(Gp-4) TEST REPORT XB-70A
62-207

Flight 2-5, 17 Sep 65
Flight 2-6, 21 Sep 65

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XB-70 JOINT TEST FORCE (FTTB)

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I. SUMMARIES:

1. Flight 2-5:

a. Flight 2-5 was conducted on 17 Sep 1965. Mr. Al White, North American Aviation, Inc (NAA), was the pilot and Lt Colonel Fitzhugh Fulton, Air Force Flight Test Center (AFFTC) was the copilot for this flight. The pilots launched the air vehicle from Edwards AFB runway 04 at 1158 PDT and landed on runway 04 at 1353 PDT, for a total flight time of one hour and fifty-five minutes. The maximum speed and altitude during this flight were Mach 1.83 and 50,500 feet respectively. Take-off weight was 488,000 pounds.

b. Data were collected during functional checkouts of the throat deviation equipment in the Air Induction Control System (AICS). These functional checkouts were conducted at 1.6 Mach and 41,000 feet and at 1.8 Mach and 45,000 feet. The automatic AICS operated satisfactorily though difficulty was encountered in setting up throat deviations because of confusing dial calibration.

c. Stability and control data were collected at 1.8 Mach and 50,000 feet, 1.6 Mach and 45,000 feet and .8 Mach and 25,000 feet. The pilot reported that no appreciable differences, with respect to directional stability, were noted between air vehicle No. 1 and No. 2 although he indicated that directional stability maneuvers were easier to perform in air vehicle No. 2 because of the difference of wing dihedral.

d. The planned engine airstart tests were not performed due to secondary nozzle problems on engine No. 1.

2. Flight 2-6:

On the first attempt Flight 2-6 was aborted during takeoff roll on 21 Sep 1965 due to rpm roll back and high exhaust gas temperature (EGT) on No. 2 engine. After slow down, when the air vehicle was on the taxi strip, the rear inboard left main landing gear tire blew causing, in-turn, damage to a landing gear electrical junction box and resulting in a false unsafe gear indication. Flight 2-6 was rescheduled for a 29 Sep 1965 takeoff with the primary flight objectives to obtain air induction control system data at Mach 2.3 and 57,500 feet, to perform stability and control maneuvers, to conduct ram purge pressurization tests, and to investigate engine airstart capability at subsonic speeds. The flight objectives were aborted after 37 minutes of flight because of high vibration and excessive EGT of No. 6 engine. This over-temperature was caused by a

compressor stall that resulted during a restart cycle after an unstart of the right inlet. The AICS operation was further complicated by turbulent duct air flow caused by the erroneous buzz signals. Further tests to validate the AICS should be accomplished in this flight regime before progressing to higher Mach flights. No. 6 engine was shut down and the air vehicle was returned to Edwards AFB where a lakebed landing was made by the pilot, Mr. Al White, NAA, and the copilot, Mr. Van Shepard, NAA. The total flight time was one hour and forty-four minutes with thirty-two minutes supersonic and five minutes of the time over Mach 2.0. The maximum speed of 2.23 Mach and the maximum altitude of 54,000 feet were attained. The lakebed landing was made as a precaution because of a cockpit indication of brake system malfunction during take-off. The lakebed landing was uneventful, and each of the three drag chutes blossomed.

II. CONFIGURATION CHANGES:

1. Flight 2-5:

System	Primary Subsystem	Description of Change
1. Airframe	Forward Fuselage	Ballast reduced to effect an increase in usable fuel load
2. Alighting and Arresting Gear	Drag Chute	Three 28 foot canopies with decreased porosity installed
3. Propulsion	Engine hydraulic positions Nos. 1, 3, 4 & 6	Insulation blanket added on engine hydraulic tank
4. Flight Control	FACS Longitudinal	Pitch, roll, and yaw augmentation power circuits revised to permit FACS disengagement without removing power from FACS electronics
5. Secondary Power	Utility hydraulics Distribution Nos. 1 & 2 (Tank No. 5)	Fuel pump stabilization and flexible lines installed (Tanks Nos. 1, 4 & 6 completed prior to flight No. 1)
6. AICS	Unstart control	Unstart system revised to prevent noise pickup from causing a restart cycle without an actual unstart signal

2. Flight 2-6:

System	Primary Subsystem	Description of Changes
Fuel	Fuel Management and Quantity Indication	Tank No. 5 fuel management control module was revised to feed tank No. 5 in two steps rather than in a single step
Alighting and Arresting Gear	Landing Gear Control	Anti-blowback feature was removed from main and nose gear door selector valves. This eliminates possible door lock opening from thermal expansion
Alighting and Arresting Gear	Brakes	Computer revised to render slip computer inoperative below 10 knots and to provide improved low speed braking characteristics

III. ENGINEERING COMMENTS:

1. Flight 2-5:

a. Propulsion:

Minor problems were encountered on the ground and in flight. During engine starts the EGT on engine S/N 170-576 (position 5) exceeded the maximum ground start limits. Maximum temperature was 690°C. This over-temperature condition does not warrant engine removal; however, it has been recorded in the engine log book. In flight, engine S/N 170-573 (position 1) nozzle malfunction caused the EGT to oscillate. The engine was reduced to idle and the scheduled airstart tests cancelled. Postflight inspection revealed that the nozzle malfunction (A_8 staying open) was caused by a faulty electrical relay in the air vehicle system.

b. Loss of Hydraulic Fluid:

(1) The Utility No. 2 system indicated a gradual loss of fluid during the flight. Minimum quantity reading reported by the pilots was 40%. Considerable checking had been done prior to this flight, since similar losses occurred on Flight 2-3 and Flight 2-4 with no definite cause having been identified.

(2) The emergency landing gear control valve was replaced after this flight. There was nothing to indicate that this was the problem but this was the only landing gear component changed since the first flight which might affect cross-system leakage. Specific cause, whether actual cross-system flow, leakage, or false indication, has not been determined.

c. Drag Chute:

The modified three-chute configuration (5 ribbons added at alternate slots) was partially successful and all three chutes eventually blossomed. The third chute in the lower position (2 on the top and 1 on the bottom) was slow and was not fully blossomed until the chutes had rotated counter clockwise to two chutes on the bottom and one on the top configuration. This occurred approximately twelve seconds after the first two chutes had blossomed.

d. Flight Squawks:

(1) Cannot transmit on UHF No. 1 from copilot's station.

(2) 60/40 mix in copilot capsule appears to leak --- had to be serviced after three hours.

(3) Instrument off light came on and instrumentation went off when the encapsulated light was turned on.

(4) U_2 fluid level went down to 40% at one time during flight.

(5) Pilot's WAFER switch (UHF selector) is very loose.

(6) Pilot's seat pin lanyard is jammed.

(7) Secondary nozzle on No. 1 engine came all the way open during flight.

2. Flight 2-6:

a. Air Induction Control System:

(1) At Mach 0.8 the automatic air induction control system (AICS) mode was selected on both inlets. The left bypass then went all the way open because of inputs from an erroneous buzz signal. The left bypass was returned to a normal position by use of the standby electric actuators with substantially no effect on the engines.

(2) Above Mach 2.0 the left inlet started and the shock position appeared to control normally. The right inlet did not control normally but finally started and then unstarted before the duct air flow was stabilized. During a restart cycle after the unstart of the right inlet, the No. 6 engine compressor stalled and an over-temperature above 1000°C followed. Shortly thereafter, No. 6 engine was shut down. Later in the flight, several additional right false buzz signals were received. After the flight, the bypass doors were isolated from the buzz sensors and the bypass movement rate was lowered to reduce the possibility of similar difficulties on the next flight. The false buzz signals have been isolated to the buzz computer and a design change is being incorporated to effect compatibility between the computer power supply and a time delay circuit card.

b. Propulsion:

Initially, Flight 2-6 had to be aborted during the takeoff roll. Immediately after brake release the engine speed rolled back to 92% rpm and the EGT went to 970°C on engine S/N 170-579 (position 2). The primary nozzle (A_8) also went closed. The suspected cause for the speed roll back and the rise in EGT is a failure of the A_8 torque motor in the nozzle area control which causes A_8 to close. Engine S/N 170-579

was replaced with engine S/N 170-555. In flight, at approximately Mach 2.2 and 54,000 feet, the EGT on engine S/N 170-560 (position 6) went above limits. The problem may have been caused by the air inlet duct starting and unstarting in rapid sequence. The vibrations on engines No. 4, 5 and 6 increased two to three mils during this period. Neither the EGT nor the vibrations went above limits on engines No. 4 and 5. Engine No. 6 shut down with the throttle at 12° throttle angle. Engine S/N 170-560 will be replaced with engine S/N 170-558.

c. Blown Tire After Aborted Takeoff:

(1) An early morning takeoff for Flight 2-6 was attempted on 21 Sep 65 and was aborted within the first 2,000 to 3,000 feet due to a No. 2 engine malfunction. The aircraft was allowed to roll to the end of the runway. The pilot did not turn onto the taxiway since braking did not appear normal when slowing for the turn. A 180° turn to the left was made on the runway overrun to return to the taxiway. After turning onto the taxiway, the left rear inboard (No. 8) tire blew damaging the electrical junction box on the bogie which resulted in a false unsafe gear indication.

(2) The tire failure appeared to be the result of heat generated from the excessive taxi distance and high side loads during the 180° turn at heavy weight on the runway overrun. The bead wires were broken and the tire blew in the side wall. Total taxi distance prior to the takeoff roll was over 18,000 feet (taxi was started from a pad across from the B-70 hangar). Total distance when the tire blew was over 35,000 feet.

(3) The adjacent No. 7 tire blew a short time later while the aircraft was being towed in after traveling another .6 mile. The failure was again in the wire bead similar to the No. 8 tire.

d. Brake Control:

The pilot reported that the brake control caution light came on at about the time the aircraft broke ground on the takeoff roll. A precautionary landing was made on the lakebed without incident. The brake computer was removed as it was found that one function affecting one brake was slightly out of tolerance. This condition is not expected to have a noticeable effect on brake operation.

e. Pilot Squawks:

(1) Right hand panel extend light stayed on most of the flight.

(2) The brake control light was on during latter part of takeoff roll.

(3) The nozzle position indicator was inoperative on engine No. 1.

(4) TACAN performance unsatisfactory --- did not lock on any station until we were less than 100 miles and in most cases less than 50 miles.

(5) We received intermittent buzz signals during the flight.

(6) No. 6 engine at 1000°C for an unknown length of time.

(7) The right hand bypass doors did not close all the way.

(8) With 200 pounds remaining in tank 2B, tank locked out.

(9) Individual fuel tank read-out knob does not line up properly.

(10) The needles on the vibe meter are unreadable --- need to be painted.

(11) The AICS reset button is loose and therefore the light is unreliable.

(12) Fuel leaking back into tank No. 1 locks out tank No. 8.

IV. OBSERVATIONS AND COMMENTS BY THE COPILOT (FLIGHT 2-5):

1. Introduction:

a. The flight was scheduled for 0700 hours takeoff but was aborted after a short taxi distance. It was rescheduled for 1200 hours. The primary purpose of the flight was to test the automatic inlet system at speeds up to 1.80 Mach. Engine re-starts at .80 Mach and stability and control at 1.60 and 1.80 Mach were secondary test objectives.

b. The airplane was airborne at 1158 and landed one hour and fifty-three minutes later. The automatic inlet worked excellently. Stability and control tests at 1.60 and 1.80 Mach were completed. The engine re-start tests were not accomplished because of a malfunction in the No. 1 engine secondary nozzle; however, stability and control tests at .80 Mach were substituted for the re-start tests.

2. Preflight and Flight Preparation:

I arrived at the airplane at 0345. After a preflight inspection and a weather and airplane status briefing, pressure suits were donned. Both pilots were in the cockpit with personal equipment checked out by 0520.

3. In the Cockpit Prior to Taxi:

The starting gross weight was approximately 528,000 pounds, which included an indicated 250,000 pounds of fuel. Several discrepancies appeared. The No. 1 UHF transmitter would not operate from the copilot station. A malfunction of the Auxiliary Gyro Platform System (AGPS) caused the attitude indicator to tumble. The AICS cooling system failed causing the warning light to illuminate. After the AGPS and AICS cooling systems were repaired, normal engine starts were accomplished. The airplane was taxied from the run station, but after traveling less than one-fourth mile, the wheel brake warning system came on and the engines were shut down on the taxiway. The airplane was towed back to the run station and the flight was rescheduled for 1200 hours. Both pilots re-entered the cockpit at 1030 hours. The copilot's 60-40% oxygen-nitrogen pressure gauge in the capsule was found to be low and was re-serviced. All engines were re-started normally. The A_9 nozzle on the No. 1 engine failed in the full open position several times. Cycling of circuit breakers was used to re-establish operation.

4. Taxi:

The airplane was taxied from the run station shortly after 1130 hours. A small amount of fuel had to be transferred from tank No. 5 several times to keep the tank No. 5 level at or below 26,000 pounds. Brake chatter was especially bad during the taxi out. The copilot seat was noted to be particularly uncomfortable and seemed to be further forward on this airplane than on airplane No. 1. After a visual inspection by the ground crew, the airplane was taxied on to the runway. Data control gave us a procedure to use in case the A_9 nozzle should fail open during flight.

5. Takeoff and Initial Climb:

The indicated total fuel quantity one minute prior to brake release was 214,000 pounds. With No. 5 fuel pump off and all others set to automatic, the brakes were released at 1158. The airplane accelerated rapidly and was two seconds ahead of schedule at 150 knots IAS. The No. 6 engine high vibration warning light flashed on momentarily during the takeoff roll but stayed out after the lift-off. Rotation was started at 185 knots and the airplane was airborne at approximately 205 KIAS. After a satisfactory hydraulic check, the gear and flaps were retracted and a 400 KIAS climb schedule established.

6. Climb:

A maximum afterburner climb continued. The AICS switches were set (C/N 603), one at a time, into automatic at approximately .77 Mach. There was no movement of either the bypass doors or the throat since .80 Mach had not been reached. The wing tips were lowered to 25° and at around 30,000 feet both bypass doors had opened slightly to 30 left and 30 right. The airplane was leveled at 32,000 feet for the acceleration. The right throat began to schedule first and went to 1.70 at around .97 Mach. At 1.07 Mach, the left throat was still full open but the right was at 1.71. The bypasses were 40 left and 30 right. The wing tips were set to 65° at 1.25 Mach to allow external photography to begin earlier. At 1.28 Mach, both throats were scheduling at 1.74 left and 1.77 right. Bypasses were 60 left and 50 right. The nose ramp was extended and at 530 KIAS a climb was initiated. The bypasses were 90 left and 60 right at 1.4 Mach. At 1.43 Mach, the throats were scheduling at 1.78 left and 1.81 right. The right bypass had opened to 430 but the left held at 90. Passing 1.45 Mach, the left bypass began to open and also went to 430. The climb continued to 41,000 feet.

7. Throat Deviation Tests:

a. While holding 41,000 feet, both bypasses were steady at 440 square inches. Throat indications were 1.77 left and 1.82 right at 1.59 Mach and were 1.84 left and 1.88 right at 1.61 Mach. The throat deviation indicators were unlocked and the following conditions resulted:

Throat Deviation	Throat Indications	Speed
+1	1.77L/1.82R	1.59 Mach
+2	1.72L/1.76R	1.60 Mach
+1	1.77L/1.82R	1.59 Mach
0	1.83L/1.88R	1.61 Mach
-1	1.88L/1.93R	1.61 Mach
-2	1.94L/1.99R	1.61 Mach
-1	1.89L/1.93R	1.61 Mach

b. The numbering system on the tenth scale of the deviation indicator was completely unacceptable and had such things as a five which actually meant four. A climb was established to reach 1.80 Mach at 45,000 feet. All hydraulic quantities were holding at 200% except for U_2 which had decreased to 140%. When abeam of Elko, Nevada, at 100 miles range, a right turn was initiated. While still in the turn, the airplane was leveled at 45,000 feet and 1.80 Mach. Bypass doors were 440 left and 440 right. Throat deviation tests during a 20° right bank produced the following:

Throat Deviation	Throat Indication	Speed
0	1.89L/1.93R	1.80 Mach
+1	1.84L/1.88R	1.80 Mach
+2	1.78L/1.83R	1.80 Mach
+1	1.83L/1.88R	1.79 Mach
0	1.89L/1.93R	1.80 Mach
-1	2.01L/2.04R	1.81 Mach
-2	2.05L/2.08R	1.80 Mach
-1	2.00L/2.00R	1.82 Mach

8. Stability and Control at 1.6 and 1.8 Mach:

With the total fuel indicating 97,500 pounds, a climb at 1.80 Mach was made to 50,000 feet. The U_2 quantity had dropped to 125%.

(C

On a southbound heading near Milford, Utah, stability and control tests were begun at 1.80 Mach, 50,000 feet. A stability set with flight augmentation control system (FACS) on and pitch augmentation off was completed. This included a pitch pulse, a sideslip, a release from sideslip and a windup turn. The stability set was followed by a sideslip and release with all augmentation off. After slowing to 1.6 Mach at 45,000 feet, the same stability maneuvers were accomplished. There were no unusual characteristics noted except during the 1.6 Mach pitch pulse when the airplane did not appear to return all the way to one "g".

9. Deceleration and Descent:

A deceleration was begun when approximately 40 miles south of Morman Mesa, Utah. Total fuel remaining was 57,000 pounds. At 1.52 Mach, the throats were 1.81 left and 1.84 right and the bypasses were 440 left and 450 right. The U_2 quantity had continued to slowly decrease and was down to 100%. The windshield ramp was lowered and the tips raised to 25° at 1.4 Mach. The right bypass door began to close first and at 1.32 Mach went to 30 square inches. At 1.29 Mach, the left bypass door also closed to 30 square inches. The throats indicated 1.74 left and 1.78 right at 1.27 Mach and indicated 1.68 left and 1.70 right at 1.05 Mach. Just before going subsonic, a small exhaust gas temperature (EGT) and A_8 oscillation was detected on the No. 1 engine. This was diagnosed and later confirmed by a chase airplane to be an open A_9 nozzle. As recommended by General Electric Company, the rpm was reduced below 80% and was set at 78%. Fuel remaining was 50,000 pounds when the airplane became subsonic. It did not appear that the throats would ever open to 1.67 or that the bypass doors would close completely, therefore, the AICS system switches were set to "standby" (C/N 4788) with throats at 1.68 left and 1.69 right and bypasses at 40 left and 20 right. After landing, the throats indicated full open and the bypass doors full closed.

10. Stability and Control at .80 Mach:

The airstart tests on engines No. 5 and 6 were eliminated from the test plan after the No. 1 engine A_9 nozzle malfunctioned. Stability and control at .80 Mach and 25,000 feet were substituted for the airstart tests. With the wing tips at 25° and with all FACS off, a pitch pulse, a sideslip, a release from sideslip, and a windup turn were completed. The sideslip was 2.8° with full rudder. After raising the wing tips up, the same stability maneuvers were accomplished. The pitch pulse was again deadbeat. During the windup turn at 1.45 "g", the pilot called out stick force lightening.

11. Fly-by and Landing:

a. (U) After resetting the wing tips to 25°, a low altitude fly-by was made from east to west down the tower fly-by line. The speed was approximately 350 KIAS and the airplane appeared to handle well even in light turbulence.

b. (C) A normal overhead pattern was entered at 300 KIAS with the wing tips up. The gear and flaps were lowered on the downwind leg and with 23,000 pounds of fuel remaining, the flare speed was computed at 185 KIAS. The U_2 quantity indicated 110% while in the pattern. The sump warning light blinked on while turning to the final approach with an indicated 21,000 pounds of sump fuel remaining. Touchdown was at 170 KIAS. The nose was lowered and the chutes deployed. All three chutes blossomed fully with a very noticeable airplane deceleration.

12. After Landing:

Military power runs were completed on all engines except No. 1. The left brake emitted light smoke while taxiing in. The airplane was parked on taxiway No. 5 and all engines were cut off with 15,000 pounds of fuel remaining.

13. Systems:

a. Air Induction Control System:

The automatic inlet system worked excellently. The bypass doors only opened to approximately 440 square inches instead of 500 square inches; however, the speed for opening and closing was as scheduled. The bypass doors creep open to approximately 20 or 30 square inches when they should be closed. The throats scheduled as predicted but indicated 1.68 and 1.69 Mach after slowing to a speed where they should be full open with a 1.67 Mach indication.

b. Engines:

The No. 1 engine A_9 nozzle went full open prior to taxi out and again near the end of the flight. All other engine operations were satisfactory.

c. Fuel:

The fuel system fed satisfactorily in automatic most of the time. There was some leakage into the No. 2 tank and whenever the fuel

quantity level reached 200 pounds, or more, the automatic sequence would stop until tank No. 2 was manually emptied. Tank No. 6 also had some leakage into the tank and tank No. 6 left showed 2,200 pounds near the end of the flight. It had been emptied in the early part of the flight and was re-emptied prior to landing.

d. Hydraulics:

The U_2 quantity gradually decreased throughout the flight and showed 110% after landing. During taxi out both primary quantities dropped from 160% to 145% during a left turn. The U_2 quantity gauge dropped to 40% indicated in a moderately steep descent. All other pressure and quantity indications were normal.

e. Personal Equipment:

The visor glare was particularly bad for both pilots. When the pilot partially lowered his green visor to reduce the sun glare, he felt that it was distracting to his horizon view.

f. All other systems operated satisfactorily.

13. Flight 2-6:

NOTE:- There was no Air Force pilot on the Flight 2-6 flight crew; therefore, no comments are included in this report.

V. CONCLUSIONS:

1. Flight 2-5:

a. This was an excellent flight and the automatic AICS performed as predicted.

b. Systems which gave overall satisfactory performance were:

Fuel	Environmental Control System
Landing Gear	Oxygen
Nose Wheel Steering	Flight Controls
Flaps	Wing Fold
Instrumentation	Air Induction Control System
Electrical	TACAN
Fire Detector	Nose Ramp
IFF	

c. The throat deviation indicators have a completely unacceptable numbering system and should be changed before the next flight.

d. Brake chatter was very bad during taxi out.

e. The copilot's seat appears to place the copilot too far forward in this airplane.

f. The pilot reported a slight stick force lightening during a 1.45 "g" windup turn at .80 Mach and 25,000 feet.

g. The throttle reset button spring on this airplane and the No. 1 airplane requires too much force to operate.

h. The Utility No. 2 hydraulic system continues to indicate a gradual loss of fluid.

2. Flight 2-6:

a. During a re-start cycle after an unstart of the right inlet, the No. 6 engine compressor stalled and an engine over-temperature followed.

b. Several erroneous buzz signals contributed to AICS operational difficulties.

c. Systems which gave overall satisfactory performance were:

Fuel	IFF
Landing Gear	Environmental Control System
Nose Wheel Steering	Flight Instruments
Flaps	Hydraulics
Instrumentation	Oxygen
Electrical	Flight Controls
Communication	Wing Fold
Fire Detector	Drag Chute
Nose Ramp	

VI. RECOMMENDATIONS:

1. Flight 2-5:

a. Renumber the 1/10 markings on the throat deviation indicators.

b. Reduce the spring tension in the throttle reset button on air vehicles No. 1 and 2.

c. Determine whether the U_2 hydraulic system loss indication is real or apparent and correct this deficiency.

2. Flight 2-6:

a. Further flights should be specifically made to assure proper AICS operation in the Mach 2.0 to 2.5 range before progressing to higher Mach flights.

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INTRODUCTION

The primary test objectives of Flight 1-51 were sonic boom data at 2.5 Mn and 60,000 ft altitude and 1.5 Mn and 37,000 ft altitude. Secondary objectives were pilot familiarization and radar airspeed calibrations.

Flight Statistics	Observed	Actual
Total Flt Time	1:39 Hrs: Min	
Max. Mach No.	2.52	2.58
Max. Altitude	60,000	60,300 Ft.
Max. Total Temp.	368	378° F
Time Above M=1.0	1:12	1:18 Hr: Min.
Time Above M=2.0	0:32	0:32 Hr: Min.
Time Above M=2.5	0:13	0:13 Hr: Min.
T. O. Gross Weight	530,000 lb.	

All tests, except for airspeed calibration data at 60,000 ft. were accomplished as planned. Only about half of the airspeed calibration data scheduled during a deceleration from 2.5 to 2.3 Mach at 60,000 ft. altitude was obtained. Loss of radar track caused loss of part of the 60,000 ft. A/S calibration data.

A low approach was planned prior to landing, but was deleted when a hydraulic leak developed in the primary 2 hydraulic system. Aircraft inspection after landing showed a 7/16 inch step in the right hand duct floor. The step appeared to be the result of structural weakening in the honeycomb panels of the affected area.

ENGINEERING SUMMARY

Sonic Boom - The primary objectives of sonic booms at 2.5 Mach number, 60,000 ft altitude and 1.5 Mach number, 37,000 altitude were accomplished. The gross weight for the sonic boom runs were 370,000 lbs and 327,000 lbs respectively. Radar tracking problems, experienced throughout most of the flight, resulted in poor vectoring of the aircraft and caused the tracks of both sonic boom runs to be off-set from the flight track directly over the sonic boom homes. In the case of the 2.5 Mach number boom, the XB-70 flight track was displaced 31,800 ft north of track. It was during this run that vector control of the XB-70 had to be handed over to NASA 1 control due to loss of radar track in the XB-70 Data Control Center. In spite of the displaced track, the XB-70 overpressure was measured at 2.09 PSF as compared to an estimated value of 2.06 PSF. The other two aircraft participating in the first sonic boom run were a B-58 and an F-104. The B-58 delivered an overpressure of 2.71 PSF from flight conditions of 40,000 ft altitude, 1.63 Mach number and a flight path off-set of 1800 ft. The F-104 boom was measured at 1.54 PSF for flight conditions of 21,100 ft altitude, 1.14 Mach number and flight path off-set of 2000 ft.

The XB-70 track for the second sonic boom run was 37,600 ft south of track. Here again problems with radar tracking of the XB-70 contributed to the off-set. The actual overpressure for this run was 2.55 PSF as compared to a predicted over pressure of 2.52 PSF. Both a B-58 and F-104 participated in this sonic boom run.