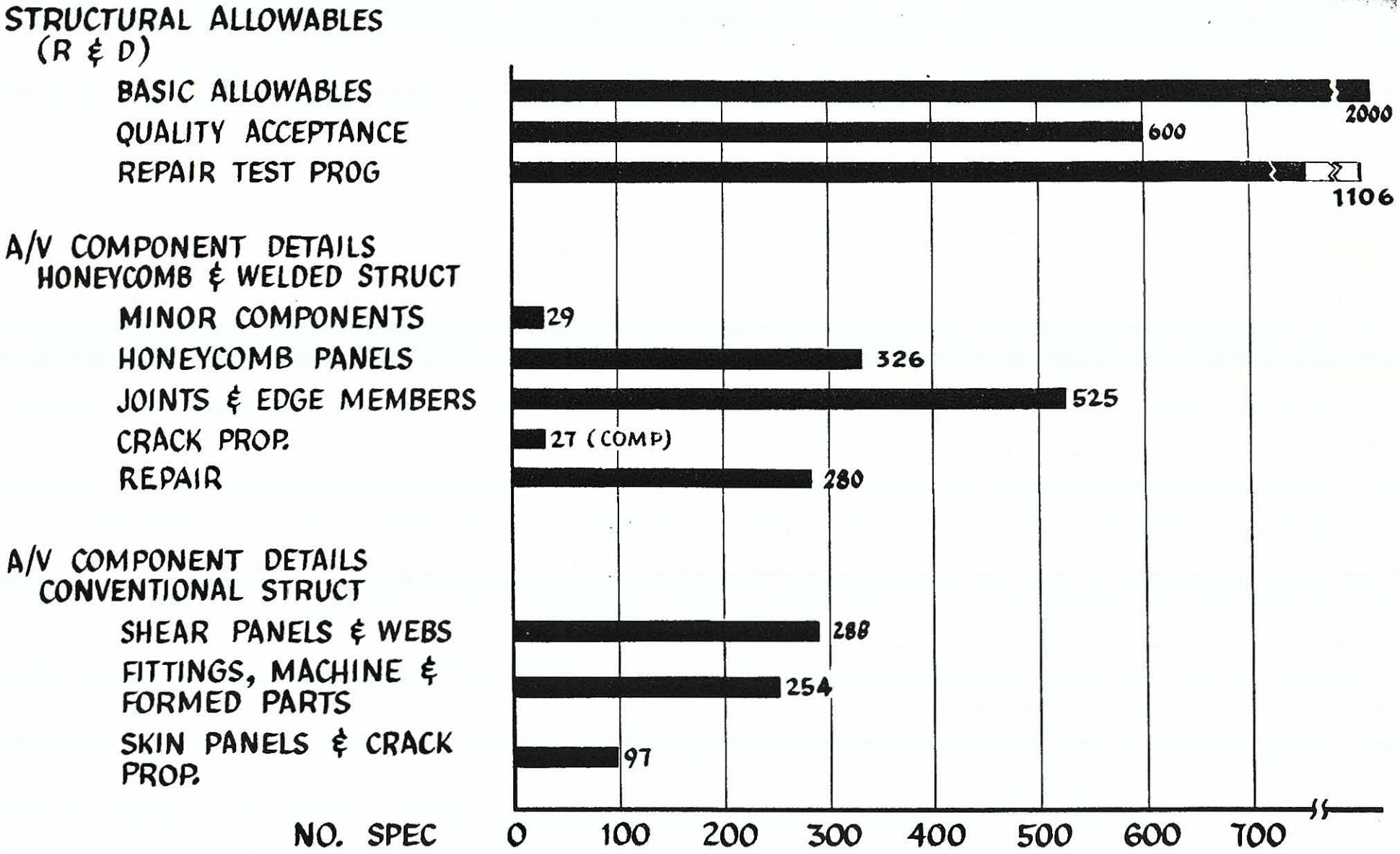
STRUCTURAL TEST PROGRAM
MAJOR SPECIMENS (CONTINUED)

During the test program, some premature failures were experienced on some of the specimens. Most of these specimens were repaired or a new test specimen manufactured and retested to satisfactory load levels. A small number of specimens that failed prematurely were never repaired or remade because the high load level at which the failure took place was adequate to provide all the information necessary to make a proper redesign. All the structural areas where failures occurred have been redesigned and the changes incorporated.

STRUCTURAL TEST PROGRAM
MISCELLANEOUS TESTS

Over 5500 small element specimens have been tested to provide the basic allowables data required in design. About half of these specimens were tested to establish basic material allowables and quality acceptance. Another 25 percent were small honeycomb panels, typical panel joints, or panel edge members to establish the typical honeycomb panel allowables. The rest of the specimens were tested to determine corrugated shear web allowables, crack propagation, typical fitting strengths, or typical panel repair allowables.

STRUCTURAL DEVELOPMENT TESTS



TSP63-7462

STRUCTURAL TEST PROGRAM
CREW COMPARTMENT

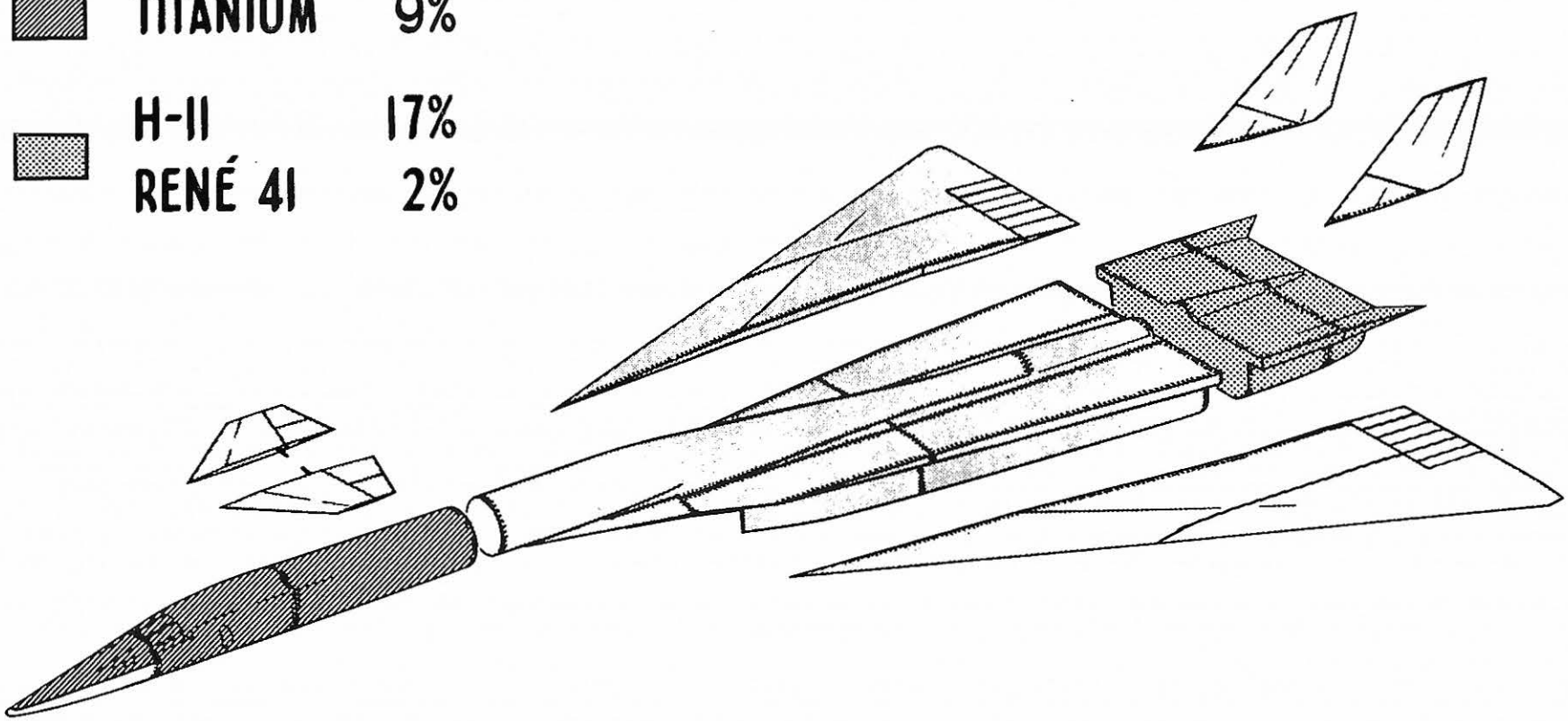
This specimen was a structurally complete section of the forward fuselage in the crew compartment including the fixed windshield, the crew access door, two escape hatches, and one operational escape system. The testing program included static tests in which simulated critical flight conditions were applied to the specimen with appropriate internal pressurization, as well as a repeated load test in which all critical flight, landing, and pressurization load cycles were imposed on the specimen. The ultimate ground pressurization test of the crew compartment was conducted on this specimen. In this test the specimen was subjected to two times the maximum normal operating pressure. Another phase of testing consisted of escape system operational tests, wherein one escape hatch and one escape capsule were ejected while the cabin was pressurized to verify the operation and trajectory of the system under cabin pressure loads. During this test, high-speed photography was utilized to record the trajectories of the hatch and capsule. A final phase of testing consisted of repeated thermal shock applications to the front glass panel of the windshield.

All testing except the escape system operational tests and the thermal shock tests were conducted with the specimen submerged in a water tank.

A few failures in detail parts were experienced during the pressurization tests. Appropriate design changes were made and incorporated in the test specimen. Retests were conducted with satisfactory results. These changes have all been incorporated into the air vehicle.

B-70 STRUCTURAL MATERIALS

	355	4%
	PH15-7 Mo	68%
	TITANIUM	9%
	H-11	17%
	RENÉ 41	2%



WSS-33-3766

XB-70A, 62-001 IN-FLIGHT OCCURRENCES

FLT NO.	DATE	OCCURRENCE	CORRECTIVE ACTION
1	21 SEP 64	MAIN LANDING GEAR DID NOT FOLD & RETRACT.	REPLACED GEAR SEQUENCE SWITCH
		LEFT REAR WHEELS DID NOT ROTATE AT TOUCHDOWN.	INSTALLED SELECTOR VALVE TO ENSURE UTILITY NO. 1 PRESSURE IS SUPPLIED TO WHEEL BRAKES, & ADDED SWITCH TO BRAKE PEDALS TO PREVENT SPURIOUS ELECTRICAL SIGNALS FROM INADVERTENTLY ACTUATING THE BRAKES.
2	5 OCT 64	UTILITY NO. 1 HYDRAULIC SYSTEM FAILED.	REPAIRED FAILED HYDRAULIC LINE TO FUEL TRANSFER PUMP IN TANK 6 LH LOWER.
6	25 FEB 65	UTILITY NO. 1 HYDRAULIC SYSTEM FAILED.	INSTALLED HEAVIER WALL HYDRAULIC LINE TUBING TO TANK 6 LOWER FUEL TRANSFER PUMPS.

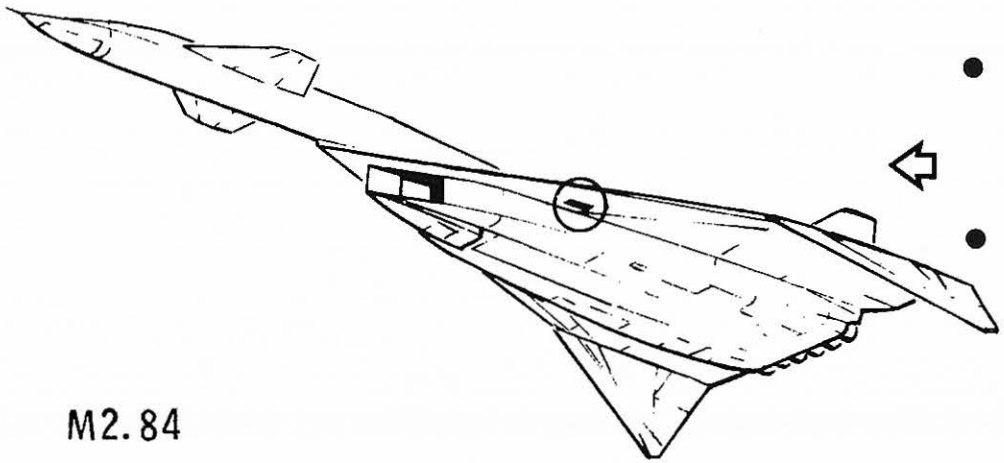
XB-70A, 62-001 IN-FLIGHT OCCURRENCES

FLT NO.	DATE	OCCURRENCE	CORRECTIVE ACTION
9	2 APR 65	UTILITY NO. 1 HYDRAULIC SYSTEM FAILED.	STRUCTURALLY STABILIZED TANK 6 LOWER FUEL TRANSFER PUMPS AND INSTALLED FLEXIBLE HYDRAULIC LINES TO PUMP MOTORS (SAME FIX ACCOMPLISHED LATER ON ALL TRANSFER & BOOST PUMPS).
12	7 MAY 65	WING APEX FAILED.	INSTALLED REDESIGNED AND STRENGTHENED APEX.
14	1 JUL 65	SECTIONS OF WING & FUSELAGE FACESHEET LOST.	STRUCTURAL REPAIR ACCOMPLISHED.
17	14 OCT 65	(INITIAL MACH 3 FLIGHT) LARGE SECTION OF LH LOWER WING FACESHEET LOST.	STRUCTURAL REPAIR ACCOMPLISHED.
20	12 NOV 65	NO. 4 ENGINE GENERATOR FAILED.	REPLACED CSD AND GENERATOR. FAULTY PRESSURE SWITCH IN CSD.
24	7 DEC 65	NO. 6 ENGINE OIL PRESSURE CAUTION LIGHT CAME ON.	REPLACED NO. 6 ENGINE DUE TO NO. 2 BEARING OIL LINE FAILURE.

XB-70A, 62-001 IN-FLIGHT OCCURRENCES (CONT)

FLT NO.	DATE	OCCURRENCE	CORRECTIVE ACTION
32	11 JAN 66	UTILITY NO. 2 HYDRAULIC SYSTEM FAILED.	REPAIRED GN_2 LINE (CRACKED WELD).
37	7 MAR 66	RH MAIN LANDING GEAR ACTUATOR FITTING FAILED DURING GEAR EXTENSION.	INSTALLED NEW FITTING MADE OF 4340 STEEL IN LIEU OF H-11 FITTING.
44	19 APR 66	NOSE GEAR FAILED TO RETRACT.	REMOVED RATE OF SINK ARM.
48	3 MAY 66	LANDING GEAR FAILED TO RETRACT.	REPLACED FAILED LH MAIN LANDING GEAR UPLOCK ASSEMBLY.
49	9 MAY 66	MAIN LANDING GEAR FAILED TO EXTEND ON NORMAL SYSTEM.	REPLACED ESSCO 10-AMP CONTROL RELAY WITH LEACH 10-AMP RELAY.

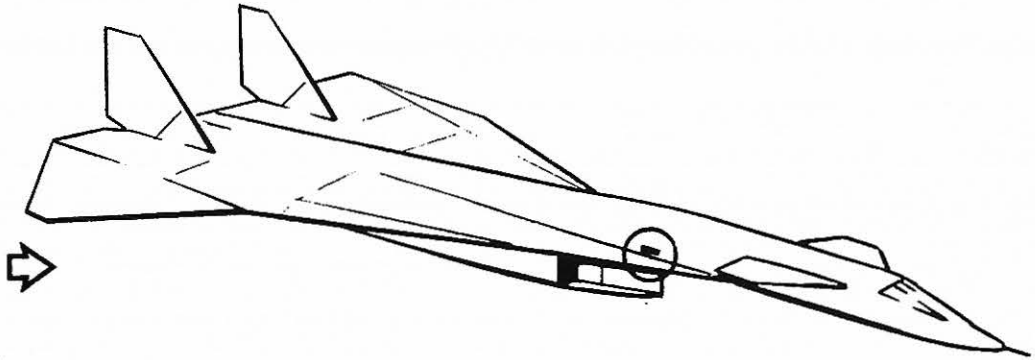
SIGNIFICANT INFLIGHT STRUCTURAL DAMAGE



- LOSS OF LOWER SKIN OF HONEYCOMB APPROX 40 X 36 IN.
- VOID COMBINED WITH TEMP. CAUSED BUCKLING, CRACKING SKIN, AND AIR FLOW PEELING

M2.84

- LOSS OF OUTER SKIN OF HONEYCOMB 8 X 38 IN.
- CAUSED BY LACK OF BRAZE IN EDGE MEMBER IN LOCAL AREA



- NOT DETECTED IN FLIGHT
- NO SECONDARY FAILURES

M2.84

TSP66-5420

WING LOWER MOLDLINE PANEL DAMAGE

Inspection of the air vehicle following a Mach 2.84 flight revealed a 3- by 4- foot piece of lower outer face sheet was missing on the left-hand wing in an area several inches outboard of the wing-to-fuselage joint and between fuselage stations 1460 and 1496. Just forward of the missing skin, an additional area of the outer lower face sheet was voided approximately 12 by 20 inches. The core in the area just forward of fuselage station 1472 was badly damaged in an area of approximately 8 by 30 inches. The outer face sheet just aft of the missing skin was gouged in two places.

The presence of two undetected gross voids in the panel splice land area and the resulting working of the skin over the void area resulted in a longitudinal crack in the thin skin adjacent to the weld land which allowed the airflow to get under the free edge of the skin and rip loose the piece of skin aft of fuselage station 1472. The piece of skin forward of fuselage station 1472 continued to work under the influence of the airflow, causing the void area to creep forward until eventually stopping at the next area of densified core. The loose skin eventually shredded and tore away from the airplane.

WING APEX PANEL DAMAGE

The pilot reported a light air vehicle rumble while flying at Mach 2.57. This was followed by high vibration on engine No. 5 and an inlet unstart. A series of events followed with the eventual emergency landing of the XB-70A on the EAFB lake bed with only four engines in operation.

Postflight inspection revealed that the forward 12 inches of the wing apex was missing and the lower skin of the apex and the leading edge extrusions for approximately the forward 3 feet were torn off. The major part of the apex debris entered the right-hand engine air intake duct causing numerous cuts, dings, and dents in the duct walls and floor as it traveled down the duct.

The wing apex panel which was brazed in September 1961 with the attaching tees on the lower surface was dispositioned to spot braze and percussion pin the tees to the upper surface. The lower furnace brazed tees were ground to 0.010-0.015 inch thickness doubler after the percussion pins were installed.

It is believed that the panel pin attachment to the gutter tees became progressively unattached followed by a possible detachment of the lower face sheet and a subsequent failure of the upper face sheet in tension allowing the apex panel and leading edge extrusion to bend down and peel the lower face sheet from the core.

The forward 3 feet of the wing apex panel was completely removed back to the splice joint at fuselage station 906 and replaced by a skin and grid type structure. The skin was plug welded to the grid and the grid was fusion welded to the vertical gutter panels and to the aft wing panels at the splice joint. A panel of similar design was also installed on Air Vehicle No. 2 to preclude any possible failure.

WING LEADING EDGE PANEL DAMAGE

Inspection of the air vehicle following a Mach 3.0 flight revealed the loss of a piece of lower mold-line skin (17 inches by 120 inches) along the leading edge of the left-hand wing. The missing skin came off the leading edge panel located between fuselage stations 1245 and 1356 just outboard of the wing-to-fuselage stub joint. The entire lower face sheet was missing with the exception of the lap brazed area. The separation of the face sheet and core took place adjacent to the lower face sheet and virtually left the core intact. The leading edge arrowhead extrusion was separated from the core and upper face sheet for a length of 40 inches. The core was sheared adjacent to the edge member and the upper face sheet was split adjacent to the lap braze joint.

The leading edge panels are designed for a normal pressure differential of ±18 psi uniformly distributed over the surface. The maximum theoretical pressure at Mach 3 flight is 1.6 psi limit.

Examination of this failure at 45X magnification revealed arc spot weld repairs for a faying surface void condition, resulting in many face sheet cracks. The cracked areas were cleaned out by drilling, reinspected, and filled with aerodynamic putty. Although all cracks reported originally on the Mylar had been drilled, numerous additional cracks were not evident in the repaired area.

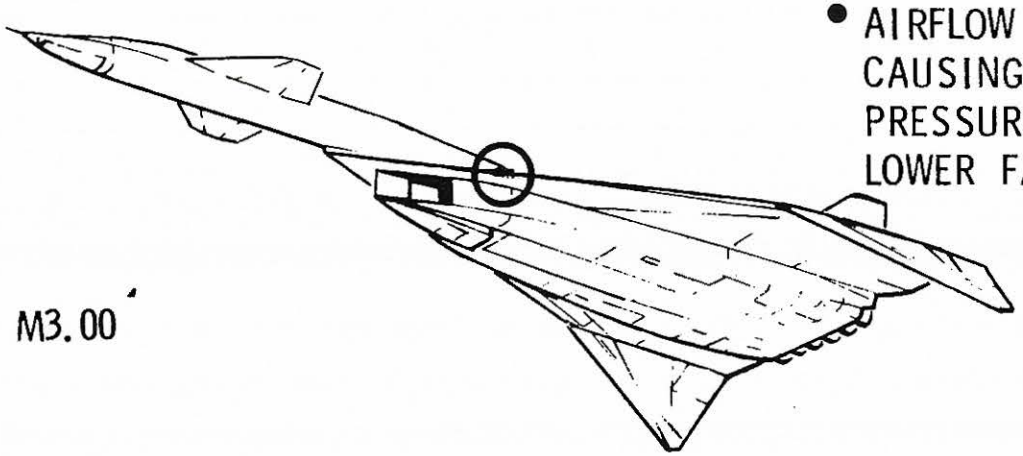
It is believed that a fatigue failure had propagated from arc weld cracks to 40 inches along the upper face sheet. Then the core-to-arrowhead attachment failed, and the arrowhead started peeling the lower face sheet from the core. The air flow entered the panel and caused excessive internal pressure which tore the lower face sheet loose from the core and its boundaries.

The braze assembly Mylars for all leading edges were reviewed. No other leading edges were reported as having cracked skin damage as a result of a faying surface repair. Three panels, which have extensive repairs for faying surface voids, were inspected on the air vehicle and no cracks were found.

The entire panel was removed and replaced with a leading edge panel of conventional design, i.e., leading edge, ribs, and skin.

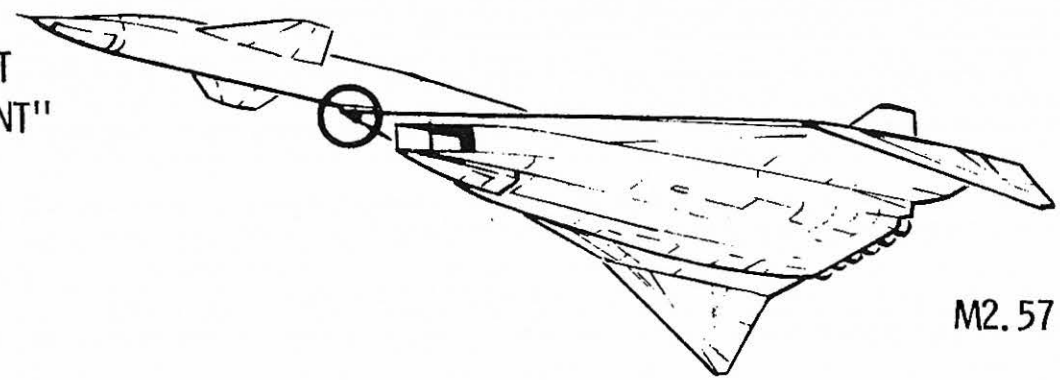
SIGNIFICANT INFLIGHT STRUCTURAL DAMAGE

- LOSS OF LOWER SKIN OF WING LEADING EDGE HONEYCOMB PANEL APPROX 17 X 120 IN.
- ARC SPOT-WELD CRACKS PROPAGATED TO 40-INCH LENGTH
- ARROWHEAD-TO-CORE ATTACH FAILED
- AIRFLOW ENTERED PANEL CAUSING EXCESSIVE INTERNAL PRESSURE WHICH TORE LOWER FACESHEET FROM CORE.



M3.00

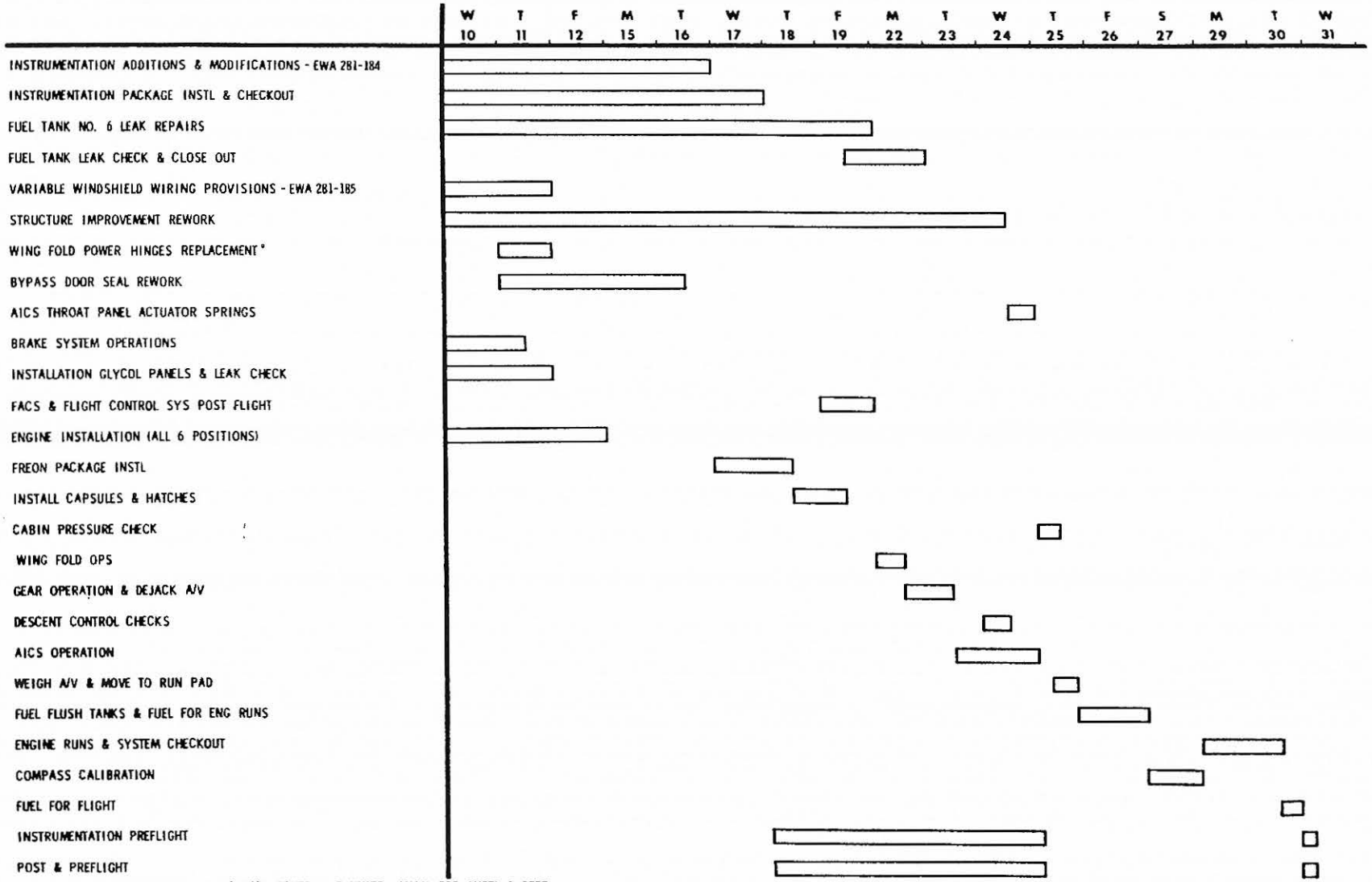
- LOSS OF LOWER SKIN OF WING APEX PANEL FORWARD 35 INCHES
- LOSS OF REPAIR PIN ATTACHMENT
- AERODYNAMIC "SHOCK DETACHMENT" PHENOMENON PRODUCED GREATER DOWN LOADS AT M1.3
- AIRFLOW ENTERED PANEL CAUSING LOWER FACESHEET TO PEEL FROM CORE



M2.57

TSP66-5412 A

XB-70 LAYUP SCHEDULE



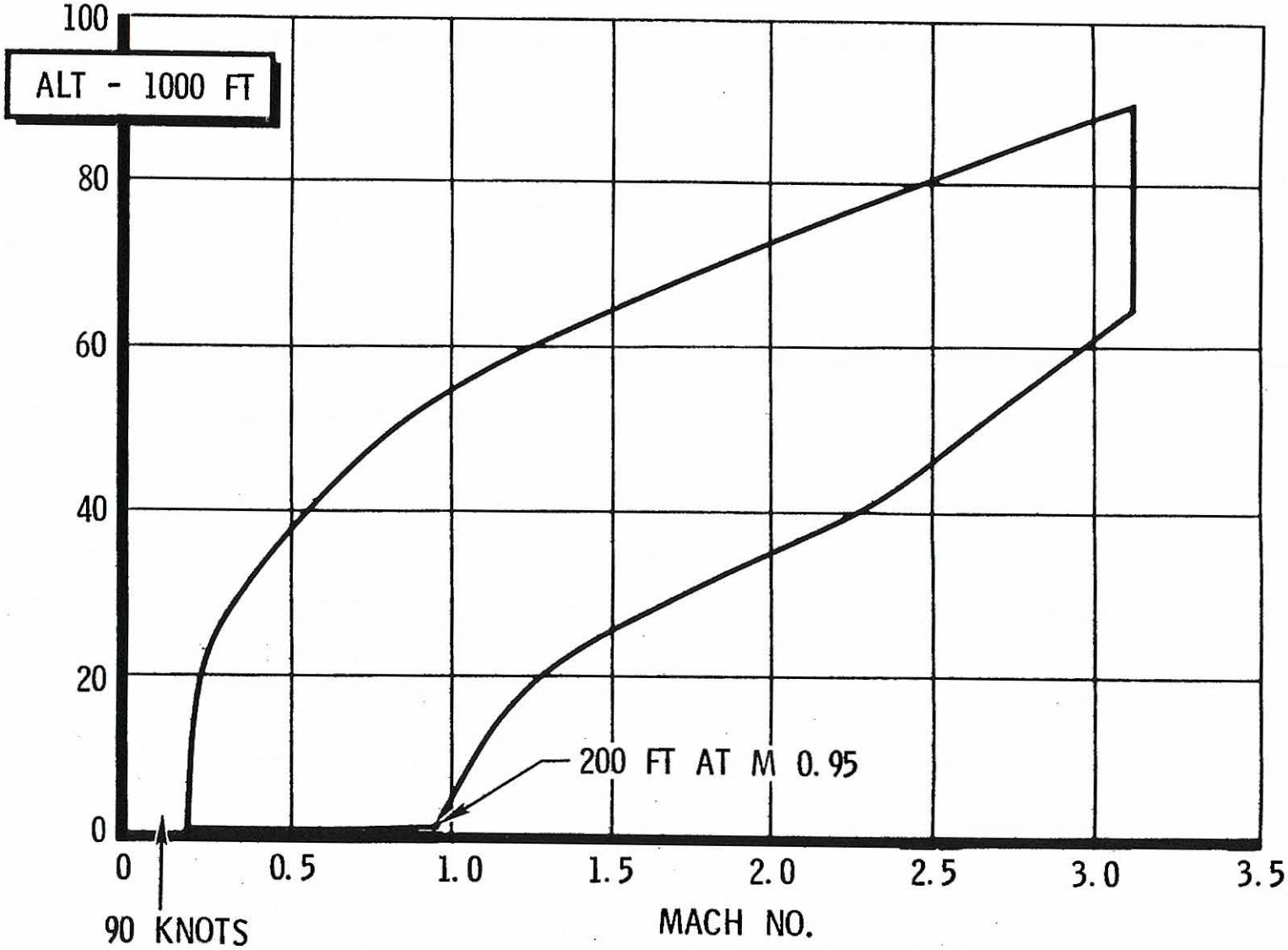
*REMAINING WING FOLD PWR HINGE REPL SCHED - 5 UNITS, AVAIL FOR INSTL 1 SEPT
3 UNITS, AVAIL FOR INSTL 1 OCT
1 UNIT, REFURB COMPLETION DATE N/AVAIL

NEW BOGIE BUILDUP & INSTL - AVAIL FOR BUILDUP & INSTL 21 OCT

NOTE - INSTL OF WING FOLD PWR HINGES & BOGIE WILL BE MADE DURING THE FIRST TURNAROUND PERIOD FOLLOWING AVAILABILITY DATE

TSP66-5413

ESCAPE ENVELOPE

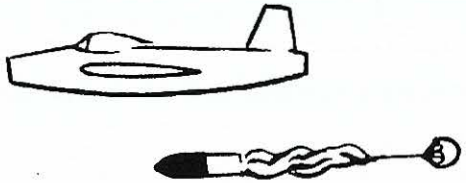


TSP66-5242

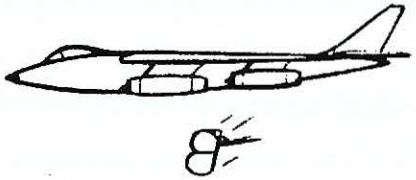
AERIAL TESTS

DUMMY
WEIGHT

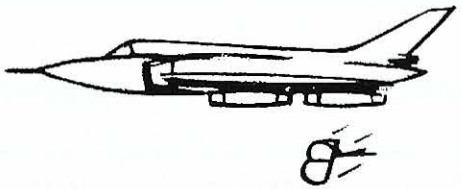
- RATE-OF-DESCENT TESTS
  24 SUCCESSFUL TESTS
- DEVELOPED ACCEPTABLE CAPSULE RATE-OF-DESCENT



- PARACHUTE STRUCTURAL TESTS
  28 TESTS
  2 FAILURES
- VERIFIED STRUCTURAL INTEGRITY OF PARACHUTE



- LOW & HIGH-ALT CAPSULE DROPS FROM C-130 & B-47
  17 TESTS
  1 FAILURE AT -89°F
- VERIFIED CAPSULE STABILITY & RECOVERY PARACHUTE PERFORMANCE

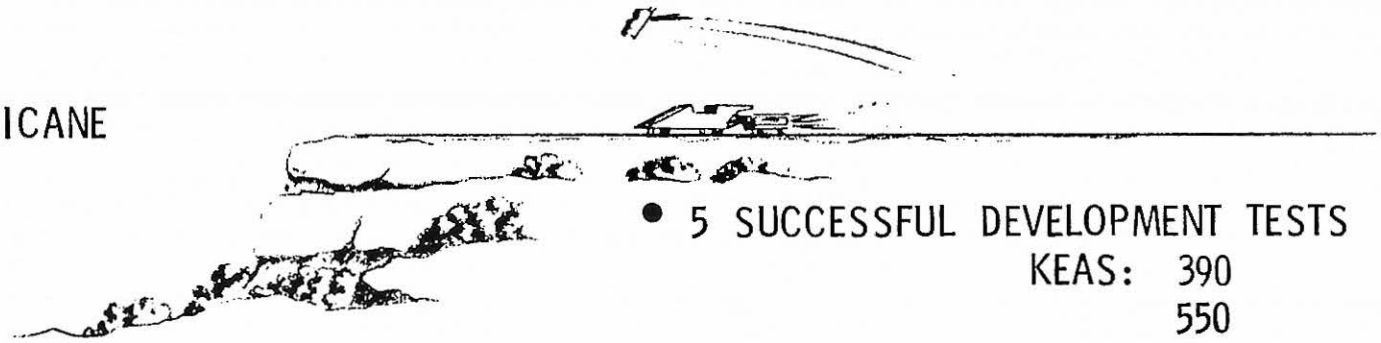


- EJECTIONS FROM B-58
  2 SUCCESSFUL TESTS
  M 0.8 AT 21,000 FT
  M 1.6 AT 38,000 FT
- VERIFIED HIGH MACH NO. PERFORMANCE

TSP66-5210 A

SLED TESTS

HURRICANE
MESA

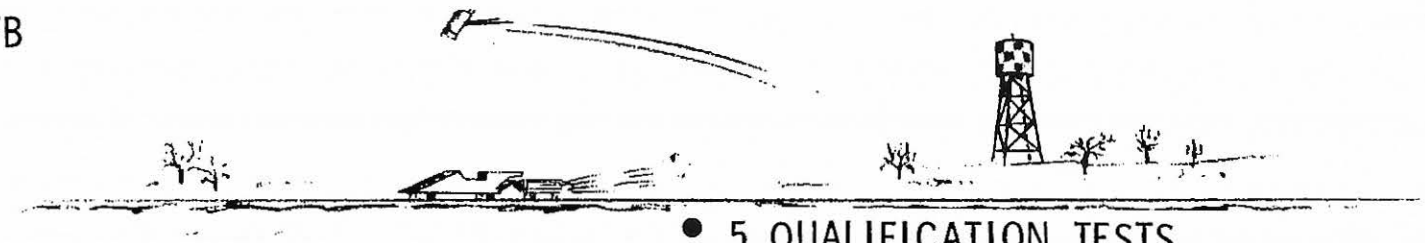


- 5 SUCCESSFUL DEVELOPMENT TESTS

KEAS:	390
	550
	550
	650
	650

- VERIFIED HIGH-q PERFORMANCE

EAFB



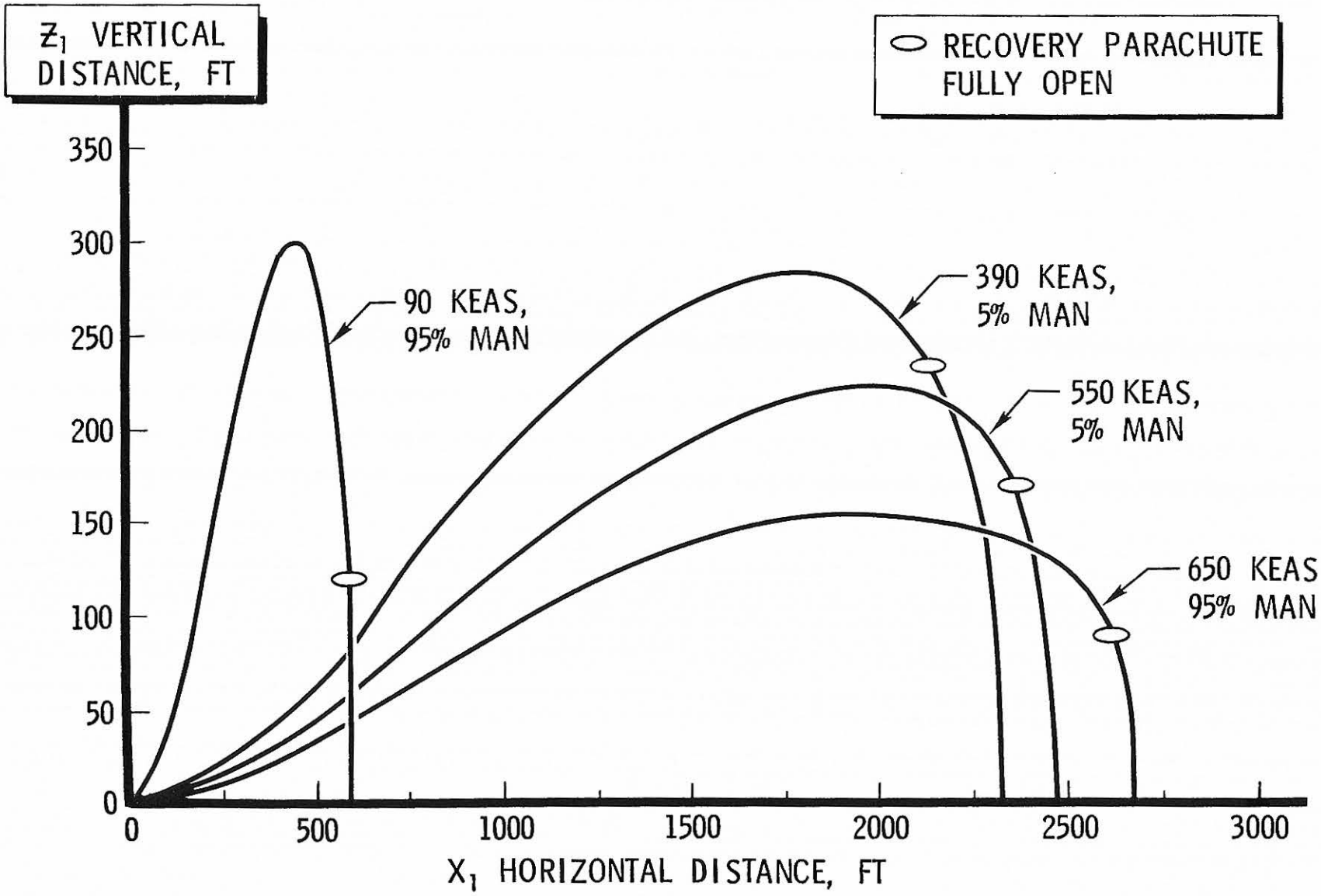
- 5 QUALIFICATION TESTS
  ONE FAILURE

KEAS:	90
	660
	660
	550
	640

- ONE 90 KEAS DEVELOPMENT TEST (SUCCESSFUL)
- VERIFIED INTEGRATION OF CAPSULE, CATAPULT & RECOVERY PARACHUTE
- VERIFIED INTEGRATED PERFORMANCE OF ALL SYSTEMS

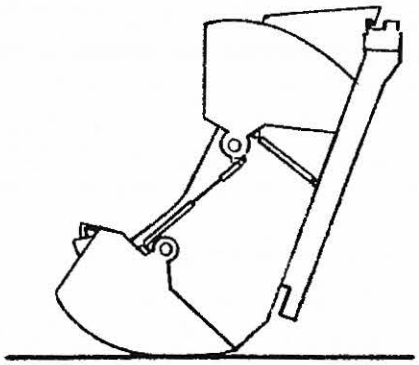
TSP66-5239 A

REPRESENTATIVE TRAJECTORIES

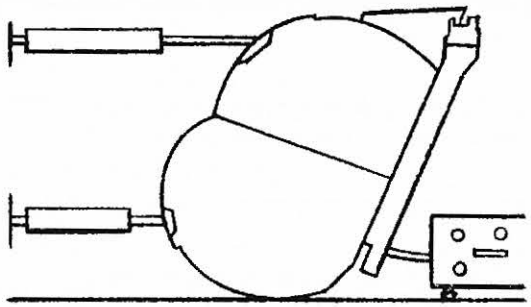


TSP66-5209

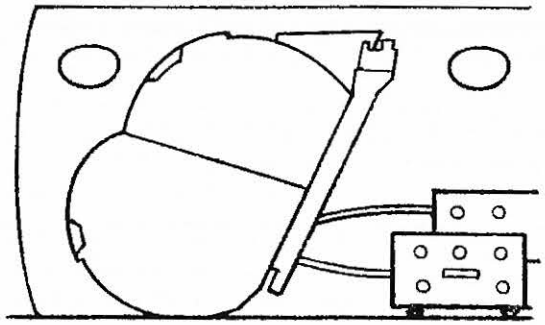
GROUND AND LABORATORY TESTS



CARTRIDGE BREADBOARD
AND OPERATIONAL CHECKS

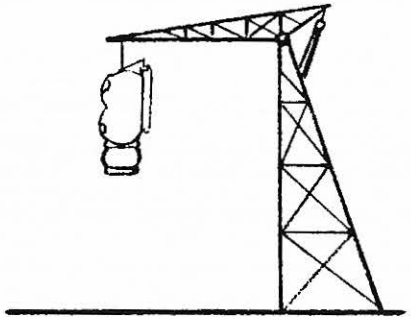


STATIC STRUCTURAL
TESTS

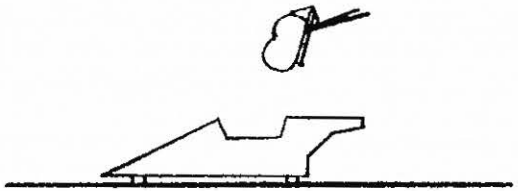


PRESSURE CHAMBER
DUMMY, SIMIAN, HUMAN
18 TESTS
MAX ALT 100,000 FT

FLOTATION
TESTS



IMPACT
DUMMY, HUMAN,
LAND, WATER
17 TESTS



EJECTION FROM
CABIN SECTION
ONE TEST

B-10 PROGRAM REVIEW AUG 66