

# Would the Real F-4G Please Stand Up?

by Jan Jacobs

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The F-4G *Phantom II* in the current U.S. inventory is a modified F-4E assigned the mission of suppressing the surface-to-air missile threat. Because the best-known Vietnam-era SAM hunters, known as *Wild Weasels*, were F-105Gs, the Air Force selected the "G" suffix for their new SAM-hunter with little regard to the fact that the F-4G designation had previously been used. The Navy first laid claim to F-4G in 1963 with the redesignation of 12 F-4Bs specially outfitted for two-way data link.

The Air Force pioneered the use of ground-to-air direction of fighter interception without voice commands. The Semi-Automatic Ground Environment (SAGE) system, first introduced in the early 1950s to complement the F-86L Sabre, provided the interceptor pilot with steering information to a target without voice communication with a ground controller. Information concerning the target's relative position and command steering information was sent to the interceptor on a radio link and displayed on the aircraft's instrument panel.

*The Navy's F-4Gs were originally designated F-4B (and later reverted to that designation) and built alongside standard F-4Bs as well as USAF versions of the Phantom. Of the eight F-4s in this photo, at least two (150636, top, second from left and 150642, second from right) are data link birds. (McDonnell Douglas D4C 13784, via Bob Lawson)*



*The best-known F-4G, the USAF's Wild Weasel Phantom, is actually the second F-4 to carry the designation. (USAF via Stan Hopton)*

In the late 1950s, the Navy was shaping its battle fleet of the future and providing for its protection with the introduction of the F4H-1 *Phantom II* (the F-4's pre-October 1962 designation) and W2F-1 *Hawkeye* (later E-2A). The *Hawkeye* was to be a major component of the Naval Tactical Data System (NTDS). This system would eventually link all elements of a battle group, both surface and air components, into a single data net to speed the transfer of information regarding the location and status of both friendly and unknown or hostile contacts. By placing the fighters in this net, significant advantages could be gained in the command





*F-4G BuNo 150489 of the Naval Air Test Center makes a hands-off approach to USS America (CVA-66) during December 1966 Automatic Carrier Landing System trials. As an F-4N, this aircraft awaits drone conversion at China Lake. (USN K-34734, via Bob Lawson)*

and control of interceptor assets. In addition to physically controlling the fighters by providing direction via a non-voice link or by coupling their autopilots to a controller located on the surface or in an airborne vehicle, the same system was designed to provide a hands-off landing system for night or bad weather operations.

To test this idea for the landing phase of data link operations, the Navy contracted with McDonnell Aircraft Company to outfit one F4H-1F (BuNo 148254) with an AN/ASW-13 data link set which provided the *Phantom* with its first hands-off landing capability when coupled with a ground- or ship-based AN/SPN-10 radar and the AN/USC-2 data link system. Tests proceeded well enough to advance to the next step, the AN/ASW-21. This data link set provided the same function as the AN/ASW-13, but with the added capability of being able to inform controllers concerning the status of the interceptor's weapons and consumables (fuel and crew oxygen).

To make the automatic landing portion of the system work properly, several modifications had to be incorporated into the *Phantom*. The SPN-10 was required to actively lock onto the aircraft and track it all the way to touchdown. To accomplish this, a radar reflector was added to the nose of the aircraft to produce a larger radar target. The reflector was bolted onto the nose

gear door of an F4H-1 for initial tests. In the production installation, the reflector retracted into a cavity beneath the nose immediately ahead of the landing gear. To make room for the data link black boxes in the production aircraft, the number-one fuel cell, located directly

behind the RIO's cockpit, was reconfigured to accommodate the equipment. This installation resulted in a 600-pound reduction of usable fuel. The cockpit configuration incorporated minor changes necessary to operate the system. New control boxes and indicators were installed in the back seat. A panel was installed in the front cockpit with data link status lights and an "acknowledge" button to inform the controller that information had been received. Additionally, a "yards to touchdown" indicator was placed on the upper right of the instrument panel. The autopilot system was modified to



*Four to-be F-4Gs (150429, 150484, 150639 and 150636) over NAS Miramar while assigned to VF-96 during the summer of 1963. (USN, courtesy CDR W.F. Fraser, USN(Ret))*

VF-96 F-4B BuNo 150639 (later F-4G) launches a KD2B target drone, August 22, 1963. (USN, LT T.D. Barrett)



allow inputs from the data link system to drive the aircraft's flight controls. An automatic approach power compensator system (APCS) was installed to automatically control the throttles while the aircraft was in the landing approach phase.

These modifications were made on the production line to 12 F-4Bs from Block N (numerically, Block 14). The first aircraft, BuNo 150481, was initially flown on March 20, 1963, by McDonnell's Thomas S. Harris with John J. Kiely in the back seat. The aircraft was accepted by the Navy on April 10, 1963, and deliveries continued until the last data link F-4B (BuNo 150645) was accepted on July 26th. Two of the 12 were sent to NATC Patuxent River (150489 and 150625), where they were used in automatic carrier landing system (ACLS) proof-of-concept tests, and the remaining ten were delivered to VF-96 at NAS Miramar. At this time, the aircraft still carried the F-4B designation. Concurrent testing of the aircraft and related systems were then carried out by both NATC and VF-96. The squadron's commanding officer, CDR William F. Fraser, USN(Ret) recalls:

After returning from our first cruise with F-4B *Phantoms* in the summer of 1963, we received ten data link aircraft which were equipped with auto-throttle, data link and automatic carrier landing systems. At first we evaluated the auto-throttle installation, which was great; it really made for a nice carrier approach. This feature would add or reduce power, based on angle-of-attack, as controlled by the stick. This made possible very accurate

speed control on final. It later became standard in all Navy *Phantoms*.

The ACLS was another story. Our initial testing was accomplished with a developmental installation at NAS Miramar. We had many interesting things happen at first. One was that upon engagement, the F-4 would go hard-over to the right and full nosedown. Of course, you would immediately grab the stick and take over. With break-out force applied, you could overpower the ACLS controlled autopilot and it would disengage. It was an attention grabber to say the least.

Another interesting characteristic was as you approached the runway at Miramar from the east and passed over the chain link fence along Highway 395, the F-4 would start into a divergent oscillation. We used to say that the fence got the electrons all confused! Then the aircraft would dampen out and continue on, with the rest of the glideslope being nice and smooth to a hands-off landing.

At the same time, the *Black Lions* of VF-213 were turning in F-3B *Demons* and sending pilots through VF-121. The required Naval Aviation Observers (later Naval Flight Officers)





## VF-116 F-4Gs?

## The Squadron That Never Was

*As part of the 1964 transfer from CVW-21 to CVW-11, the Black Lions of VF-213 thought they would be redesignated VF-116. The squadron went as far as repainting their aircraft before a message from the Chief of Naval Operations cancelled the redesignation. These photos were taken Aug–Oct 1964. (Credits: top: Clay Jansson, others Doug Olson, )*



began arriving in preparation for receiving the *Phantom*. The first data link F-4B was transferred from VF-96's custody and was accepted on January 4, 1964, by VF-213. The remaining nine aircraft were transferred in February and March of that year. In addition to the ten data link aircraft, the squadron operated two standard F-4Bs.

Owing to its unique avionics suite and mission capabilities, BuWeps decided in March 1964 to change the data link *Phantom's* designation. The two NATC *Phantoms* were officially designated F-4G on March 31, 1964, and the ten in VF-213 followed suit on April 6.

One interesting sidelight of the turnaround for VF-213 was its transfer from CVW-21 to CVW-11. In early 1964, ComNavAirPac directed VF-213 to change its designation to VF-116 to reflect the change in air wings. As a result,



VF-213 (third squadron of CVW-21) was scheduled to be redesignated VF-116 (sixth squadron of CVW-11). Preparations went as far as painting the new squadron designation on *Black Lions* aircraft in readiness for the transfer. However, a message from CNO dated September 16, 1964, canceled the action and the *Black Lions* reverted to the VF-213 designation.

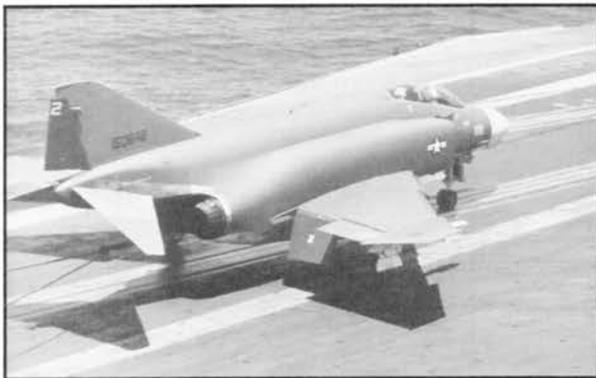
The *Black Lions* continued to test the data link, both during workups and during the combat cruise in USS *Kitty Hawk* (CVA-63), which began on October 19, 1965. In addition to this, the squadron was selected to test an experimen-

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**Top left:** VF-213 F-4G traps aboard USS *Kitty Hawk* (CVA-63), South China Sea, July 1965. **Top right:** 150487 at NAS Miramar, April 3, 1965. **Right center:** *Black Lion* F-4G BuNo 150645 in flight with baggage pod under left wing. This aircraft was lost in combat on April 28, 1966. **Right:** 150645 landing aboard *Kitty Hawk* in June 1965. (**Top left:** Lionel Paul, **Top right:** Doug Olson, **Right center:** USN No. 1115559, **Right:** USN)



## Green Phantoms for Black Lions



*As part of an operational camouflage test on the Vietnam cruise of 1965–66, VF-213 painted its F-4s with green upper surfaces, leaving the undersides white. After reviewing the results, the Navy decided not to proceed with the scheme for its carrier aircraft. The dark colors made the aircraft hard to spot on a dark carrier deck and easy to see against a light sky. **Top left:** Two green Black Lions on Kitty Hawk's Cats Three and Four go through pre-start checks as two Aardvarks from VF-114 in more traditional gray F-4Bs await their turn from behind the jet blast deflectors. **Upper left, center:** F-4G 150642 in the wires. **Lower left, center:** 150642 just before touchdown. **Bottom left:** Green EKA-3B of VAH-4 tanks Black Lions Phantom. **Above:** 150484 taxis to CV-63s bow cats with 150642 close behind. (Top left: McDonnell Douglas D4C-36469, upper left, center: McD D4C 38097, lower left, center: USN, bottom left: USN, Above: McD D4C-38103)*



# F-4G SERVICE HISTORIES

BuNo/ Seq. No.	Aircraft History	Date	BuNo/ Seq. No.	Aircraft History	Date
150481 (269)	Accepted, BWR St. Louis as F-4B NAS Miramar VF-96 VF-213 Redesignated F-4G VX-4 NATC Service Test Redesignated F-4B NavPro Bethpage NARF North Island Redesignated F-4N VF-101 Det Key West MASDC (storage) Stricken from service	10 Apr 63 30 May 63 21 Jun 63 3 Mar 64 6 Apr 64 21 Jul 66 19 Mar 67 5 Aug 70 4 Dec 70 11 Jul 74 10 Sep 74 1 May 75 11 Dec 77 1 Aug 83	150492 (280)	Accepted, BWR St. Louis as F-4B NAS Miramar VF-96 VF-213 Redesignated F-4G RDT&E Pt. Mugu VX-4 Redesignated F-4B NARF North Island Redesignated F-4N VF-51 VF-202 VF-201 MASDC (storage)	26 Jun 63 3 Jul 63 8 Jul 63 9 Mar 64 6 Apr 64 11 Oct 66 18 Nov 66 30 Nov 67 5 Jul 73 6 Jul 73 5 Feb 74 15 Aug 76 8 Jul 82 3 Feb 84
150484 (272)	Accepted, BWR St. Louis as F-4B VF-96 Redesignated F-4G VF-213 VX-4 VF-92 Redesignated F-4B VMFA-314 VMFA-122 VMFA-314 VMFA-115 VMFA-122 H&MS-24 NARF North Island Redesignated F-4N VMFAT-101 VMFA-323 MASDC (storage)	7 May 63 7 Sep 63 6 Apr 64 3 Sep 64 26 Aug 66 1 Oct 67 25 Oct 67 1 Jul 68 10 Feb 69 22 Feb 70 31 May 71 5 Nov 73 22 Aug 74 5 Feb 75 21 Dec 77 18 Sep 78 23 Oct 80 4 Sep 81	150625 (283)	Accepted, BWR St. Louis as F-4B NATC Service Test Redesignated F-4G BWR Pax River NARF Norfolk NARF Cherry Pt. Redesignated F-4B VMFA-312 H&MS 14 VMFA-312 NARF Cherry Pt. NARF North Island Redesignated F-4N VMFA-314 Broke up in flight during ACM	24 Jun 63 27 Jun 63 31 Mar 64 8 May 67 22 Jun 67 14 Jul 67 1 Jan 69 7 Jan 69 1 Apr 71 12 Dec 71 24 Apr 72 20 Jun 72 3 Jan 73 31 Dec 73 30 Apr 76
150487 (275)	Accepted, BWR St. Louis as F-4B VF-96 VF-213 Redesignated F-4G RDT&E, Pt. Mugu VX-4 VF-121 VX-4 Redesignated F-4B Lost At Sea—Inflight Fire	27 May 63 21 Jun 63 4 Jan 64 6 Apr 64 6 Jul 66 13 Dec 66 28 Aug 67 16 Sep 67 5 Jan 68 18 Sep 72	150629 (287)	Accepted, BWR St. Louis as F-4B VF-96 VF-213 Redesignated F-4G NAS Cubi Pt. NARF North Island Redesignated F-4B VF-121 VX-4 VF-121 VF-142 Combat Loss	5 Jul 63 13 Jul 63 4 Mar 64 6 Apr 64 28 Mar 66 29 Apr 66 10 May 66 20 Dec 66 14 Jun 67 27 Jun 67 16 Aug 67 30 Oct 67
150489 (277)	Accepted, BWR St. Louis as F-4B NATC Service Test Redesignated F-4G RDT&E, Pt. Mugu NATC Service Test Redesignated F-4B NavPro Bethpage NARF North Island Redesignated F-4N VF-84 VF-301 VF-21 NWC China Lake (storage)	20 Jun 63 24 Jun 63 31 Mar 64 22 May 65 2 Mar 66 11 Dec 69 21 Oct 70 12 Mar 74 18 Mar 74 4 Nov 74 7 Jan 76 4 Feb 81 27 Aug 82	150633 (291)	Accepted, BWR St. Louis as F-4B VF-96 VF-213 Redesignated F-4G NAS Cubi Pt. NARF North Island Stricken from service	23 Jul 63 26 Jul 63 4 Mar 64 6 Apr 64 1 May 66 13 May 66 2 Aug 66
			150636 (294)	Accepted, BWR St. Louis as F-4B VF-96 VF-213 Redesignated F-4G VF-121 Redesignated F-4B VMFA-323 Lost at sea—hit by debris from target	12 Jul 63 18 Jul 63 1 Apr 64 6 Apr 64 5 Jul 66 27 Oct 66 29 Jun 71 4 Oct 71



## F-4G SERVICE HISTORIES

(Continued)

BuNo/ Seq. No.	Aircraft History	Date	BuNo/ Seq. No.	Aircraft History	Date
150639 (297)	Accepted, BWR St. Louis as F-4B	19 Jul 63	150642 (300)	Accepted, BWR St. Louis as F-4B	19 Jul 63
	VF-96	23 Jul 63		VF-96	26 Jul 63
	VF-213	19 Feb 64		VF-213	9 Mar 64
	Redesignated F-4G	6 Apr 64		Redesignated F-4G	6 Apr 64
	H&MS-23	21 Jun 66		H&MS-33	22 Jun 66
	VF-121	31 Aug 66		VF-121	29 Aug 66
	Redesignated F-4B	27 Oct 66		Redesignated F-4B	27 Oct 66
	VF-161	27 Jan 67		VF-32	26 Jun 67
	VF-154	19 Jul 67		VF-171 Det Key West	6 Jun 68
	VF-213	18 Aug 67		VF-171 Oceana	27 Oct 70
	VF-92	7 Nov 67		NATF Lakehurst	5 Jun 72
	VMFA-542	9 Jul 68		NARF North Island	6 Sep 73
	VMFA-323	16 Mar 70		Redesignated F-4N	9 Oct 73
	H&MS-33	26 Aug 70		VF-51	11 May 74
	VMFA-323	13 Oct 70		VF-201	6 Jun 76
	VMFAT-101	17 Dec 73		VF-202	15 Mar 83
	NARF North Island	27 Jun 75		VF-171	10 Feb 84
	Redesignated F-4N	22 Jul 75		Stricken from service	22 Feb 84
	VF-51	3 Jun 76			
	VF-171 Det Key West	21 Dec 77			
	MASDC (storage)	10 Nov 82			
			150645 (303)	Accepted, BWR St. Louis as F-4B	26 Jun 63
				VF-96	6 Aug 63
				VF-213	27 Feb 64
				Redesignated F-4G	6 Apr 64
				Combat Loss	28 Apr 66

*VF-213 aircrew on board Kitty Hawk, 1966. Bottom (l-r) LTs B.L. Argus, D.C. Anderson; ENS D.F. Harbrecht; LTJG R.E. Amidon; LT J.M. Nash, CDR J.H. Wilson (CO), LCDRs T.L. Curry, E.D. Conner; LT E.A. Cowart; LTJG H.N. Dyer. Middle: LTJG K.A. Cahill; LTJG R.J. Ziolkowski; LCDR P.E. Newille, LTJG D.M. Ulrich. Top: ENSs B.W. Bang, R.C. Peterman; LTJGs S.R. Smith, B.R. Lowell; ENS W.F. Voelker; LCDR N.B. Dyer; LTJG T.W. Triebel; LT D.E. Thompson; ENS D.N. Nichols; LT R.S. Huston. (USN)*



tal green upper-surface camouflage. One-half of CVW-11's squadrons were chosen to participate—VF-213, VA-115, VA-113 and RVAH-13. After reviewing the results and comments of the participating units, the advantages gained from the dark colors were outweighed by the disadvantages, and the plan to implement this type of camouflage on Navy carrier aircraft was scrapped (see **The Hook**, Fall 1987). The dark color made spotting the aircraft on the flight deck at night difficult and in some flight

regimes the dark color actually made the aircraft easier to see. It was also found that the green aircraft of the air wing suffered more losses from ground fire than did the standard Navy gray and white aircraft.

While on the cruise, VF-213 lost one F-4G (150645) and one F-4B (152257). The F-4G was lost on an armed reconnaissance mission over North Vietnam. Armed with rockets, *Black Lion 111*, piloted by LT R.A. Schiltz and RIO LTJG D.C. Lewis, attacked a group of cargo



Returned from cruise and just prior to transfer, one of VF-213's green F-4s sits on the NAS Miramar flight line, July 16, 1966. (Clay Jansson)



junks. At 2,000 feet, the aircraft came under anti-aircraft fire and was hit. The crew ejected and were picked up by a Navy helicopter. The F-4B was lost over Laos while participating in a SAR mission. Both crewmen ejected and were picked up by an Air Force helicopter.

Another F-4G (150633) was damaged and was transferred to Cubi Point. From there it was shipped to NARF North Island, where it was stricken from service as unrepairable on August 2, 1966. After return from the Vietnam cruise in June 1966, the eight remaining VF-213 F-4Gs were transferred and replaced with F-4Bs.

The automatic landing and remotely-controlled intercept capabilities became a standard feature of the F-4B with the AN/ASW-25 data link retrofit installation. The two-way feature of the AN/ASW-21 was not incorporated into this later system. The AN/ASW-25 also was used in the F-4J, F-4N and F-4S.

Beginning in 1966, the surviving airframes were reworked, stripped of their AN/ASW-21 data link gear and redesignated F-4B. This process was completed by 1970 and the aircraft were dispersed throughout the Navy and Marine Corps. Seven of those eventually underwent the *Beeline* retrofit program and became F-4Ns.

Of the 12 original F-4Gs, six ended their service life in storage, either at China Lake or Davis-Monthan. In addition to the two VF-213 losses mentioned earlier, four other data link Phantoms met violent ends. VF-142 operated BuNo 150629 when it was lost in combat on October 30, 1967. LCDR E.P. Lund and LTJG

J.R. Borst were engaged with MiGs when Lund fired an AIM-7E *Sparrow*, which exploded 100 feet in front of the aircraft and FOD'd the right engine. The aircraft made it back to *Constellation* (CVA-64) in the Gulf of Tonkin, but the landing gear failed to lower as a result of damage to the hydraulic and pneumatic systems. Both crewmen ejected alongside the ship and were recovered. The Marines also had trouble with the results of a missile firing on October 4, 1971. BuNo 150636, attached to VMFA-323, flew through the debris of an airborne target during a missile shoot. The aircraft was lost at sea. While assigned to VX-4, BuNo 150487 was lost at sea on September 18, 1972, the result of an inflight fire. BuNo 150625 broke up during an ACM flight on April 30 1976, while attached to VMFA-314.

As of January 1991, two of the surviving F-4Gs were assigned to storage (150489 at NWC China Lake and 150492 at AMARC, Davis-Monthan AFB) awaiting possible conversion to QF-4N target drones.

## ACKNOWLEDGMENTS

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*Top left: Naval Air Test Center F-4G BuNo 150625 at NAS Patuxent River's "USS Enterprise Jr." flight deck simulator participating in carrier landing aids testing circa 1965. Left center: Same F-4G in company with NATC A-7A at sea, circa 1965. Below right: The other NATC data link Phantom, 150489 had reverted to F-4B designation when this photo was taken at St. Louis, April 15, 1970. Bottom: 150489 again, this time as an F-4N with VF-301 in 1977. This aircraft is now in storage at China Lake for conversion into a QF-4N (Top left: USN, Left center: USN, Below right: Fred Roos, Bottom: Robert L. Lawson)*

## NATC F-4Gs...



*...and one that later found service as an F-4N*

