

Re: The RCS: Voice Transcript

Source: <http://sci.tech-archive.net/Archive/sci.space.history/2004-08/1208.html>

From: Peter Stickney (peter_at_adelphia.net)

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In article <10guppepi4g0b09@corp.supernews.com>,

Pat Flannery <flanner@daktel.com> writes:

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> *Mary Shafer wrote:*

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>>*On Sun, 01 Aug 2004 16:12:15 -0500, Pat Flannery <flanner@daktel.com>*

>>*wrote:*

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>>>*It always amazed me that something that streamlined could be that slow;*

>>>*of course it wasn't area-ruled and that didn't help it any,*

>>>*but it looked like it was doing around Mach 4 standing still.*

>>>*It lifted off at 260 MPH, and once actually managed to Mach 1.21 in a*

>>>*power dive. So its maximum speed was around three times its takeoff*

>>>*speed...not terribly impressive.*

>>>

>>>

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>>*The X-3 had the same problem as the One-Oh-Wonder and a couple of*

>>*other aircraft and it wasn't lack of area ruling.*

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>

> *Take a look at it head on though:*

> http://www.globalsecurity.org/military/systems/aircraft/images/X-3_3view.gif

> *Not only does the fuselage have a lot of wetted area, but it's basically*

> *square in section back where the wings are attached; which also is about*

> *its thickest point, the non-area ruled fuselage was enough to prevent*

> *the YF-102 from getting through the sound barrier due to transonic drag-*

> *in the case of the X-3, the transonic airflow over the wing gets to run*

> *into the fuselage side at a ninety degree angle; far worse than if it*

> *were to encounter a more cylindrical shape like on the YF-102.*

> *I don't think you would have much luck getting this thing to go to*

> *higher Mach numbers even with more thrust; and the inlets also were*

> *badly designed from an aerodynamic and airflow to the engines point of view.*

Yabbut, what's important for the Area Rule is the change in cross-sectional area. With such a small, thin wing, it really doesn't add much, and the fuselage is actually pretty close to a Sears-Haack Body. (Think Rifle Bullet) I wonder about the base drag, though. Reviewing the NACA reports on the X-3 that are on the NACA and Dryden Tech Reports Servers shows that predicted and measured drag were actually very close.

>>It was lack of thrust, coupled with lack of space for a bigger engine.
>>Just as a rule for aerospace success, design and build either an
>>airframe or a power plant, but not both at once. The second rule is
>>that you can't ever have too much thrust, but you can easily have too
>>much drag and too much weight. These two rules work for everything
>>from little RC models to the Space Shuttle.
>>
>>If you have a proven powerplant, you design the airframe to fit around
>>it. That's vastly easier than designing a new engine to fit into an
>>airframe built to hold an old engine[1].
>>
>>Not following this rule is how the USAF got McAir to do the Voodoo
>>that they did, instead of doing the Voodoo that they meant to do. So
>>if you want to know how to do the voodoo that you should do, you do.

Of course, if logic had reigned, they'd have let Kelly Johnson stick J47s into the F-90 (XF-88 competitor.) If you look at a photo of the F-90's rear end, the tailpipes of its itty-bitty J34's only take up half of the engine bay. The F-90 was a real low-drag airplane, too – Given its size, and the lack of power, it moved pretty good. (But couldn't climb for beans) With a developed F-90 with real engines, The Air Force would have bought them instead of the F-101, or, for that matter, the F-105 or the Air Force F-4. Of course, there would have been no F-104, either.

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Pete Stickney

A strong conviction that something must be done is the parent of many bad measures. -- Daniel Webster