PHOTO FEATURE:

MARINE CORPS SKYHAWKS

by FRED ROOS

Douglas Aircraft Company's extremely successful light attack bomber, the A4D/A-4 Skyhawk, is generally thought of in terms of its long career aboard carriers of the U.S. Navy. Granted, it was the mainstay of the Navy's day attack force for a number of years through the late 1950's and most of the 1960's, serving with more than 30 Navy attack squadrons in its heyday, and it was responsible for unloading many, many tons of ordnance on targets in Southeast Asia while flying from carriers in the South China Sea. By the end of the last decade, however, the A-4 was well on its way to being supplanted in Navy first-line service by the LTV A-7.

More recently, the Skyhawk has reappeared in the headlines as a result of its large-scale employment in the attack role by the Israeli Air Force during the various flareups that have taken place in the Middle East. The A-4 serves as the primary ground-attack aircraft used by the Israelis, who think very highly of the little bomber, enough so that they are always anxious to acquire more of them.

Not nearly so well-appreciated is the extensive use of the A-4 by the U.S. Marine Corps. This in spite of the facts that the Marines were in on the Skyhawk program from the beginning, they have used more different versions of the A-4 than any other service, including the U.S. Navy, and they will be flying the A-4 in first-line

A pair of A-4Es (#150073 and #150134) of VMAT-102 in flight near the Grand Canyon in mid-1972. Paint is standard, rudders are insignia red and white. Positions of "S" and "C" on tail are reversed on opposite side. McDonnell Douglas photo by Harry Gann.

service into the late 1970's, long after the Navy has retired the last of its A-4's.

After scanning over published material on the Skyhawk (e.g., the A-4 PROFILE and AIRCAM), the author felt that the Marine Corps Skyhawks have been rather neglected in the enthusiast literature. This article was prepared with the intention of remedying that situation. In the following, both the development and USMC operational use of the A-4 series will be covered, although emphasis will be on the latter (as the development side of the Skyhawk story has been reasonably-well covered in other publications). Differences among the various versions of the A-4 are noted, primarily from the point of view of providing externally-visible clues for type identification. The photos and drawings accompanying this article have been selected both to illustrate the markings carried by Skyhawks of most Marine squadrons and to cover the entire range of A-4 variants operated by the Marines.

SKYHAWK DEVELOPMENT

In the early 1950's a number of aircraft designers around the world were at work on concepts intended to reverse the existing trend toward ever more complex and weighty combat aircraft. Although the continual development of more-and-more powerful jet engines allowed the weight-and-complexity trend to proceed, there were associated with this trend the problems of higher-and-higher aircraft system costs and increasing degradation of low-speed performance and maneuverability. To counter this trend, Ed Heinemann's design group at Douglas Aircraft developed a comparatively simple, light-weight fighter design which it proposed to the U.S. Navy early in 1952.

As the Navy's primary need at that time was for a day-attack aircraft to replace its piston-engined attack equipment (primarily the very successful Douglas Skyraider), it encouraged Douglas to continue its studies but to redirect them toward producing a relatively simple light attack aircraft. This effort was given a significant boost a short time later, when the Navy decided to cancel its effort to develop the problem-plagued turboprop Douglas XA2D-1 Skyshark into a satisfactory replacement for the Skyraider. The immediate result was the letting of a contract on 21 June 1952 for Douglas to produce a light-weight, single-seat, single-engine, high-performance, carrier-based, day attack aircraft suitable for the performance of dive-bombing, interdiction, and close-support missions utilizing both conventional and nuclear weapons, and capable of operating without fighter escort in an environment where air superiority was not assured.

Exactly two years after the placement of the initial contract, Douglas' answer to the Navy's requirement, the XA4D-1 Skyhawk, made its maiden flight on 22 June 1954. The aircraft, which immediately entered its flight-test program, was built around the Wright J-65, a license-built version of the Armstrong Siddeley Sapphire engine; it was somewhat unusual in combining a modified-delta wing planform with a conventional horizontal tail. The intensive two-year flight testing, during which a number of records were set, was successfully concluded in mid-1956; deliveries of A4D-1 aircraft to Fleet attack squadrons commenced in late October of that year. The most obvious identifying feature of the -1 Skyhawk (A-4A after the 1962 redesig-

nation) was the smooth surface of the rudder; all later Skyhawk variants had the externally-stiffened rudder. Another giveaway aspect of the A4D-1 configuration was the absence of an in-flight refueling probe.

While the A4D-1 was undergoing its test and evaluation program, an improved Skyhawk was already under development. The A4D-2, which differed from the -1 model primarily in possessing superior bombing and navigation systems, first flew on 26 March 1956. Fleet deliveries of the -2 Skyhawk, later redesignated A-4B, began a year and a half later, the first A4D-2 production aircraft actually being delivered to the Marine Corps commencing in September 1957. Both the externally-stiffened rudder and the in-flight refueling probe were introduced with the A4D-2. Whereas the -1 Skyhawk was quickly supplanted in first-line service by the -2, the latter remained in first-line operational usage by Navy and Marine units for about eight years; total production of this variant amounted to 542 aircraft (compared to 166 examples of the -1 version).

Once again a revised, improved Skyhawk was well into the works even as the first of the -2 models were being introduced into service. A proposed version of the A4D with all-weather radar, autopilot, and the more-powerful Pratt & Whitney J52 engine was ordered by the Navy in 1957 as the A4D-3, but the high cost of developing this variant soon led to its cancellation in favor of a less-ambitious version, the A4D-2N. The -2N, redesignated A-4C in 1962, included limited all-weather avionics and an autopilot, but retained the Wright J65 engine of the earlier versions. This Skyhawk model, which first took to the air on 21 August 1958, was destined to be the most-produced Skyhawk, with a total of 638 examples rolling off the lines by the time production ceased in December 1962. Again the Marines were first to receive the new Skyhawk, with VMA-225 at MCAS Cherry Point taking delivery of A4D-2N's in March 1960. Externally, the obvious distinction between the A4D-2N and the earlier A4D's was the extended nose of the -2N model, required to house the additional avionics.

On 30 July 1959 the A4D-2N contract was modified to call for the final two A4D-2N aircraft to be completed to A4D-5 configuration (the A4D-4 having been a dead-end paper project). The -5 (which was redesignated A-4E before any examples went operational) was a very extensive revision of the Skyhawk. By this time sufficient funds were available to permit the redesign of the forward fuselage required for installation of the P&W J52 engine, as had been proposed earlier. Further improvements in avionics and radar were incorporated, and the wing structure was strengthened to permit addition of two more wing pylons for external stores. The improved fuel consumption rate of the P&W engine gave the -5 greater range, and the beefed-up structure allowed an external ordnance load of 8200 lbs to be carried (compared to 5000 lbs for the -1 model). It first flew on 12 July 1961 and began operational service in December 1962 (as the A-4E). The A-4E was recognizable by its further-lengthened and recontoured nose, the total of five pylons (compared to three on earlier versions), and the redesigned inlets (the plane of the inlet face was moved forward and canted slightly, and small splitter plates were added).

During the production run of the A-4E, which eventually ran to 500 aircraft, the Navy decided to proceed with development of a two-seat

operational-training version of the Skyhawk. Initial orders for this aircraft were placed in 1964, the first prototype (designated TA-4E) flying initially on 30 June 1965. In addition to the obvious alterations required to accommodate a second seat in the A4D airframe, a number of operational improvements were incorporated into this version, including an improved ejection seat and control alterations to improve crosswind handling, as well as an uprated version of the J52 engine. By the time of the first deliveries of the production version of this trainer, which took place in May 1966, a single-seat model incorporating the operational improvements had been ordered as the A-4F; hence the trainers were all delivered as the TA-4F.

The A-4F model, which ended up being produced in rather modest numbers (a total of 146 "F" models was built), first flew on 31 August 1966. Deliveries of the A-4F to the Fleet began in June 1967. Although the first A-4F was outwardly indistinguishable from the "E" version, production examples were all fitted with a large avionics "hump" extending from the cockpit to the leading edge of the vertical tail. Unfortunately, this did not long remain a positive identifying feature of the "F" model, as the avionics fairing was soon retrofitted to a number of A-4E's.

The "G", "H", "K", "N", and subsequent versions of the A-4 will not be considered here, as all are variants developed specifically for foreign service. Although some of these have been ordered through the U.S. Navy and hence have been assigned U.S.N. Bureau Numbers, none has in fact served with either the Navy or the Marine Corps.

Early in 1968 the Navy decided to replace its aging TF-9J Cougar two-seat advanced trainer, in service with the Naval Air Training Command, with a simplified version of the TA-4F two-seat Skyhawk. The new trainer, under the designation TA-4J, did away with most of the weapons systems of the "F" model and, because it thus operated at lower weights, reverted to the less-powerful engine used in the A-4E. The "J" first flew in May 1969, and has been in production since. In addition to new production, quantities of the two-seat "F" model are being converted into TA-4J's. The one ready-made distinguishing feature of all "J" models, including the conversions, is the overall glossy white paint applied to these aircraft (the TA-4F models are all painted in the standard gray and white Navy scheme).

The next model in the Skyhawk series, the A-4L, was never built as such. All 100 "L" model Skyhawks were produced by conversion of A-4C aircraft. Interestingly, the modification program was entirely for the benefit of the Navy and Marine Reserves; no A-4L's ever served with the Fleet. Basically, the A-4L was an A-4C brought up to A-4F standards in terms of avionics, weapons systems, and control systems; however, the original Wright J65 engine was retained. The first A-4L conversion was accomplished by Douglas, who then produced 99 kits to enable the Navy to turn as many "C" models into "L" models at Navy overhaul depots. Externally, the A-4L was identical to the "C" except for the obvious "humpback" electronics housing.

Having originally planned to join the Navy in replacing A-4 series aircraft with the A-7 Corsair II, the Marine Corps backed off and re-evaluated the situation in 1969. Always in a bind for funds, the Marines finally decided to reject the A-7 in favor of a rather less-expensive development of the Skyhawk, the A-4M, which Douglas had proposed specifically to meet the USMC requirement. As a re-

sult, the Marines are currently in the process of re-equipping all A-4 squadrons with a sort of "Super-Skyhawk". Perhaps the greatest single improvement in the A-4M model is the use of a version of the J52 engine that is 20% more powerful than any used in earlier A-4's. This leads directly to significantly-improved maneuverability, higher rate of climb, increased acceleration, and superior short-field performance. A great many other improvements were incorporated into the A-4M, too, such as an enlarged cockpit canopy, increased ammunition supply for the 20 mm cannon, a drag 'chute, and further-advanced avionics. The first A-4M flew on 10 April 1970, with deliveries to USMC units commencing just a year later, on 16 April 1971. Identification features of the A-4M are many, the most prominent being the enlarged canopy, the square-tipped vertical fin, and the drag 'chute housing just below the tailpipe.

ASSIGNMENTS TO USMC OPERATIONAL UNITS

Operational usage of the Skyhawk by USMC units began in January 1957 with the re-equipment of VMA-224, which swapped its F9F-8B Cougars for A4D-1s. The -1 remained in first-line service for a very short time, however, and only one other squadron, VMA-211, is known to have flown the A4D-1.

The first widely-used Skyhawk, the A4D-2, quickly followed the -1 into operational service. VMA-211, one of the units flying the -1, received the first -2s in September 1957. The importance of these aircraft to the USMC is apparent from the fact that the Marines began introducing the A4D-2 into service before the Navy did! Other Marine Attack Squadrons soon converted to the Skyhawk; VMA-311 was the first West-Coast-based unit to equip with the A4D-2, obtaining them in 1958. Over the next few years, almost every VMA received A4D-2 aircraft.

An interesting grouping in that a trio of A4D-2Ns (#147787, #147769, and #147776) are being led by an earlier A4D-2. Note that three of these VMA-332 aircraft carry "buddy pack" refueling tanks on their centerline pylons. Rudders are white with red bars; noses on -2Ns are flat black. Squadron flew polka-dot-marked Corsairs in Korean War combat, now operates A-6As as VMA(AW)-332. USMC photo.

Even as the A4D-2 deliveries were taking place, the most-used Marine Corps Skyhawk went operational. In March 1960, at MCAS Cherry Point, VMA-225 accepted the first A4D-2N (A-4C) aircraft assigned to the USMC. Once again, the Marines began receiving this new Skyhawk variant before the Navy. The A-4C remained in first-line USMC service for a number of years, some units operating the type into the early 1970s. At the height of its utilization by the Marines, in the mid-1960s, the A-4C equipped a total of nine VMAs.

VMA-331 became the first USMC A-4E unit when it traded in its A-4Bs in 1963, a few months after the Navy began receiving A-4Es. Although a total of nine VMAs flew this Skyhawk type, they did not all do so simultaneously. A couple of factors were responsible for this. For one, the Navy needed all the combat aircraft assets it could muster to fulfill its role in the Southeast Asia war in the mid- to late-1960s. Another, and even more significant, element in the situation was the appearance in the USMC inventory of the A-6A Intruder. This aircraft had been designed and developed from the ground up as an all-weather bomber, using a second crew member to operate the highly-sophisticated navigation and bombing systems. It gave the Marines a capability that just couldn't be approached by the A-4; the USMC wanted this capability enough to pay for it, and began in 1964 to convert several A-4 squadrons over to the VMA(All-Weather) mission with A-6 equipment. A total of six of the twelve attack squadrons authorized for the Marines were eventually equipped with A-6As, the conversions having been completed by late 1968. VMA-242 was the first squadron to convert, trading its A-4Cs for A-6As at Cherry Point in October 1964.

FRONT-LINE MARINE SKYHAWK SQUADRONS IN 1964

Squadron	Model	Tail Code	Prior Type	Conv. Date	Other A-4s	Later Type	Conv. Date
VMA-121	A-4C	VK	AD	4-61	E	A-6A	1968
VMA-211	A-4C	CF	AD	1957	A,B,E	-	-
VMA-214	A-4C	WE	FJ-4B	1-23-62	B,E,F,M	-	-
VMA-223	A-4C	WP	FJ-4B	1-61	E,F	-	-
VMA-224	A-4C	WK	F9F-8B	1-57	A,E	A-6A	11-66
VMA-225	A-4C	CE	AD	1958	B	A-6A	4-66
VMA-242	A-4C	DT	none	10-1-61	B	A-6A	10-64
VMA-311	A-4C	WL	F9F-8	1958	B,E	-	-
VMA-324	A-4B	DX	AD-6	5-59	E,M	-	-
VMA-331	A-4E	VL	AD-6	8-59	B,M	-	-
VMA-332	A-4C	EA	AD-6	1958	B,E	A-6A	8-68
VMA-533	A-4B	ED	F9F-8B	?	none	A-6A	7-65

Although none were delivered new to the Marines, A-4Fs began to replace "E" models in some VMAs as the 1970s arrived. These were USN aircraft released as a result of continuing A-7 production for that service. At least two VMAs have been equipped with the A-4F: VMA-214, which has since obtained the A-4M, and VMA-223.

First-assignment dates and units are not known for the two-seat TA-4 variants. The only units to use the TA-4F in quantity were the two USMC operational/instrument training squadrons, VMT-103 at Yuma and

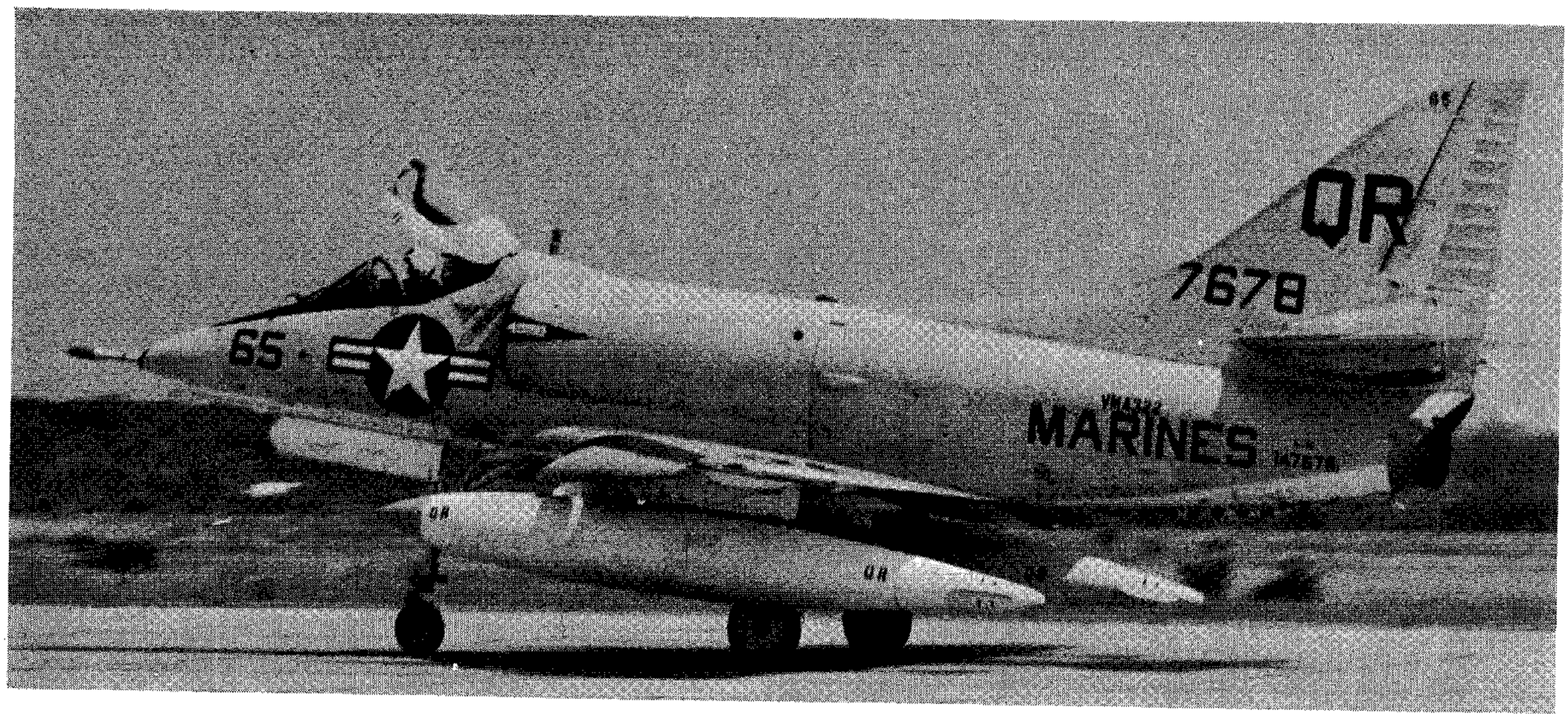
VMT-203 at Cherry Point (the assets of -103 have since been transferred to VMAT-102, and -203 has become VMAT-203). The TA-4J has largely replaced the TA-4F in these training units. Also making considerable use of the TA-4F have been the various Headquarters and Maintenance Squadrons (H&MS) in the USMC. Each Marine Aircraft Group, which normally contains several operational aircraft squadrons, has an H&MS to handle administrative and maintenance duties for the Group. With few exceptions, every H&MS has several aircraft assigned to it for proficiency flying and other miscellaneous purposes. Many H&MSs have had three or four TA-4Fs on strength at one time or another. The following are known to have operated TA-4Fs:

Squadron	Tail Code
H&MS-10	SE
H&MS-11	TM
H&MS-12	WA
H&MS-13	YU
H&MS-14	CN
H&MS-15	YV
H&MS-31	EX
H&MS-32	DA
H&MS-33	WM
H&MS-37	QF

The latest Marine Corps Skyhawk model, the A-4M, became operational with deliveries to VMA-324 at MCAS Beaufort in April 1971. Several other VMAs have since received this type, and it is expected that eventually all six A-4-equipped VMAs will be flying the A-4M. It should be noted that the Marines continue to place a very high value on the A-4 as a close-support aircraft. This is clearly evident in the fact that VMAs equipped with the AV-8A Harrier, another aircraft about which the Marines feel very strongly, have been formed not by re-equipping A-4 squadrons, but by replacing F-4 and A-6 units!

As early A-4 models were phased out of first-line USN and USMC service, they began appearing in Reserve units around the U.S. A very few A-4As made it into the Reserves, but the Reserve Skyhawk program really got under way when the A-4B became available. All Marine Reserve VMAs were flying the A-4B during the middle and late 1960s. However, because Navy and Marine Reserve units were sharing aircraft during this period, specific USMC unit markings did not appear. By about 1970, deliveries of late-model A-4s and A-7s to the first-line USN and USMC attack units made the A-4C available to the Reserves. At about the same time, the entire USN/USMC Air Reserve program was overhauled, one significant objective being the assignment to each remaining Reserve squadron a full complement of operational aircraft. Hence A-4Cs began showing up in the markings of individual Marine Reserve VMAs.

Several Reserve VMAs benefitted from the program of converting A-4Cs into A-4L models. Three squadrons were eventually equipped with this type. Very recently, the Marine Reserve squadron at NAS South Weymouth, VMA-322, received A-4E aircraft to replace its A-4Cs. Because of the improved performance provided by the J52 engine used in the later Skyhawk models, it is to be expected that all remaining Reserve VMAs will be outfitted with "E" or "F" models before too long.



A-4C #147678 of VMA-322 taxiing at its home station, NAS South Weymouth, Mass. Nose number "65" was unusually high for a VMA aircraft. Photo was taken in 1972, some time after tail code had been changed from earlier "5Z". VMA-322 recently became the first Marine Air Reserve unit to equip with the A-4E. Photo by Fred Roos.

CURRENT USMC A-4 SQUADRONS

Squadron	Type(s)	Base	Code
VMAT-102	A-4E, TA-4F/J	Yuma	SC
VMA-124*	A-4L	Memphis	QP
VMA-131*	A-4C	Willow Grove	QG
VMA-133*	A-4C	Alameda	ME
VMA-134*	A-4C	El Toro	MF
VMA-142*	A-4L	Jacksonville	MB
VMAT-203	TA-4F/J, A-4M	Cherry Point	KD
VMA-211	A-4E	Iwakuni	CF
VMA-214	A-4M	El Toro	WE
VMA-223	A-4F	Yuma	WP
VMA-311	A-4E	Iwakuni	WL
VMA-322*	A-4E	South Weymouth	QR
VMA-324	A-4M	Beaufort	DX
VMA-331	A-4M	Beaufort	VL
VMA-543*	A-4L	Glenview	MD

*Asterisk denotes Marine Air Reserve squadron.

USMC A-4 OPERATIONS

Several aspects of the in-service operations of Marine Corps Skyhawks will be of particular interest to the enthusiast. Although space limitations preclude anything like a complete rundown on USMC squadron operations with the A-4, some of the more interesting and unusual areas deserve coverage.

One operational activity occasionally engaged in by A-4-equipped VMAs has been the deployment aboard Fleet carriers as elements of

Carrier Air Wings. Although not very well known, the employment of Marine squadrons in this manner is a long-established fact; the Marine Corps is, after all, an arm of the U.S. Navy. In this connection it might be noted that toward the end of World War II a number of Carrier Air Groups were composed entirely of Marine units.

Of course, a VMA deployed with a carrier functions just as any Navy attack squadron would. Among other things, this means that the basic close-air-support function of the A-4-equipped VMA is suppressed to some extent in favor of the bombing role more typical of the Navy light attack mission. Because of the heavy commitment of USMC air units to support Marine ground operations in Southeast Asia, VMA carrier deployments were suspended during the late 1960s. The following table lists VMA carrier deployments known to the author.

CARRIER DEPLOYMENTS OF A-4 VMAS

Squadron	Carrier	Year	Location
VMA-225	Essex	1959-60	Med.
VMA-224	Independence	1960-61	Med.
VMA-225	Shangri-La	1961	Med.
VMA-225	Enterprise	1962	Med.
VMA-223	Hancock	1963	WestPac.
VMA-324	Independence	1963-64	Med.
VMA-331	Forrestal	1964-65	Med.
VMA-324	Independence	1966-67	Med.
VMA-331	Independence	1970-71	Med.

A number of Skyhawk VMAs came close to becoming involved in combat operations late in 1962, during the Cuban Missile Crisis. That situation resulted in the mobilization of a great many U.S. military units, with much of the alerted firepower being concentrated in the Southeastern U.S., for obvious reasons. Half of the Marine Corps' A-4 assets were involved, with six of twelve VMAs being placed on combat alert. The time period involved ran from late October into early December of 1962.

VMA-224 was alerted at its home station, Cherry Point, and remained there during the alert. VMA-242 and VMA-533, also based at Cherry Point, were relocated to NAS Key West when alerted on 22 October. Also transfered to Key West was VMA-324 from MCAS Beaufort; VMA-331 from Beaufort was moved to NAS Roosevelt Roads, Puerto Rico for the duration of the alert. The only West Coast VMA called out was VMA-121, which left MCAS El Toro to set up shop at NAS Cecil Field in Florida. Fortunately, the missile problem was solved politically, enabling these VMAs to stand down peacefully from their combat alert.

Of course, the Marine Corps Skyhawks did see combat action, and plenty of it, in Southeast Asia. The involvement of Marine A-4s in that area actually dates back to mid-May of 1962, when VMA-332 was deployed to Udorn, Thailand. A Communist threat to the Thai government had necessitated the sending of a Marine Expeditionary Force to Thailand. The threat soon eased, permitting VMA-332 to leave Udorn on 2 July without having had to fire a shot.

Actual combat operations by Marine A-4s came about with the large-scale U.S. involvement in the war, triggered by the Gulf of Tonkin

incident of August 1964. Marine air operations in Southeast Asia were really quite extensive throughout the period of U.S. involvement there. In fact, at the peak of U.S. air operations, in mid-1968, essentially half of the Marine Corps' deployable squadrons were in the Western Pacific. Except for one or two jet squadrons that would be located in Japan (regrouping and retraining after a period in Vietnam), at any one time all of these squadrons were stationed either in Vietnam or with the Special Landing Force of the Seventh Fleet operating off the coast of Vietnam. The primary reason that all this Marine air effort was not as well-publicized as USN and USAF activity is simply that the Marines, in their close-air-support role, did not generally fly missions over North Vietnam.

Marine Air's region of responsibility corresponded to the area in which Marine ground forces operated, which was the Vietnamese Army's I Corps Tactical Zone (later designated Military Region 1), a long, narrow region extending about 225 miles southward from the Demilitarized Zone. It included the five northernmost provinces of the Republic of Vietnam (Quang Tri, Thua Thien, Quang Nam, Quang Tin, and Quang Ngai). The second-largest city in South Vietnam, Da Nang, and the Imperial City of Hue both were in this Zone.

Initial Marine tactical air operations were flown out of Da Nang, but a second USMC air base was needed when the rapid buildup of U.S. air forces in SEA got underway early in 1965. A site along the coast about 50 miles south of Da Nang was selected for this second jet base, and a Marine Air Group (MAG) including several A-4 squadrons was scheduled to be located there. The location, to become known as Chu Lai, had no airstrip or other improvements at the start.

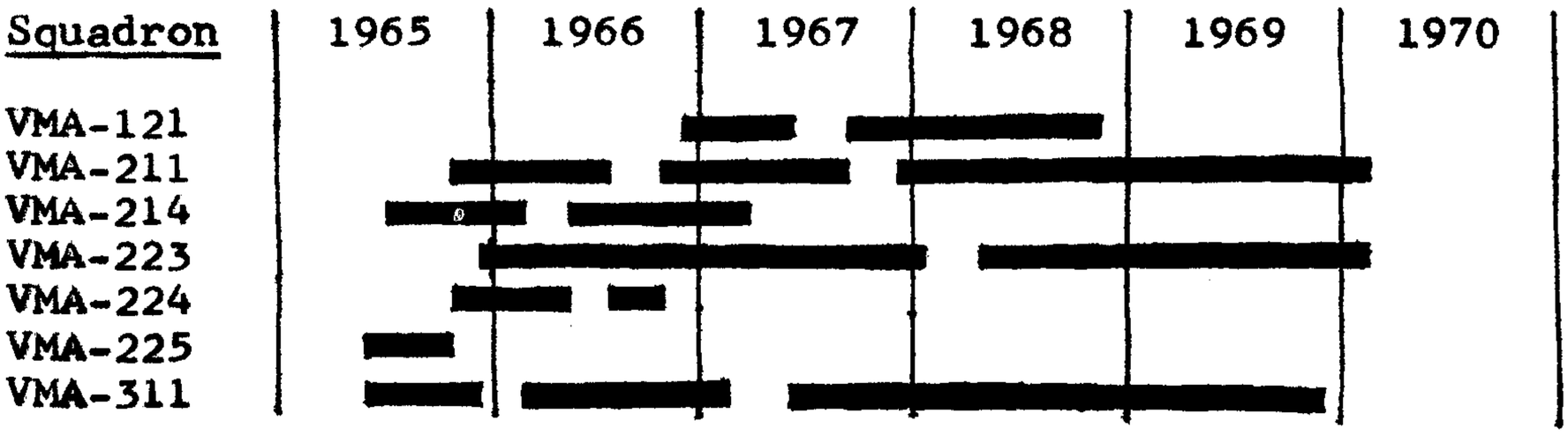
Fortunately, the Marines had developed a system for just such a situation. The system, known as SATS (Short Airfield for Tactical Support), involved the laying of a few thousand feet of aluminum-plank runway over a reasonably flat surface that required a minimum amount of preparatory earth moving. To permit normal operations from a short strip, either a catapult or JATO was needed for takeoff assistance, and a mobile arresting gear was installed to permit arrested landings.

Seabees began construction of the Chu Lai SATS on 9 May 1965. Less than a month later the strip was capable of supporting air operations, and on 1 June the C.O. of MAG-12 landed the first A-4 on the aluminum runway at Chu Lai. Other aircraft quickly followed, and the first USMC A-4 combat mission was JATO-launched later that same day, led by the C.O. of VMA-225.

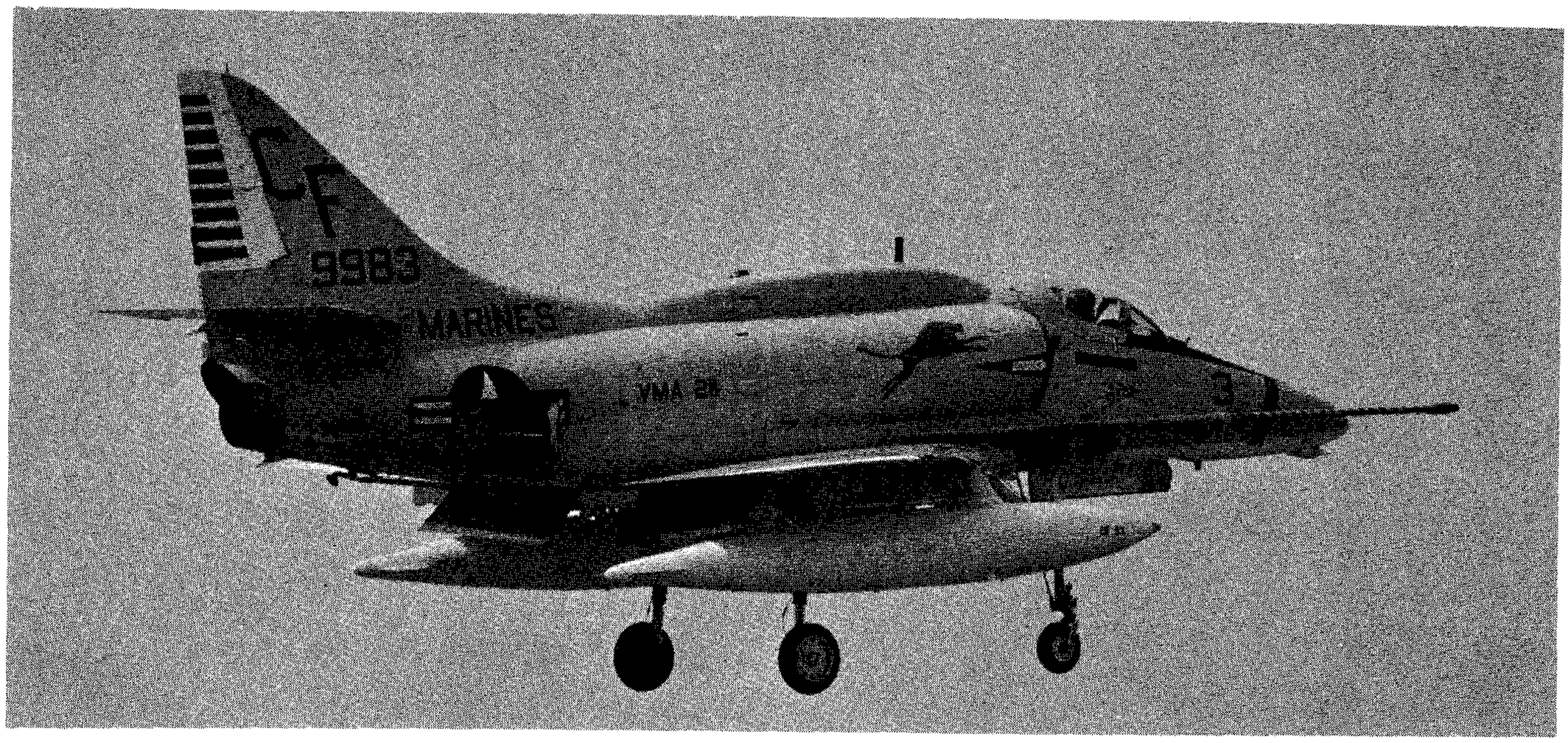
As more taxiways and parking ramps were constructed, additional A-4s arrived; by the end of June, three full VMAs of A-4s were in place as elements of MAG-12 at Chu Lai. The initial SATS at Chu Lai had just 4,000 feet of runway. Eventually a full 10,000-foot concrete runway was laid down at Chu Lai, and two full MAGs were based there. But during the early days of 4,000-foot operations, JATO was widely used when high temperatures and/or heavy bomb loads required it. In addition, a Marine KC-130F tanker was kept available to top off A-4s after takeoff, using inflight refueling.

A great many sorties were flown out of Chu Lai. Operations were primarily in support of USMC ground units in Military Region 1 of Vietnam until March of 1968. At that time a reorganization of all U.S. tactical air units into a "single-manager" system effectively placed the Marines' A-4s into a pool with all other available USMC and USAF aircraft. Strike missions were assigned to pool aircraft by the Seventh Air Force tactical control headquarters according to air support requests coming in from the field.

SKYHAWK UNITS ASSIGNED TO MAG-12 AT CHU LAI



The above chart lists the A-4 VMAs assigned to MAG-12 at Chu Lai (MAG-12 was the only Group in SEA with A-4 squadrons assigned). As can be seen, the early stages of A-4 operations involved the rotation of complete VMAs in and out of MAG-12. However, the disruption and inefficiency associated with the periodic replacement of entire squadron-size groups of personnel, aircraft, and equipment



A-4E #149983 of VMA-211 on final approach to MCAS Iwakuni, Japan sometime in 1972. VMA-211, one of the workhorse Marine Attack units during the Vietnam conflict, originally gained fame for its heroic efforts in the unsuccessful defense of Wake Island in December 1941 (as VMF-211). Reorganized in 1942, VMF-211 fought throughout World War II and remained active postwar, becoming VMA-211 during the Korean War. Unit has flown the Skyhawk for 17 years, having been one of the VMAs to fly the original A4D-1 model in 1957! Rudder bars, nose band, and fuselage emblem are all in insignia red; refueling probe has red & white spiral. Photo via Duane Kasulka.

led to the establishment of a system of replacement of men and aircraft on an individual, as-needed basis. The squadron organizations, aircraft, and equipment remained in place at Chu Lai once this system was fully established, with the exception of brief rotations of full squadrons to Japan for training and reforming. Although the chart above does not show all of the rotations of VMAs to Japan, some of the unmarked breaks can be guessed on the basis that through 1968 and 1969 there were only three operational VMAs at Chu Lai at any given time.

It is difficult to single out for comment any individual sortie or mission flown by Marine A-4s, because all such missions were strictly routine close air support operations. The spectacular, noteworthy, and well-known missions were those flown "up north", particularly when the Hanoi or Haiphong areas were involved; as has been noted, VMA A-4s didn't participate in such operations. Marine A-4s did perform the workhorse close support missions, busting tanks with rockets or hitting enemy personnel concentrations and weapons sites with combinations of bombs, napalm, and 20-mm cannon fire.

USMC A-4s supported all of the major ground operations in I Corps, including such well-known efforts as Operation Dewey Canyon in the Spring of 1969. The biggest effort of all in I Corps, however, took place in response to the North Vietnamese Army's siege of Khe Sanh early in 1968. The successful defense of Khe Sanh depended very heavily on air operations, for resupply as well as for holding back the enemy forces pressing Khe Sanh. Tactical air support flown by USAF, USN, and USMC units (including VMAs with A-4s) made an immediate ring around Khe Sanh; B-52s struck farther out.

It was during the battle for Khe Sanh that an operation known as the "Super Gaggle" was developed. This was a technique for resupplying outposts in the hills around Khe Sanh, an extremely hazardous proposition owing to the heavy concentrations of enemy anti-aircraft weapons in the vicinity. The "Super Gaggle" was a flight of transport helicopters escorted by A-4s and UH-1E gunships, all under the control of an airborne tactical controller. The idea was to take advantage of any break in the typically monsoon weather and to have all aircraft rendezvous over the designated point simultaneously. The tactical controller (in a TA-4F) and KC-130F tankers took off from Da Nang, the A-4s from Chu Lai, UH-1E gunships from Quang Tri, and CH-46s from Dong Ha. All aircraft joined up over Khe Sanh within a 30 minute period. Under direction of the airborne controller, the area was worked over with napalm, rockets, 20-mm, and smoke. The CH-46s let down in a spiral column and deposited their loads at Khe Sanh and the hill outposts in less than five minutes and then spiralled back on top and returned to their bases. The A-4s also climbed back on top, plugged in to the KC-130Fs for refueling, and headed back to Da Nang and Chu Lai.

By early 1969 plans had been made to begin a phased withdrawal of U.S. units from Vietnam. A-4 operations at Chu Lai were not affected until the third increment of withdrawal, which called for a reduction in the number of units flying out of Chu Lai. MAG-12 moved out in February, 1970, relocating to Japan; VMA-211 went along with the Group. Another of the A-4 squadrons also left Vietnam, as VMA-223 returned to the U.S. This was not nearly the end of Marine Skyhawk operations, however, as VMA-311 remained at Chu Lai, being reassigned to MAG-13. VMA-311 continued flying air sup-

port missions in-country, as well as interdiction missions along some of the North Vietnamese supply routes. In April, 1970, plans were announced for the complete withdrawal from Vietnam of all USMC units by May, 1971, to be accomplished in several stages. USMC air activities at Chu Lai were closed down altogether by late Summer, 1970, but VMA-311 still wasn't through, being reassigned to Da Nang Air Base as an element of MAG-11. With the reduced American ground activity in I Corps, more and more of VMA-311's effort was directed toward Laos, primarily in the form of strikes along the Ho Chi Minh Trail complex. USMC A-4 operations did finally come to a halt when VMA-311 flew its final strike into Laos on 7 May 1971, packing up immediately thereafter and rejoining MAG-12 in Japan.

Another interesting facet of A-4 operations during this period was the employment of two-seat TA-4Fs in a tactical air control role (as in the "Super Gaggle" operation described above). For political as well as tactical reasons, almost all USMC air strikes had to be controlled by airborne controllers. Over friendly terrain and within range of artillery support, the Marine controllers flew O-1E Bird Dog and (after mid-1968, when they first became available) OV-10A Bronco aircraft of comparatively low performance. Over enemy-controlled territory, the Tactical Air Coordinators (Airborne), or TAC(A)s, flew high-performance jets. Their mission was to coordinate various strike aircraft and to ensure that they hit the right targets. In this role the Marines first used the two-seat TF-9J, but beginning in late 1967 they employed the TA-4F. Because VMAs were not assigned two-seat A-4s, the aircraft utilized in the TAC(A) role were the H&MS aircraft of each MAG (recall that each MAG includes a Headquarters & Maintenance Squadron which, among other things, "owns" several TA-4Fs for proficiency flying, courier duties, and other miscellaneous support activities).

TA-4Fs flew hundreds of missions into the southern regions of North Vietnam, performing in the visual reconnaissance as well as in the TAC(A) role. They located SAM sites, truck parks, supply dumps, and other targets, and then controlled other strike aircraft against them. Some ordnance was often carried by TA-4Fs on these missions (smoke rockets for target marking, or unguided air-to-ground missiles), endowing the TAC(A) aircraft with a limited strike capability against small targets. The TA-4Fs also spotted and controlled naval gunfire for the battleship USS New Jersey and other ships that participated in bombarding the North. H&MSs of three Groups were able to provide TA-4Fs, these being H&MS-11,-12, and -13.

The departure of VMA-311 from Da Nang in the Spring of 1971 appeared to mark the conclusion of USMC A-4 operations in Southeast Asia, but such was not the case. On 30 March 1972, the North Vietnamese began a large-scale invasion of northern South Vietnam as part of a three-pronged attack against the Republic of Vietnam. The heavy offensive made steady and extensive headway against the Vietnamese Army defenders of the region (primarily Quang Tri Province), and Marine Air was called back into action to help turn the tide. MAG-12, in Japan with its two A-4E squadrons, was alerted to return to Vietnam.

Somewhat surprisingly, MAG-12 was not returned to Military Region 1, in which it had operated earlier (and into which three F-4 squadrons were being returned), but was sent instead to Bien Hoa Air Base, near

Saigon in Military Region 3; this was a field that had not previously supported USMC air operations. The move to Bien Hoa began on 16 May, with the first combat sorties flown three days later. Operational missions flown out of Bien Hoa by A-4Es of VMA-211 and VMA-311 covered the southern half of Vietnam and the Cambodian border area. With no ground Marines in action, the two VMAs were available to fly close support missions (as well as other types of tactical missions) as needed throughout their operational area. As earlier, nearly all close air support missions were being controlled by airborne tactical controllers.

With the assistance of large doses of U.S. air power, the Vietnamese were able to halt the North Vietnamese Army's drive. In fact, by midsummer the South Vietnamese were able to mount a counteroffensive. With intensive peace negotiations underway in Paris, the late months of 1972 saw at least a state of equilibrium, if not victory, achieved in South Vietnam. This is not to say that VMAs 211 and 311 were left with nothing to do; a great deal of military activity continued in the Cambodian border regions, with the two A-4 squadrons flying many tactical strike missions. Even after the Vietnam peace agreement was reached, the two Marine Skyhawk units continued to fly sorties right up to the time the cease-fire became effective; VMA-311 delivered the last Skyhawk-load of ordnance over Cambodia just moments before the cease-fire took effect on 28 January 1973. It was indeed fitting that the Tomcats of VMA-311 should close out USMC A-4 operations in SEA, as they had been the most active Skyhawk unit in the war, compiling a record of over 50,000 combat sorties flown during almost eight years in the theater.

PAINT AND MARKINGS

A few brief remarks concerning Marine Corps Skyhawk color and marking schemes are in order, although it must be said that more can be learned through careful study of the illustrations accompanying this article than can possibly be written here.

All USMC A-4s have been painted in the same basic USN scheme for tactical aircraft. The fuselage sides and top, the vertical tail surfaces, and the upper wing and horizontal tail surfaces are all light gull gray, while the fuselage underside and the undersurfaces of the wing and horizontal tail are insignia white. Aircraft painted within the last few years show a semigloss gray; the gray was previously non-specular. The white has always been glossy.

Prior to mid-1962 all control surfaces (rudder, ailerons, etc.) were painted to match the adjacent fixed surfaces (e.g., rudder was gray, elevators were gray on top and white underneath, etc.). Similarly, areas exposed by the opening of slats, flaps, etc. were painted to match the local surface color. Anti-glare panels were a non-specular medium gray, and RESCUE arrows were red with white lettering.

Changes introduced in 1962 called for all control surfaces to be painted gloss insignia white, and areas under flaps, slats, speedbrakes, etc. to be painted insignia red. Anti-glare panels became matte black (although many aircraft appear to have none at all), and RESCUE arrows became yellow with black lettering.

A glance at the photos will reveal that two types of jet intake warning markings were used, apparently with no set pattern to their use.

It should be pointed out that two different overall schemes of basic markings exist. On A-4A through A-4C aircraft (including the A-4L, since it is a modified A-4C) the national insignia is carried on the forward fuselage, the name MARINES appears on the aft fuselage, and the last four digits of the Bureau Number (if shown at all) are presented just forward of the horizontal tail on the vertical stabilizer (in most cases). In contrast, the national insignia on all A-4E and later models is carried on the aft fuselage, MARINES invariably appears on the vertical tail just ahead of the horizontal tail surface, and the abbreviated Bureau Number is presented above the horizontal surfaces, on the vertical stabilizer. It should be emphasized that the later scheme was not retroactively applied to the earlier model A-4s, even during rework cycles.

ACKNOWLEDGEMENTS

Many individuals have been of direct or indirect help to the author in the preparation of this article. In particular, the many photos provided by Harry Gann of the Douglas Aircraft Company were of great value in clarifying details of paint schemes and unit markings. The tremendous knowledge of Navy and Marine squadrons, aircraft, and markings possessed by Duane Kasulka aided the author in many ways. Finally, the author would like to thank the many Marine Corps information services personnel who provided unit history material for use in this article.

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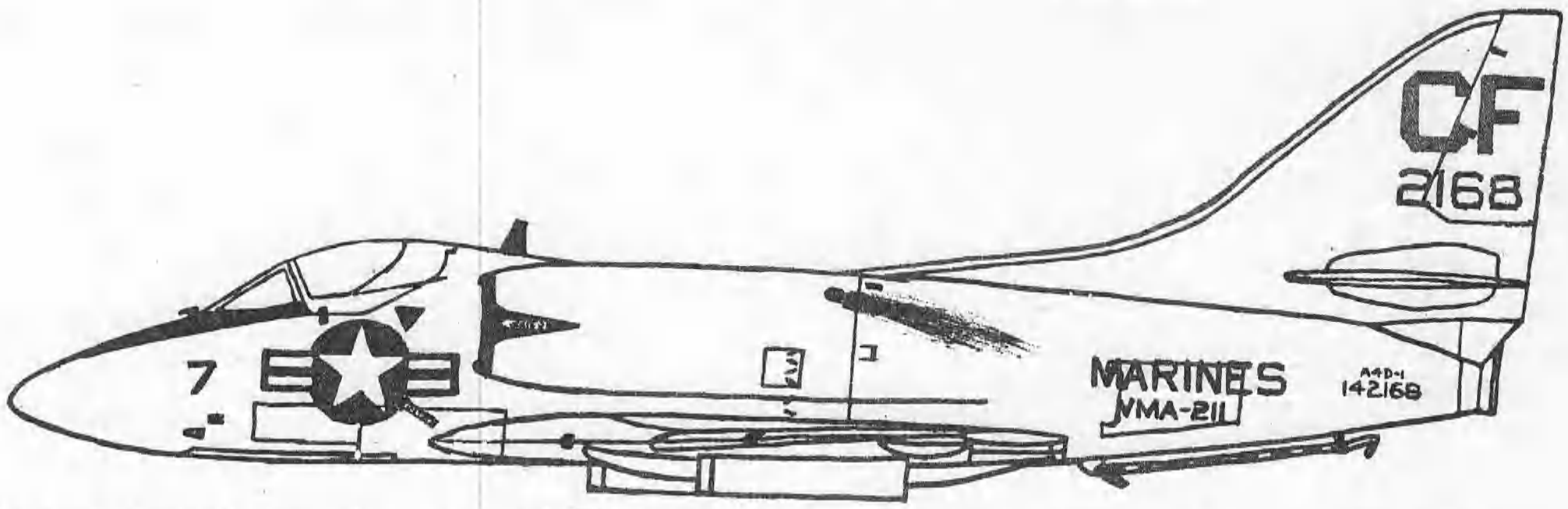
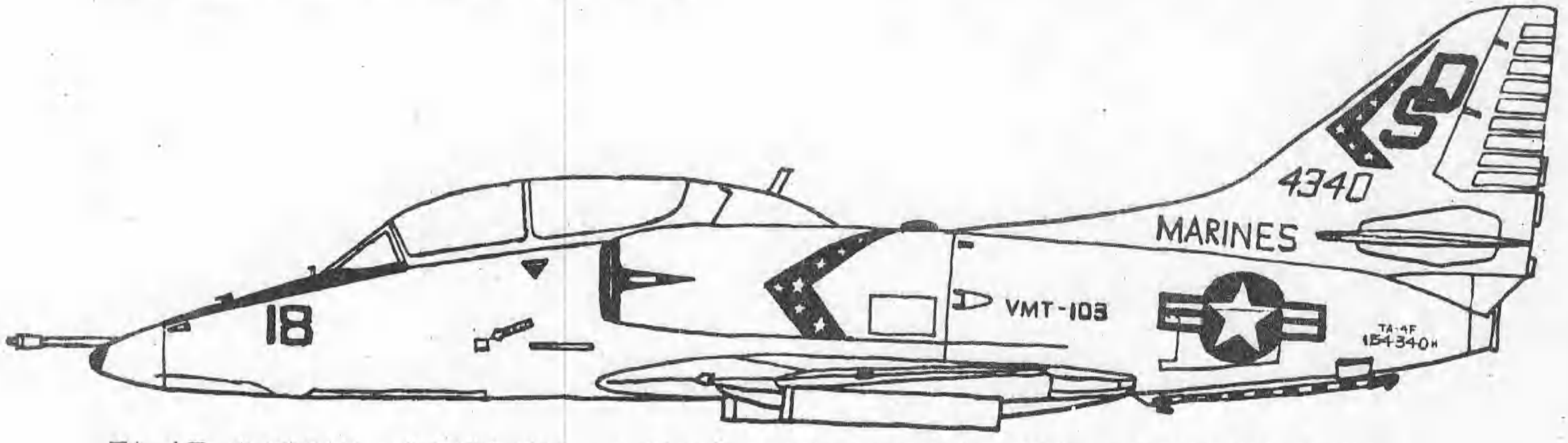
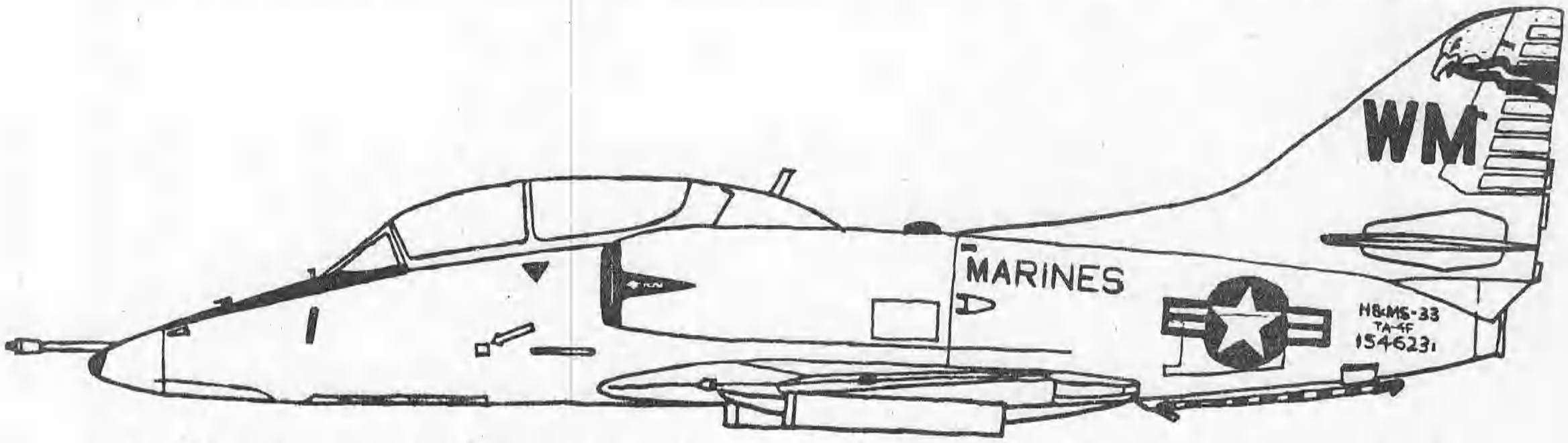


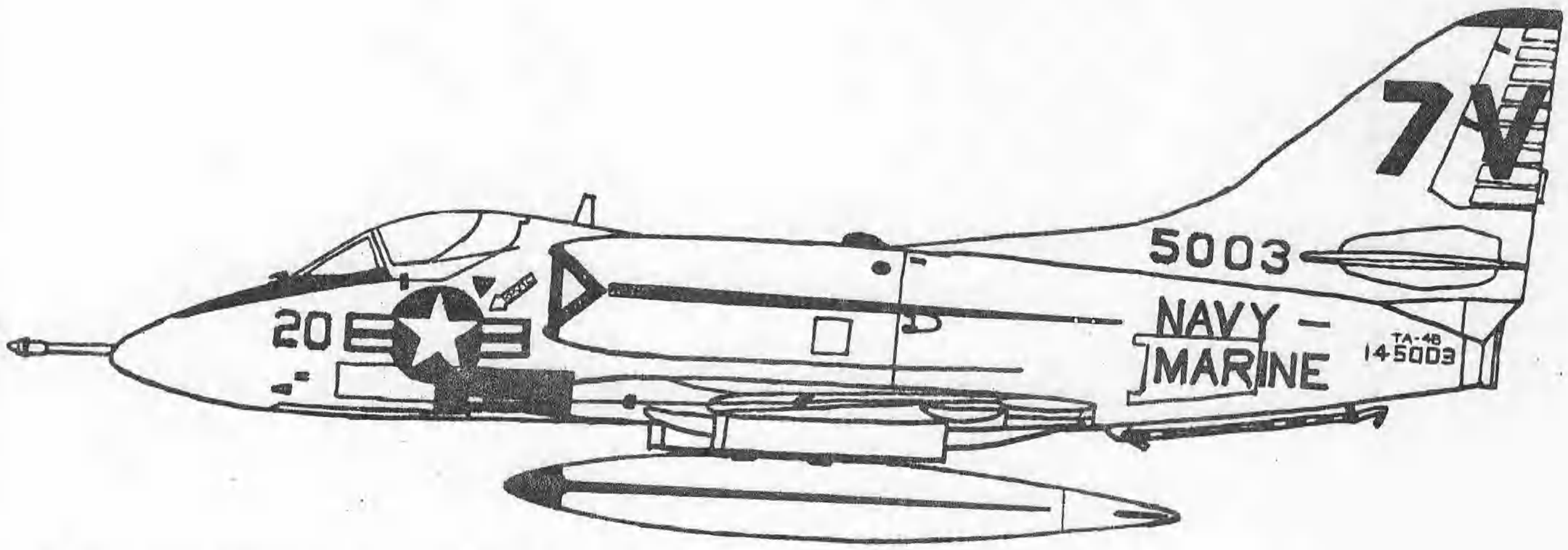
A4D-1 #142168 of VMA-211, circa 1957. Very simple markings, standard paint scheme. Nose anti-glare panel is non-specular medium gray, not black. RESCUE arrows are red with white lettering, rather than the current yellow with black. Leading edges of wing and tail surfaces are corogard. Rudder is gull gray, not white. Note oil streak on fuselage aft of oil breather; also note absence of wing-root cannon installation on this aircraft.



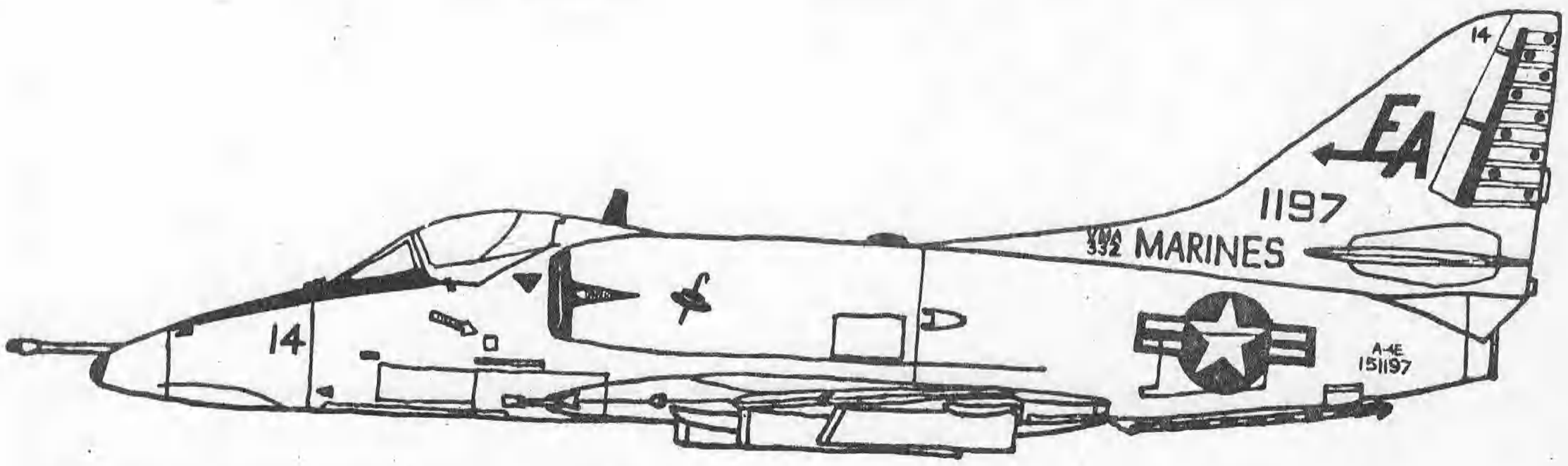
TA-4F #154340 of VMT-103, a Marine advanced-training squadron home-based at MCAS Yuma. Standard gray overall, including rudder. Bands on tail and inlets are dark blue with white stars. Tail letters slant other way on far side, with positions of letters reversed, i.e., "S" sits above "D". "4340" also slants opposite way on other side of tail.



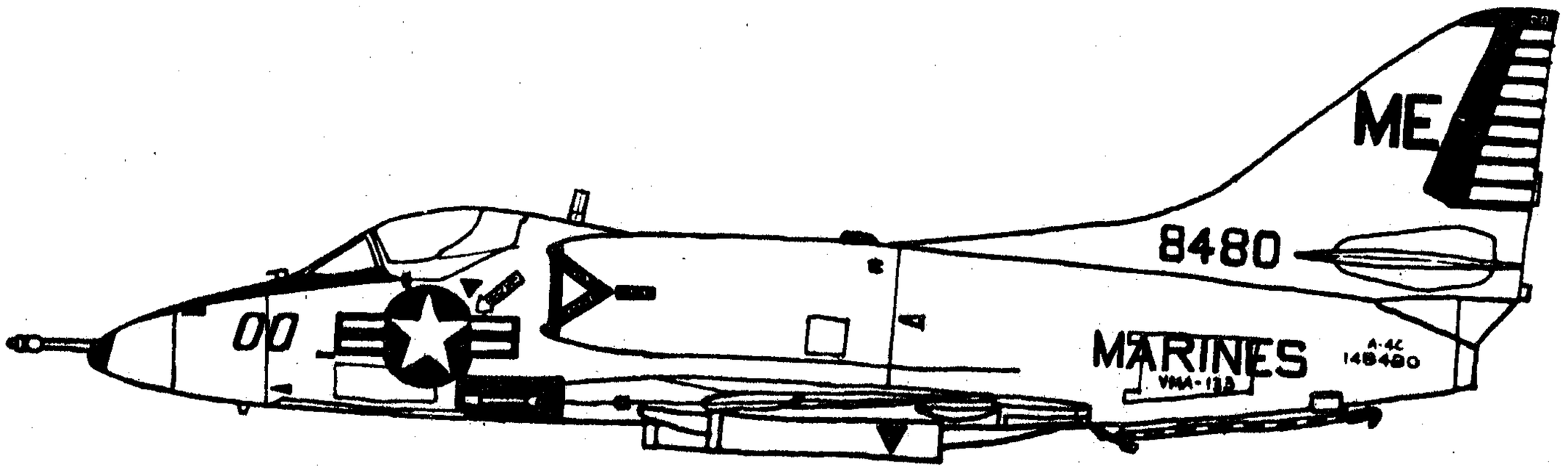
TA-4F #154623 of H&MS-33 in mid-1972. This ship sports a very unusual tail marking that is rather striking in color. Aircraft is gray overall, including rudder. Anti-glare panel is black, along with all lettering (note unusual position of "MARINES" and Squadron designation). The eagle head on the tail is medium brown with black outline and details; the beak is yellow. Colors on the banner streaming from the eagle's beak are (from the top down) medium blue, yellow, and insignia red.



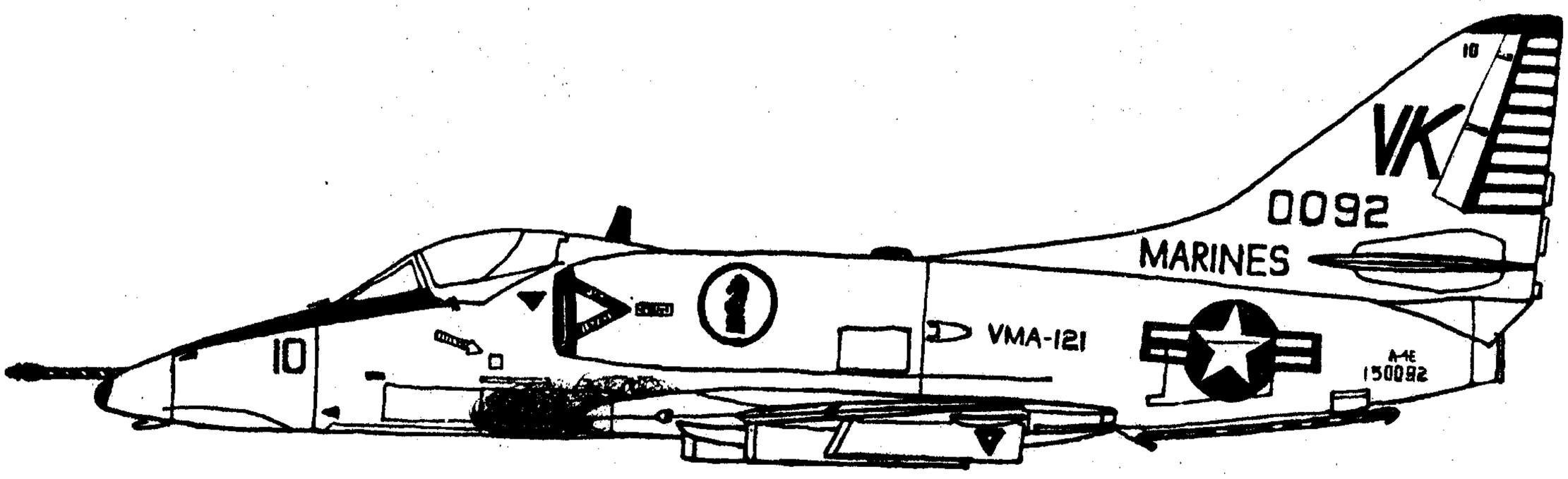
TA-4B #145003 flown by VMA-543 (as well as a Navy unit), a Marine Air Reserve squadron home-based at NAS Glenview, as seen in 1969. Note the unusually-large tail code "7V" (in late '69/early '70, Marine Air Reserve units ceased sharing aircraft with Naval Air Reserves, began carrying "5"-series tail codes--e.g., Glenview Marines painted "5V" on their planes). Standard paint, black lettering, yellow/black RESCUE arrows; note the glossy black area on the fuselage adjacent to the cannon (so deposits from gunsmoke won't look so messy). Rudder is white; fin cap, streak on fuselage side, and marking on external fuel tank are all insignia red (remainder of fuel tank is gloss white).



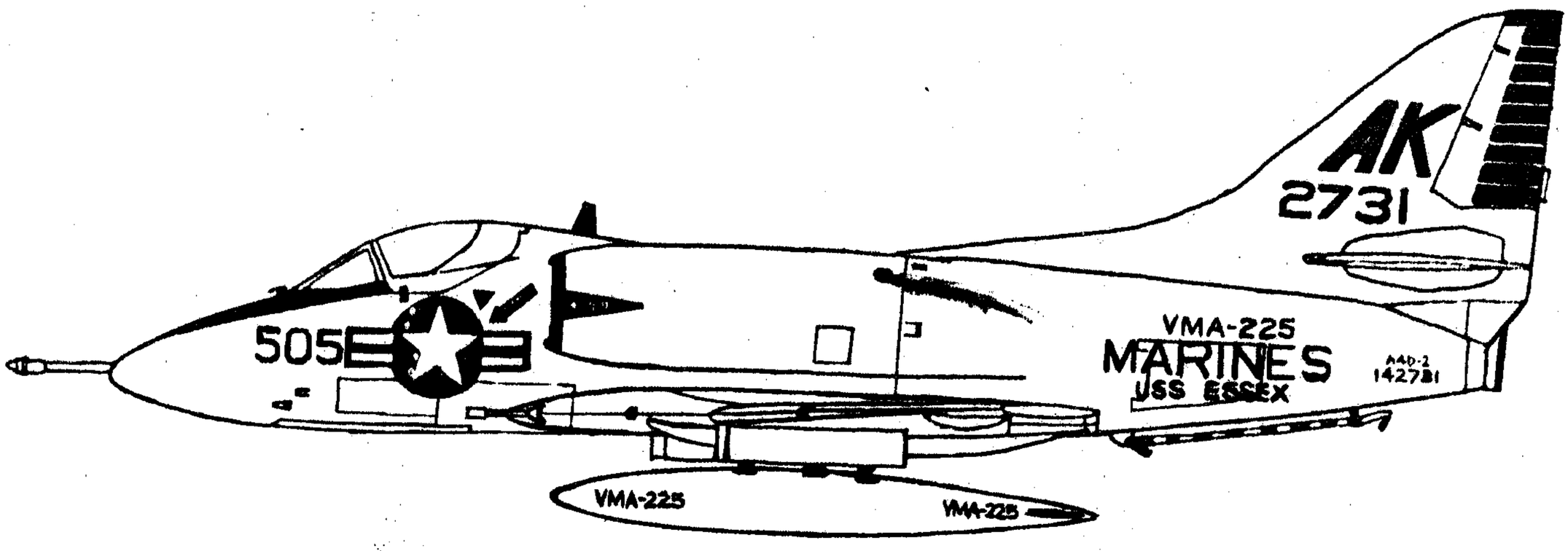
A-4E #151197 of VMA-332, circa 1964. (VMA-332 has become VMA(AW)-332 with A-6A aircraft.) Paint is standard, lettering is black, and anti-glare panel is gray. Rudder is white; vertical bar and polka-dots on rudder are insignia red. "EA" tail marking slants backward on other side of tail, but arrow points forward on both sides. Squadron emblem on inlet consists of a straw hat on a cane, both in straw-yellow (except for a white hatband); emblem is mirror-imaged on other side of fuselage, i.e., cane slants toward tail on both sides.



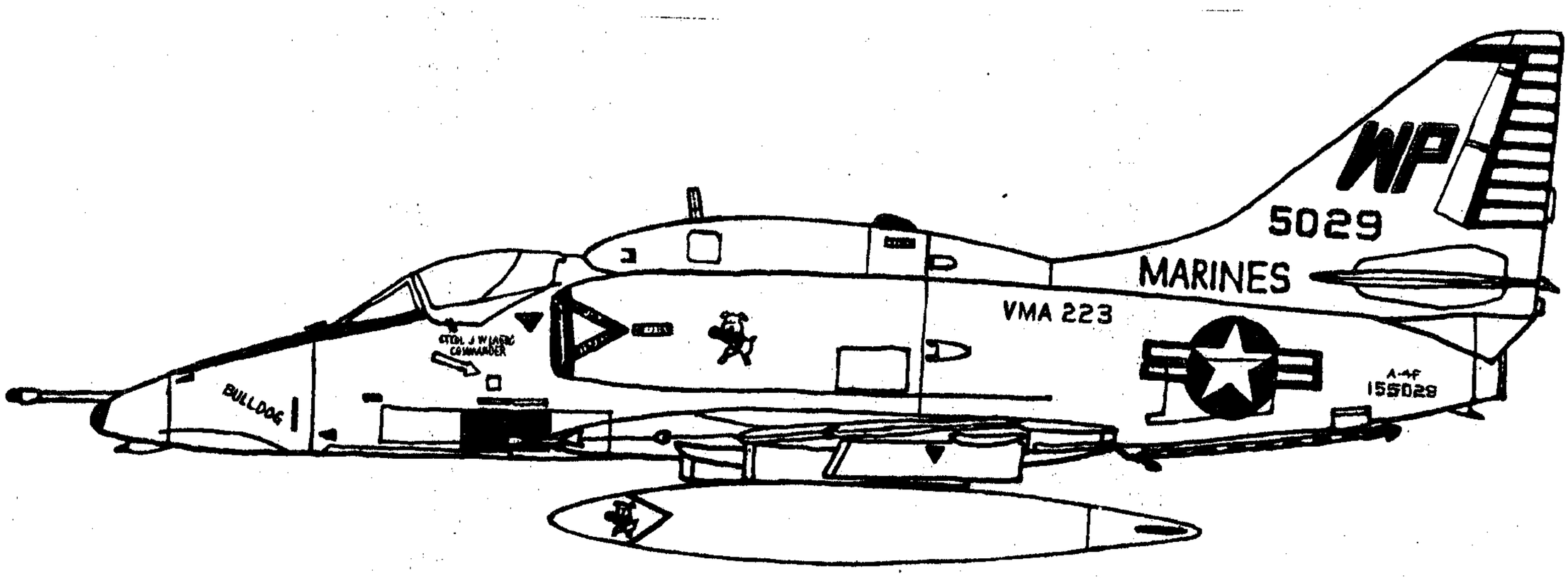
A-4C #148480 of VMA-133, a Marine Reserve unit based at NAS Alameda. This is the Group C.O.'s airplane, as indicated by the "00" nose number. Aircraft is shown as seen in February, 1972; a photo of this ship in slightly earlier markings (with old "5G" instead of "ME" tail code) appeared in the author's "Nose Number" article in the May 1972 Phantom Flyer. Standard paint, black lettering, black anti-glare panel on nose, and gloss black gun-blast area. Dark color on rudder and fin cap is insignia red, while panels between rudder stiffeners are yellow. Note small "00" in white on top of rudder. "00" on opposite side of nose slants oppositely.



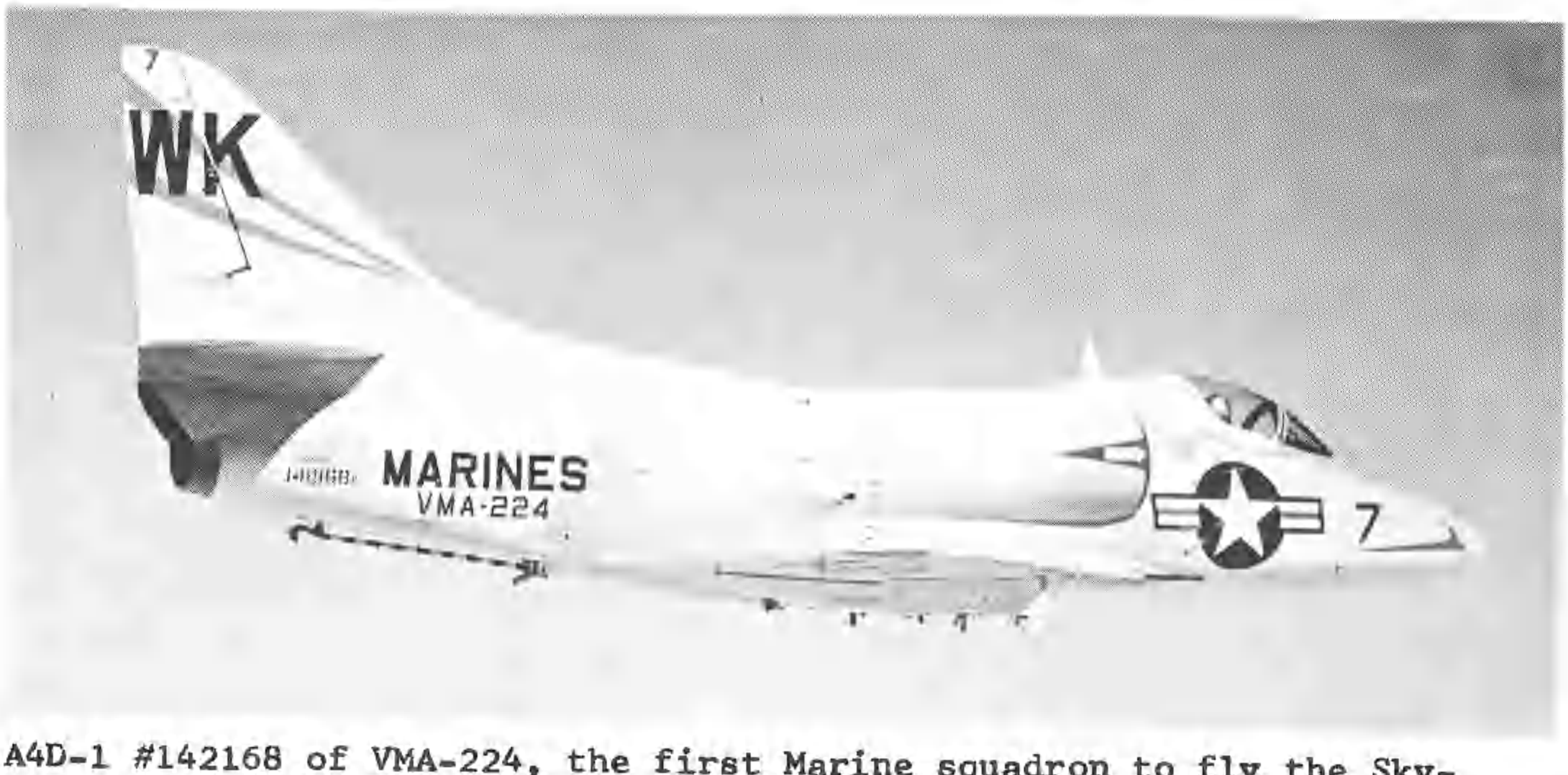
A-4E #150092 of VMA-121, seen at Ubon RTAFB late in 1968. Paint is standard, with black anti-glare panel and black lettering. "Green Knight" emblem is just that--a medium green knight (chess piece)--on a green-rimmed white disk. Emblem on opposite side of aircraft is identical, so that knight faces aft instead of forward. Rudder is white with medium green trim. Tail code "VK" slants backward on other side of tail. Note green-and-white candy-striping on the refueling probe (which extends aft as far as the panel line just forward of the windshield), and the smudging of the fuselage in the wing-root area resulting from cannon fire.



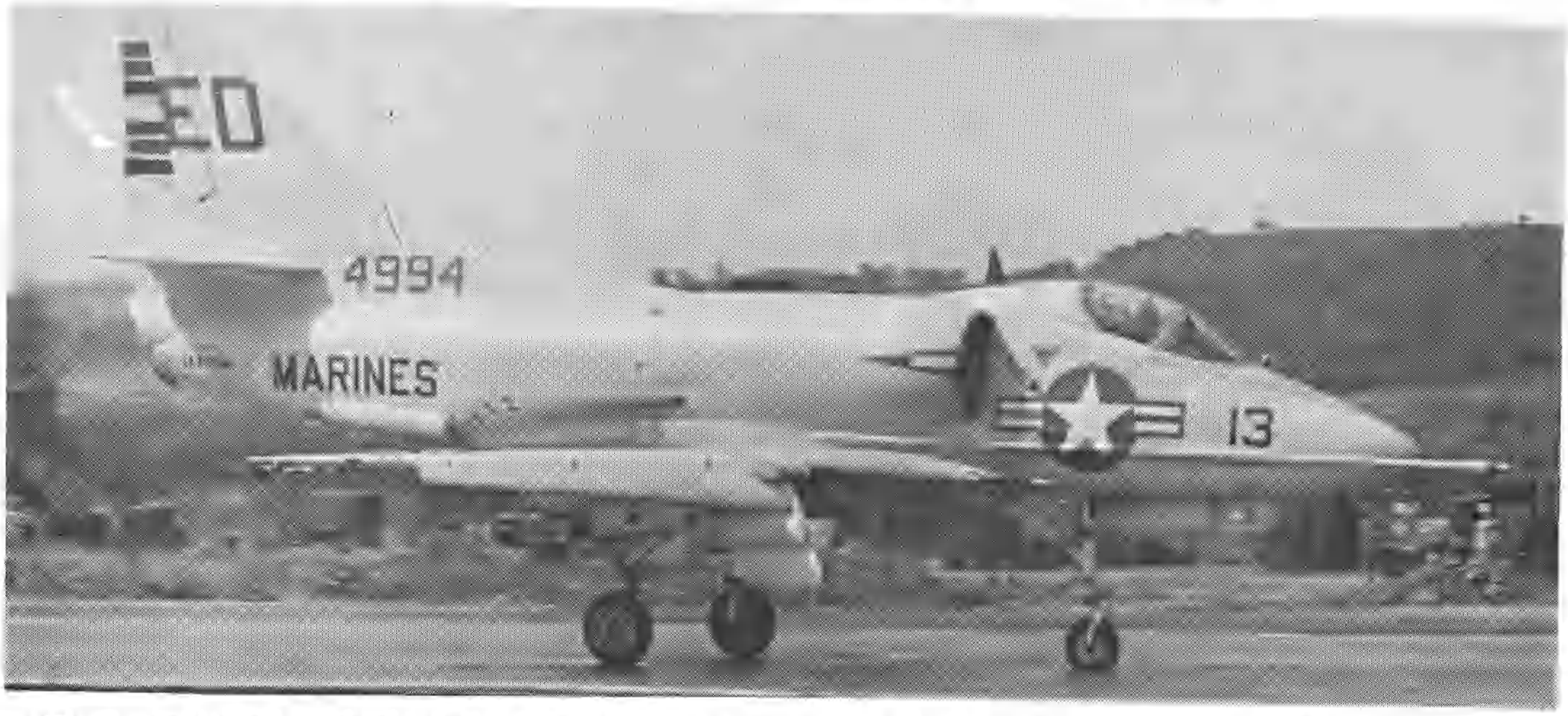
A4D-2 #142731 of VMA-225 while deployed aboard USS Essex with the Atlantic Fleet, circa 1960. Essex was an ASW carrier at the time; light attack squadrons (both Navy and Marine) often deployed aboard these carriers to provide some measure of CAP and intercept capability. On this aircraft, paint is standard and all lettering is black, including VMA-225 in two places on each gloss white external fuel tank. Color bars between stiffeners on rudder are dark green; remainder of rudder is gray, not white. RESCUE arrow is red/white; anti-glare panel is gray. Note streak aft of oil breather on fuselage side. Tail letters slant backward on other side of fin.



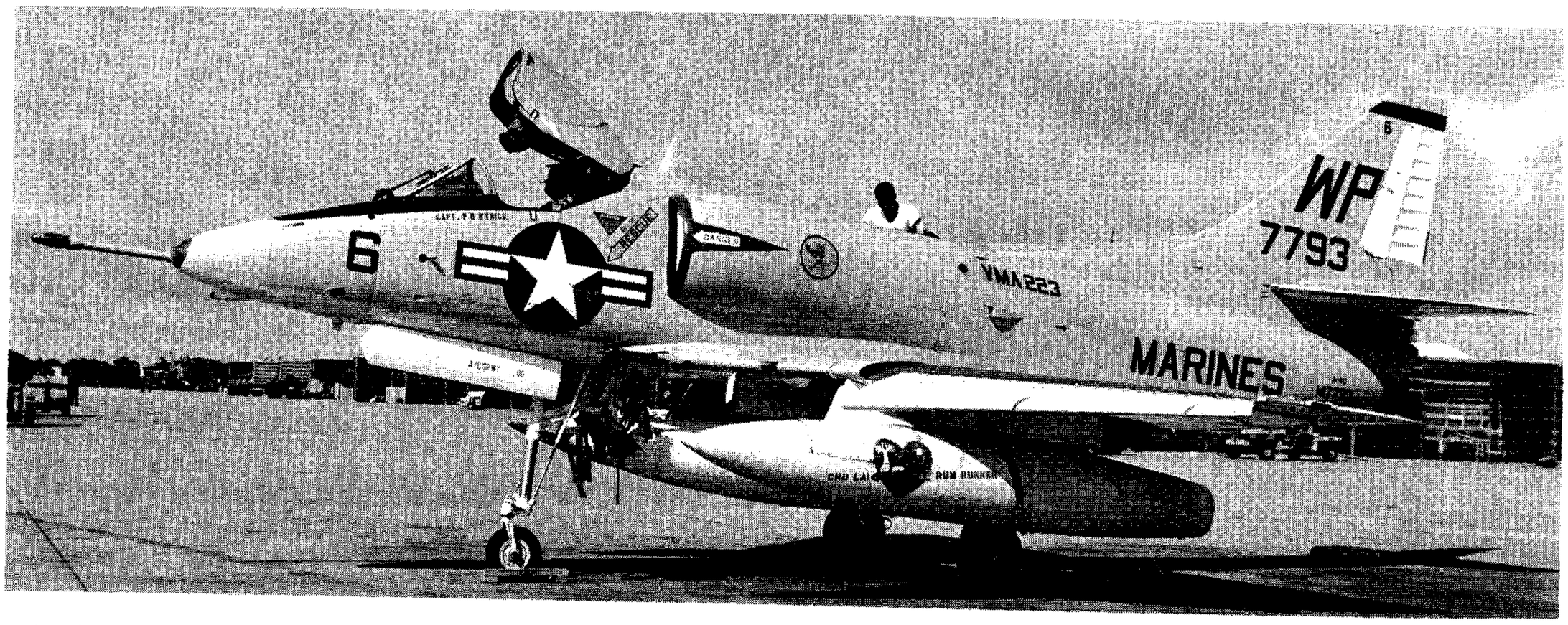
A-4F #155029 of VMA-223 in Spring, 1972. This quite-colorful ship is the mount of the Squadron's C.O., as indicated by "BULLDOG 1" on nose and "LT. COL. J.W. LAEZO, COMMANDER" under the cockpit (this side only). Bulldog emblem, which always faces forward, has gray body with black outline and details, black-and-yellow striped sweater, and carries red boxing gloves. External tanks are gloss white except for yellow area at nose, set off with black stripe; emblem is on both sides of each tank. Tail code "WP" slants toward trailing edge on both sides; shadowing of letters is in yellow. Rudder stiffeners are insignia red; panels between stiffeners are yellow, as is fin cap. Other dark marks on fin and rudder are black; remainder of rudder is white. Note gloss black painted area adjacent to cannon; anti-glare panel is also black.



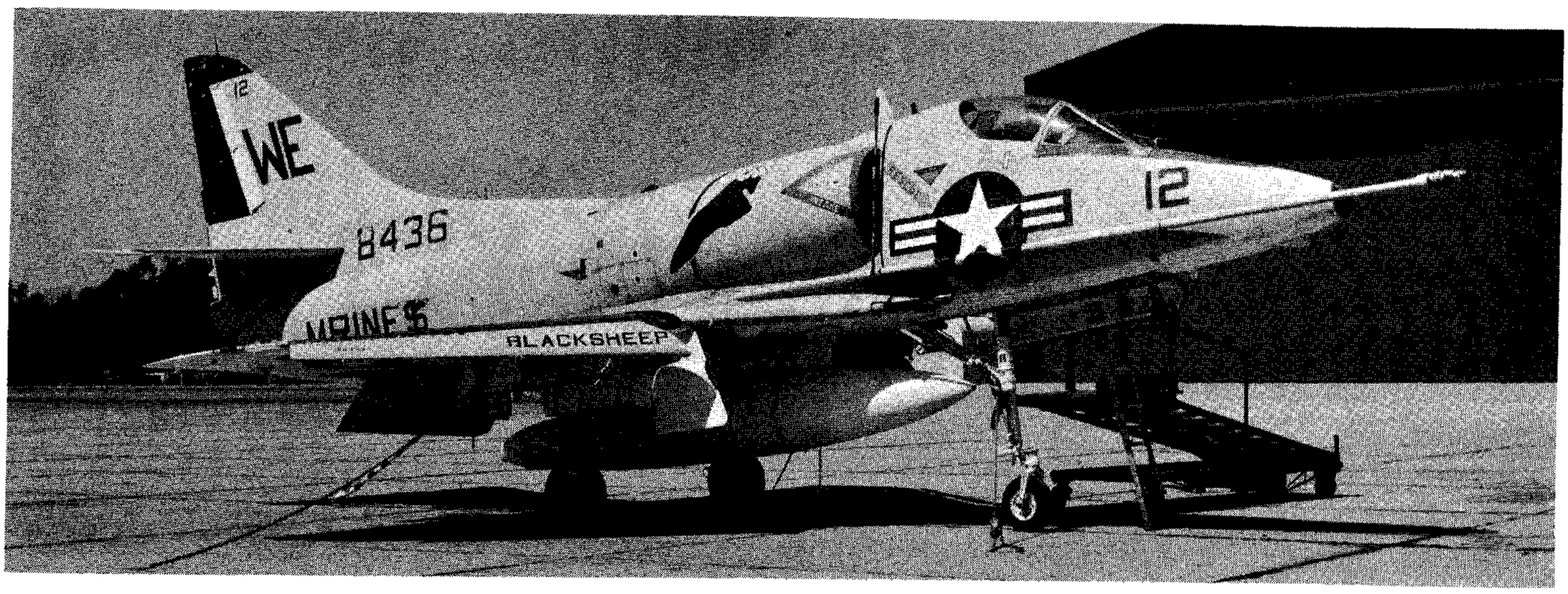
A4D-1 #142168 of VMA-224, the first Marine squadron to fly the Skyhawk. The unit was commissioned as VMF-224 in 1942, later seeing combat in the Pacific theater. Having been redesignated a VMA, the Squadron gave up F9F-8Bs for these A4Ds in January, 1957; after switching to the A4D-2N (A-4C), VMA-224 took up the All-Weather Attack mission as VMA(AW)-224 in the middle 1960s, acquiring A-6A aircraft at that time. This A4D-1 sports a gray rudder and red RESCUE arrows; the marking at the nose is medium green, as are the two slashes on the vertical tail and the outboard tips of the ailerons. USMC photo.



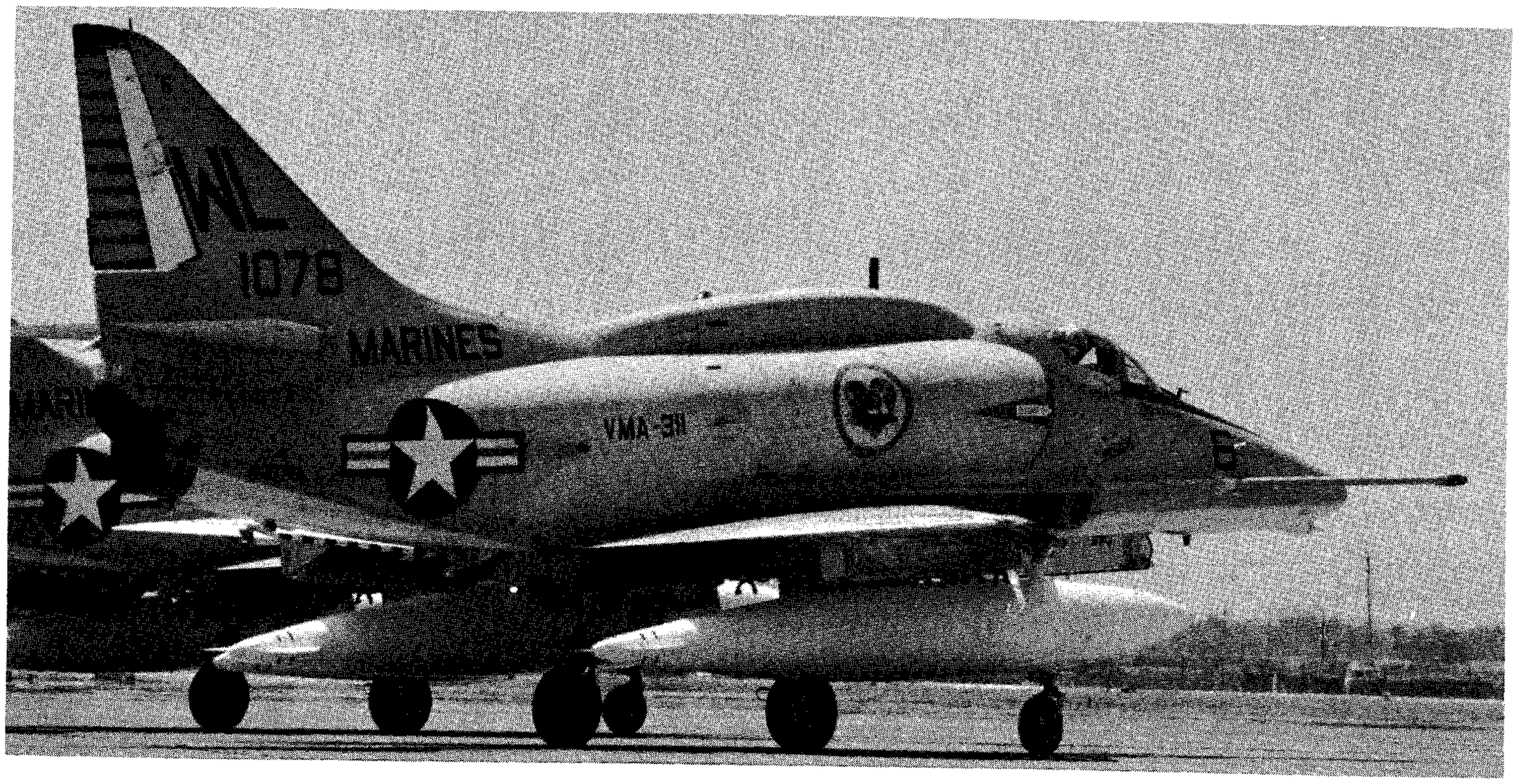
A4D-2 #144994 of VMA-533 makes an arrested short-field landing during maneuvers at NAS Roosevelt Roads, Puerto Rico, in 1961. Commissioned as VMF(N)-533, the Squadron saw night-fighting combat during W.W.II. It remained a Night-Fighter Squadron for several years, flying the -4 Banshee during the early 1950s. Becoming a VMA in 1957, the unit soon traded in its F9F-8B aircraft for A4Ds; it has since transitioned into A-6 Intruders, changing to the VMA(AW)-533 designation in the process. Note the gray anti-glare panel on this aircraft, as well as the gray rudder, the red RESCUE arrows, the absence of red paint under the slats, and the takeoff booster rockets on the aft fuselage. Colors of bars on rudder are not known; info regarding same would be appreciated. USMC photo.



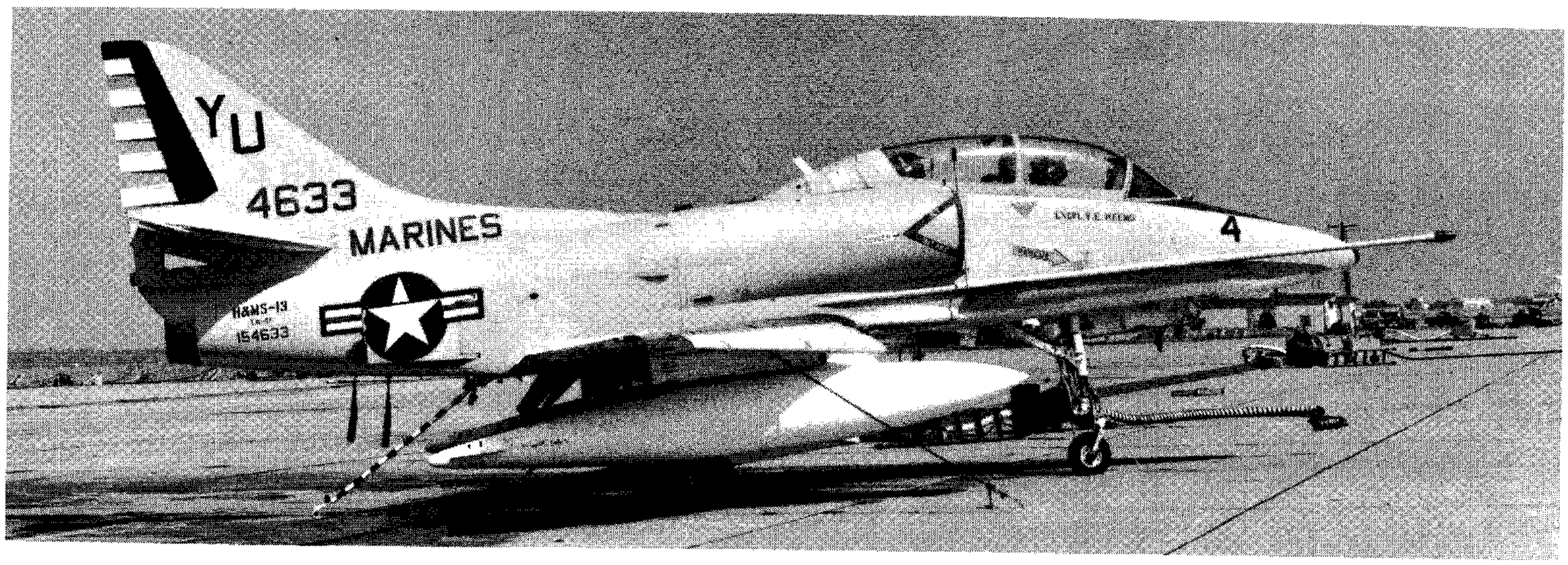
A-4C #147793 of VMA-223 at Ubon RTAFB in late 1968. Note the name, "Chu Lai Rum Runner", on the external tank. This tank has been modified with a couple of removable hatches, permitting it to be loaded up with canned beer at Ubon for the Marines at Chu Lai Air Base--hence the "Rum Runner" nickname! The emblem on the "beer tank" is actually that of VMA-311, which shared the Chu Lai field with VMA-223; it consists of a black & white Sylvester cat riding a gray flaming rocket, superimposed on a red heart. The top of the vertical fin is yellow, set off with a black band; the Squadron emblem on the inlet is a yellow disk with a black rim, carrying a gray bulldog with a black-&-yellow-striped sweater and red boxing gloves. Photo by Al Piccirillo.



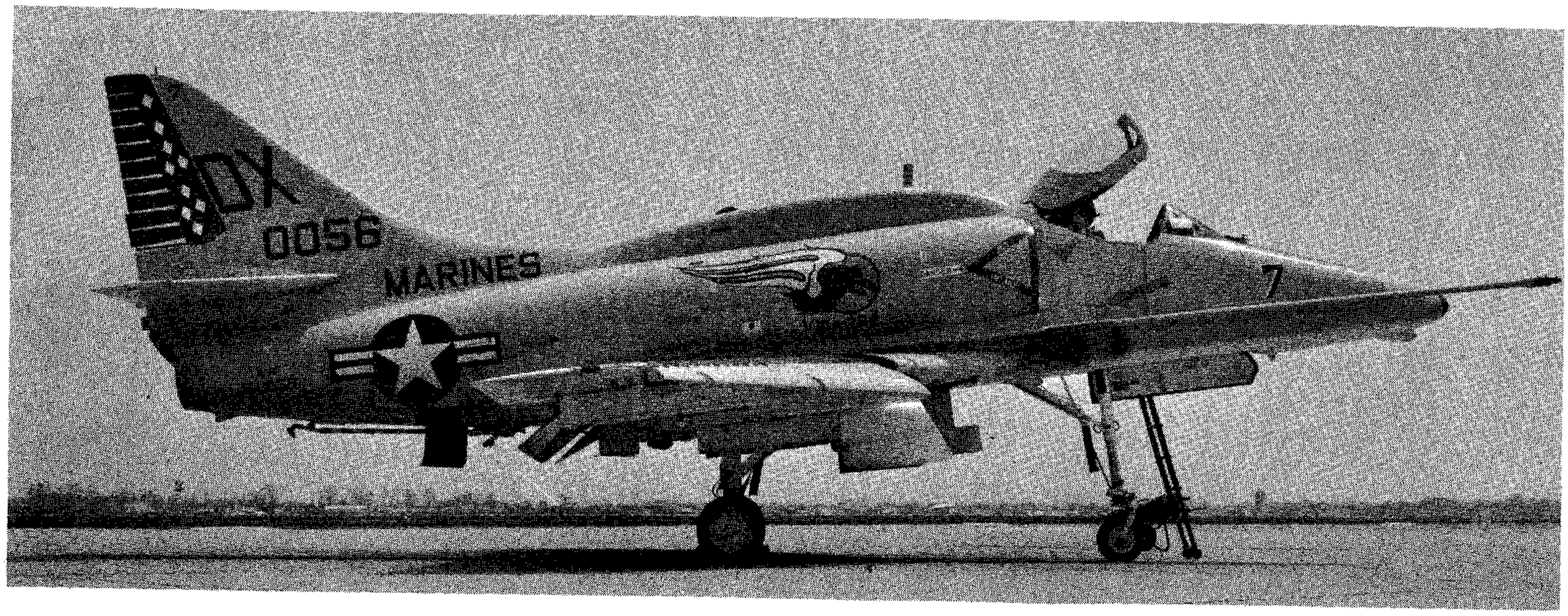
A-4C #148436 of VMA-214 at MCAS El Toro in July, 1969. A very well-known unit, VMF-214 was formed in 1942; it saw combat action later in the War, including carrier-based operations toward the War's end. On August 3, 1950, VMF-214 flew its F4U-4s off the USS Sicily to become the first Marine squadron to enter combat in the Korean War. The unit remained a VMF until 1958,when it exchanged F2H-4 Banshees for FJ-4B aircraft. VMA-214 has gone through several versions of the A-4 since equipping with the A4D-2 in January, 1962; it now flies the A-4M. Markings on this A-4C are all in black & white. Note BLACKSHEEP on the leading-edge slat (both sides), and the insignia red paint on areas of the wing exposed when the slat is out. Arnold Swanberg photo.



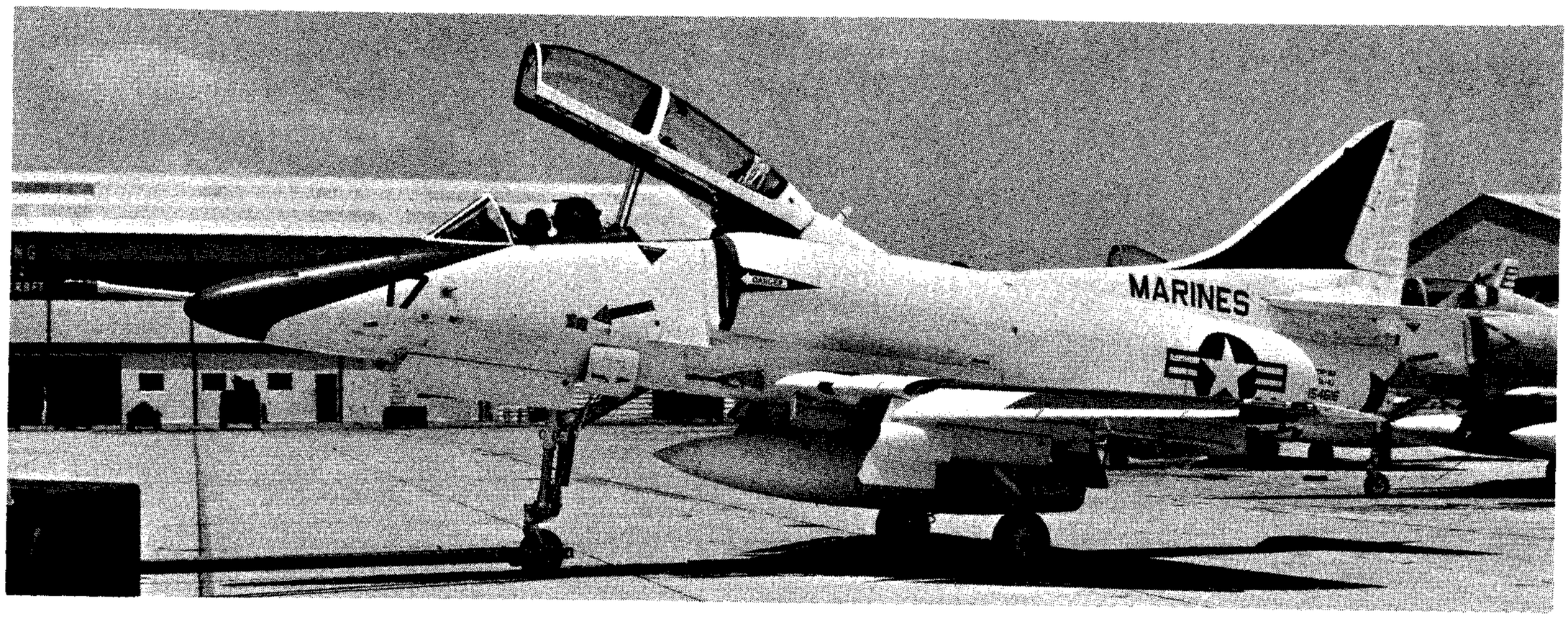
A-4E #151078 of VMA-311 taxis at MCAS Iwakuni, Japan. The Tomcats, assigned to Marine Aircraft Wing One, were one of the last two Marine squadrons to operate in Vietnam; during their 1972 tour of duty (flying from Bien Hoa AB), they increased their overall SEA combat tally to over 50,000 sorties. Commissioned during World War II as VMF-311, the Squadron served in W.W.II and later in the Korean War; in fact, it flew F9Fs into combat as the first Marine jet unit to operate in Korea (December 12, 1950). The Squadron's designation was changed to VMA-311 in 1958, at the time it traded F9F-8s for A4D-2s. Markings of the A-4E shown here consist of red on the rudder top and stiffeners, yellow bars between the stiffeners, and white on the remainder of the rudder; the Squadron's emblem is a black & white Sylvester cat riding a dark gray flaming rocket (facing forward on both sides) on a red heart in a yellow field with a red surround. Photo by Hideki Nagakubo, via Duane Kasulka.



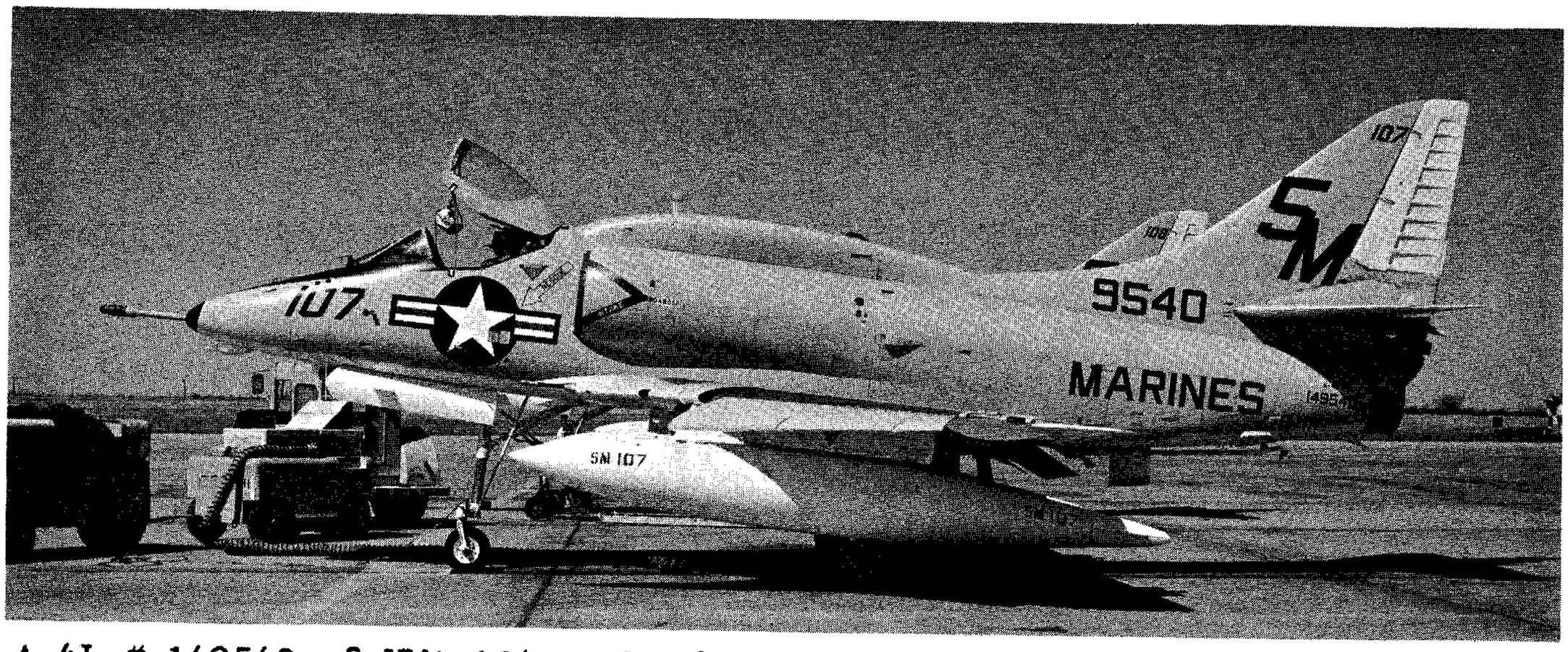
TA-4F #154633 of H&MS-13 (Headquarters and Maintenance Squadron 13) at MCAS El Toro in Spring, 1971. Overall paint scheme is standard. Rudder has insignia blue vertical band and blue top, alternating red and white bars between stiffeners, reminiscent of 1930s markings. Positions of "Y" and "U" are reversed on other side of tail. Photo by Harry Gann.



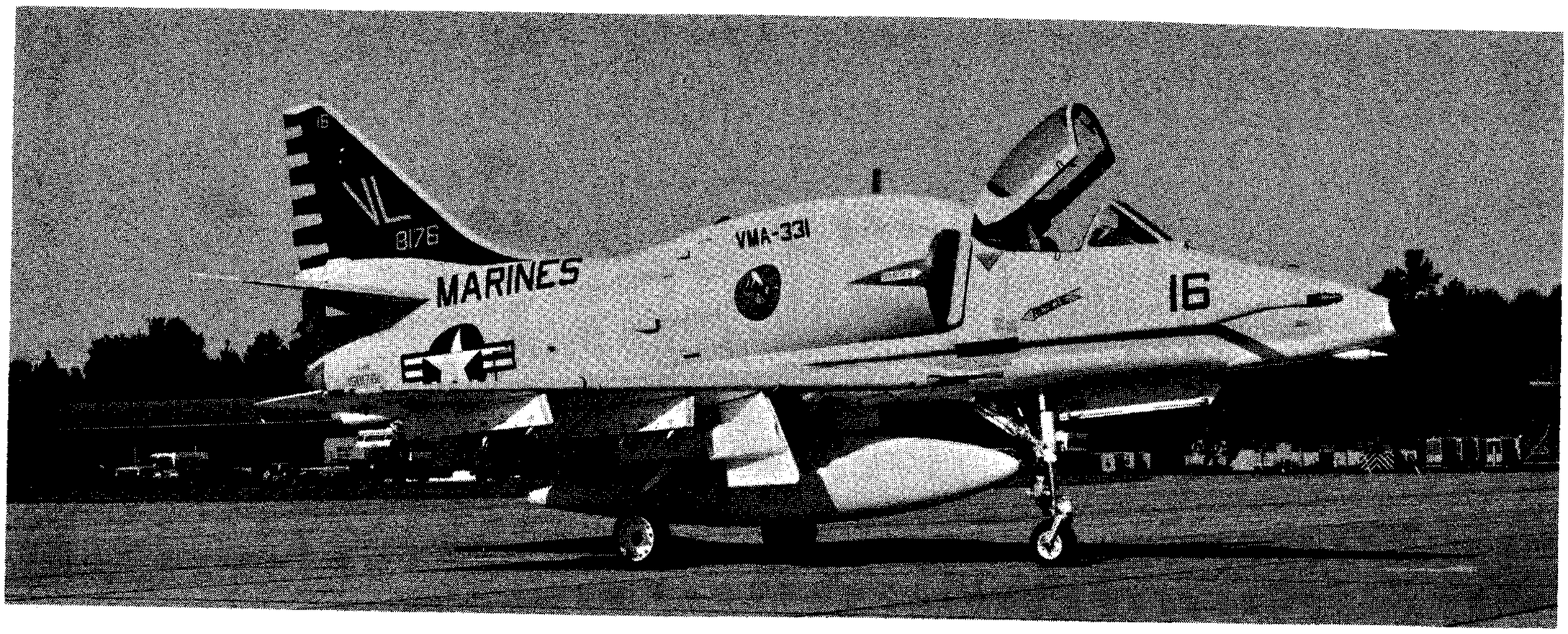
A-4E #150056 of VMA-324 in markings that were devised shortly before the Squadron became the first to fly the new A-4M. Rudder is insignia red with white diamonds and white on the stiffeners. The Squadron emblem, which faces forward on both sides of the aircraft, consists of a white-winged brown dog's head, both with black outline and details, superimposed on a red-bordered yellow disk. Other markings are typical; note white shadowing to "7" on nose. "DX" tail letters follow slant of rudder leading edge on both sides of tail. Humpback avionics fairing originally appeared on the A-4F, but was retrofitted to many A-4Es. VMA-324 originated as a Fighter Squadron in 1943, was decommissioned after the war, and was recommissioned as an Attack Squadron during the Korean War; it has remained active as VMA-324 since that time. Photo taken at NAF Detroit in May,1971 by Bill Greeley.



TA-4J #154616 of VMT-203, a Marine Advanced Training Squadron at MCAS Cherry Point, seen in June, 1971. Glossy paint scheme is white overall with international orange (red-orange) on nose, vertical stabilizer, and outer wing panels (above and below--inboard extent can be observed on extended leading-edge slat). Note very small unit designation just above aircraft designation on rear fuselage; also note the black anti-glare panel. Tail code of this unit is actually "KD"; letter "K" is uppermost on both sides of tail. The TA-4J is basically a TA-4F with most of the weapons-delivery avionics omitted; VMT-203 flies both types. Fred Roos photo.



A-4L # 149540 of VMA-124, a Marine Air Reserve unit based at NAS Memphis, seen here in April, 1971, shortly before the "5M" tail code was replaced by "QP" in the new Reserve coding system. Paint is glossy gray in place of the earlier non-specular gray; otherwise markings are standard. Tail code and nose number slant oppositely on starboard side of aircraft. A-4L is an A-4C modernized to A-4F standard in many respects (e.g., the dorsal avionics package); conversions all went to Navy and Marine Reserves. As VMF-214 in World War II, this squadron was the first Marine unit to fly F4U Corsairs, taking them into combat from Henderson Field, Guadalcanal in February, 1942. Photograph by Fred Roos.



A-4M #158176 of VMA-331, the second squadron to be equipped with the newest Skyhawk model, seen here at its home base, MCAS Beaufort, in June, 1972. This unit originated in 1943 as VMSB-331, seeing combat action before being decommissioned at the end of W.W.II; it was activated as VMA-331 during the Korean War, and has remained operational ever since. It flew Skyraiders for a long time during the 1950s before picking up Skyhawks around 1958; it has since operated several models of the A-4. Tail on this A-4M is black with a gray leading edge and yellow lettering and rudder bars. Squadron badge is a black & yellow bumblebee with white wings, face, and antennae, carrying a medium-green bomb with two white bands, all superimposed on a white-bordered red disk; bee faces forward on both sides of fuselage. Photo by Frank MacSorley, via Rowland Gill.