FORGOTTEN HISTORY

A SPIRITUAL CONNECTION (PART II): THE ATF PROGRAM

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the stream will start soon!

FORGOTTEN HISTORY SERIES

28 MAY	1800	A Spiritual Connection: Part II – The ATF Program
07 JUN	1800	*VALKYRIE*
09 JUL	1800	A Spiritual Connection: Part III – The "Raider"

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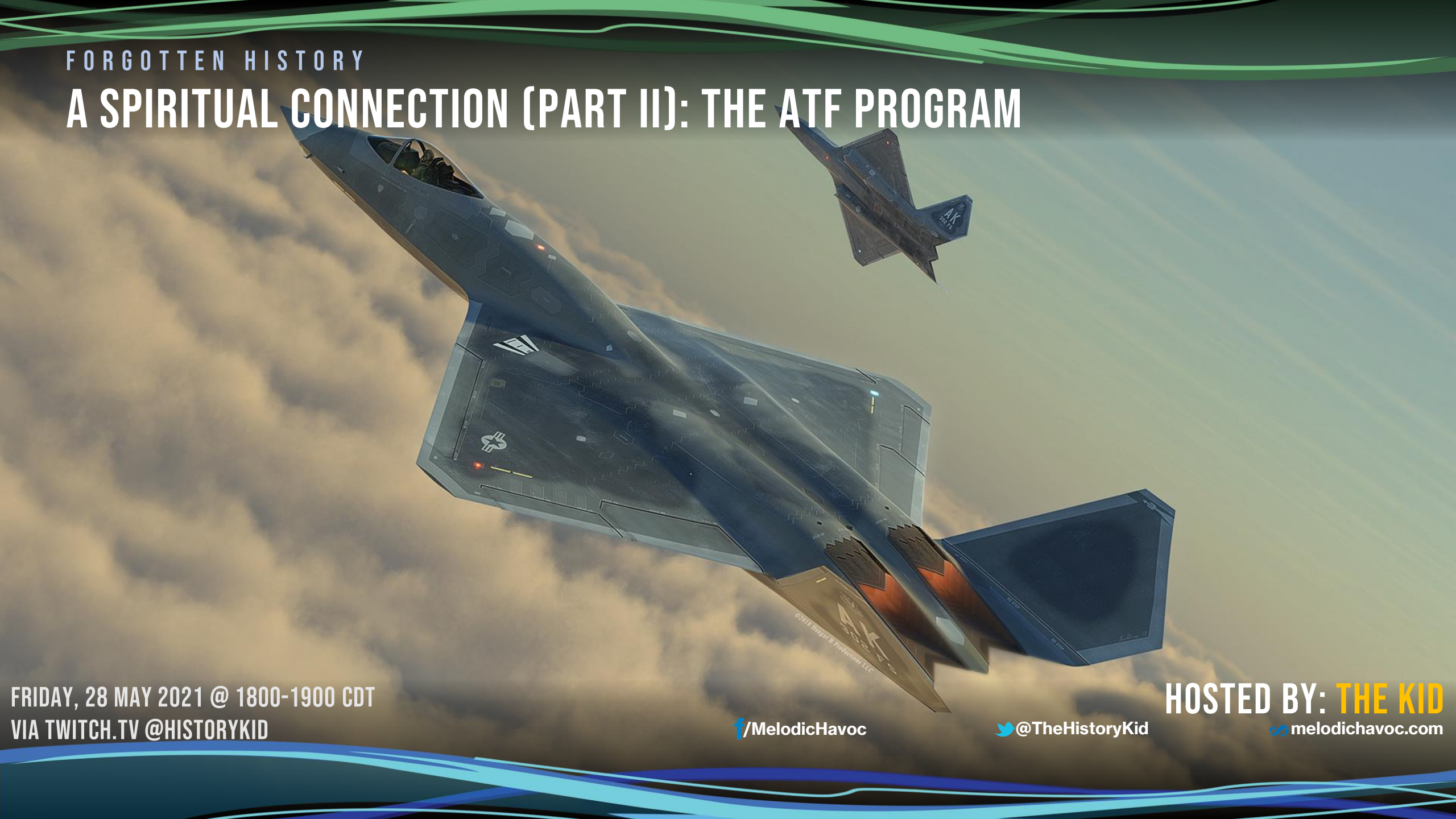
A SPIRITUAL CONNECTION (PART II): THE ATF PROGRAM



FRIDAY, 28 MAY 2021 @ 1800-1900 CDT
VIA TWITCH.TV @HISTORYKID

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DEFINING A "FAMILIAL SYSTEM"

THERE ARE 2 DIFFERENT TYPES OF FAMILIAL SYSTEMS:

INHERENT FAMILIAL

- Uses cumulatively procured technology.
- Has multiple design schematics with a single "parent."
- Anthological characteristics make information sensitive.

OPERATIVE FAMILIAL

- Uses uniform technology across platforms.
- Utilizes a unified design schema.
- Popular with mission and materiel consolidation.

FAMILIAL SYSTEMS ARE NOT NEW, NOR IS THE DEMAND FOR SUCH A SYSTEM.

ROADMAP IN THE PROGRAM

N-1M

1940

YB-35

1943

YB-49

1946

B-2

1984

YF-23

1990

B-21

IN DEVELOPMENT

2037 BOMBER

PLANNED

THE AURORA INHERENT FAMILY OF WEAPON SYSTEMS

1979 – present

- The codename was given to the entire ATB Program.
- There were two competitive companies in the Aurora Family.
- Northrop was the winning bid for the program.
- The entirety of the ATB Program was funded as “Aurora.”

The B-52 was the glue holding Strategic Air Command and the Nuclear Triad together after the Vietnam War.

Rockwell’s B-1A Lancer Bomber had been cancelled by President Carter in 1977 in favor of ICBM’s and B-52’s.

- Standard procedure for new programs to be “black.”
- Aurora’s function was to add a new dimension to evasion.
- Origins in design to 1946.
- Northrop’s 1981 victory in the program resulted in a new name: Spirit.
  The program is still funded up through completion as Aurora.
- Lockheed’s entry looked like a jumbo F-117.

IT BEGINS DURING VIETNAM

CONSOLIDATION AND DEMAND FOR A FAMILIAL AIR PLATFORM

McNamara's gamble for air defense clashes with McNair

An F-106A in 1982, these aircraft were the second to last century series to be retired.

- SecDef McNamara orders the armed forces to consolidate aircraft.
- USAF & USN poised to find a lightweight fighter to fill the need across branches.
- GEN LeMay wants bombers. Just bombers.
- B-58 chopped, XB-70 program gutted, *Blackbird* family shut down.
- Century program the focus of cuts, emphasis on the A-4 and F-4 platforms.

- Lightweight fighter proposal launches the F-X program.
- Northrop eventually is selected for this contract which results in the F-5 and T-38's.
- USN's needs were not fulfilled with this contract.
- Opted in the VFX program, which goes on to produce the F-14 *Tomcat*.
- F-X fails to meet the requirements for interception.
- Air Force spitballs the idea of cannibalizing the F-5, but ultimately opts with a revamp for air superiority, the F-15 in 1969.

Northrop's YF-5A Prototype on TARMAC in 1959, the fruit of the F-X Program.

THE RISE OF MODERN AIR DOMINANCE: THE F-117 & THE F-15 TAKE TO THE SKIES

A Need for Stealth and Speed

An F-117 *Nighthawk* low pass in Nevada, the *Nighthawk* was the last century-series aircraft to be retired.

- The F-117 entered the scene in the early 1980s.
- Stealth had been applied for just over 20 years (A-12 *Oxcart*).
- Served in the attacker/strategic strike role.
- Had no-air combat capabilities.
- Introduced smaller and more agile applications for stealth technology.

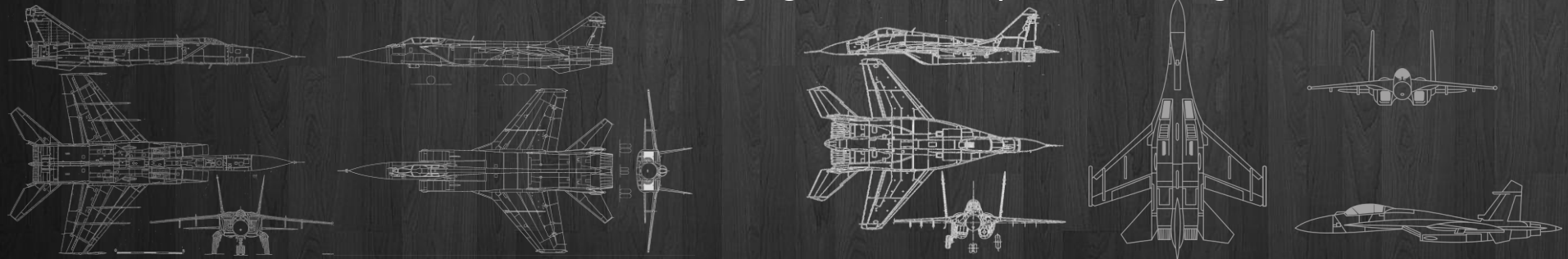
* Also aged stupidly fast. ☹

- Air missions assumed by the F-14, 15, and 16 – the Teen Series.
- The F-15 was the craft to meet the need of interceptor to counter the MiG-25.
- The F-16 countered the MiG-29 in quick-response air support.
- Meanwhile, the F-14 covered down on the needs for the U.S. Navy.
- The F-15 was marketed as the key replacement in the U.S. air superiority mission, replacing the F-4 and most Century Series aircraft.

F-15A sitting with an early production A-10A *Thunderbolt II* in the background in 1977.

THE SOVIETS MEET THE AMERICANS IN THE SKY: THE MIG-25

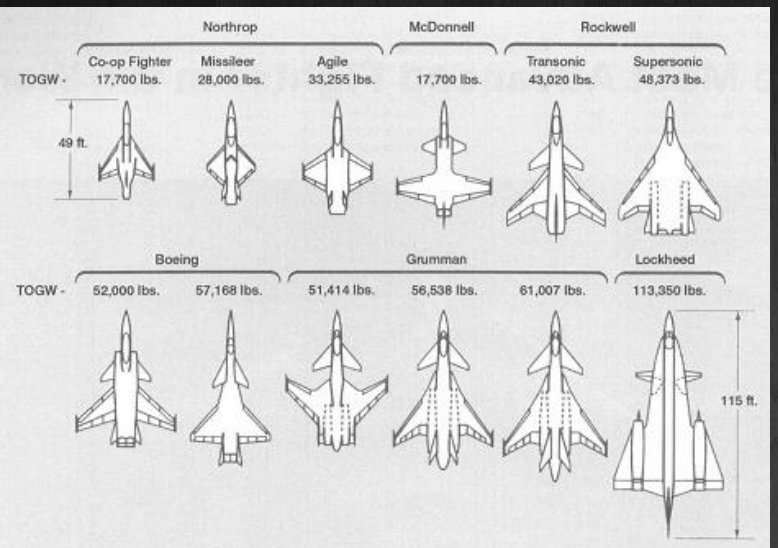
- The race in superiority was centered around bomber scare.
- Tu-95's and Tu-22's the focus for concern.
- Soviets match the Americans with supersonic aircraft.
- Counter to the Century Series was the MiG-25 Foxbat.
- The MiG-25 was an innovation and reimaging of airborne platform design.



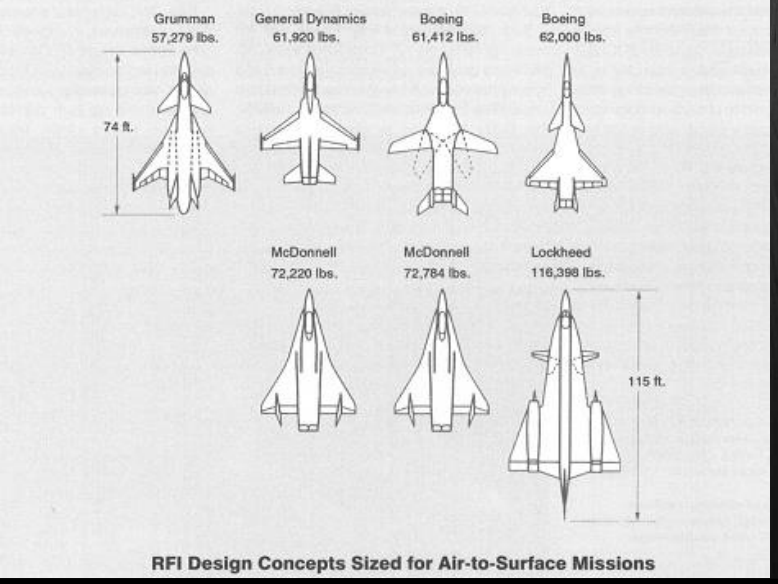
- Peripheral designs to fill air support missions went to the MiG-29 (1977) and Su-27 (1985).
- Soviets respond to the F-15 with the MiG-31 – a rehash on the MiG-25 platform.
- Similar rebuilds happen with the MiG-29 (33), and Su-27 (35) in subsequent years.
- Soviet matching of the F-15 cause for great concern in the USAF and calls for an aircraft to outpace and counter the aircraft were dubbed "an immediate need."

THE ATF PROGRAM IS BORN

SIX CONTRACTORS RACE FOR THE FINISH LINE – YOU'LL NEVER SEE IT COMING...



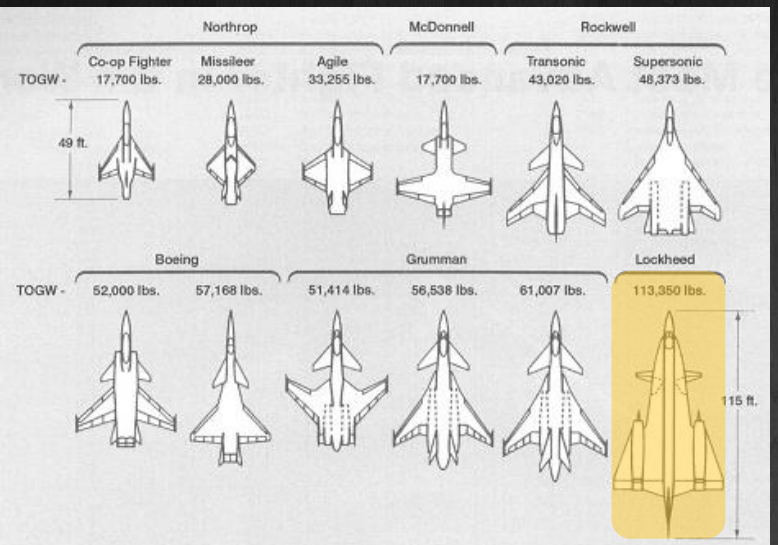
RFI Design Concepts Sized for Air-to-Air Missions



RFI Design Concepts Sized for Air-to-Surface Missions

- Concept requirements for an air superiority fighter to replace the F-15 in 1981.
- There were two proposed requirements: Mach 3+ and/or stealth concept.
- Refinements to the requirement in 1983 demanded a Mach 2/stealth aircraft.
- Request for Information (RFI) in 1981 resulted in 19 designs from 7 contractors.
- Boeing's A2A concepts resembled Soviet Sukhoi aircraft.
- Grumman's A2A concepts borrowed from the F-X program (later builds to X-29).
- Lockheed's submission builds off the *Blackbird* family.
- General Dynamics submitted a twin-engine F-16 (which is later purchased by Japan).
- McDonnell's A2S proposal closely resembled public perception of the *Aurora.*
- Only Northrop's designs (*Missileer* and *Agile*) did not undergo transformation.
- Boeing's blended proposal goes on to the X-31 program and eventually is used to produce the Eurofighter *Typhoon.*

THAT WHICH WOULD BECOME A BIRD OF PREY...



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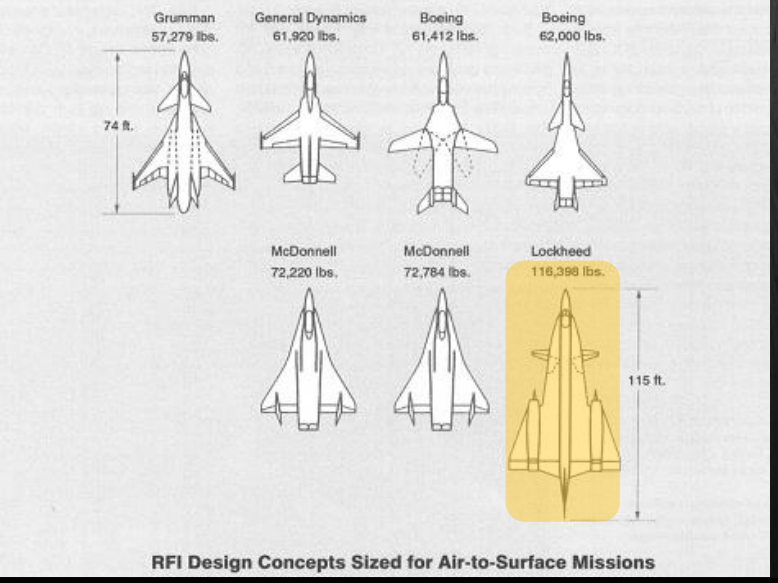
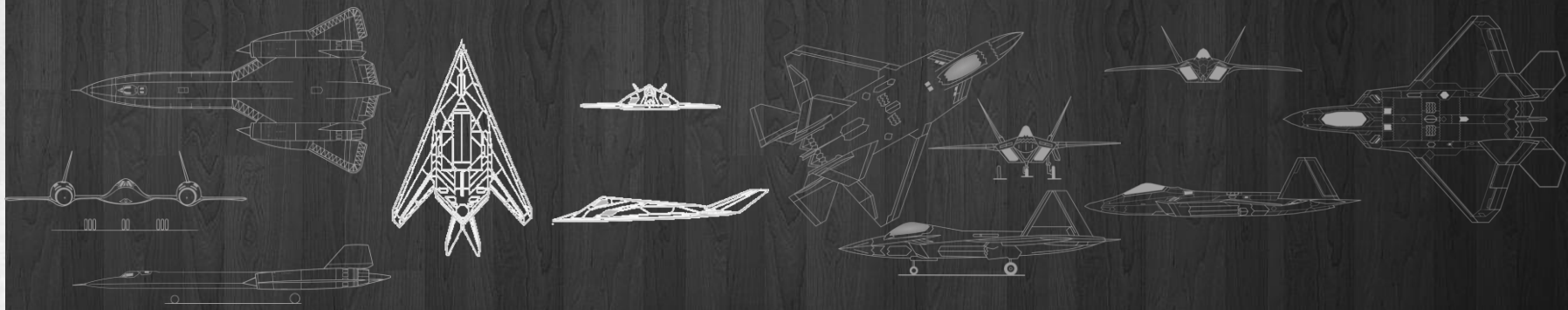


RFI Design Concepts Sized for Air-to-Surface Missions

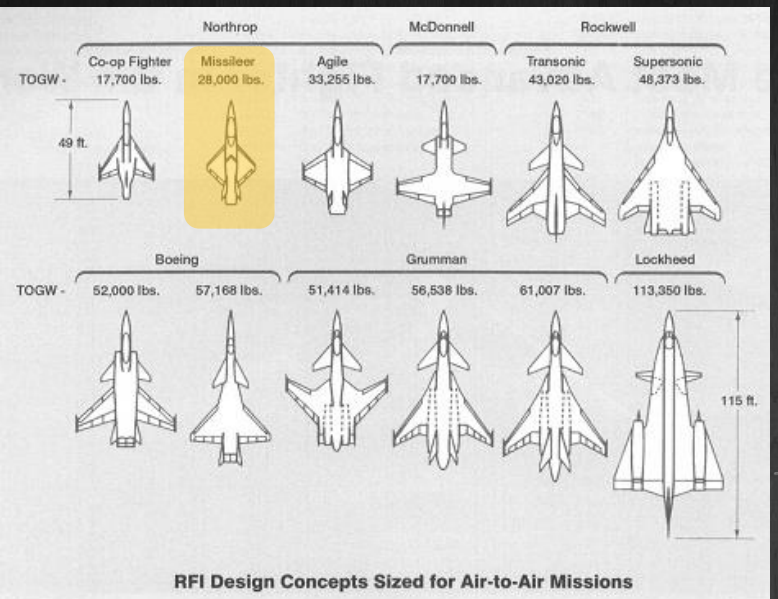
- Lockheed's original concept looked like a modernized *Blackbird.*
- Utilized the same J58 engines from the *Blackbird* as well, goal of Mach 3+.
- Fulfilled both an A2A and A2S mission as defined by the USAF.
- At over 100,000 lbs empty and over 100 ft long, it was the largest proposal in ATF.



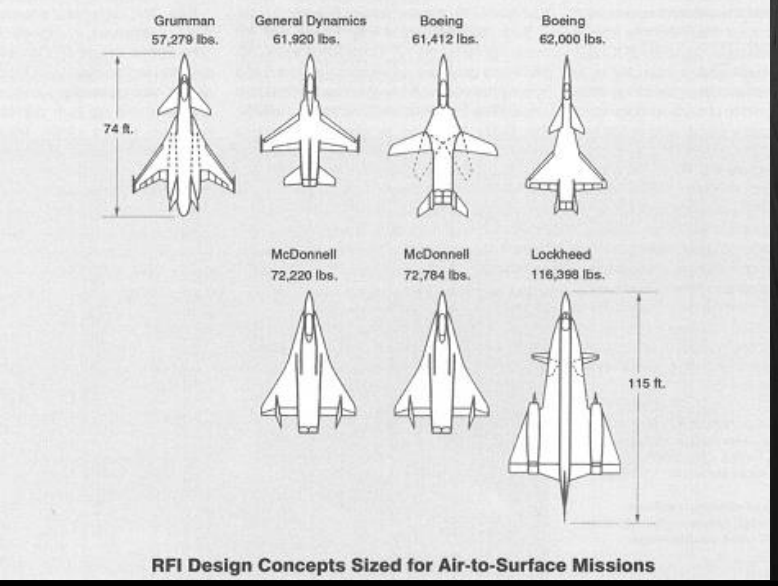
- Changes in the requirements of the ATF lead to changes in Lockheed's proposal.
- By 1985, the final concept that implemented the size of the F-117 was introduced.
- The proof-of-concept was half the size and a quarter of the weight.
- General Electric & Pratt & Whitney engines removed the J58's from the design.
- Speed adjustments were to have the aircraft fly around Mach 2.

A SPIRITUAL CONNECTION: THE *MISSILEER*

START TO FINISH INNOVATION IN AVIONICS AND DESIGN



RFI Design Concepts Sized for Air-to-Air Missions



RFI Design Concepts Sized for Air-to-Surface Missions

- Northrop's design changed the least of the two RFI's.
- Design 3 (shown below) and Design 2 (highlighted left) were carried into production.
- Neither concept was built as designed, but typical design modifications used.
- Design 1 was a carry over design from the F-X program that was not accepted.

- Requirement in the ATF program demanded internal weapons payload.
- *Agile* was therefore scrubbed for *Missileer* in 1983.
- GE & P&W engines also required additional modifications to the airframe.
- By 1985, the preliminary design concept was that of the production YF-23.
- Retained the light-weight as outlined in the RFI.

TRICKLE DOWN INNOVATIONS

IT HAD SPIRITUAL CONNECTIONS...

One of two YF-23 prototypes on a TARMAC during testing in the ATF program.

- Advanced Tactical Fighter program was launched in the 1980s.
- Northrop utilized trickle down technology designed with the B-2.
- The YF-23 borrowed many features from the design of the then-built B-2.
- Stealthy and sleek, the YF-23 boasted additional advantages to older aircraft.
- Used similar control features to the B-2.

Rear view of the YF-23 displaying embedded engines and shielding.

- Despite losing the ATF program, Northrop pitched the idea in ATA.
- Additional bomber programs led to rescuffing the YF-23.
- Northrop's pitch was dropped each time in favor of others – or the programs were mothballed altogether.
- More recently, Northrop used the Spirit as a basis for the B-21.

STEALTHY, SEXY, BUT A FRANKENSTEIN ALL THE SAME

Both YF-23's in flight, *Black Widow II* (S/N800) top, and *Grey Ghost* (S/N801) bottom.

- The YF-23 was a sleek and slender design.
- Max speed was unpublished, but it was clocked at least at 1,450 mph.
- Had an internal weapons payload of four hardpoints.
- Lower profile hardpoints, surface features, and engine troughs resulted in a significantly reduced RCS.
- Two ships produced: *Black Widow II* and *Grey Ghost*.

Grey Ghost & *PAV-1* in flight over the Nevada test site.

- Cannibalized multiple aircraft for internals and control surfaces.
- Utilized parts from the F-15, F/A-18, and the then-secret B-2.
- McDonnell Douglas provided additional aid for RDE on the YF-23.
- Engine troughs and blended wing concept borrowed from Jack Northrop's legacy designs (including the B-2).
- Lightweight and agile, the YF-23 could outmaneuver the YF-22.

A BIRD SOARS ABOVE THE SPIDER

SENIOR SKY GET'S HER WINGS...

- The Lockheed entry, *Senior Sky,* saw more demonstration hiccups.
- PAV-2 crashed in 1992 but was salvaged to the point of static display.
- Neither PAV demonstrated practical characteristics that outpaced or outmached the YF-23.
- Was a complete redesign and a complete reimagining of what an aircraft looked like beyond that of the ATB concept.
- Had a larger RCS due to higher profile.

The first F-22 delivered was named *Spirit of America,* shown above.

The transition from the prototype to the production, the F-22's (temporarily F/A-22) design differed slightly.

- Had a greater internal weapons capacity (eight versus the YF-23's four).
- Had thrust vectoring engines which allowed for better stability and control.
- The inclusion of super-cruise was a major selling point in the program.
- Lockheed is subsequently selected as the winner of the ATF program.
- Boeing and General Dynamics worked with Lockheed on the production variant F-22, as well as the prototype YF-22.

PRODUCTION OF THE F-22

THE SPIRIT OF AMERICA BECOMES THE F-22 RAPTOR

Production F-22 in flight, the model number was assigned after briefly being the F/A-22.

- The F-22 enters production by 1996.
- First aircraft delivered was *Spirit of America.*
- Made its maiden flight in 1997 after a vigorous QAC check.
- Lockheed & Boeing were the primary contractors, with Pratt & Whitney providing the engines.
- Briefly sported the F/A-22 (to highlight the multirole functionality) nomenclature before reverting to F-22.

- Featured a redesign still over the YF-22 prototype.
- The F-22 was heavier than the YF-22 and had a larger wing area.
- Control surfaces were smoothed, and the design took a more rounded shape.
- Production carried thru 2011 when the production was cancelled.
- Sequester resulted in the destruction of all facilities and tooling needed to build the F-22, thus rendering the project unsalvageable in the JSF era.

Two F-22's in flight. The final livery design of the F-22 was standardized across the USAF due to the stealth paint.

F-22 OPERATIONS IN ASIA - GENERALLY...

- Most F-22 deployments have been to Asia (Korea, and the Middle East).
- The first overseas deployment of the F-22 doesn't happen until 2007.
- The primary mission for F-22's was interception and C2.
- The first combat sortie was not executed until 2014 in strikes against ISIS.
- Most combat sorties included the use of 1,000 lb bombs.
- C2 missions remain the primary function of the F-22 at home and abroad.

F-22's during an elephant walk, note the external fuel tanks exhibiting the F-22's addon external pylons.

F-22 arriving in Southwest Asia during ISIS counterinsurgency operations.

- F-22 operational installations are considered high security threats.
- Frequent airspace interceptions in North America against Russian bombers.
- The F-22 fills gaps in NORAD defense networks created by aging F-15's.
- F-22B was planned as a trainer but was cancelled – meaning most F-22 flight training is done with EMD craft.
- The F-22 is one of only four aircraft barred from American export.

THE YF-23'S STORY CONTINUES

MISSION 2037

Artistic rendering of a production F-23A in flight. Production models were likely to see some modifications from their prototype variants.

- YF-23 saw a few opportunities to be revived between 1991 and 2011.
- One of these was to replace the Navy's F-14 *Tomcat*.
- Another was to fulfill the need of a perceived 1999 bomber gap.
- The Navy opted for the F-14D *Super Tomcat* followed by the F/A-18E/F *Super Hornets* to fulfill the need (the F-35 ended the hope for the YF-23).
- The 1999 bomber gap concept was filled by the B-21 *Raider* by Northrop.

- The B-21 is slated to fill a hole by the lack of production B-2's and aid in the replacement of the B-52.
- While the 2037 Bomber program was cancelled, a bomber will be needed to replace the B-2 and the B-1 in this range.
- Proposals for a B-3, or subsequent design have included proof-of-concepts that resemble the B-2, B-21, and YF-23.
- There are no known schematic or drawings on the 2037 Bomber.

Artistic rendering of a 2037 Bomber. A blended wing design is a recurring theme in modern aviation concepts.

THE STEALTH MISSILE: HAVE DASH

Artistic renderings of the *HAVE DASH* stealth missile (left) and the AIM-260 hypersonic missile (right).

- *HAVE DASH* was a proposed stealth missile.
- Proposed to be equipped on the ATF result and the F-15.
- Concept quickly fell through for focus on other platforms.
- Focused has shifted to high-speed, long-range missiles since.
- Lockheed currently is working on the AIM-260 to fulfill this need, which will be equipped on the F-22 in the future.

- The Navy is currently fielding offers for its next multirole fighter in the 2030 range.
- The F/A-XX program is set to meet this need and may be the first 5+ gen aircraft.
- The demand is to have an air design that has both a manned and unmanned version.
- Boeing is currently providing designs that include SWARM techniques.
- Concepts range from blended wings to blended tailless designs.
- The future of this program is uncertain.

Boeing's proposal for the F/A-XX. Conceptual drawings show a piloted frame and a slave drone.

NEXT HISTORY STREAM:

VALKYRIE AIRS 7 JUNE @ 1800

Next Stream: Final Fantasy VII Remake – Episode 9
TONIGHT @ 2000

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THANK YOU FOR JOINING US

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