

Cc's to Mess

Smyle, Smith, Morley & McCarty & R. N. L.

SECRET & CONFIDENTIAL

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MEMORANDUM TO FILE

RE: SOME BRIEF IMPRESSIONS ON VISIT TO  
EDWARDS AIR BASE, AND B-52 BRIEFING  
ON JUNE 20TH AND 21ST, 1956.

Mr. McCarty and the writer visited Edwards  
Air Base and attended the I.A.S. Confidential Meeting on the  
B-52 on Wednesday and Thursday, June 20th and 21st.

N.A.C.A. Hangar at Edwards Air Base

Discussions with Mr. B. Beeler, Chief of  
Flight Research and Development, and Mr. J. Weil, Chief of  
Dynamics --

Aircraft Seen: Bell X1  
Bell X2  
Douglas X3  
McDonnell F-101  
Convair XF102 & F102A

We also saw other research aircraft, in-  
cluding a variable wing sweep aircraft, which I believe is  
called the 'X5', and saw the B-50 launching platforms for the  
'X' series aircraft.

Douglas X3

The X3 has been to a Mach number well ex-  
ceeding 2, and has had a number of problems, including bad  
roll-yaw characteristics induced by inertia coupling, due to  
the long and heavy fuselage and the very small wings. I was  
also surprised to learn that this aircraft, which has straight  
wings, of very low aspect ratio, had a tendency to pitch up  
on occasion, due to tip stalling, and the N.A.C.A. people  
said that there was a certain amount of evidence that pitch-up  
was not necessarily confined to highly swept aircraft.

Apparently, the aircraft lands at about 260  
knots.

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F-102A

This is the fully area ruled Convair F-102, and some rather interesting points came out of our discussions with the flight test people on this.

The large side fairings adjacent to the nozzle at the rear of the fuselage gave a marked reduction in drag and, apparently, almost made the difference between subsonic and supersonic flight.

The fineness ratio increase achieved by increasing the length of the nose had also decreased the drag by approximately the amount calculated.

The waisting of the fuselage for area rule had apparently not shown the gains envisaged.

Generally, the R.A.C.A. flight test group felt that the F-102 problems were now sorting themselves out, and that although there was still some pitch-up and directional instability, this aircraft represented the most advanced state of the art for a fully operational production aircraft. They particularly mentioned that the actual pitch-up on flight test was considerably less than that obtained in the wind tunnel, and they believed that they could remove the fences altogether without increasing the pitch-up appreciably.

McDonnell F-101

Performance-wise, they consider that the McDonnell F-101 is superior to the F-102. However, they mentioned that they were having more structural and aerodynamic problems with this aircraft than with any other supersonic aircraft. It has a marked pitch-up which has been difficult to cure, and has bad roll-yaw characteristics due to inertia coupling. They have also had some  $C_L$  buffet problems, and the aircraft is restricted in altitude at the present time to around 40,000 to 45,000 feet.

They felt that a lot of effort would be required to deal with these problems, but considered that once

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they were cured this would be a very good aircraft due to its very high performance. They did agree that it is also a 'hot' aircraft, and landing and take-off speeds are extremely high.

#### Lockheed F-104

They said that this aircraft had less vices than any of the contemporary supersonic aircraft, but at the same time pointed out that its capacity for carrying weapons, i.e., its use as a defence weapon, was inferior to the F-101 and F-102. They also felt that, due to the high wing loading, there may be pitch-up tendencies due to tip stalling at high speed, similar to the X3. Inertia coupler will also probably be a problem on this aircraft due to its similarity to the X3.

#### B-52

The main points in the Confidential Briefing on the B-52 were as follows.

Up to the end of May, the B-52 flight test vehicles had done 12,000 hours of flying, involving 2,000 flights, and it has the remarkable record of being operational for more than 75% of the time it has been at the test establishments.

They have done a considerable amount of ground running, and, for instance, have run all engines for five hours continuously with water injection, which is equivalent to 2,000 hours of flight testing, without any adverse effects due to fatigue, etc. In their flight re-fuelling program, they have transferred over 6,000,000 lbs. of fuel. Their average flight time per month per aircraft has been close to forty hours. The aircraft has been flown up to 450,000 lbs. gross weight — the take-off speed at that weight is around 160 knots.

Tex Johnson, the Chief Test Pilot, said that there were no real vices on the aircraft, and that you could control it with one hand under most conditions of flight. They have flown the aircraft up to Mach .93 in a dive.