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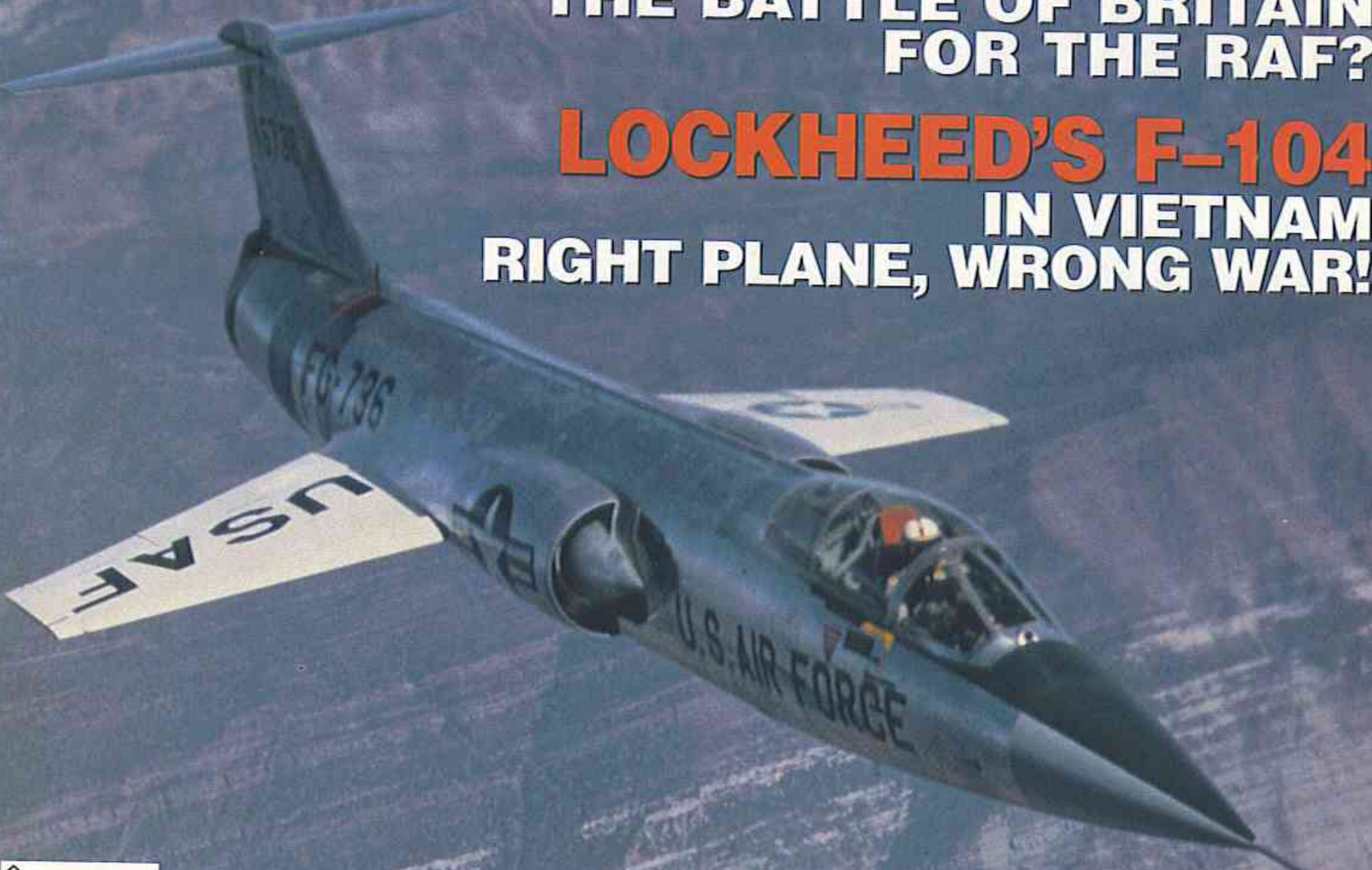
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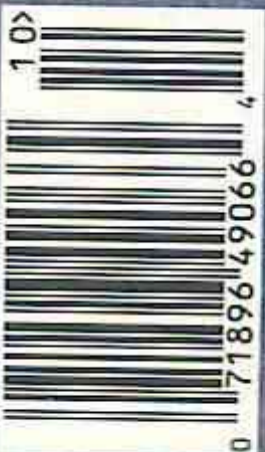
**BEHIND THE
BIG WING
CONTROVERSY**

**DID IT ALMOST LOSE
THE BATTLE OF BRITAIN
FOR THE RAF?**

**LOCKHEED'S F-104
IN VIETNAM
RIGHT PLANE, WRONG WAR!**

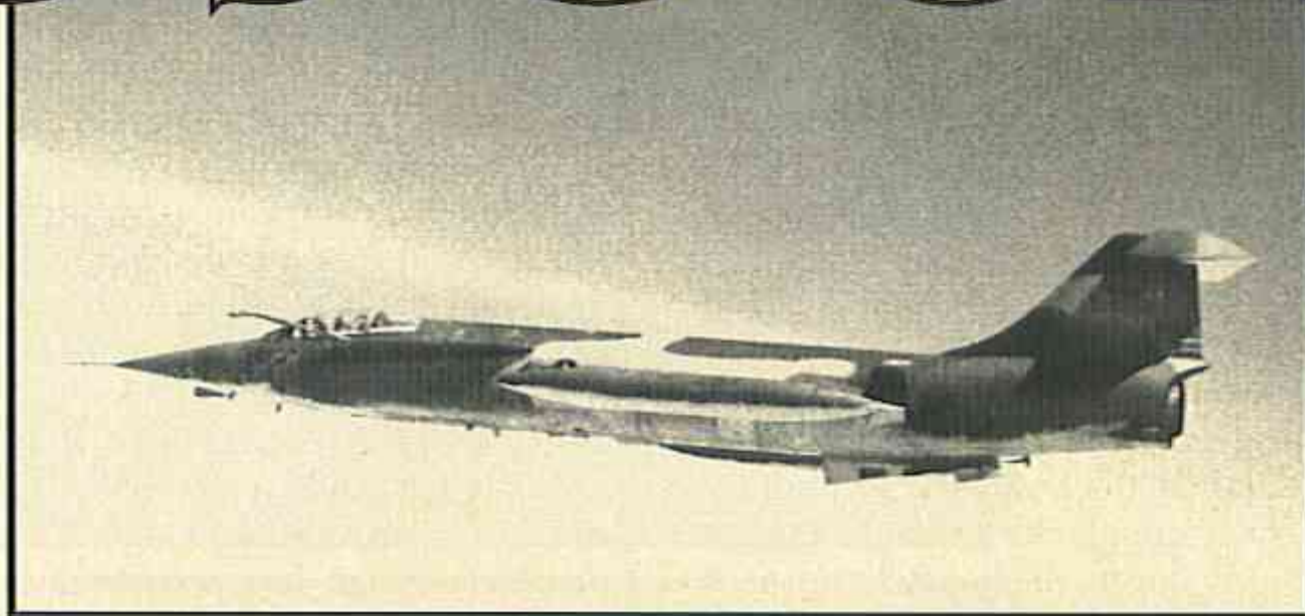


**THE YAK FIGHTER
STAR OF THE SOVIET UNION'S
WW II GUARD BRIGADES**



STARFIGHTER

SOJOURN



The Lockheed F-104 In Vietnam

By Warren Thompson

Photos courtesy Roger Wichers and Duke Harris.

Developed as a point defense interceptor, built to fly high and fast, and climb like a rocket, for sheer performance there was nothing to compare with Lockheed's F-104 Starfighter when it first appeared in February, 1954. Originally conceived to be lightweight and uncomplicated, it was designed around an abbreviated, but broad, wing that had a razor blade thin leading edge and a thickness at the root of only 4.2 inches. Measuring just 7-1/2 ft. from the root to the tip tank, this was not an airfoil designed to carry large amounts of external stores; but in April, 1965, twenty eight F-104Cs equipped with improved versions of the G.E. J79 engine, which provided extra thrust and better fuel consumption, were dispatched to Southeast Asia to help protect U.S. airfields in South Vietnam against attack by enemy aircraft.

These Starfighters belonged to the 476th Tactical Fighter Squadron, of the 479th Tactical Fighter Wing, headquartered at George AFB, California, and the unit's original complement of 18 Starfighters was beefed up to 28 for the mission. This provided 24 primary aircraft with four spares for the trip to Taiwan, their main operational station, approximately 1,400 miles from their forward operational base at DaNang, South Vietnam.

Any visions 476th pilots entertained about tangling with enemy MiGs soon evaporated in the heat and humidity, and the absence of hostile North Vietnamese aircraft overhead. As a result, the Starfighter's entire tour in the Vietnam War changed from one of projected air defense to escort and, even, close support, a mission never envisioned for it.

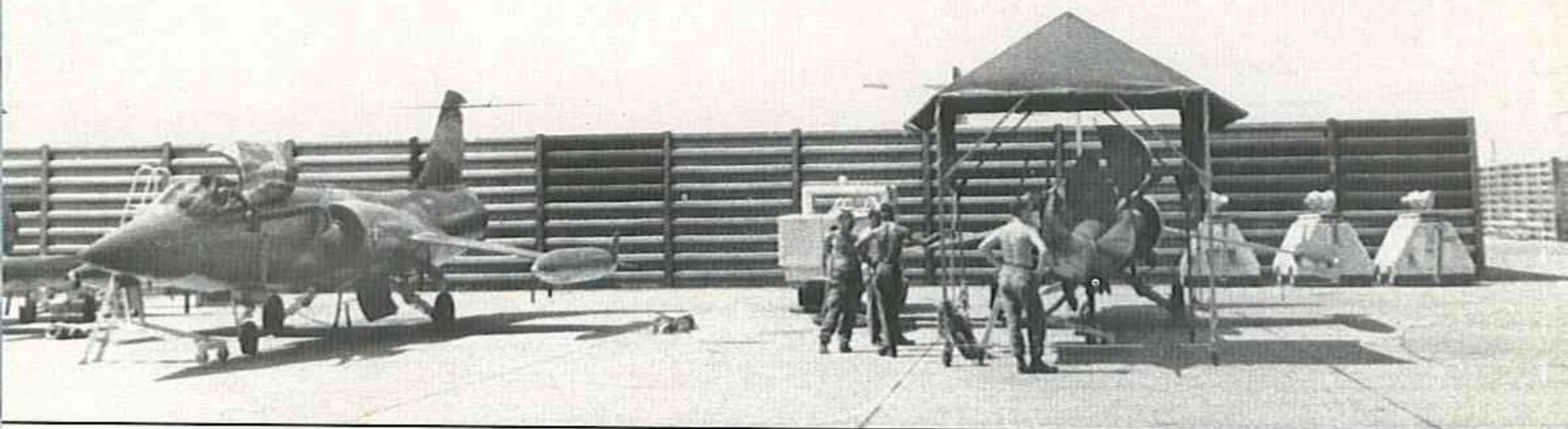
Early on, both the McDonnell F-4 Phantom and the Republic F-105 Thunderchief had been provided with

Above: Switched to escort missions for Douglas EB-66s and Lockheed EC-121 Constellation radar planes operating in Vietnam, the short-legged F-104 Starfighter had to refuel numerous times in order to stay with the longer-ranging aircraft. Here, refueling probe extended, a 476th Tactical Fighter Sqdn. F-104C, flying out of Udorn, Thailand, closes in on its tanker. Such missions often covered more than seven hours in the air, requiring up to six refuelings.

Electronic Countermeasure (ECM) pods to help them evade North Vietnamese surface-to-air missiles (SAMs) when flying ground attack missions. Because of the F-104's short wings and fully packed rocket-like fuselage, which already housed everything except the aileron actuators, the Starfighter was not seriously considered for this role. For, while the much larger F-4s and F-105s could load these pods, fuel and armament on their built-for-the-purpose ordnance racks, without sacrificing much in range and basic maneuverability, the made-over F-104 had no such option. At that time, although it had three external store fittings for bombs or fuel, no bomb rack was designed for it. Nevertheless, F-104s actually flew ground attack missions, dropping napalm for Laotian forces, and did surprisingly well at them.

The main focus of the F-104, like that of the Convair F-102 Dagger, also sent to Southeast Asia, had been interception. It was now switched to long-range escort for command and control Lockheed EC-121s, military versions of the Constellation transport. These missions were long, grueling, and very taxing on the pilots who flew them. Some lasted up to 7-1/2 hours, requiring six aerial refuelings. According to the 435th Squadron's Maintenance Officer, Major "Duke"

(Text continued on page 32)



Above: Udorn, Thailand, with metal bar revetments for the F-104Cs of the 435th Tactical Fighter Sqdn., which remained there until 1968.

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(Text continued from page 24)

Harris, the 476th, "lost two aircraft while flying escort. One was due to a refueling incident and one occurred when landing, caused by severe pilot fatigue. In each case, both pilots survived and continued to fly missions."

Equipped with an excellent afterburner, the F-104's J79 engine was to put it on the supersonic map. Even in maximum normal thrust, the needle-nosed fighter could just about reach Mach 1. With full afterburner, speed moved beyond Mach 2, and the only limiting factors were temperatures in the engine and on key parts of the airframe.

Early in 1968, F-4 Phantoms became available in quantity. They took over the long-range escort job and assumed most close air support assignments. During the rapid buildup of U.S. forces three years before, the Air Force had assumed, as was the case in Korea, that there would be a great deal of fighter-to-fighter contact, particularly in the defense of U.S. bases. That threat never materialized, at least from the air, and the F-104's original mission in Vietnam became superfluous. However, before leaving the region, other Starfighter units of the 479th Wing, including the 435th Tactical Fighter Sqdn. based at Udorn, Thailand, took part in several important aerial campaigns, including *Operation Bolo* in January, 1967.

Often called the Air Force's most famous fighter battle of the Vietnam War, *Bolo's* sole purpose was, quite simply, to destroy North Vietnam's fighter arm. Prior to the fall of 1967, the North Vietnamese Air Force had not posed much of a threat, shooting down just ten American aircraft in three years. Now, equipped with brand-new, Russian-built MiG 21 fighters, carrying both radar-guided and heat-seeking missiles, they were growing more aggressive. Since obtuse politics prohibited American forces from bombing enemy air bases, *Operation Bolo* was conceived to get the North Vietnamese to commit their fighters in air-to-air combat.

Using F-4 Phantoms to impersonate F-105 bomb-droppers, the idea was to decoy the North Vietnamese MiG pilots into believing they were attacking American strike planes. When the enemy came up against missile-firing F-4 Phantoms instead, it was assumed that they would break off and quickly attempt to return to their bases. At this point, more F-4 Phantoms would be waiting for them, protected by flights of F-104s providing top cover.

The plan worked and, during the ensuing thirteen minute confrontation, the Phantoms destroyed seven MiG 21s, which represented a significant portion of North Vietnam's inventory of new fighters. No U.S. planes were lost and the covering force of F-104s did not engage. At first, it was believed that the F-104 would make a good escort fighter in this theater, by virtue of its excellent speed and its M61 20mm Vulcan cannon for use in close-in combat, but as the war progressed the multi-role F-4 became the fighter of choice, and the last F-104s departed Udorn, Thailand in 1968.

By that time, in the hands of the resurrected German Luftwaffe, the much revised F-104G, with an airframe nearly



Above Left: No! Not quite visiting big brass, but close enough for public relations purposes. Television/radio personality, Arthur Godfrey, a pilot and reserve colonel in the Civil Air Patrol, makes a goodwill visit to the 435th Sqdn. in the late summer of 1966.

Above Right: Working in the oppressive heat of the Far East, ground crewmen have erected a portable rig to keep the sun off. During December of 1966, the 435th's maintenance was so outstanding, it was able to log 1,707 hours in 506 sorties, realizing an amazing utilization rate of 96.6 percent.



twice as strong, and weighing up to 3,000 lbs. more, had become an acceptable multi-role, low-level fighter bomber. With vastly improved radar, inertial guidance and upgraded autopilot, data-link, and an on-board weapons computer - plus underwing racks for sensors and weaponry - the new Starfighter, first flown in 1960, was a vest pocket nuclear bomber, able to quickly penetrate enemy defenses in Central Europe.

Demanding of its pilot, and not very forgiving, the F-104 was designed during an era when interception was the primary and only responsibility of fighters. During the Vietnam War, multi-role fighters came to predominate. After it, the lightweight interceptor was again very much in vogue, but even it was

assigned a bomb-carrying capability, witness the success of the F-16. Today, it is a certainty that the next generation Lockheed F-22 will be both a fighter and a bomber. For these days, when a new weapons system costs more than a wing of bombers did twenty five years ago, the military demands, and gets, what it wants. Whether it gets its money's worth is another matter.

Oddly enough, it was Kelly Johnson, designer of the F-104, who first postulated

this trend to very expensive, ultra-sophisticated flying hardware, prophesying in the late Sixties that, "The Air Force will be able to get everything it wants in a new airplane, including every bit of performance and all the special equipment required. Of course, in that case, it will only be able to afford one airplane."

(For the full story of the F-104, see *Wings* June, 1986, available in back issue.)

Above: An F-104C from the 435th refuels during an escort flight over the Gulf of Tonkin. Without aerial refueling, C model had a combat radius of just 425 miles, but even that was better than the earlier two-seat F-104B's round trip endurance, which was little better than 460 miles; one reason why they served for only a year with regular Air Force squadrons, before being turned over to the National Guard.

Below: Pilots of the 435th Tactical Fighter Sqdn. pose beside a Starfighter during an early tour of Vietnam, prior to their F-104s being given a coat of camouflage paint.

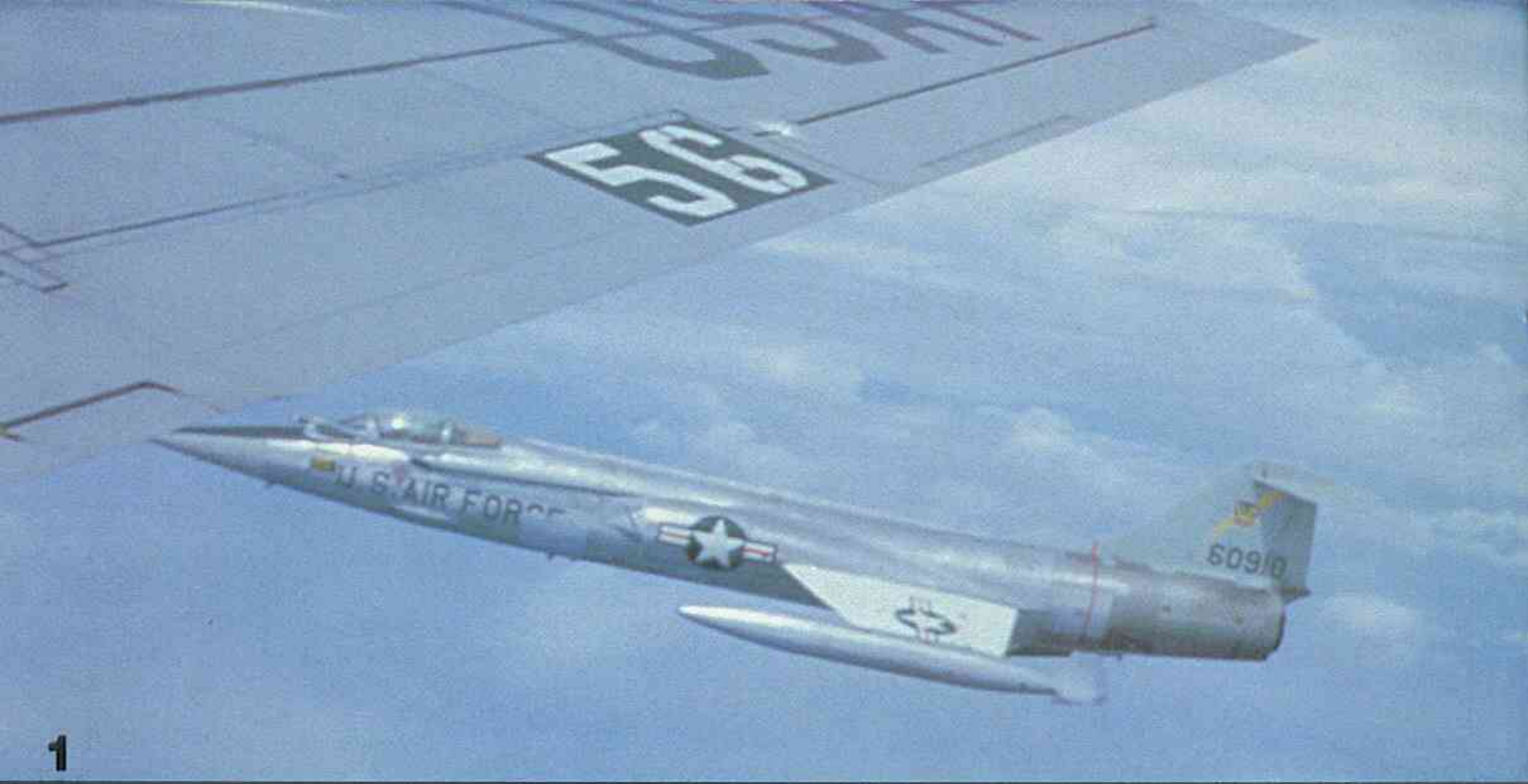




Above: At home at George AFB, California, an F-104C from 479th Tactical Fighter Wing exhibits its external stores, including 120 gallon tip tanks for its miniscule 21 ft., 9 inch wing. Underwing stores consisted of 1,000 lb. bombs and 200 gallon drop tanks, but there were only three stations to handle them. Twenty millimeter cannon shells are laid out in front for six-barrelled rotary cannon which fired from bay under left forward fuselage. (Ray Holt)

Below: Arriving at DaNang, South Vietnam, in April, 1965, the mission of twenty four F-104Cs was to protect the base from enemy air attacks that never came. Later, these Starfighters were switched to escort and ground attack missions. They also flew top cover for F-4 Phantoms. Lack of range and small carrying capacity, dictated by the size of its wing, soon precluded the F-104 from being used in close support role. F-104C was first Starfighter with probe and drogue refueling capability (note extended nose probe in this photo) and the first to feature blown-flaps. On December 14, 1959, an F-104C from George AFB set an altitude record of 103,389 ft. (Larry Knox)





1

1. Sticking close to its tanker, this F-104C from the 436th Tactical Fighter Sqdn. makes the long flight across the Pacific, en route to Southeast Asia in February, 1966. Starfighters completed several deployments during the war, all three 479th Tactical Fighter Wing squadrons participating, and most were eventually based in Thailand. (Larry Knox)

2. April, 1965, and one of the first of twenty four F-104Cs arrives at DaNang. Two aborted en route from California, landing at Hickam AFB, Hawaii, before continuing on to Southeast Asia.

3. Snug in their sandbagged blast pens, F-104Cs from the 476th TFS are shown at DaNang in July, 1965. During their initial deployment, 52 percent of all sorties flown were as escorts over the Gulf of Tonkin for Lockheed Constellation EC-121 radar planes. (Norm Lockard)

4. California, to Hawaii, to Guam, and then on to Taiwan, before reaching Vietnam, was the itinerary Starfighters followed. Here, one refuels from a Boeing KC-135 tanker on the Hawaii to Guam leg, June 26, 1965.

5. Reinforcements, in the form of eighteen F-104Cs from the 435th Tactical Fighter Sqdn., began arriving in Vietnam in January, 1966. These planes spent a great deal of time on escort duty. In December, 1966, the squadron logged a total of 1,706 hours, an unusually large number for just 18 aircraft. (E. Arriaga)

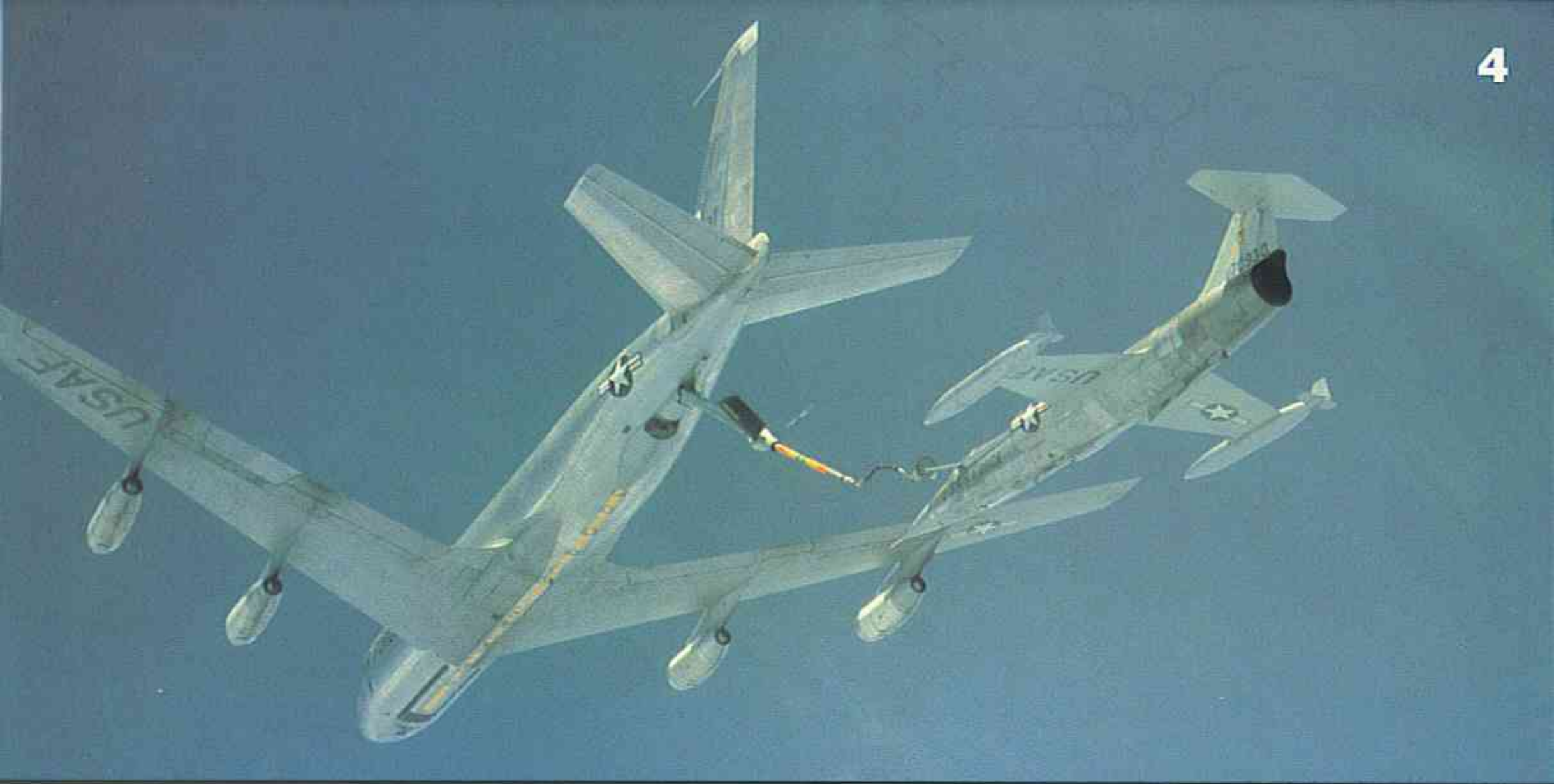
6. Ready alert at DaNang, with pilots' helmets propped on cockpit coamings. Although designed to take on the ground attack role, C model still had a downward firing ejection seat, not very reassuring when maneuvering close to the ground. This was changed to an upward firing seat in the G model sold to foreign forces. (Norm Lockard)



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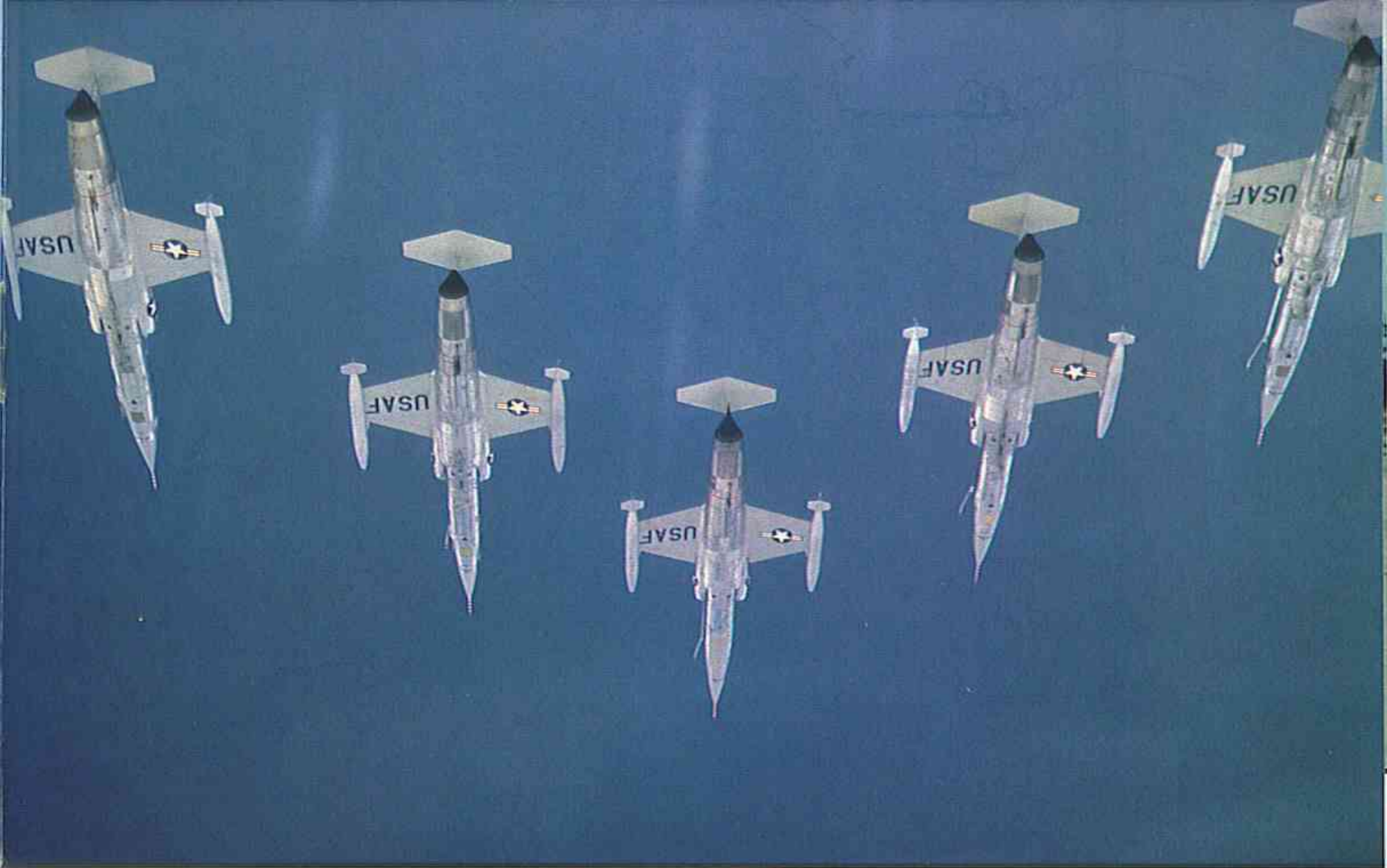




Above: Starfighter quintet en route to Vietnam. It took three months - April to July - to complete deployment of all 28 aircraft from the 476th Tactical Fighter Sqdn. (Ray Holt)

Below: Convair F-102s were also dispatched to Vietnam for air defense. Here, one from the 509th Sqdn. shares the DaNang ramp with an F-104C from the 435th, which had been equipped with the Delta Daggers. F-102s were among the first U.S. fighters to reach Southeast Asia, arriving in the spring of 1961. One was lost in air-to-air combat, before the last eighteen were withdrawn from Thailand in 1967. (Bob Donaldson)





STARFIGHTER

Only three squadrons flew the F-104 in Vietnam and all were from the 479th Tactical Fighter Wing, George AFB, Victorville, Calif. These, from the wing's 476th Sqdn., are shown in formation deployment to South Vietnam. (Ray Holt)

SOJOURN



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2





STARFIGHTER SOJOURN

1. Captains Martinez, Knox and Huff of the 476th Tactical Fighter Sqdn., soon after their arrival at DaNang in April, 1965. Although the Starfighter enjoyed widespread overseas sales, only 273 were built for the USAF. These consisted of two prototypes, 15 service test Y-104As, 153 production F-104As, 26 F-104Bs and 77 F-104Cs, of which 21 were revised two-seaters, designated F-104Ds.
2. Broiling sun on the DaNang flight line for F-104Cs. Prior to major U.S. intervention, Southeast Asian runways in Laos and Vietnam were about seven to eight thousand ft. long, built of concrete, and without overruns, but with great big ditches at their ends. Accommodations were Spartan: tents, air mattresses and mosquito netting. (Larry Knox)
3. Size comparison between F-104C (22,000 lbs.) and Convair F-102 (28,000 lbs.). Biggest difference is in height. The Starfighter sat low to the ground, at 13 ft., 6 in., while the Delta Dagger stood 21 ft., 2 in. (Bob Donaldson)
4. An even greater size differential was that between the Republic F-105 (background) and the Starfighter. Tasked with doing much of the heavy bomb hauling up through 1967, the single-seat F-105D, shown, had a gross weight of 48,500 lbs. Photo was taken in December, 1965 by F-104 pilot, Morgan Lilly.



The U.S. Air Force originally ordered 722 Lockheed F-104 Starfighters, before cutting back to 296. Of these, 77 were built as the fighter-bomber variant F-104C. These had improved engines and were the first to be fitted with in-flight refueling capability. The last one was delivered in July of 1959, and all were assigned to the 479th Tactical Fighter Wing's two squadrons, the 319th and 331st. During the mid-Sixties, these organizations were redesignated and became the 435th, 436th and 476th Tactical Fighter Squadrons. Large photo shows the last production batch of F-104Cs with their identifying buzz numbers on rear fuselage and Tactical Air Command badge on fin. Note that the second aircraft from front has its refueling probe extended. Small photo - inset - depicts the first F-104C (56-883) on its October 16, 1958 delivery flight.



