THE OFFICIAL MONOGRA US NAVY & MARINE CORPS AIRCRAFT COLOR GUIDE

Vol 4 1960—1993

John M. Elliott Maj. USMC(Ret.)

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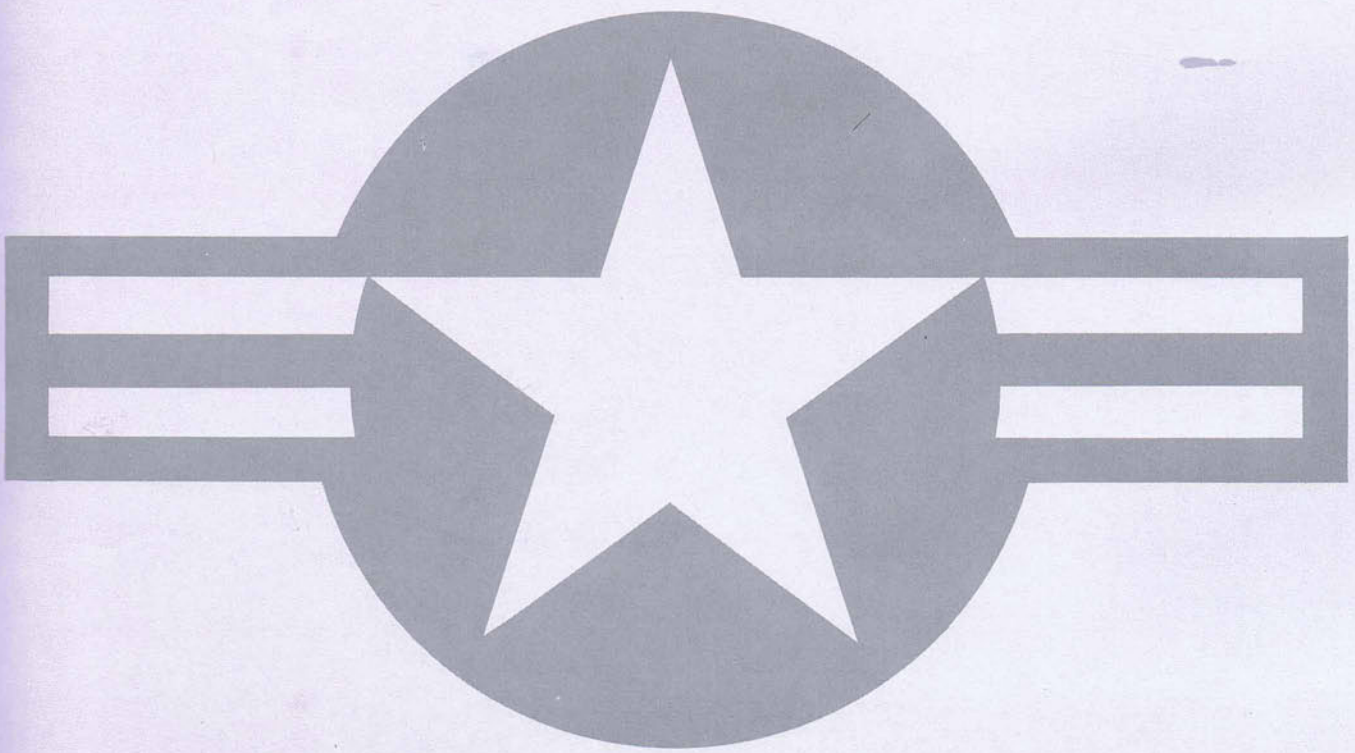

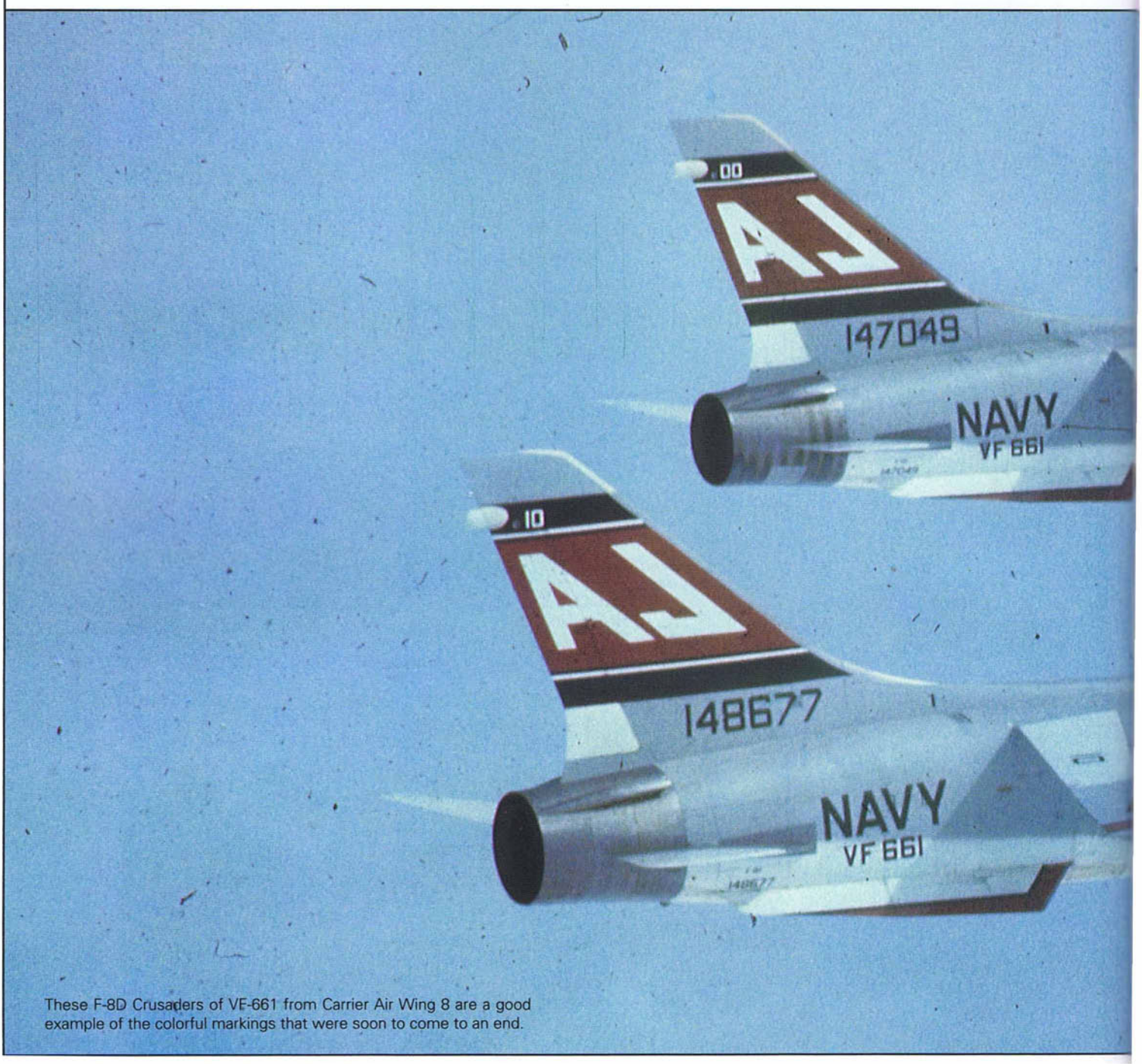

These F-8D Crusaders of VF-661 from Carrier Air Wing 8 are a good example of the colorful markings that were soon to come to an end.

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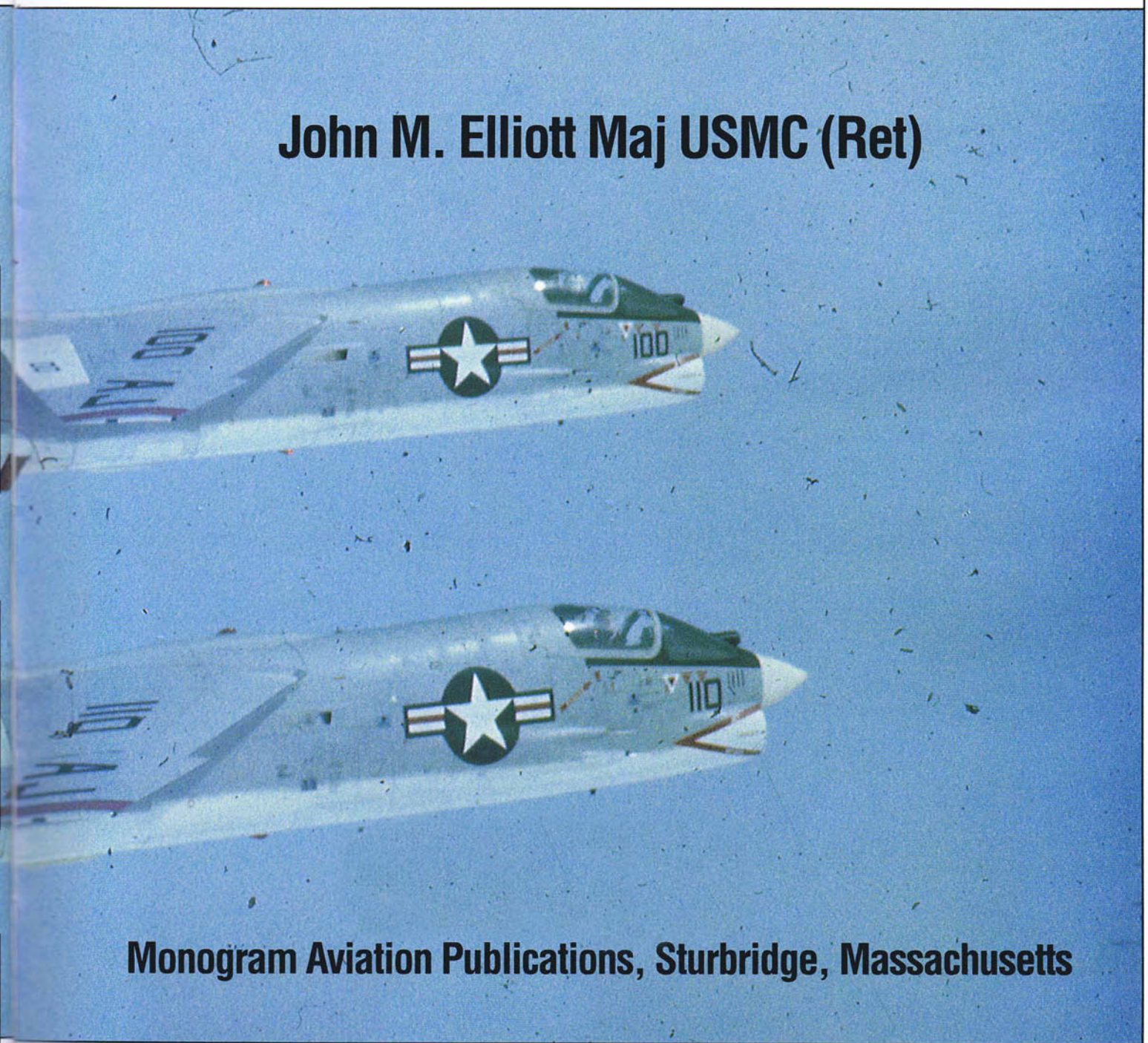

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The 7Z on the tail of the S-2A identifies it as belonging to a reserve squadron at NAS South Weymouth.

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NS
136658

This S-2A with its radar dome and MAD boom extended is identified as a component of Anti-submarine Carrier Air Group 53 by the letters NS on the tail.

FOREWORD

Throughout the history of Naval Aviation, numerous changes occurred in the paint schemes and markings used on Navy and Marine Corps aircraft. Some of these changes can be documented through review of old and new specifications, standards and correspondence. However, many of the paint schemes that have at one time or another appeared on Navy and Marine Corps aircraft were experimental in nature or implemented only at the squadron or air wing level. Accordingly, little documentation is available to determine the details of the paint scheme applied or why such a scheme was utilized. John Elliott, with his first three volumes of the Official Monogram US Navy & Marine Corps Aircraft Color Guide provided a much clearer insight into the use of paint schemes and markings of aircraft since the beginning of Naval Aviation in 1911.

John Elliott's fourth and final volume covers the period of 1960 to 1993. During this period, as with the periods covered in his previous volumes, numerous changes occurred. The Navy progressed from glossy paint schemes with colorful markings to the present flat gray tactical paint schemes with contrasting gray markings. Gone are the days of colorful tail markings and red white and blue national insignias. Practicality replaced the romantic notion of knights in the sky with their colorful coats-of-arms. Along the way, many experimental schemes were tested and discarded. John Elliott provides an excellent account of this latest evolution in his final volume.

One may ask if the use of paint schemes are still important in the current era of sophisticated weapon and missile systems? The answer to the question is an unequivocal yes! Optical tracking is still vital to certain anti-aircraft weapon systems. In order to maximize the survivability of an aircraft one must address all factors effecting survivability. One factor is minimal visual detectability. The current schemes used on Navy and Marine Corps aircraft while not flashy, increase survivability. The aircraft might not look pretty, but their chances of a round trip are increased with today's paint schemes. So when you compare the colorful schemes in the first three volumes to the schemes in this volume, keep this in mind. Better a dull airplane than a missing one.

David P. Hornick

David P. Hornick
Combat Survivability Branch Head
Naval Air Systems Command

The opinion expressed in this foreword are the personal opinions of the foreword's author and not necessarily the opinions of the US Navy, Department of Defense or the Federal Government.

INTRODUCTION

Thirty years ago I saw the following quotation in the book *The Eye of the Wind* by Peter Scott. "Stories which I have been telling for years with great conviction, believing them to be true to the smallest detail, have proved after careful research among my papers to be greatly garbled. Such stories can be corrected, but what of the most of other reminiscences of which no contemporary record remains? Must I water them down in the sacred name of truth, or can the reader be trusted to apply the "Scott Reduction Index" — an arbitrary figure between twenty and fifty percent by which all lengths, breadths, weights, distances and vehement statements should automatically be reduced?"

This has been a guiding principle in the compilation of these four volumes, so that the reader can be sure that what is presented is factual and not the product of numerous "Sea Stories," but a text book to be relied on as to how the Navy and Marine Corps intended their aircraft to be painted. I trust you will find this to be so.

During the thirty years covered in this book, there have been sweeping changes in US naval aviation that have had an effect on the painting and marking of aircraft, as well as the directives which have prescribed these schemes.

On August 18, 1959, after thirty-eight years, the Bureau of Aeronautics ceased to exist. On this date the Bureau of Aeronautics and the Bureau of Ordnance were combined under the title Bureau of Naval Weapons. This marriage lasted for seven years, when another reorganization took place on May 1, 1966. The offices with which we are concerned, along with others, were reorganized into the present Naval Air Systems Command. These changes are reflected in the cognizance letters which follow a directive number.

In 1962, a sweeping change took place to bring all US military aircraft under the same identification system. This changed the designation of all Navy and Marine Corps aircraft from the system which had been in use since 1922. See Appendix A for complete coverage of this new system.

We sometimes are lulled into a false sense of security with the title "Standard" and begin to believe that what is standard will remain for all time. However, even standards change, and on December 15, 1989, Federal Standard 595b *Colors Used in Government Procurement* was issued. It should be remembered that this standard covers all colors which may be used on any US government project or equipment. Consequently, there are only a select few colors which pertain to aircraft. There are, however, some new colors, such as Field Green, which were not in the earlier book, and a new shade for Insignia White. The white color used on US Navy and Marine Corps aircraft never met FED-STD-595 color number 17875, because military specifications did not permit tinting agents in this color. To correct this discrepancy, General Services Administration (GSA) established a new color, number 17925, which is the actual color which had been used in the past.

After a period of fourteen years in which no major directives pertaining to aircraft painting and marking were issued, the long-promised instructions were published. MIL-STD-2161(AS), dated April 18, 1985, *Military Standard; Paint Schemes and Exterior Markings for U.S. Navy and Marine Corps Aircraft* completely revised the painting and markings which are to be applied to US naval aircraft. For the first time, specific instructions are provided for each aircraft type in service, not only for the overall paint scheme, but the size and location of all mandatory markings which are to be painted on the exterior surface of the aircraft. Both tactical and land camouflage schemes are depicted for appropriate aircraft. Where required, the high-visibility scheme is shown, as are the schemes for special-purpose aircraft. Military aircraft used in research projects, of course, are not covered, as they are subject to Naval Air Systems Command approval in each case.

Because of this sweeping change in policy, and to insure there are no areas of confusion as to what may still be in effect, I have chosen to describe the entire system, rather than just those portions which have been changed, with the understanding, as in the past, that an item not mentioned as changed or deleted would continue to be used as described in some previous volume. Obviously, it is not practical within a book of this size to provide a detailed drawing of each aircraft type in the naval service. This means that not all tactical paint schemes or land camouflage schemes will be depicted. While these designs may not be changed without approval, there should be little problem, with the aid of the numerous photographs, drawings, and paintings provided, to determine with reasonable accuracy what a specific aircraft scheme

should be. To be completely accurate, though, the Military Standard 2161 must be consulted.

In the three previous volumes, and in this book up to the introduction of MIL-STD-2161(AS), color names have been used to identify colors. These names were established in the appropriate directives pertaining to glossy and nonspecular paints. When a specific color was mentioned, such as International Orange, the color name was capitalized. However, when a general color was mentioned, such as gray, which was not a specific color name, it was not capitalized. With the introduction of MIL-STD-2161(AS) on April 18, 1985, there are numerous new colors being used in the painting of US naval aircraft which have not previously been identified by a specific name. At this point in the text it has become necessary to add the Federal Standard 595 five-digit number, enclosed in parenthesis after the general color name, to insure the correct color being identified. These new colors are not capitalized.

This fourth book in the series of painting and marking of US Navy and Marine Corps aircraft brings the series to a close with the most current information available at the time it was submitted to the printer. There have been numerous paint schemes applied to naval aircraft that have not been mentioned in these four volumes. There were several reasons for these omissions. The paint schemes that have been covered are those for which official directives exist and can be documented. There have been changes which I am aware of, such as the change from Light Gray to Aluminum on the fuselage in the mid-1930s, but for which no directives have been located. Even the painting instructions of Douglas Aircraft and Grumman Aircraft Engineering Corporation, that specified the aluminum finish, fail to identify the Navy directive that specified the change. There were other schemes tried which were a local change or experimental scheme on very few aircraft. This was especially true during the period covered in this volume. In addition to these overall color schemes, there is the problem of individual squadron markings. Some of these, without a doubt, produced the most brilliant and colorful aircraft in any military service. However, there were so many variations, and they changed so frequently, that it would take a book of its own to document them. I have tried in the paintings, drawings, and photographs to show enough of these imaginative schemes to give a feel for the period in which they were so popular. Additional examples may be found in the numerous books on the individual aircraft of the period.

It is not the intent, nor is it within the scope of the four books in this series, to track the lineage of any squadron, but rather to document the various markings carried on the aircraft of any squadron. There are numerous cases in the visual identification system tables in which a squadron will disappear as you read from one table to the next, yet you will not find it listed in subsequent table of disestablished or deactivated units. These cases are not the result of an oversight, but are caused by a movement of the unit to another command in which it is then identified by the code of the senior command.

Another word of warning concerning the use of these tables in tracking a squadron — DON'T DO IT! A given squadron designation in one table does not necessarily indicate the same squadron designation as shown in the previous table. For example: the designation VF-1 through the years has been used by seven different squadrons which had no connection with each other. Only the official unit history compiled by the Aviation History Branch, Navy Historical Center, can give the correct lineage.

As in the three previous books, the drawings may show designations used by an actual squadron, but they are not intended to depict any specific squadron's aircraft, or to show all structural details. Rather, they are intended to illustrate the placement of markings and intended application of the various color schemes as given in the directives, all of which, in many cases, have been disregarded by using activities, as the directives were frequently many years out of date.

This volume brings us full circle. From the early days when navy aircraft were to be Light Gray and Aluminum, through the colorful schemes of the 30s and drab wartime camouflage to the bright Insignia White, Light Gray and fluorescent Red Orange, to the present gray-on-gray. Even the familiar national aircraft insignia has lost its patriotic red, white and blue, to become shades of gray, or black, as have the distinctive yellow rescue arrows and red warning symbols. Not only have the colors changed, but so has the composition of the paints used, which renders the paint low IR reflective. Unfortunately, due to poor quality control of paint, or utilizing the wrong colors during field touch-up operational aircraft can soon develop a splotchy appearance.

But there is a faint glimmer of light. We are now seeing a slight bit of color appearing on some aircraft. Not the imaginative

markings of the past, to be sure, but enough to lift some aircraft out of the drab and monotonous gray-on-gray tactical paint schemes.

Those who have read through these four volumes must now realize the large discrepancies through the years between what was specified and what was actually done. The only consistent aspect of painting US naval aircraft has been its inconsistency. Because of this, I would be the last person to say that any specific scheme has not been used. The reader should also now realize the futility of trying to prescribe an exact paint scheme for a given period without a photograph of the aircraft in question. It is even more impossible to define an exact paint color — which probably didn't exist in the first place — for a specific period.

However, I have tried to identify the myriad of changes in the painting and marking of US naval aircraft and the directives which decreed each change.

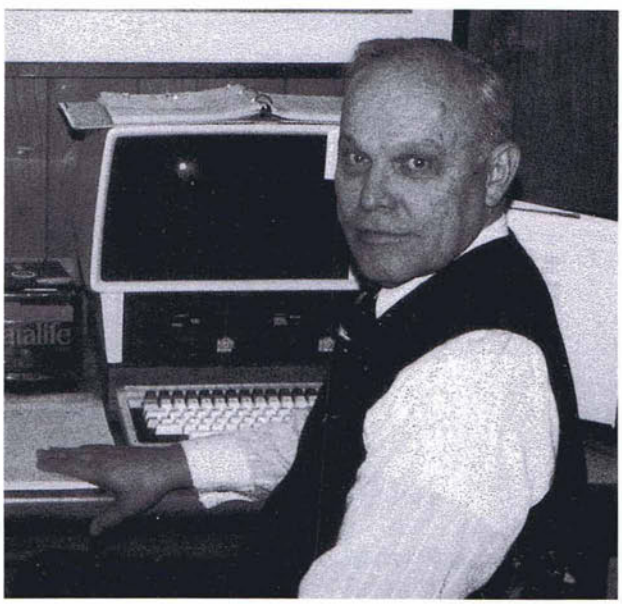
It has been a long, sometimes frustrating project, yet a project I felt needed to be undertaken. It is with a sense of relief that I have reached its conclusion, and I hope it will help to fill a void in the history of US naval aviation.

Winston Churchill once said "Writing a book is an adventure. To begin with, it is a toy, an amusement; then it becomes a mistress, and then a master, and then a tyrant." The adventure is over; I have laid the tyrant to rest.

ACKNOWLEDGMENTS

Prior to embarking on a project as large and involved as this series, an author must feel that he is quiet familiar with the subject. But, more importantly, he must have access to a vast number of photographs, documents and other support material. However, no one could anticipate every potential trouble spot. An author simply has to move ahead with what he has until gaps or weaknesses are encountered. It is at this point authors often seek the assistance of fellow enthusiasts.

It is certainly true that Marines help each other and I have been fortunate in this respect through many former associates in the Corps. I would like, though, to specifically recognize Harold W. Morris for his assistance with the painting of Marine Corps helicopters during Operation Desert Storm. LtCol. W.A. Beebe, with his personal experience, was equally helpful for the Vietnam period.



A cheerful response was always forthcoming from Lynda Crawford in Op 5-15, the Aviation Statistical Branch, when official records required checking.

I mastered drafting fifty odd years ago, which made it possible to produce the line drawings in this series. But I want to thank Charles C. Cooney, Art Director Naval Aviation News, for guiding me through color overlays.

The three pages of colorful unit insignia appearing in this volume were painstakingly reproduced by Sonny Schug of Studio West, Scottsdale, Arizona.

The Munsell system of color identification has made it possible to tie the various color numbering systems together with a system format that is recognized world wide. Thanks to this format it is now possible to correctly identify a specific color with great accuracy. This activity would not have been possible without the assistance of the Munsell company. I especially wish to thank Louise P. Galyon, the Resident Manager in Baltimore, Maryland and Harold Marcus, Product Manager, Munsell in Newburgh, New York.

Finally, I also want to personally thank all contributors who have not been mentioned, for without the interest and participation of all, this series would have not been possible.

BELOW: The A-4C was operated for a number of years by various reserve squadrons. Notice the variety of weapons carried on this example photographed at NAS South Weymouth in October 1969.

SECTION 1

AIRCRAFT COLORING AND PROTECTIVE COATING

CHAPTER 1 1960-1969

MIL-C-8779A(ASG), *Colors, Interior, Aircraft; Requirements for,* dated June 20, 1960, slightly modified the painting of interior areas. Control knobs were now to be Dark Gull Gray, with their handles remaining Light Gull Gray.

Upholstered seats, seat cushions and bunk covers were to be a rust color to match Color No. 22203 of Federal Standard 595a.

Special operational compartments were identified as those where there is no regular need for making visual observations from the aircraft at night and no advantage in dark adaptability of aircrew members. In these areas, the immediate working area in front of the operators, such as mounting racks, control surfaces, table tops and support structures were to be Dark Gull Gray. In all other areas, wall and ceiling surfaces above a line 3 feet (91.44 cm) from the floor, including all exposed structures and ducts, were to be Light Green to match Color No. 34516.

Nonfunctional table tops in passenger and recreational areas were to match Color No. 33531. Lavatory floors and walls up to a line 3 feet (91.44 cm) above the floor, as well as all curtains in lavatory areas, were to be Light Gull Gray. Remaining walls and ceilings were to be Light Green. Soundproofing and trim throughout the aircraft were now to be Light Green.

Amendment 1 to MIL-C-8779A(ASG) required all detachable seat cushions and padding to be approximately the same as Color No. 22246 (Orange). All other upholstered seats were to remain Color No. 22203. There is really very little difference between these two shades.

The use of fluorescent Red Orange paint was still required on all transports operated predominantly within the conti-

Right: The FJ-3D of VU-1 in the distinctive drone control scheme contrasts sharply with the FJ-3 and FJ-4 in the normal carrier scheme.


NAVY
9
A
6107
NAVY
8
6
7

Left: Identification of this Engine Gray HSS-1 of HS-8 was far easier in 1960 than with the current paint scheme.

nental US, as well as other aircraft utilized for training, pilot proficiency and utility aircraft. However, the areas to be painted with this material were greatly reduced with the issuing of MIL-C-18263(Wep), *Colors, Exterior, Naval Aircraft; Requirements for*, dated December 27, 1961.

Both the upper and lower surface of the wings from the tip inboard for about one-third of the length of each wing were to be so painted. This area was to extend no less than 4 feet (121.92 cm), nor more than 8 feet (243.84 cm), and should terminate at a natural break in the wing contour, unless specific dimensions were given. Horizontal control surfaces, including ailerons, were not to be overpainted with fluorescent material. The entire vertical tail section, to the zone where the fin flares into the fuselage, was to be painted. In the event it was deemed advisable to avoid critical rebalancing, vertical control surfaces could be left the normal painted finish of the aircraft. On transports, the bottom and sides of the fuselage, starting at the radome, if any, and extending aft to a line perpendicular to the leading edge of the wing on two-engine aircraft, or aft to a line perpendicular to the most forward portion of the engines on four-engine aircraft, were to be painted fluorescent Red Orange. All other aircraft were to have this paint applied on the bottom and sides of the front portion of the fuselage, starting at the radome, if any, and extending aft to a line perpendicular to the forward edge of the front canopy. As before, the customary insignia, markings, solar heat-reflecting finish, antiglare surfaces, walkway materials, rain-erosion-resistant finish, deicer boots, transparent areas, hinges, screens, any part of the exhaust trail areas, leading edges, polished areas, or any area that would produce glare in the pilot's or co-pilot's eyes were to remain in their original color and not be overpainted. A margin, not to exceed 2 inches (5.08 cm), was to be left around the national aircraft insignia. Small areas that would require extensive masking prior to application of the fluorescent finish could retain their original color scheme. Fluorescent paint was not to be applied to painted nose sections having an area of less than 2 square feet (12.90 cm^2), nor to any horizontal control surfaces.

As in the past, combat aircraft operating in localities of high-density air traffic could have the fluorescent finish applied locally, when authorized by the applicable commander (Commander, Air Force, U.S. Pacific Fleet; Commander, Air Force, U.S. Atlantic Fleet; for the Navy, and in the case of aircraft assigned to the Marine Corps, Commanding General, Aircraft, Fleet Marine Force, Pacific; Commanding General, Aircraft, Fleet Marine Force, Atlantic; or the Commandant of the Marine Corps). However, prior to overseas deployment, except for purely training exercises during such a deployment, the temporary high-visibility paint scheme had to be removed and the aircraft restored to its originally specified color scheme.

A new colorful paint scheme was now specified for aircraft assigned to the Search and Rescue mission. The vertical stabilizer, upper and lower surfaces of the wing from the wing float outboard, less the ailerons, and sides of the bow forward from a point approximately in line with the forward-most point of the windshield, were to be fluorescent Red Orange. Wing tip floats and struts, the center section of the wing upper surface, including upper surface of engine nacelles aft of the wing leading edge, and a 3-foot (91.44 cm) band around the rear of the fuselage, were to be glossy Orange Yellow Color No. 13538. The bottom and sides of the fuselage, both sides of the horizontal stabilizer and elevators, both sides of the rudder above the elevators, entire engine cowls, and all wing surfaces not previously specified, were to be Seaplane Gray. The remainder of the upper fuselage was to be Insignia White, with the exception of the antiglare panel. On each side of the fuselage, centered between the leading edge of the wing and the bow, was to be a rectangle, the length of which was to be three times its height. The height was to be one-third the height of the projection of the fuselage side at point of application, except that it could be no greater than 36 inches, nor less than 20 inches (91.44 cm, nor less than 50.80 cm). This rectangle was to be glossy Orange Yellow and enclosed by a glossy Black border 2 inches (5.08 cm) in width.

Rain-erosion-resistant finishes for metal surfaces on all aircraft, such as leading edges of airfoils, were to be Light Gray or Aluminized. This finish was now specified to extend aft to a line established at approximately 3 inches (7.62 cm) from the leading edge.

The interior surface and inboard end of wing leading edge slats, as well as the wing area covered by the slats in the closed position on training aircraft, were to be painted glossy Insignia White.

Vertical control surfaces on aircraft painted in the carrier scheme, previously painted Light Gull Gray, were now to be painted glossy Insignia White on both sides, as were the horizontal control surfaces.

Walkways on trainers were to be nonspecular black. Walkways and steps were to be outlined in nonspecular black or white, as applicable, to give the greatest contrast, unless contrasting walkway material were used on these areas.

With the introduction of remote-controlled drone helicopters in the antisubmarine warfare role, a visual means of identification as to the right side or left side of the vehicle was necessary. This was provided by the logical application of red to the left side and green to the right, in accordance with the standard color coding used in ship running-lights. To increase the visibility of these colors, fluorescent Red-Orange and fluorescent Green were used.

Amendment 1 to MIL-C-18263C(Weps), dated September 20, 1962, required a fluorescent Red-Orange stripe to be applied to the bottom of the hull of all helicopters having a flotation hull and which were painted in the fluorescent scheme.

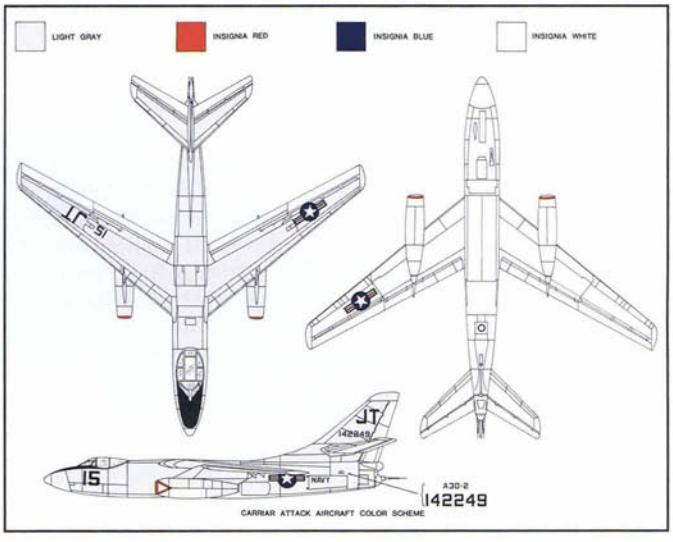
Aircraft which were specified to be aluminum finish could have the bare metal painted with an aluminized finish or Aircraft Gray, if required for corrosion protection.

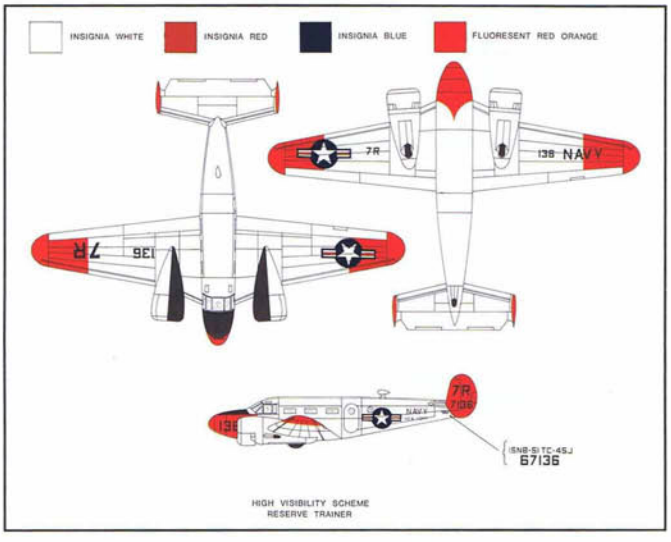
MIL-C-8779B(Weps), dated January 1, 1963, modified some interior colors. Detachable seat cushions in the cockpit and flight deck areas were now to be colored to match Color No. 22246, as had previously been specified for similar cushions in crew or passenger compartments. Passageways and catwalks located in otherwise uninhabited spaces were now to be nonspecular Light Gull Gray. These specifications do not apply to Naval aircraft used for research projects. The interior color scheme of such aircraft was subject to departmental approval in each case.

While Federal Standard 595a color numbers were used throughout this specification, it stated that color requirements of ribbed nylon cloth used for seats was to be comparable to the colors issued by the Textile Color Card Association of the United States, Inc., rather than the colors of Federal Standard 595A. This conversion is as follows:

Federal Standard 595a	TCCA Cable Number
36231 Dark Gull Gray	70153 Steel Gray
22203 Rust	70160 Rust
22246 International Orange	70072 Indian Orange

Left: This Piasecki HUP-2 assigned to rescue duty at NAS Moffett Field in 1960 was painted overall International Orange. Part of the wording ABANDON CHUTE can be seen on the bottom of the fuselage.





Amendment 1 to MIL-C-8779B(Weps) was issued May 22, 1963, and for the first time specified the colors to be applied to ejection seats. When authorized by the cognizant command, the high visibility color scheme could be applied to ejection seats. This marking had to be removed prior to deployment beyond the continental United States, except on purely training exercises.

The area of the outer surfaces of the ejection seat back and side parts of the seat bucket from the top to 3 inches (7.62 cm) below the level of the canopy sill, when the seat is in the full up position, were to retain the existing Dark Gull Gray. The outer surfaces were to have vertical 3-inch (7.62 cm) borders of glossy Insignia White from the bottom of the seat to the retained dark color. The remaining area between the side borders was to be fluorescent Red Orange.

The inner surface of the ejection seat back and bucket were to retain the Dark Gull Gray from the top to 1 foot (30.48 cm) below the top of the detachable seat cushion and padding, and on vertical 3-inch (7.62 cm) borders. The outer edges of the inner surfaces of the bucket seat were to retain the existing Dark Gull Gray. The remaining areas between the borders were to be fluorescent Red Orange, except where exposed by openings in the detachable seat cushion and padding. Exposed portions of the ejection seat back and bucket, as well as the inner surfaces of any side portions of the ejection seat bucket, were to retain the Dark Gull Gray color.

All other structural components of the ejection seat assembly, such as moving parts, mountings, pedals, control knobs and handles, were to conform to the color requirements for those areas, as defined in the specification.

Sound proofing and thermal insulating blankets were now to conform in color to the wall colors specified in the areas in which they are applied, rather than just Light Green. However, any sound proofing and thermal insulating blankets installed in uninhabited areas were to be Light Green.

Chief of Naval Operations letter Op-502n/pep, dated February 18, 1964, rescinded most requirements for high visibility paint schemes which had been in effect for the past eleven years, first with International Orange and then with fluorescent Red Orange. Studies relating to the reduction of mid-air collision potential due to the application of high visibility paint schemes indicated that for certain missions and operational conditions the insignificant safety potential gained did not justify the additional expense and upkeep work. In addition to this, and the advances made in the

Right: This colorful F-8E was operated at DaNang in 1967 by VMFA-235. The squadron Death Angel normally displayed on the tail can be seen on the red edge of the raised wing. The well known star design has been carried since introduced on the FJ-2 and can be seen on the pilot's helmet.

positive control of aircraft, high visibility schemes were now only required on Training Command, target control and SAR aircraft. Reserve Training Command aircraft were included in the category that does not receive fluorescent paint.

On May 5, 1964, Chief of Naval Operations directed that those aircraft which were required to be painted in the high visibility paint scheme were to be painted with International Orange.

MIL-I-18464E(Weps) *Insignia and Markings for Naval Weapons Systems*, dated May 20, 1964, changed the paint scheme for large seaplanes and amphibians assigned to the Search and Rescue mission. Upper and lower surfaces of both wing tips were to be painted nonspecular Orange Yellow from the wing tip inboard a distance equal to seven percent of the total wing span (float excluded on PBY type aircraft). A glossy black border 6 inches (15.24 cm) in width was to be added on the inboard edge. The wing tip floats and struts were also to be painted nonspecular Orange Yellow. The upper surface of the wing center section, including the rear projection portion of the engine nacelles, were painted nonspecular Orange Yellow to a point just outboard of the two engine nacelles. A glossy Black border 6 inches (15.24 cm) in width outlined this area. A 36-inch (91.44 cm) wide nonspecular Orange Yellow band, approximately 3 feet (91.44 cm) forward of the leading edge of the horizontal stabilizer, encircled the aft portion of the hull. This band was not to extend onto the last step or keel. This band was outlined with a 6-inch (15.24 cm) stripe of glossy Black on each edge. A nonspecular Orange Yellow rectangle, whose length was equal to three times its height, was painted on each side of the forward part of the hull and centered between the leading edge of the wing and the bow. A 2-inch (5.08 cm) glossy Black stripe outlined the rectangle. The height of the rectangle was to be thirty-three percent of the vertical dimension of the projection of the fuselage side at the point of application, except that the height of this rectangle could not be greater than 36 inches (91.44 cm) nor less than 20 inches (50.80 cm), excluding the border. The rectangle was to be located as near as possible to the center of the vertical projection of the fuselage at the point of application. The national aircraft insignia, which normally would occupy this space, was to be located aft on the hull to clear this marking.

MIL-C-18263D(Weps), dated June 29, 1964, among other changes clarified the requirement for the high visibility paint scheme. The aircraft now required to be painted in this manner were Training Command, (not to include Reserve aircraft) target control, SAR aircraft, target towing, target aircraft and drones.

In 1964, it was decided to provide the President helicopters for rapid transportation. These VH-3A and VH-34D helicopters were to be drawn from HMX-1 at MCAS Quantico, Virginia, and from the Army Davidson Field, Fort Belvoir, Virginia. It was desired that there be no identifiable branch of service recognition on these aircraft. All service markings were removed and a new color applied. This consisted of a 50-50 mix of Marine Corps Green and Army Olive Drab. This mixture was facetiously called "Breen" by those who had proposed it.

Bureau of Weapons message 061849Z of July 6, 1964, to the Bureau of Weapons Representative at the Sikorsky factory specified the following markings were to be applied. The top of the helicopters was to retain the Insignia White solar heat reflecting finish. All warning decals and/or signs were to remain unchanged. The remainder of the aircraft was to be painted "Breen." A 30-inch (76.20 cm) national aircraft insignia was to be applied to the bottom of the fuselage at station 330, and a 25-inch (12.70 cm) national aircraft insignia was to be applied on the upper surface of the horizontal stabilizer. UNITED STATES OF AMERICA was to be applied in 8-inch (20.32 cm) white letters within the "Breen" area above the windows and extending from approximately station 400 to the tail cone. The American flag was to be applied on the engine access doors, both sides, with the blue field forward. Two narrowly separated white stripes below the windows were to extend approximately from station 140 to 505. The aircraft model and serial number were to be applied in 2-inch (5.08 cm) Insignia White letters and numerals at station 620, which was approximately the normal position for this data.

The solar heat reflecting Insignia White top on transports now started at the top forward edge of the pilot's enclosure. It extended aft to include the vertical stabilizer and rudder, the upper surface of the horizontal stabilizer and elevators, and down each side of the fuselage to the line of

the bottom of the row of windows. All other metal surfaces were to be painted Aircraft Gray, except in the case of C-118 and C-131 aircraft, which had the lower fuselage and vertical stabilizer in bare aluminum. Aircraft with fabric-covered controls were to have them finished with aluminized dope. On VIP and staff aircraft, a blue stripe could be added below the white area and a blue chevron on the engine nacelle for decorative purposes. On these aircraft the Aircraft Gray could be eliminated, except as required for corrosion protection in, for example, exhaust trail areas.

Carrier-based aircraft were to have the frontal areas painted overall in Insignia White, including all glass fiber reinforced plastic assemblies, for which white rain-erosion material was to be used. Other aircraft were to leave the rain-erosion-resistant material its natural color and not overpaint for color matching. Aft facing radomes were to be painted white on carrier aircraft and Light Gull Gray on other types.

The Special Patrol Plane scheme was dropped and once again Warning Aircraft, which normally flew at altitudes of 15,000 feet (4572 m) or less, were to be overall Seaplane Gray.

KD Target Aircraft were to be Insignia White on the upper surface of the wings, horizontal stabilizer, elevators, vertical stabilizer and rudder. The entire fuselage was to be fluorescent Yellow Orange, while the bottom surface of the wings, horizontal stabilizer and elevators were to be Insignia Red. Target drones were to be overall fluorescent Yellow Orange.

Above: An early E-2A at Calverton in 1968 still with the Grumman Hawkeye designation on the nose. **Bottom:** The patriotic Liberty Bell was carried on this E-2A during the Bicentennial period.

At the request of Chief of Naval Air Training, Chief of Naval Operations Speedletter Serial 2784P50, dated November 13, 1964, exempted transport-type aircraft assigned to the Training Command from the high visibility paint scheme requirement. However, this did not apply to any transport-type aircraft used in the Training Command which was regularly used in student pilot, Naval Aviation Observer, or navigation training.

MIL-C-18263E(WP), dated May 11, 1965, discontinued the use of fluorescent paint. The new paint scheme for Target

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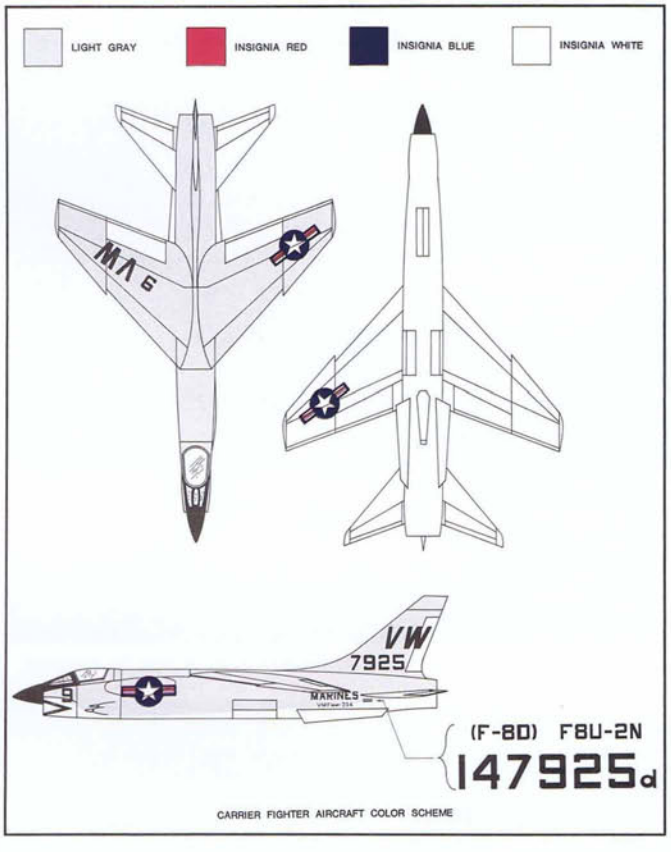
Above: This UH-1L was flown by the manufacturer in this scheme prior to delivery to a squadron. **Right:** UH-46D of HMMT-302 were painted standard Field Green in 1968 without any high visibility markings associated with a training squadron. **Below:** While some consideration was given to the camouflage provided by the Field Green Color, none of the service or identification markings were subdued on their CH-53A of HMM-462 in 1967.

Left: Several models of small aircraft, such as this Piper U-11A, were obtained for small transports as the old reliable C-45/SNB were retired. As can be seen in this 1967 photo, the paint schemes used did not always conform to the current regulations.



Above: Numerous servicing instructions can be seen in the wheel well of this A-3E. **Below:** A nice clean F-8E, as many think naval aircraft always look, flown by the Commanding Officer of VF-124 in 1965. Notice the 00 markings denoting a Air Group Commanders aircraft.

Above: The patrol aircraft community had some of the most distinctive tail markings as shown by this P-3B of VP-92. **Right:** The International Orange tail stripe and 400 block aircraft numbers identify this A-6A of VA-196 as being the fourth squadron aboard the USS Constellation (CV-64) in 1968. **Below:** The aluminum doped rudder on this C-47J assigned to Headquarters, Fleet Marine Force Pacific is in sharp contrast to the white top and Light Gull Gray of the fuselage.

Above: VT-9 at NAS Meridian, Mississippi painted their T-2 Buckeye trainers in this high visibility paint scheme. **Left:** The first AH-1J Sea Cobra at the Bell Helicopter plant in Fort Worth awaiting delivery to the Marine Corps in late 1969. **Bottom:** In the late 1960/1970 period, the Marine Corps operated several S-2A such as this one assigned to Air, FMF Pac at MCAS Kaneohe Bay, Hawaii.

Right: A typical label identifying the facility, date and materials used in refinishing an aircraft is shown on this F4D-1. **Below:** Newer aircraft, such as the C-131, replaced the tried and true R4D/C-47 in the Marine Corps. In 1964, the white top, natural metal bottom and brightly colored propeller blades help to identify this C-131F as a station aircraft. **Bottom:** This Grumman HU-16C Albatross was assigned to the rescue mission at MCAS Iwakune, Japan in 1964.

Above: This SP-5B taxiing on the water of San Diego harbor in 1965 is about to herald the end to a long history of water born aircraft in the Navy which started in January 1911 at the same location. **Left:** This black EP-3A at NAS Point Mugu in 1970 was one of the more unusual paint schemes of the period. **Below:** Along with the colorful marking on this TA-4J Skyhawk of VF-126, the red warning around the landing gear doors is clearly visible.

Right and Bottom: The limited number of markings required to be applied by the manufacturer is illustrated by these photos of a factory fresh A-6A at the Grumman factory, awaiting delivery in 1968.

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Towing Aircraft become as follows. Both upper and lower surfaces of the wings, horizontal stabilizer and elevators were to be glossy Orange Yellow. The vertical fin and rudder(s) were to be glossy International Orange. The fuselage, cowling and engine nacelles in the case of multi-engine aircraft (excepting surfaces extending into the upper wing surface) were to be glossy Engine Gray. Wing walkways were to be semigloss Seaplane Gray or nonspecular Black. The 3-foot (7.62 cm) wide wing bands were positioned as before, but were now to be glossy International Orange.

Colors for aircraft assigned to the Search and Rescue mission were also modified. The Orange Yellow markings remained, as far as location was concerned, but were now to be glossy. Wing tip floats and struts were also to be glossy Orange Yellow. The wing tips outboard of the wing floats, excluding the ailerons, were now to be glossy International Orange, as was the vertical fin and rudder.

The high visibility color patterns for other aircraft remained as before. However, the color used was once again to be glossy International Orange rather than fluorescent Red Orange.

Chief of Naval Operations letter Serial 2528P50, dated February 14, 1966, authorized the elimination of high visibility paint schemes on TF-9J aircraft assigned to COMNAVAIRLANT, COMNAVAIRPAC, Navy and Marine fleet pilot training units. Where local conditions might warrant, the International Orange scheme was authorized at the locations so desiring. The provisions for high visibility scheme remained in effect for TF-9J aircraft assigned to Naval Air Training Squadrons.

Amendment 1, to MIL-C-18263E(AS), dated July 26, 1967, modified the blue stripe and chevron on VIP and staff aircraft to a black stripe and chevron.

Aircraft assigned to the Reserve component were no longer painted with the orange fuselage band special markings. Their overall exterior paint scheme was to be the same as comparable aircraft types operating in the Fleet, which allowed for rapid mobilization without the need of extensive repainting in time of emergency.

Left: This UH-46A is a good example of the high gloss achieved on the overall Sea Blue scheme. **Bottom:** In contrast is this SH-3A of Antisubmarine Squadron 6 HS-6A. This brilliant scheme was used in 1984 aboard the USS Enterprise (CV-65). Notice how the national aircraft insignia is blocked out by the open door.

The walkways on carrier aircraft remained nonspecular Light Gull Gray, except in cases where gross contamination was prevalent, due to the aircraft configuration, in which case nonspecular Dark Gull Gray could now be employed.

Warning aircraft that operate as land-based and normally operate at 15,000 feet (4572 m) or less were to have the glossy Insignia White solar-reflecting top applied. The remainder of the aircraft was to remain semigloss Seaplane Gray.

The overall Engine Gray scheme for helicopters in the Submarine Search and Attack Mission was modified for the SH-3 helicopters. These were to be painted Insignia white on the upper surfaces down to an undulating line extending from the bottom of the lower window in the pilot's compartment to the bottom of the tail hinge. The lower portion was to be Light Gull Gray.

In the case of C-118 and C-131 aircraft, the instructions to leave parts unpainted were modified to those used in a VIP or Staff capacity, which could have the area of paint coverage reduced. However, areas of bare metal were required to be brightly polished.

The Field Green overall land camouflage used on observation aircraft was modified in the case of the OV-10. These aircraft were now to have the surfaces viewed from below painted glossy Light Gull Gray.

MIL-M-24047C(ASG), dated June 18, 1968, *Marking for Airplanes, Airplane Parts and Missiles (Ballistic Missiles Excluded)*, required the underside of the wing leading edge slats on carrier-type aircraft, i.e., aircraft having white undersurfaces, to be painted glossy Insignia White to match adjacent surfaces. This area on other aircraft was to remain Insignia Red.

MIL-C-8997C(AS), dated September 12, 1968, made numerous changes in the interior colors of Naval aircraft. Two color schemes were now to be used, as shown in the following chart. Color Scheme 1 employs predominantly neutral gray/light green for overhead, sidewalls and floor. Color Scheme No. 2 is lighter in reflectance and employs "warm" colors, including colors commonly referred to as ivory, beige and cream. These two color schemes were to be used in nonflight crew stations, which include such areas as combat information compartments, radar and sonar stations,

Right: The interior lining was removed from this CH-46D in Vietnam by HMM-364 to reveal the structure and make repairs easier.

crew and passenger compartments, galley and crew rest areas, and other aircrew stations where there is no regular need for night vision capability of the crew members. The color scheme was to be selected according to the characteristics of the various aircrew stations, with consideration being given to compartment size and lighting, climatic control, and the physiological and psychological well-being of the aircrew.

Color Scheme No. 1 was to be employed in aircraft with large area workspaces and relatively large window spaces, where the operator's tasks are critically dependent on uniform lighting systems and where interior climatic conditions can be precisely controlled.

Color Scheme No. 2 was to be employed in aircraft with compact workspaces, relatively few open areas, few and small window areas, where there is little interaction between lighting systems and the interior color scheme, and where environmental climatic conditions vary over a wide range. The two color schemes must not be intermixed in the same aircraft.

TABLE I

COLOR SCHEME FOR NONFLIGHT CREW COMPARTMENTS IN NAVAL AIRCRAFT

LOCATION	COLOR SCHEME No. 1	COLOR SCHEME No. 2
Overhead, sidewall down to scuff trim	———	37855
Overhead, sidewall down to 3 feet (76.20 cm) from floor	34516	———
Floor covering and scuff trim	———	30318
Floor covering and sidewall from floor to 3 feet (76.20 cm) from floor	36231	———
Control and display surfaces	36231	36231
All detachable seat cushions and padding	22246	22246
Galley counter and table tops in rest area and other nonfunctional table tops	33531	36555
Unupholstered seats, seat bases, and steps	36231	36231
Bunk covers, upholstered seats in crew dining and rest areas	22203	25109
Exposed structural members and ventilating ducts	34516	37855
Bunk structures, handrails and table legs	Satin aluminum finish	Satin aluminum finish
Lavatory interior	———	37855
Rack interior, toilet seat, urinal	36555	37875
Lavatory overhead, sidewall down to 3 feet (76.20 cm) from floor	34516	———
Lavatory floor and sidewall up to 3 feet (76.20 cm) from floor	36440	———

On September 4, 1969, the Commanding Officer of Fleet Composite Squadron Eight (VC-8) requested a change in the paint scheme as applied to aircraft employed in the target towing and drone control mission. Several factors prompted this request, such as the reduced number of paint colors required, a reduction in the deterioration of aircraft wiring, and internal corrosion due to heat. The primary concern, though, was to reduce the internal heat by use of a lighter color scheme, which would increase cockpit habitability and reduce pilot fatigue. This request was approved by the Chief of Naval Operations on October 17, 1969. Aircraft currently in the target towing/drone control scheme were to retain their present color scheme until processed through their next scheduled rework. At that time they were to be repainted in the standard Light Gray and Insignia White. However, International Orange was to be retained on the vertical tail surface only.

Above left: The demarkation between the Light Gray and Field Green of the land camouflage scheme is clearly evident on the VMO-8 Bronco. **Left:** The red warning markings around wheel doors, speed brakes, and flaps is clearly visible on this newly painted A-6A. **Below:** This QF-9 Cougar of VC-8 shows the distinctive paint scheme for a target aircraft in 1968.

Below: A beautiful formation shot of F-8D Crusaders of VF-661 with all aircraft conforming to the same paint scheme.

CHAPTER 2 1970-1979

With the introduction of the AV-8A Harrier, a new paint scheme was introduced to Marine Corps aircraft. This consisted of the three-color camouflage pattern regularly applied to the Royal Air Force Harriers. The first twelve aircraft were delivered with a glossy finish. At the request of the Marine Corps, aircraft number thirteen and subsequent were delivered with a nonspecular finish. The colors used are British colors, with no equivalent in Federal Standard 595a. British Standard 381C:1964, *Colors for Specific Purposes*, identifies these colors as follows:

Reference No.	Name	Approximate Munsell No.
627	Light Aircraft Gray	N7
638	Dark Sea Gray	2.5PB 4/1
641	Dark Green	10Y 3.5/1

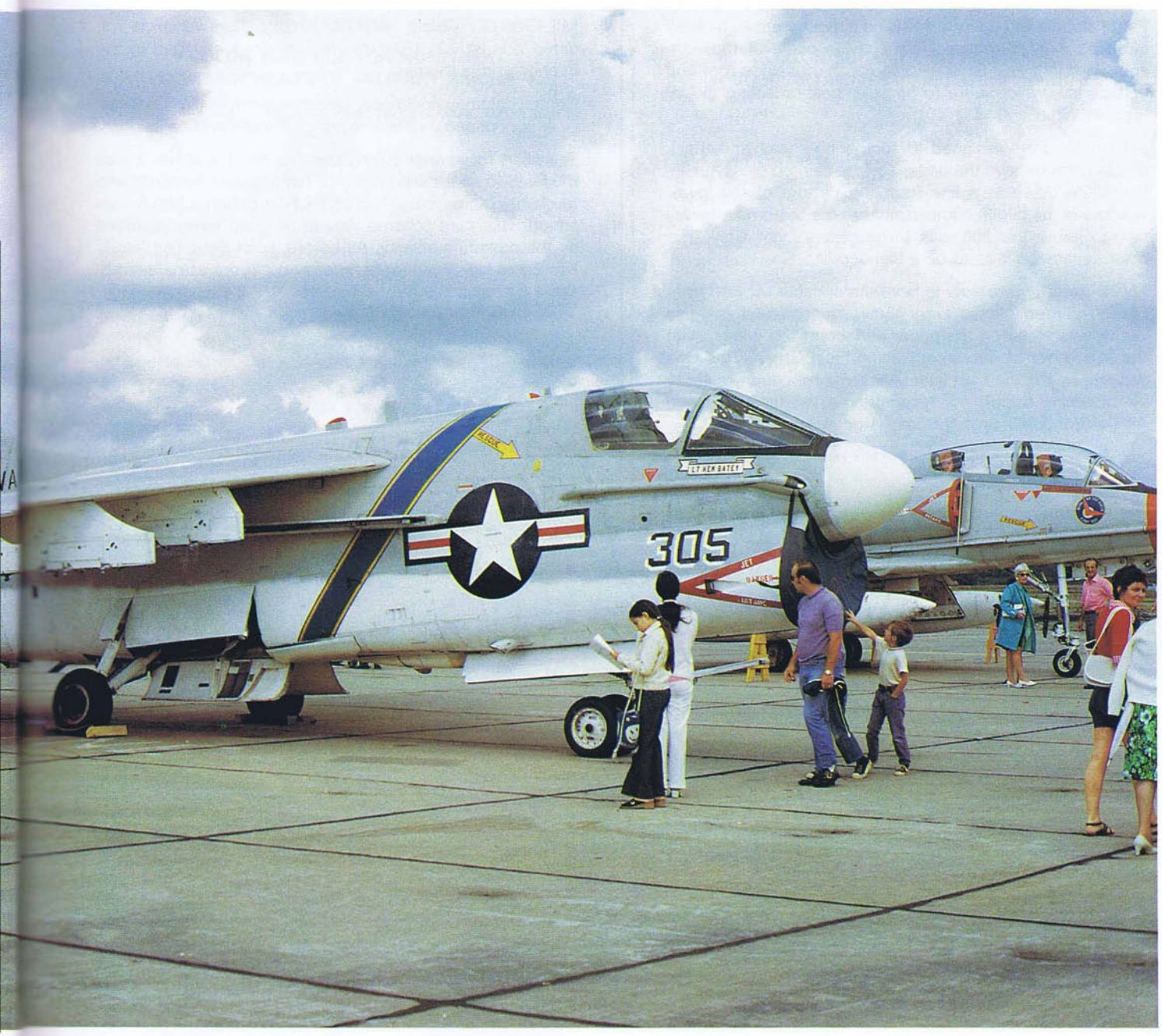
MIL-C-18263F(AS), dated June 29, 1971, dropped the high-visibility color scheme for helicopters in combat SAR configuration. These aircraft were to be painted as directed by the type commander.

The interior of the engine cowling, which had been painted glossy Aircraft Gray, was now to be painted glossy Light Gray.

With the switch to polyurethane coatings for exterior surfaces, the nonspecular Light Gull Gray previously applied to surfaces viewed from above on carrier aircraft was replaced with glossy Light Gray. Glossy Light Gray also replaced the Aircraft Gray which had been used on all surfaces except the solar heat-reflecting glossy Insignia White top on land-based transports. Thus, these entire aircraft were now painted with a glossy finish. The requirements remained in effect for fabric covered control surfaces on transports to be doped aluminum, as well as the special Black stripe and chevron markings for VIP transports.

Right: A brilliantly painted A-7A Corsair II of VA-83 with a stylized version of the letters AA and a large squadron insignia on the tail.

Left: Number three aircraft of Heavy Reconnaissance Squadron 13 is further identified by the squadron insignia high on the tail. The form of letters for the tail code is not correct.



Left: One of the better known paint schemes was this design used by VMFA-531 on their F-4B which depicted their night fighting capability.

Patrol aircraft and utility land-based aircraft were to have all surfaces painted glossy Light Gray in place of the non-specular Light Gull Gray, except for the fuselage roof and vertical tail, which were to be solar heat-reflecting glossy Insignia White.

SH-3 helicopters assigned to submarine search-and-attack duties were to have the upper surface painted glossy Insignia White down to a line from the bottom of the lower window in the pilot's compartment to the bottom of the tail hinge. Below this line was to be glossy Light Gray. The color separation was to be a blended line.

OV-10 aircraft were now to have the surfaces viewed from below painted glossy Light Gray. Nonspecular Insignia White was to be on the upper surface of the wings, with the remainder of the aircraft being Field Green. This was dictated by the Vietnam experience whereby the possibility of attacking aircraft not recognizing a low-flying Forward Air Control (FAC) aircraft in the target area.

MIL-C-8999D *Colors, Interior, Aircraft, Requirements for,* dated August 23, 1971, made numerous changes in the interior paint schemes.

Control columns could now be either nonspecular Dark Gull Gray or nonspecular black to match the control handle grips.

The chart for interior color Schemes No. 1 and No. 2 was modified to consolidate many of the separate headings and to change some colors. In addition, a Scheme No. 3 was added. This third scheme was to be used when specified by the procuring activity. As before, color Schemes No. 1, No. 2 and No. 3 cannot be intermixed in the same aircraft. Table II shows the new schemes.

Below: A brilliantly painted A-4L of VA-204 while a component of CAG-6 in 1973.

Right: The distinction between working consoles and the cabin walls and ceiling can be seen in this E-2B.

TABLE II

COLOR SCHEMES FOR NONFLIGHT COMPARTMENTS OF MILITARY AIRCRAFT

	COLOR SCHEME NO. 1		COLOR SCHEME NO. 2		COLOR SCHEME NO. 3	
Location	COLOR	FED. STD. COLOR No.	COLOR	FED. STD. COLOR No.	COLOR	FED. STD. COLOR No.
Overhead, sidewall down to wainscoting	Green	34516	White	37855	Gray	36440
Floor covering and 1 foot (30.48 cm) or 2 feet (61.00 cm) of wainscoting	Gray	36231	Brown	30318	Gray	36231
Control and display surfaces	Gray	36231	Gray	36231	Gray	36231
All detachable seat cushions and padding	Orange	22246	Orange	22246	Red	21136
Galley counter and table tops in rest area, and other nonfunctional table tops	Yellow	33531	Gray	36555	Gray	35231
Unupholstered seats, seat bases and steps	Gray	36231	Gray	36231	Gray	36231
Bunk covers, pillows, mattresses	Orange	22203	Blue	25109	Gray	36231
Upholstered seats in crew dining and rest areas	Orange	22203	Blue	25109	Red	21136
Exposed structural members and ventilating ducts	Green	34516	White	37855	Gray	36440
Bunk structures, handrails and table legs finish	Satin aluminum finish		Satin aluminum finish		Satin aluminum finish	
LAVATORY INTERIOR						
Rack interior, toilet seat, urinal	Gray	36555	White	37875	White	37875
Lavatory overhead, sidewall down to wainscoting	Green	34516	White	37875	Gray	36440
Lavatory floor and 1 foot (30.48 cm) to 3 feet (91.44 cm) of wainscoting	Gray	36440	Gray	36440	Gray	26175

When specified by the procuring activity, the interior color scheme for passenger compartments was to conform to Table II.

TABLE III

COLOR SCHEME FOR PASSENGER COMPARTMENTS IN MILITARY AIRCRAFT

LOCATION	COLOR	FED. STD. COLOR No.
Floor and 1 foot (30.48 cm) to 3 feet (91.44 cm) of wainscoting, steps, table tops, writing surfaces, bunk covers, pillows and mattresses	Gray	36231
Passenger seats, seat bases and backs, and seat cushions	Gray	36231
Passenger seat arm rest upholstery	Red	21136
Troop seat bottoms and back webbing	Red	21136
Ceilings and walls, including all exposed structural members, ventilating ducts, etc., within wall and ceiling area	Green	34424
Bunk	Gray	36440
Handrails, bunk structures and table legs	Satin aluminum finish	——
LAVATORY COMPARTMENT		
Ceiling	Gray	36440
Floor and 1 foot (30.48 cm) to 3 feet (91.44 cm) of wainscoting and all curtains	Gray	26176
Toilet seat, urinal	White	37875
Handrails	Satin aluminum finish	——

Amendment 1 to MIL-C-18263F(AS), dated March 9, 1972, changed the nonspecular Field Green used on all Marine Corps helicopters and land-based observation aircraft to glossy Field Green. The upper surface of the wings of OV-10 aircraft was changed to nonspecular Insignia White, while the undersurfaces of the wings was to be glossy Light Gray. This was to commence upon depletion of the low gloss paint. Records indicate, however, that in many cases the change was made before the low gloss paint was expended. Obviously, therefore, a firm date cannot be established for this change.

Left: This F-4J of Marine Fighter Attack Training Squadron 201 was based at MCAS Cherry Point in the mid 1970s. **Bottom:** This F-4J is marked with the required markings and shows how the tail code letters may be adjusted to conform to the shape of the tail.

During 1975, numerous complaints were received from the Fleet concerning the high detectability of the gray and white scheme. Due to these concerns, Naval Air Systems Command (NAVAIR) commenced a development program for a new camouflage system. Originally, the plan was to have several gray/blue schemes evaluated by Fleet activities to determine which combination was the most effective. The first scheme tried was gray and blue on a TA-4F, using the desert/sand pattern specified in Douglas Aircraft drawing 5824115. The colors selected for this trial were 35237, 36307, 35414, and 35622. Numerous other aircraft were painted in this or similar schemes. While significant data was developed during these tests, the participating squadrons were not in agreement as to the best overall scheme. However, it did determine once again that nonspecular (flat) colors must be used for maximum effect.

Early in 1976, Mr. Keith Ferris proposed a deceptive paint scheme of three shades of gray in a jagged pattern with a false canopy painted on the bottom of the aircraft. This is reminiscent of the earlier Barclay scheme[1], which painted false aircraft components, such as engine nacelles, on the aircraft. Many fighter aircraft of different types from several squadrons were painted in the Ferris scheme for an extended evaluation. Although some deception did occur, the "confusion factor" decreased as pilots flew more sorties against the scheme. In addition, the scheme increased the initial detection range of the aircraft.

While the Ferris scheme was being evaluated in 1976, NAVAIR established the Tactical Paint Scheme Program. The basic concept of this plan was that since no single paint scheme was optimum under all conditions, a multi-theater tactical paint scheme would be developed for each fighter and attack aircraft model as well as theater specific paint schemes. The theaters selected were SEASIA, Europe, Middle East, and the Northern Flank. These schemes were to be developed using computer simulation, as well as actual flight testing. A similar Air Force program had shown that the detection ranges predicted by the computer model were very close to the actual detection ranges determined during flight testing. As the project progressed, it became evident that the theater specific concept was not really practical. The necessity of changing paint schemes when-

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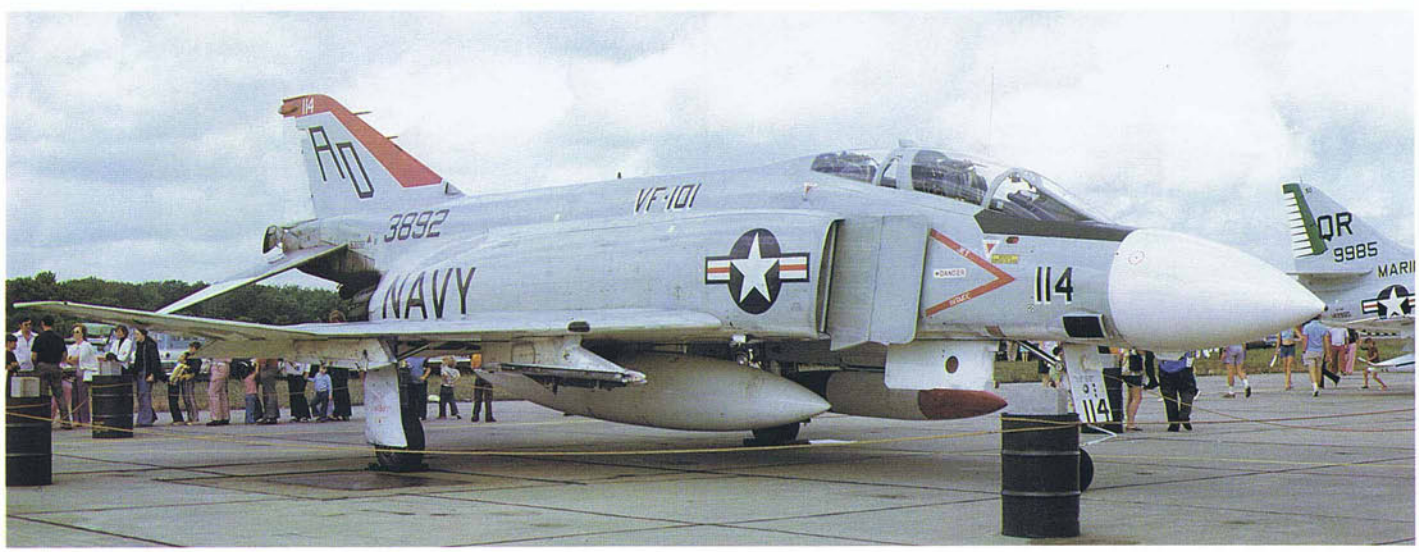
1 See The Official Monogram US Navy & Marine Corps Aircraft Color Guide 1940-1949, Vol-2, Monogram, 1989 by John M. Elliott.



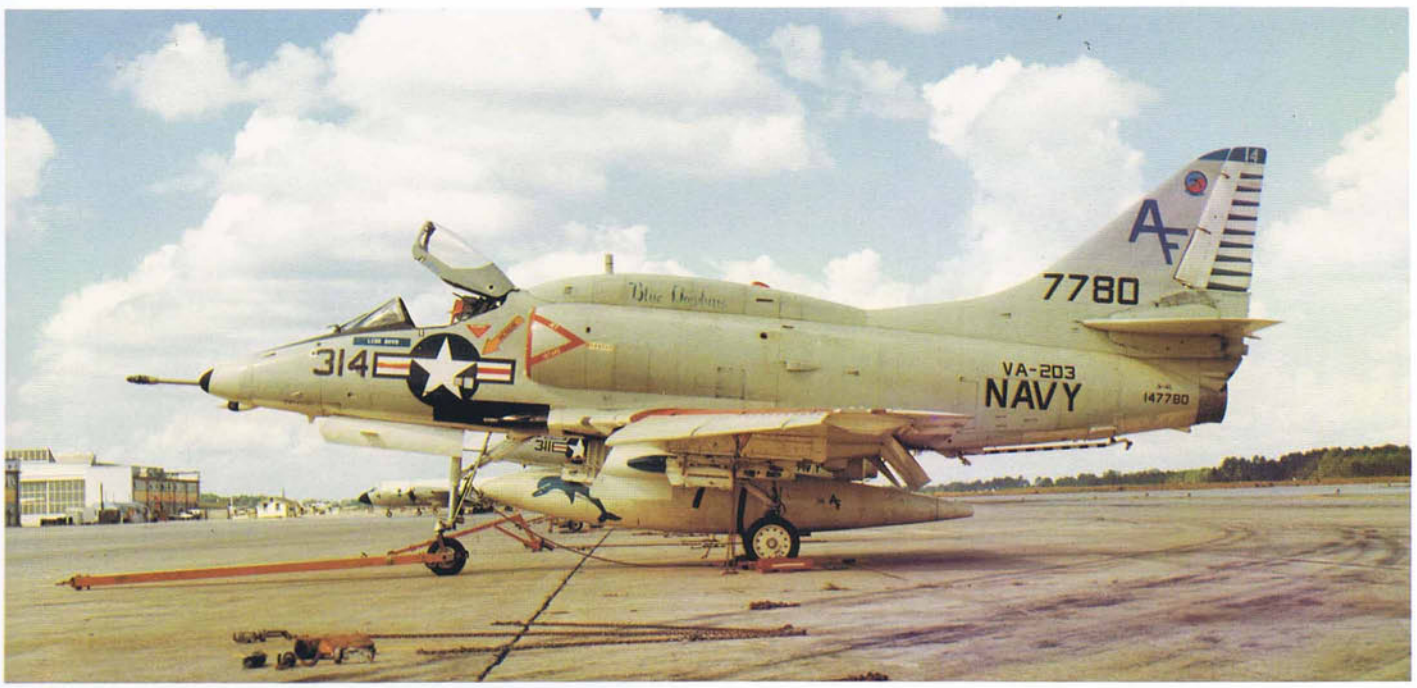
Above: A CT-39G assigned to MCAS Iwakuni, Japan in 1981 carries the Official Marine Corps seal and a colorful Bronze Gold and Insignia Red fuselage stripe. **Right:** This T-39 staff transport for use of the Commandant of the Marine Corps in 1971 was all white with U.S. MARINES, fuselage stripe and radio call number in red. The Marine Corps seal on the tail was in full colors. **Below:** The hardened areas for walkways are clearly marked on this US-2C painted in the target towing/ drone control scheme.

Above: A NOP-2E modified from a P-2E for evaluation of special electronic reconnaissance equipment was assigned to the Naval Air Development Center and operated with the standard paint scheme. **Left:** A SP-2H assigned to VP-92 painted in the normal patrol aircraft scheme. **Below:** A view of the flight deck of the USS Saratoga (CVA-60) in the 1970s well illustrates the variety of paint schemes as well as the crowded operating conditions aboard a carrier.

Above: This overall white scheme on a DeHavilland U-1B assigned to Naval Aerospace Recovery Facility at NAF El Centro in 1971 was unusual. **Right:** A TA-4J of Training Squadron 86 at NAS Pensacola in 1985 with limited high visibility markings. **Below:** A DeHavilland U-6A assigned to the Naval Air Facility El Centro was possibly painted overall white to combat the desert heat.

Above: Notice the undulating pattern of the white and gray demarcation line on the fuselage and that both sides of the rudders are white on this F-14A. **Left:** This OV-10A of VMO-1 in 1972 has the nonspecular White upper surface and Light Gull Gray undersurface scheme. The White upper surface of the wing was a safety feature to increase visibility from above while flying low level missions in Vietnam. **Below:** The VAQ-135 squadron design on the tail of these KA-3B covers most of the white rudder surface. Obviously the threat of a nuclear thermal pulse was not a serious consideration.

Above: An unusual aircraft for an attack squadron. This TC-4C was used by VA-128 to train bombardier/navigators for the A-6A Intruder. The extended radome nose is Insignia White. **Right:** In 1972, this SH-3D was painted glossy White on the upper surfaces and Light Gull Gray on the bottom for its antisubmarine warfare mission. **Below:** VA-203 The Blue Dolphins could easily be recognized with their name on the fuselage spine, insignia on the tail, and a Blue Dolphin on the drop tank. As the third squadron in the Air Group, they also used Blue for the tail code and fin and rudder tip.



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ever an aircraft changed location, and the associated cost in man-hours involved, were not justified by the slight gain in concealment provided by the various color schemes. Therefore, a single multitheater TPS was adopted for each model, which was the best overall compromise.

It was realized that this test procedure to develop a Tactical Paint Scheme (TPS) would require several years. Chief of Naval Operations was concerned about continuing to have glossy white applied to fighter aircraft. This concern was caused by the fact that in air combat an adversary pilot was given a visual cue as to which way the aircraft was turning, due to the split scheme of Light Gray on top and Insignia White on the bottom. This was rectified on February 18, 1977, by CNO message 181716Z, which changed the paint scheme on fighter aircraft to an all glossy Gull Gray.

The Commandant of the Marine Corps, in message 181522Z of November 1976, requested the application of Low Infrared reflective paint for all tactical USMC helicopters. The Chief of Naval Operations responded in January 1977, by message 121828Z, which authorized the application of this nonspecular Marine Corps Green for the following aircraft within the existing program funding:

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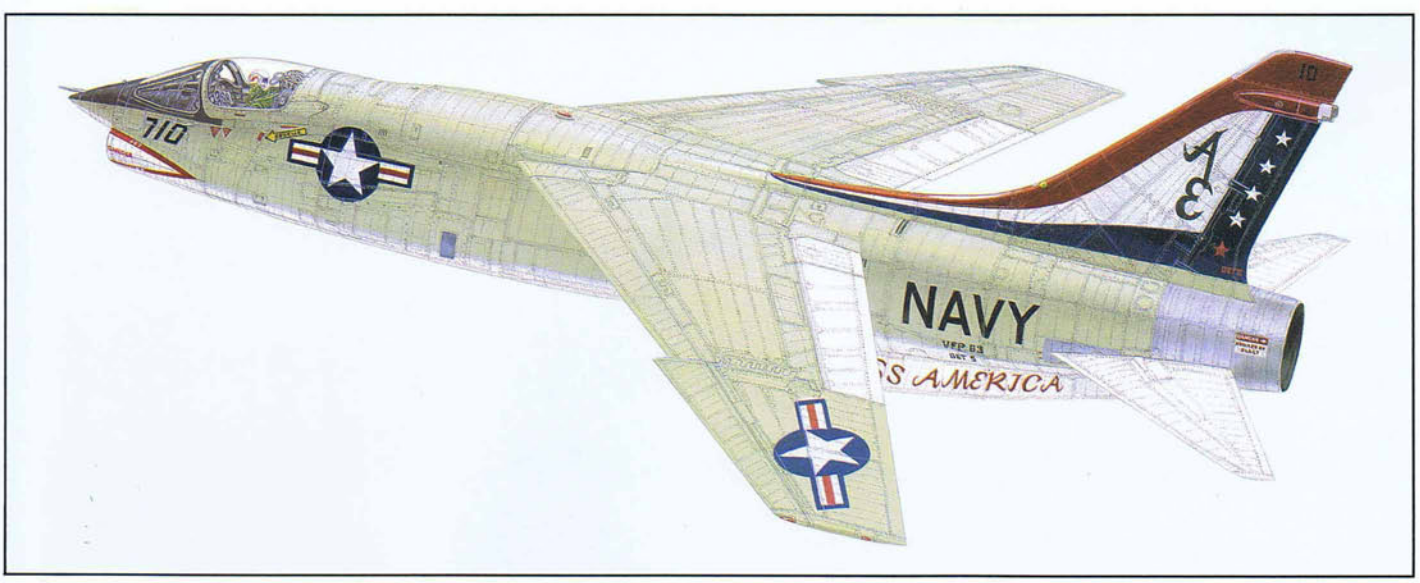
Above: This EKA-3B of VAQ-35 Det 1 in 1973, clearly shows the unpainted areas on the engine nacelles and the demarkation between the Light Gray and Insignia White. **Below:** An A-3B of Tactical Electronic Warfare Wing 13 (VAQW-13) with the standard carrier attack aircraft paint scheme. Due to the high temperature of the jet exhaust, the aft portion of the engine nacelle is left the natural metal finish.

Above: This AV-8A of VMT-203 clearly shows the hard line of demarkation between the camouflage pattern of the upper areas and the white of the under side. **Right:** All of the red markings, black lettering and the National Aircraft insignia tend to destroy any visual camouflage derived from the scheme applied to this AV-8A Harrier in 1973. **Below:** When redesignated VMAT-203 flew the TAV-8A with this camouflage scheme.

Above: This C-117D assigned to the Naval Air Facility, Atsugi, Japan in 1974, appears to be painted much darker than the Aircraft Gray specified. A bit of local artistic license was taken in applying the base name in a vertical position as well as the formation of the letters. **Left:** The tail pipe of the F-8H is bare metal due to the extreme heat of the jet exhaust. **Below:** VAQ-135 Det 1, a component of CVW-6 aboard the USS Franklin D. Roosevelt (CV-42), identified their A-3Bs with Maroon tail markings and their squadron insignia in 1974.

Above: This E-1B of VAW-121 assigned to the USS Franklin D. Roosevelt in the early 1970s is identified by the Insignia Blue tail markings as an Air Group spare. **Right:** E-1B "Willy Fudd" of VAW-111 assigned to CVW-21. Note that the radome is painted in the same manner as the horizontal airfoils with the Insignia White going over the leading edge to the upper surface. **Below:** A RF-8G of VFP-63 in a beautiful but nonregulation paint scheme.



Above: An A-3B of VAQ-208 proudly displays the squadron insignia and the coveted "E". **Left:** Not really a Marine Corps aircraft, this A-4E was assigned to the Navy Fighter Weapons School in 1974 and shows one of their peculiar paint schemes. **Below:** The S-2E of VS-29 assigned to the USS Ticondaroga (CV-14) had this distinctive tail design in 1975.

Above: Tail markings on this A-6A, photographed at South Weymouth in August 1973, become confusing with the tail code painted over the squadron insignia of VA-42 Pawns. **Right:** The landing lights were just too much of a temptation not to add eyebrows and a smiling mouth to these E-2B of VAW-117 in mid 1975. **Below:** A T-28C assigned to NAF Washington, DC in a high visibility paint scheme. Note the black and white striped tail hook on the C model.

Above: A SH-3D of HS-8 had this colorful scheme applied in 1977 for the Bicentennial Celebration. **Left:** An US-2B from Naval Air Facility Detroit had this Bicentennial motif applied to the tail. Normally the engine nacelle would be painted two tone the same as the fuselage. **Below:** This T-28B assigned to the Naval Air Facility, Washington, DC had the official Bicentennial logo on the rear of the fuselage in addition to a colorful paint scheme on the tail.

Right: The folded wings on this E-1B make a unique opportunity to see the upper surface of the wing while having a good view of the side markings. **Below:** RVAW-110 added a bit of color to their E-1B for the celebration. **Bottom:** The Insignia Red edge of landing gear doors and surface under the leading edge slats are clearly visible on this A-4F.

Left: TA-4Js and a T-2 of the Training Command in colorful schemes for th 75th Anniversary of U.S. Naval Aviati **Below:** A F-4S of VX-4 painted in ove Sea Blue with Bronze Gold markings the 75th Anniversary. **Bottom:** Traini Squadron 22 (VT-22) had this coorful paint scheme applied to one of their TA-4J for the 75th Anniversary. **Opposite top:** This F-4J Phantom II VX-4 in a 75th Anniversary of U.S. Na Aviation paint scheme must be the gaudiest paint scheme applied to any U.S. naval aircraft. **Opposite right:** These F-4 of VX-4, the Navy's test squadron for fighter aircraft and weapons, illustrate several of the col schemes being evaluated in the late and early 80s. The bright red aircraft QF-4B drone painted for maximum rather than minimum visibility.


76
Bicentennial
USNAVY
VX-4


0435
NAVY
3783
NAVY
NAVY

Numerous imaginative designs had been applied to naval aircraft during the Bicentennial Celebration. None of these schemes conformed to the regulations and there had been no directives authorizing or even condoning such markings. However, due to the subject, there was no official objection raised and the subject aircraft became a morale booster in the squadrons. It should be remembered that these were individual aircraft schemes and not applied to the entire squadron. The 75th Anniversary of Naval Aviation brought out a new assorment of paint schemes. The idea of applying the 75th Anniversary Logo designed by Charles C. Cooney was abandoned when the cost involved was considered. The 75th Anniversary of Marine Corps Aviation pased quietly the following year.

Above: Training Squadron 25 included the "E" and "S" awards in their colorful paint scheme on one of their TA-4J. **Below:** A T-2B Training Command scheme.

Top: Even the patrol community was caught up in the Bicentennial painting of aircraft as seen by the Liberty Bell and thirteen stars on this P-3A of VP-66. **Above:** Colorful tails became a trademark of the patrol community as shown on this P-3C of VP-49 taken at South Weymouth in October 1974. **Below:** In June 1975, VQ-1 operated their EP-3E Orion with all electronic packages painted Black.

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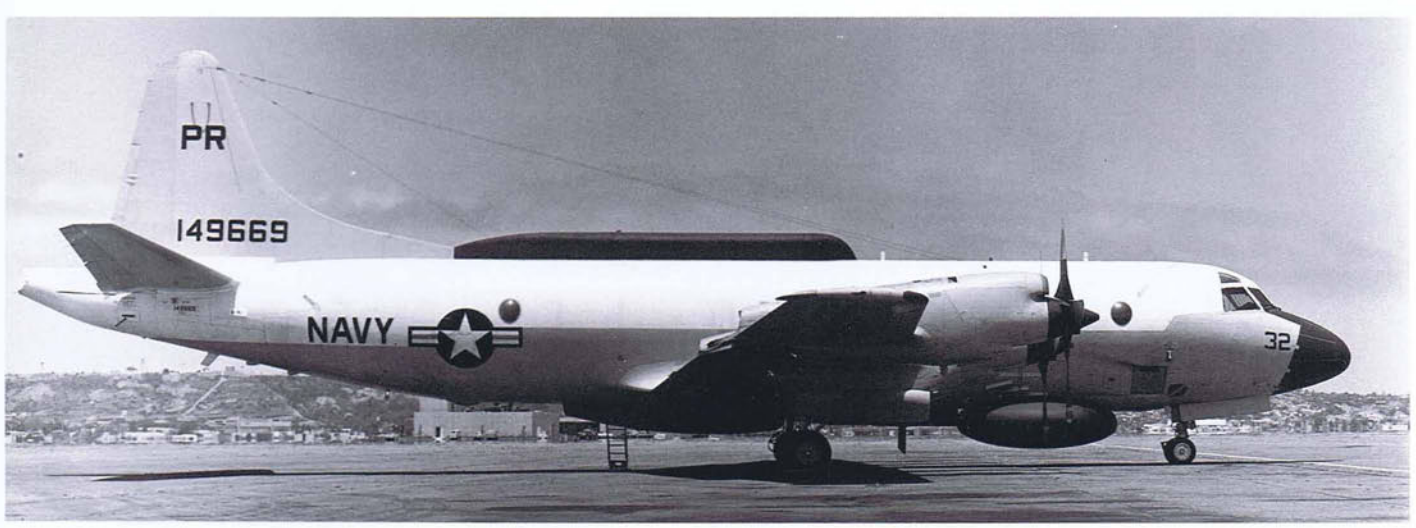
a. All AH-1T in production.

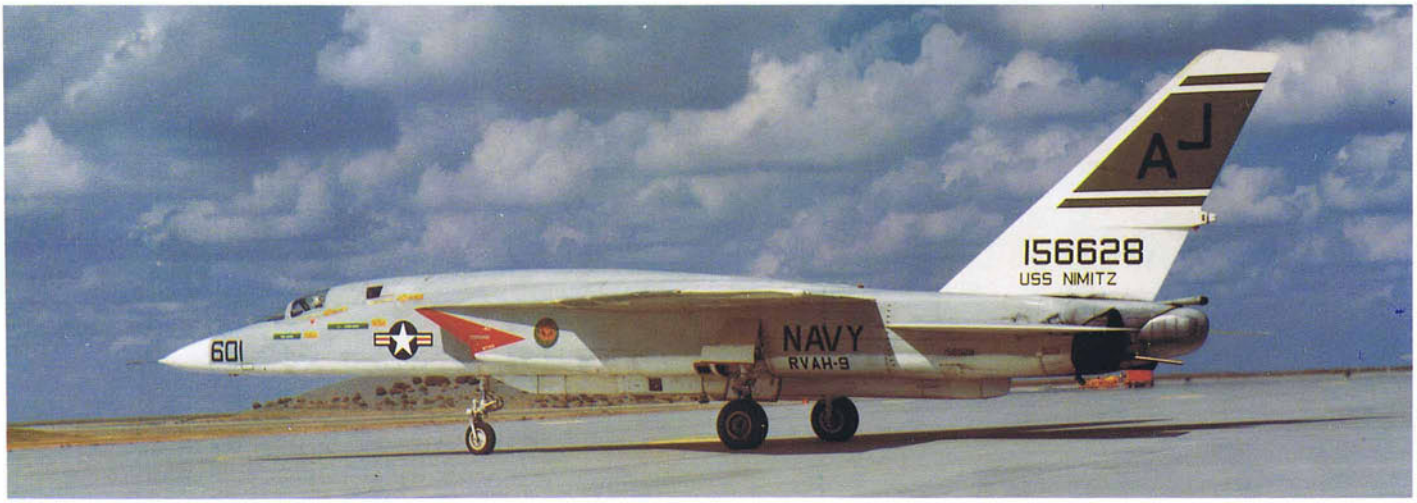
b. All USMC UH-1N in production, if feasible.

c. All AH-1J/G, USMC/USMCR UH-1N/E during rework.

IR reflective paint was to be deferred on CH-46 and CH-53 helicopters until completion of tests and evaluation. Approval for this scheme was granted in CNO message 041506Z of April 1977.

During the course of the next two years, Tactical Paint Schemes were developed for the A-4, A-6, EA-6, A-7, AV-8, F-4, F-14 and F/A-18. These schemes were based on the aircraft shape, the mission profile they would fly, and the possible theater of operation. While no Fleet evaluation of these schemes had been performed, NAVAIR recommended that the scheme for the F/A-18 and A-4 be approved for use. These two schemes were approved in July and August 1980. The reason for this early implementation was that the Navy did not want the current Gray and Insignia White scheme applied to these new aircraft models, which were soon to be delivered to the Fleet.





Above: The tail color should have been Black on this RA-5C of RVAH-9 aboard the USS Nimitz (CVN-68) in 1975 as a component of CVW-8. **Left:** The radome of this S-3A Viking of Air Antisubmarine Squadron 21 is the natural finish of the synthetic material. **Below:** T-2C Buckeye trainer of VT-23, a component of Training Wing Two at NAS Kingsville in 1978, with its high visibility paint scheme.

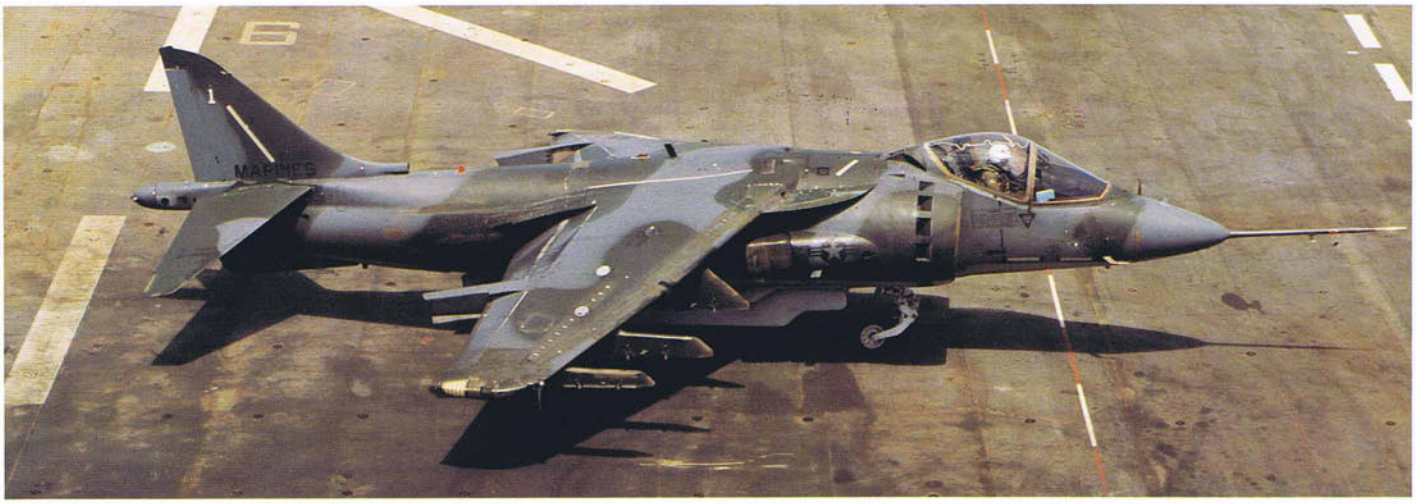
Above: Note that the aft radome on this Heavy Photographic Reconnaissance Squadron 62 RA-3B is painted white in accordance with the attack aircraft scheme. **Right:** This COD (Carrier Onboard Delivery) C-1A assigned to the USS Oriskany (CVA-34) in June 1975 is painted in the standard carrier scheme of Light Gull Gray and Insignia White. **Below:** It is unknown why this S-3A of VS-31 in 1978 has a blue tail rather than Dark Green as specified for the seventh squadron.

Left: In contrast to the high visibility scheme on this TS-2A, notice the large antiglare areas on the inboard side of the engine nacelles and the walkways on the upper surface of the wing, fuselage and engine nacelles. **Below:** While this UH-1E of VMO-6 is painted with the land camouflage scheme, the white lettering is highly visible. **Bottom:** Carrying BQM-34 Firebee target drones this DC-130A is painted in the colorful drone control scheme. Note the black areas of the under wing surface that are impinged upon by the engine exhaust.

Above: This SP-2H Neptune from NAS Los Alamitos has the standard ASW patrol plane scheme of Seaplane Gray with the Insignia White solar heat reflecting top of the fuselage. **Right:** A fleet Neptune assigned to Patrol Squadron 65 also in the standard ASW scheme. **Below:** The last Skyhawk built was painted in this colorful scheme which included flags of the six other countries to operate the A-4. This aircraft was assigned to VMA-331 and continued to operate with this scheme for a short period. The flags are, left to right, Singapore, New Zealand, Kuwait, USA, Israel, Australia and Argentina.

Above: The white stripes on the side of this CH-53A are guide lines to the various steps. **Left:** Helicopter Antisubmarine Squadron Light 31 carried numerous bright markings on the Engine Gray background. **Below:** This glossy Field Green CH-46F of HMM 263 shows all the colorful markings in effect prior to April 1977.

Above: This Ling-Temco-Vought A-7A, assigned to VA-37 aboard the USS Kitty Hawk, was photographed at NAS South Weymouth in September 1969. **Right:** This A-7C Corsair II assigned to the Naval Air Facility, China Lake, California has a High Speed Anti Radiation Missile (HARM) mounted under the left wing. **Below:** Note that the multiple suspension bombrack which is an accessory is painted white to match the under surface of the wing. Guided missiles, rocket launchers, etc. are also painted white, but bombs still retain their Olive Drab color.



Above: The camouflage pattern on the upper surface of the AV-8B is clearly visible during the sea trials aboard the USS Peleliu in 1984. **Left:** Unlike the original wrap around camouflage scheme on the AV-8A, a change was made to this scheme with Light Gull Gray under surfaces. Because of the great difference between upper and lower colors there was no need to eliminate a hard line of demarcation between them. **Below:** While undergoing evaluation at the Naval Air Test Center, Patuxent River in 1979, the YAV-8B carried this colorful scheme.

Above: A CH-46F of HMM 263 in the nonspecular Field Green scheme in effect after April 1977. **Right:** The launcher and practice Sidewinder missile are in sharp contrast to the subdued markings on this AH-1J. **Below:** A TH-57C Sea Ranger assigned to Helicopter Training Squadron 18 of Training Wing 5 at NAS Whiting Field painted in a International Orange High Visibility Scheme.

CHAPTER 3 1980-1993

Air Force, Atlantic Fleet (AIRLANT) was directed by the CNO on December 30, 1980, by message 301815Z to evaluate the TPS of additional fighter and attack aircraft prior to approval. The standard paints currently being used on naval aircraft, epoxy primer and polyurethane topcoat, the colors specified for the TPS, were to be used in these tests. The cove areas, such as interior of flaps, speed brakes, etc., were to be painted gray in place of the normal Insignia Red. On February 4, 1981, Carrier Air Wing 7 was designated by AIRLANT to be the test wing.

The reports which began coming in all came to essentially the same conclusions. It was difficult for adversaries to find an aircraft with the TPS until close in. Then they found trouble in maintaining contact and had serious difficulties in low-light/night environments. All those reporting mentioned the difficulties of cleaning the aircraft and touching-up the paint finish.

There were problems with visual identification. It was difficult to quickly read side numbers on the deck, and the painting of cove areas gray instead of red removed safety and malfunction warnings. There were also numerous reports of problems with inflight join up and misidentification.

On October 8, 1981, AIRLANT submitted its evaluation to NAVAIR, in which it stated, "During this evaluation TPS proved far more effective for tactical employment of aircraft than the present paint scheme." As a result of these tests the following recommendations, among others, were made.

A. A TPS was to be adopted for all tactical aircraft, but certain aircraft, such as tanker, SAR, and Transport/Cargo, would retain the standard paint scheme, or have special identifying markings applied.

B. Prior to adoption of the TPS, the undersurface of the aircraft must be painted a darker color.

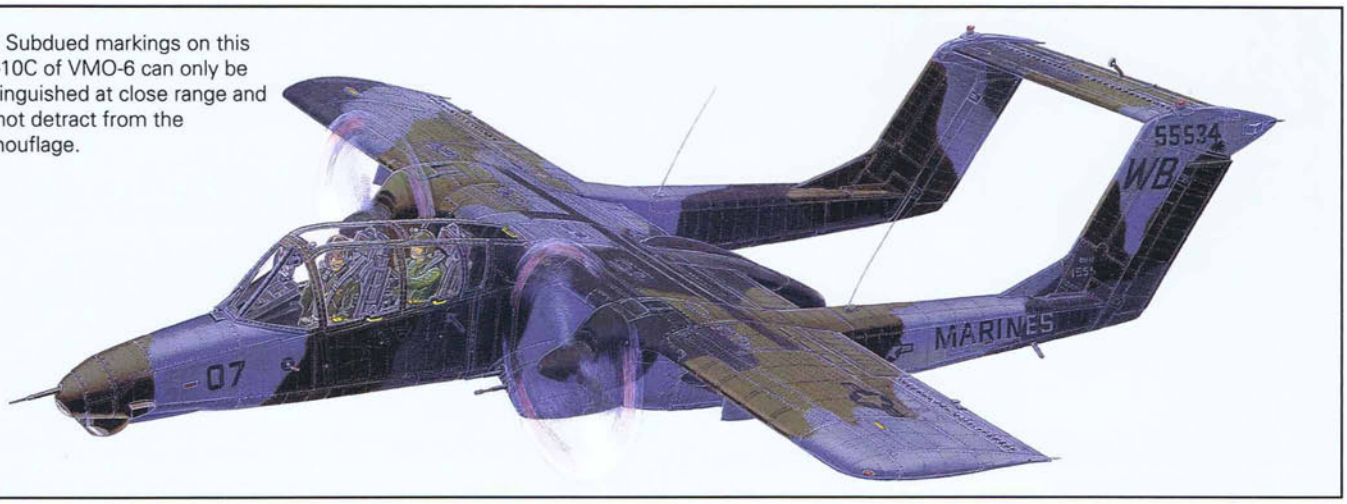
C. Red cove areas and landing gear door markings were to be retained.

D. Lighten or outline modex for greater visibility.

NAVAIR submitted a letter to the CNO on December 29,

Right: The three-tone gray tactical paint scheme proved to be far superior during Desert Storm than the previus land camouflage pattern.

Left: A Marine Corps RF-4B of VMFP-3 in Tactical Paint Scheme but with enhanced markings.



The Subdued markings on this OV-10C of VMO-6 can only be distinguished at close range and do not detract from the camouflage.

1981, recommending the TPS be applied to the A-6, EA-6, A7, and F-14, but not to the KA-6D. Operations with tanker aircraft had shown that low visibility was quite undesirable for that type of aircraft. With the approval of the CNO, NAVAIR implemented the schemes for both the Schedule Depot Level Maintenance and the new production aircraft. The F-14 TPS was not approved at this time for production aircraft, as the Engineering Change Proposal was disapproved, due to its cost.

Following the development of the TPS for fighter and attack aircraft, and the general acceptance of the advantages of these schemes in the Fleet, numerous fleet squadrons requested that TPS be developed for additional aircraft models.

The TPS for the F/A-18 was changed in June 1983, to darken the undersurfaces. Due to delivery schedules, the initial F/A-18s used by AIRLANT had been painted in the TPS prior to evaluation of the scheme, and had gray (36495) on the bottom. This color change specified gray (36375), the same color used on the bottom of other fighter and attack aircraft.

During 1983-1984, the Fleet evaluated another scheme for fighter and attack aircraft. This scheme was called the Heater-Ferris Paint Scheme, which was a deceptive scheme somewhat similar to the earlier Ferris scheme. Again, the aircraft was painted in large geometrical-shaped areas, using the colors Intermediate Blue Gray (35164), Blue Gray (35237), Light Gray (36307), and Light Gray (36375). Air Force, Pacific Fleet (AIRPAC) submitted an Operational Requirement to use this scheme on all fighter and attack aircraft. After careful study, the CNO disapproved the request on May 29, 1984, and said "... it does not appear that the proposed paint scheme would have any significant benefits over current tactical paint scheme when considering all environmental conditions and flight profiles."

Chief of Naval Operations memo 506E2/459 dated September 6, 1984, requested standardized paint scheme patterns be developed for application on Marine Corps helicopters and OV-10 aircraft. The purpose of this scheme was to increase aircraft survivability on the modern battlefield by providing a disruptive paint pattern to reduce visual identification. Naval Air Systems Command message 282029Z of November 1984, authorized Corpus Christi to paint a UH-1N assigned to Marine Aircraft Group 39 in a camouflage pattern for evaluation at MCAS Yuma, Arizona.

MAG-39 message 032047Z April 1985, reported that this scheme was evaluated over all types of terrain and flights against F/A-18 and A-4M aircraft. These tests showed the camouflage pattern superior to the current overall Field Green to prevent visual detection by aerial observers over most types of terrain. The medium gray used in this evaluation required toning down to provide less contrast over green backgrounds. It was requested that low Infrared (IR) brown and tan paints be developed to replace the gray color.

At this time a study was also requested to develop paint schemes for any area in the world as well as procedures for the expeditious application in the event of contingence activation. Of necessity this would require the use of water-based paints.

Additional tests were conducted using OV-10, CH-46E and CH-53E aircraft painted in a pattern of low IR Field Green (34095), flat Black (37038), and medium Gray (35237) with markings applied in Black. In February 1986, Marine Aviation Weapons and Tactics Squadron 1 reported by message 110028Z that both aircraft had been observed from the ground as well as in the air in the desert environment of Yuma. The broken pattern was extremely successful in distorting what would have been the well defined helicopter outline characteristics of the current Field Green Marine helicopters. Unlike the Field Green aircraft, camouflaged aircraft were very difficult to detect from the ground. Their gray colored elements, the pattern itself, or a combination of both greatly impeded visual acquisition against a sky background. The advantages of such a camouflage scheme became more pronounced when considered with the world wide surface-to-air antihelicopter capabilities. Camouflage aircraft positioned with a sky background were difficult to see. However, against the desert floor or mountains, they were often as visible as the same type positioned in the same proximity that were painted Field Green. While this pattern was extremely effective against sky or water, the medium gray employed contrasted with some desert backgrounds. The camouflage scheme on these two helicopters provided them significant survivability features nonexistent in the Field Green aircraft. It was recommended that the camouflage scheme on these CH-46E and CH-53E be incorporated immediately as standard depot level maintenance requirements for all Marine Corps CH-46 and CH-53 helicopters. They also requested the quick development of Sand, Desert Sand, and Suidi Sand for possible future application.

Additional TPS were developed, so that by mid 1985, schemes had been approved for the SH-2F, RF-8G, SH-3, and S-3. In some cases, it was determined that fleet evalu-

Right: As the colorful era came to a close in 1984, VC-10 used this scheme on their TA-4J. The painting of both sides of thin control surfaces white to reflect a thermal pulse clearly shows against the gray of the upper surfaces.
Bottom: The squadron line of VS-31s S-2E Tracker at NAS Quonset Point, Rhode Island clearly shows their colorful rudder markings.

ation was not necessary, due to approval of TPS on a similar model. In January 1987, requests were received from both AIRLANT and AIRPAC for TPS for the C-130. Such a scheme was developed and approved on March 11, 1987.

As of April 18, 1985, MIL-STD-2161(AS) *Paint Schemes and Exterior Markings for US Navy and Marine Corps Aircraft* superseded the three directives MIL-I-18464G(AS), MIL-C-18263F(AS), and MIL-I-6140B that had been the controlling directives for so many years. The instructions describe high visibility and other special purpose paint schemes, in addition to TPS for all fighter, attack, utility, cargo, trainer, helicopter, and SAR aircraft, with detailed drawings for most models.

There are two new distinct schemes for tactical aircraft.

1. Tactical Paint Scheme to reduce visual detection comprised of a nonspecular gray, with all exterior markings in a contrasting shade of nonspecular gray. TPS are used for deception, to reduce initial detection range, or to confuse and mislead observers as to the identity, extent, number, etc. Tactical Paint Scheme patterns are applied to an aircraft to lessen probability of detection visually or photographically, in flight or on the ground. Patterns are based on optical principles that dictate certain nonreflective colors, color configurations and color proportions. The arbitrary application of markings and color schemes other than those described below will reduce the effect of tactical paint schemes and are not permitted. Decals may be used in place of paint for insignia and markings, provided they are made of a nonreflective material and conform to the gloss requirements of the coating system. Decals are not permitted to be used to apply large markings, such as the national aircraft insignia.
2. Land Camouflage Scheme, which blends into land backgrounds comprised of a solid nonspecular Marine Corps Green, or green, gray and black colors, with all exterior markings applied in nonspecular black. This scheme is to be used for land-based Marine observation aircraft and helicopters assigned to the Marine Corps. It may be applied locally on other aircraft and helicopters when authorized by the Naval Air Systems Command and the CNO.

Letters not less than 1/2 inch (1.27 cm) in height are applied to all aircraft to identify the paint coatings applied to the exterior surface, such as the wing, fuselage, fixed and moveable control surfaces, main landing gear, and engine cowl. Notation of the last major paint finish is to be stenciled on the interior of the nosewheel well-door. For those aircraft that have fixed

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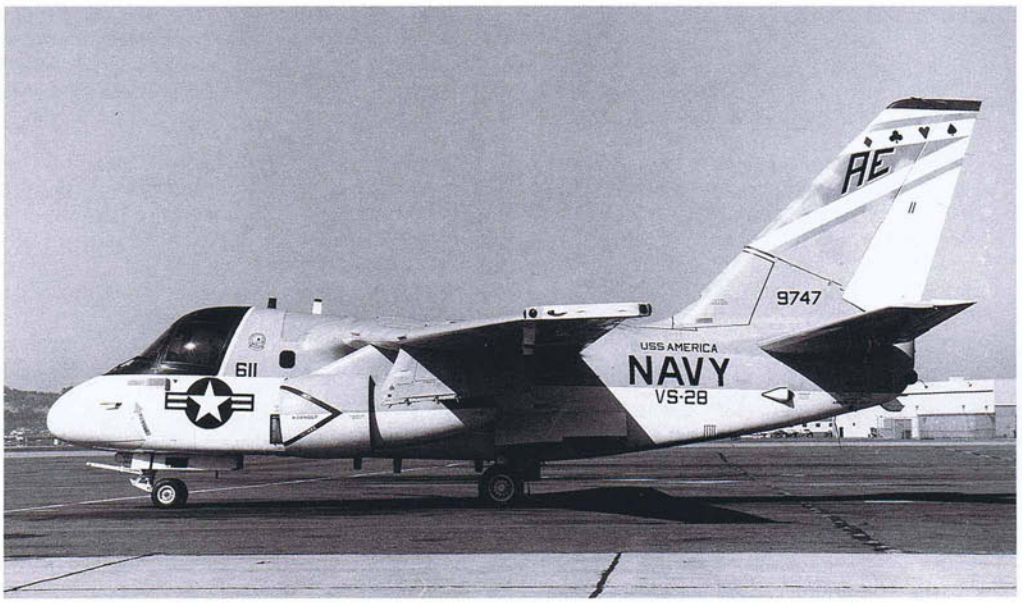
Above: VP-67 used this large bird design on the tail of their P-3A in 1984. **Left:** Just prior to deployment in 1985, VMFA 323 aircraft were painted to conform with the Navy Air Wing. While all the identification markings are highly visible, the national aircraft insignia in accordance with the tactical paint scheme can hardly be seen. **Below:** An extensively modified P-3A for use by the Naval Research Laboratory whose initials provide the Modex marking on the tail. The American flag is unusual on a P-3.

Above: A two-tone blue camouflage tested at the Navy Fighter Weapons School. **Right:** The hard line separating the Insignia White and Light Gull Gray on the fuselage of this S-3A is repeated on the engine nacelle rather than the normal blending of the colors. **Below:** "Mongoose" an A-4E stripped of all equipment except rudimentary avionics was flown at the Navy Fighter Weapons School in this three-tone Sand, Brown and Green Camouflage.



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landing gear, the marking is applied on the fuselage under the right horizontal stabilizer of fixed wing aircraft or the tail boom of helicopters.

The high-visibility paint scheme is to be employed only on aircraft in the training command (excluding reserve training), target control, SAR aircraft (excluding helicopters in combat SAR configuration), target aircraft, drones, and where required, test and evaluation aircraft. International Orange is to be used for all high visibility applications, except for targets and drones. Transparent areas, hinges, openings, screens, and any part of the exhaust trail and antiglare areas are not to be overcoated with the high visibility finish.

The wing tip markings are placed on the top and bottom of the wing, extending inboard on the wings approximately one-third of the length of each wing, but extending inboard no less than 4 feet (121.92 cm) or more than 8 feet (243.84 cm). Unless specific dimensions are given, this marking should terminate at a natural break in the wing surface. Horizontal control surfaces are not to be painted International Orange. The entire vertical tail section, except for the control surface, is to be painted to where it flares into the fuselage.

Above: A VFA 25 "Fist of the Fleet" F/A-18A in an experimental blue camouflage. **Below:** A three-tone scheme evaluated by VF-101 Det Key West. Notice the red edges of all wheel doors and surface under the slats is retained.

All aircraft, except transports, are to be painted on the bottom and sides of the front portion of the fuselage, starting from the radome, if any, and extending aft to terminate at a line perpendicular to the forward edge of the front canopy. On transports, the bottom and the sides of the front of the fuselage are to be painted starting from aft of the radome and extending aft 12 feet (365.76 cm), or to a line perpendicular to the most forward portion of the engines, whichever distance is less. The normal insignia, markings, solar reflecting finish, antiglare, walkway materials, rain-erosion-resistant finish, deicer boots, exhaust trail finish, etc., are to retain the original color, and these areas are not to be overpainted.

Wing tip tanks on aircraft finished in the high visibility color scheme are to be painted over in International Orange, except for the antiglare and polished areas. The application of high visibility finish should be avoided on all aircraft on areas which would produce glare in the pilot's or copilot's

Above: One of the many color schemes evaluated in brown and green combinations is shown on this F-14A. **Right:** The CH-53A flown by MAG 26 in 1987 had all markings in flat black on the flat Field Green aircraft. **Below:** A Desert camouflage used by the Israeli Air Force and the Navy Fighter Weapons School is shown on this A-4E.

Left: The reason for painting areas black that are impinged upon by the exhaust is well illustrated by this SH-3G assigned to NAS Point Mugu. **Below left:** In contrast to the reduced visibility national aircraft insignia, the "Valions" (VFA 15) painted all other recognition markings so as to be clearly visible.

eyes. The high visibility finish must not be applied to any transparent or translucent plastic, or metal frames or fittings on window areas, nor applied to nose sections having an area of less than 2 square feet (.1858 m^2).

The TPS patterns are to be applied in accordance with the specific aircraft illustrations in the instructions. These illustrations are intended as guides, and minor variations in pattern are acceptable. However, care must be taken that the proportion and balance of different colors are approximately as illustrated. Boundaries between colors are to be irregular and fade into each other, with no sharp lines of demarcation. A 6-inch (15.24 cm) blend line is to be used.

Most tactical paint schemes use a single color on the underside of the fuselage, wings, horizontal stabilizer, and control surfaces. The bottom color is to be brought up the sides of the fuselage to give the approximate side view appearance in accordance with the application illustration for each model. The transition from the underbelly color to the upper surface pattern is to be an irregular, indistinct, countershaded area. A sharp line and any regular repeating pattern, such as a scallop, will compromise the overall effect and raise the risk of detection. On low wing aircraft, the bottom color on the fuselage is to be brought into the wing root to meet the bottom color under the wing.

Drones are to have the upper surfaces (except fuselages), vertical stabilizer, and rudder painted Insignia White (17925). The entire fuselage is to be painted fluorescent Yellow Orange and the bottom of all aerodynamic surfaces Insignia Red.

Target aircraft are to have all exterior surfaces painted fluorescent Yellow Orange, except for QF-86 aircraft, which are to have only the wing tips and vertical tail painted fluorescent Yellow Orange.

All cargo transport and utility land planes are to be painted with the solar heat reflecting color scheme, except those painted with the tactical paint scheme. The upper surface of the fuselage is to be painted Insignia White, beginning at the top forward edge of the pilot's enclosure and extending aft, to include the vertical stabilizer and rudder, the upper surface of the horizontal stabilizer and elevator and extending down each side of the fuselage to the bottom of the windows. Those aircraft used in a transport or staff capacity may employ stripes below the white area and a chevron on the nacelles for decorative purposes.

All pilot-operated aircraft are to have nonspecular Black applied to all airframe surfaces which would produce glare in the pilot's or copilot's eyes or induce eye strain due to excessive brightness, except those aircraft painted with

Right: This search and rescue UH-2C "Angel" assigned to the USS Coral Sea (CVA-43) deviated from the normal Engine Gray scheme. **Bottom:** HAL-4 operated their HH-1K with subdued markings in black on a nonspecular Field Green aircraft.

tactical paint schemes. Those aircraft painted with a tactical paint scheme are to use nonspecular Gray (36320) or Blue (35237).

Assemblies fabricated of glass fiber-reinforced plastic, such as radomes, radio antenna housings, noses, fairings, wing tips, and intake ducts, which require rain-erosion protective finishes, are to be painted to match the color of adjacent surfaces, except for the frontal areas. These frontal areas are to be in the natural color of the rain-erosion protective finish and are not to be overcoated for color matching purposes. The extent and location of the frontal areas thus finished are to be as specified in MIL-R-7705. Aircraft with tactical paint schemes, or land camouflage schemes with plastic assemblies requiring rain-erosion coatings, are to have the coating the same color as adjacent areas.

Retractable landing gear, wheel well areas, wheel assemblies, inner surfaces of landing gear doors and all auxiliary doors and struts are to be colored glossy Insignia White, except for Marine helicopters, in which case they are to be Field Green or Black. On aircraft with a tactical paint scheme, these areas are to be either black or the same gray used on the aircraft. The edges of the landing gear doors are to be painted glossy Insignia Red, without overcovering the white. The outer surface of the doors is to be painted to match the prescribed color scheme of the particular aircraft.

Fixed landing gear is to be painted to match the prescribed color scheme of the particular aircraft.

The interior surfaces of speed brakes and wing flaps are to be painted glossy Insignia Red. Exterior surfaces are to be painted to match the prescribed color scheme of the particular aircraft. Wing flap areas which are covered by the wing when they are in the retracted position are to be glossy Insignia Red. In case of hostility, Fleet commanders have the authority to overpaint these red areas for tactical advantage.

The interior (lower) surface and inboard end of wing leading edge slats, and the wing area covered by the slat when in a fully retracted position, are to be painted glossy Insignia Red. Exterior surfaces are to be colored to match the prescribed color scheme of the particular aircraft.

Where anti skid material is applied, the color is to be as follows: On conventionally painted aircraft, the color is to be Gray (36231) or Black (37038). On land camouflage aircraft, the color is to be Black (37038) or Field Green (34095). Aircraft painted in a tactical paint scheme are to have walkways and steps painted to match the adjacent areas.

External fuel tanks, pylons, rocket launchers, missiles, pods, and other externally carried equipment are to be painted to agree with the aircraft scheme. Gray (36375) is to be used when carried on aircraft with tactical paint schemes, ex-

Left: The P-3C needed the solar reflecting white top to help keep the cabin temperature down for the crew operating all the electronic equipment. **Bottom:** One of the numerous paint schemes evaluated in 1988. Notice the Light Blue being used in place of red, yellow and white markings.

cept for stores peculiar to the A-4 and SH-60B aircraft. In these cases, Gray (36495) land camouflage paint schemes (except the AV-8) are to use Green (34095). External stores peculiar to the AV-8 are to be painted Gray (36440). All other paint schemes are to use Insignia White (17925). Stores used on two different color scheme aircraft are to be painted to match the primary user.

Blade-type antennae, antenna mast, antennae covers and radomes are to be painted to match the color of adjacent areas, except as for frontal areas previously described.

Main and tail rotor blades, hubs, transmissions and rotor mechanisms are to be painted nonspecular Black, except where tactical paint schemes are utilized. In this case, the blades are to be painted to match the tactical paint scheme.

When the same model/series aircraft is used in both the Navy and Marine Corps, and each service requires a different paint scheme, the assemblies, including blades, are to be painted Black (37038) or gray on all aircraft. The decision as to which color is to be used is based on which service has the most aircraft of this model/series.

The color of the adjacent aircraft exterior is to be carried around the lip of the duct, and into the duct, approximately 6 inches (15.24 cm). The remaining interior surfaces of the duct are to be painted glossy Insignia White.

Propeller blades, spinners, hubs and domes are to be painted nonspecular Black, except on aircraft with a tactical paint scheme, in which case they are to match the tactical paint scheme.

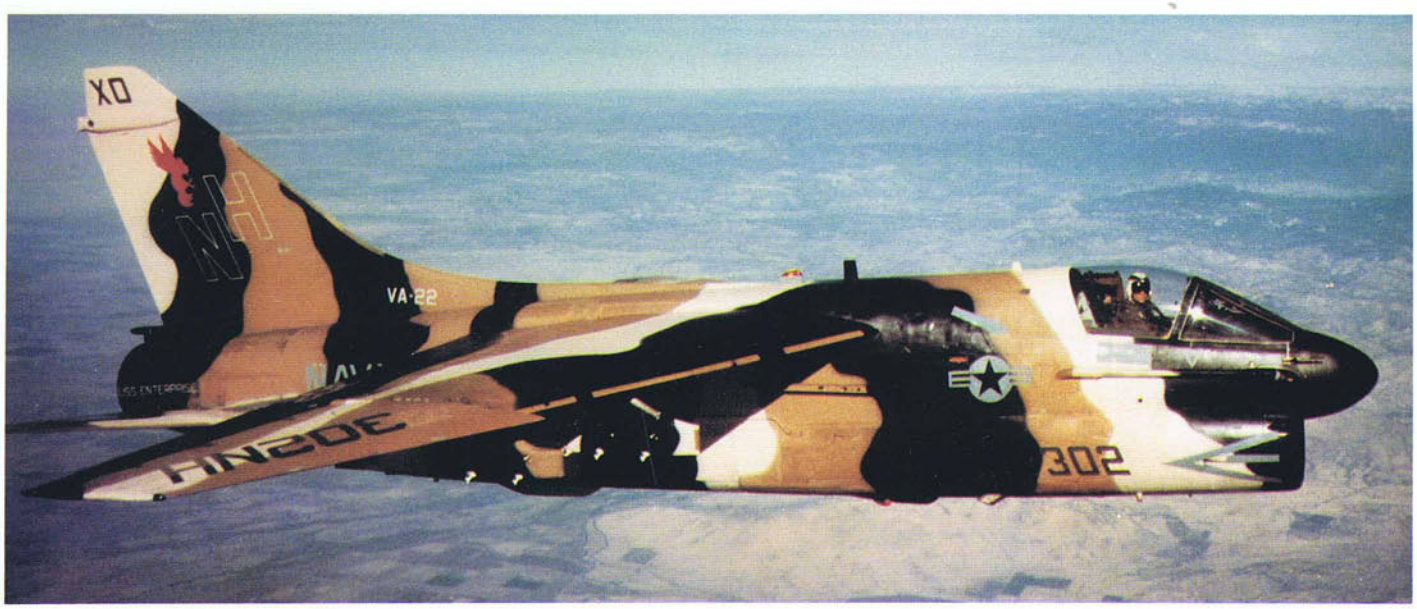
Engine cowl interiors are to be painted Gray (16440).

The Chief of Naval Operations letter 506E2/6U403045, dated April 11, 1986, authorized the painting of all Marine Corps AH-1, UH-1, CH-46, CH-53, and OV-10 aircraft in the approved green/gray/black camouflage scheme at Scheduled Depot Level Maintenance (SDLM). At the discretion of the Operational Commander, non-low IR brown and tan paints were authorized to be substituted for low IR green, gray, and black paints of the approved camouflage schemes.

A low IR brown and tan camouflage scheme was still desired for Marine Corps helicopters and OV-10s.

From the beginning, Naval Air Systems Command had stressed the point that paints in the tan and brown area possessed a much higher IR visibility than the evaluated colors and should therefore not be used.

There is always considerable interest in the "odd ball" and one-of-a-kind paint schemes. One of the more unusual was the tactical paint scheme applied to a C-20D aircraft at the personal request of the Assistant Secretary of the Navy (Air)



Right: Painted in the new tactical paint scheme, practically no markings show on these A-6A Intruder of VA-34 the "Blue Blasters". **Bottom:** In contrast, this A-6E of VA-34 during the same period has all marking in striking contrast.

in January 1987. Branch of Service, radio call numbers, and national aircraft insignia were to be 12 inches (30.48 cm) in height. If the background color was Blue (25237), then Gray (26320) was to be used for markings. If the background was Gray (26320), then Blue (25237) was to be used for markings. If the background was Gray 26375, then Gray (26320) was to be used for markings. The basic aircraft paint scheme was in accordance with the instructions contained in MIL-STD-2161.

The seventy-fifth anniversary of US naval aviation was celebrated on May 8, 1986. Numerous aircraft had colorful paint schemes applied during the year to celebrate this event. There were no instructions issued to govern these schemes, nor even one that would authorize temporary markings for the event. However, the idea caught on and provided some of the most colorful and unusual paint schemes ever applied to US naval aircraft. These schemes were short lived and a year later were only a memory.

After Chief of Naval Operations message 011809Z July 1986, approved a P-3 generic paint scheme concept, Naval Air Systems Command 252027Z of July directed the following changes be made to all US Navy P-3 aircraft.

1. Eliminate all markings, i.e., tail feathers, Bureau Numbers, from the vertical stabilizer.
2. Eliminate unit aircraft numbers from the aircraft nose.
3. Eliminate any other squadron unique emblems/markings.
4. Add an aircraft number to the inner surface of nose wheel door.

MIL-STD-2161 specified that RH-53D helicopters be painted glossy Engine Gray (16081) overall. As there were only four Navy squadrons that required this scheme, which necessitated an extra one hundred and twenty man-hours to apply, Naval Aviation Depot Pensacola requested by message 131324Z of August 1987, that these aircraft be painted with the gray camouflage scheme used on the MH-53E. By message 151712Z of September 1987, the Chief of Naval Operations approved the painting of RH-53D helicopters overall in Gray (36081), with markings in Blue (35237).

Looking forward to the transition of SH-3H helicopters taking over the SAR/Utility role currently being performed by SH-3D/G models, Commander Aircraft Pacific requested by message 120116Z of January 1990, that all SH-3D/G, and

Left and below: These three color schemes were evaluated by the Training Command in 1989 for increased visibility of their T-34C training aircraft.

Right and bottom: A green and tan scheme was used during Desert Storm on the AH-1W and UH-1N of Marine Light Attack Helicopter Squadron 169 (HMLA-169). These aircraft fulfill the dual mission of the squadron.

those SH-3H aircraft not assigned to HS squadrons, be painted in the glossy scheme, while SH-3H aircraft assigned to HS squadrons be painted in the tactical paint scheme. This request was based on the increased workload of maintaining aircraft, with a tactical paint scheme, which were being employed at shore-based activities with nontactical missions.

Naval Air Systems Command message 231710Z of March 1990, approved all SH-3G helicopters assigned to VC-5 which were or will be employed in an overseas operational theater be painted in the glossy scheme.

In response to the movement of aircraft to Southwest Asia in Desert Shield, Naval Air Systems Command in September 1990, issued message 051656Z on paint scheme guidance for desert environments. From past desert paint scheme evaluations, it had been determined that desert tans and browns were only effective for low level flight conditions with the observer at a higher altitude. This effectiveness is minimized due to aircraft shadows on the desert floor. In cases where the camouflaged aircraft was above or at the same altitude as the observer, the desert tans and browns increased the detectability over a tactical paint scheme gray aircraft. It stressed the gray tactical paint scheme as being superior in a desert environment and that tans and browns do not possess low Infrared reflectance.

Based on these reasons, the following was recommended:

1. Fixed wing aircraft, other than AV-8B and OV-10, should not be repainted.
2. Since the green and black colors would result in increased detection ranges in a desert environment, AV-8B and OV-10 aircraft should have green and black areas painted as follows:
   a. AV-8B green areas should be repainted 36375 or 36220 gray. (Those painted at MCAS Cherry Point used 36375.)
   b. OV-10 green areas should be repainted 36375 gray.
   c. OV-10 black areas should be repainted 36320 gray.
   d. OV-10 blue areas should remain 35237 blue.

All Marine Corps helicopters should be repainted in accor-

continued on p. 77

Above: VA-65 operated their A-6E from the USS Theodore Roosevelt (CVN-71) during the Persian Gulf operations in this camouflage scheme. **Left:** A typically mottled aircraft in 1985 due to the problems of matching paint colors when doing minor repairs or normal touch-up. **Below:** This CH-46D of HMM-161 was painted in this two-tone brown and than scheme during Desert Storm.

Right, below and bottom: There were at least three different camouflage schemes applied to the CH-53s of HMH-466 as shown here. All of the imaginative schemes used in Desert Storm were the product of on the spot application of whatever paints were available in an attempt to find something more satisfactory than the standard Marine Land Camouflage.

Left: HMM-164 used this Light Blue and Green scheme on their CH-46F during Desert Storm. **Below and bottom:** VMO-2 also had more than one scheme applied to their OV-10A/D aircraft.

Above: A F/A-18 Hornet from VFA-81 based on the USS Saratoga (CV-60) during Desert Storm. **Bottom:** Even with all the effort to reduce the visibility of naval aircraft, the externally carried bombs still retain their Olive Drab paint and color code to denote the explosive filler.

continued from p. 73

dance with paragraphs 2b., c., and d. above. Repainting was recommended to be accomplished using temporary water-based paints. These paints were to be removed at eight week intervals to ensure no damage to the aircraft. As the hot desert environment would tend to bake on temporary paint, they were to be spot checked at two week intervals to insure removability. Despite the extensive studies on tans and browns, some Marine Corps aircraft were re-painted using the tan and brown colors.

After extensive deliberation and evaluation, Headquarters Marine Corps, by message 130001Z, dated August 1991, stated that gray tactical paint schemes provide the best overall reduction in initial aircraft detection, and requested two-tone gray tactical paint schemes be specified as the standard paint scheme for all Marine Corps helicopters and OV-10 aircraft. They still held out on the AV-8B. This request was concurred with by CNO message 191536Z of August 1991.

Naval Air Systems Command message 030195Z of October 1991, directed that effective immediately, commands involved with the immediate repainting of Desert Storm helicopters and OV-10 aircraft, as well as aircraft processed through Scheduled Depot Level Maintenance, were to paint the aircraft as follows: All surfaces, except rotor blades, rotor assemblies and propellers of tactical helicopters, and OV-10 aircraft that are visible in a clean flight configuration, be painted in a Blue (35237)/Gray (36375) scheme. Surfaces viewed from directly above were to be Blue (35237). Surfaces viewed from below and from the side were to be Gray (36375). Markings placed on a blue background were to be painted gray, and vice versa. Rotor blades, rotor heads, gear boxes, etc., as well as OV-10 propellers, were unaffected by this tactical paint scheme and were not to be changed from the current black.

At the time this is being written, there is as yet no official approval of a new tactical paint scheme for AV-8B aircraft, but they are being repainted with a gray tactical paint scheme.

SECTION 2

NATIONAL AIRCRAFT INSIGNIA

CHAPTER 4 1960-1993

Amendment 2 to MIL-I-18464E(Wep), *Insignia and Markings for Naval Weapons Systems*, dated December 16, 1964, directed that the national aircraft insignia on the undersurface of patrol aircraft, painted Light Gull Gray, was to be applied in low gloss colors.

MIL-I-18464F(WP), *Insignia and Markings for Naval Weapons Systems*, dated July 12, 1965, changed the sizes of the national aircraft insignia. They now were to be from 10 inches (25.40 cm) to 60 inches (152.40 cm) in diameter. The 10-inch (25.40 cm) to 35-inch (88.90 cm) sizes were to be in steps of 5 inches (12.70 cm), while the 40-inch (101.60 cm) to 60-inch (152.40 cm) sizes were to be in steps of 10 inches (25.40 cm). Decalcomanias could be used for all these sizes.

MIL-I-6140B, *Insignia, National Aircraft*, dated October 20, 1972, made the first change to the national aircraft insignia since 1965. This change reduced the size of the insignia. Insignia applied to the wings of aircraft were to have a maximum diameter of 40 inches (101.60 cm) and a minimum diameter of 10 inches (25.40 cm). Standard sizes continued to be in multiples of 5 inches (12.70 cm). The diameter chosen was to be the standard size closest to, but does not exceed of, fifty percent of the distance between the leading edge of the wing and the leading edge of the aileron cutout at the point of application.

Insignia applied to the side of the fuselage of all aircraft, including helicopters, were also reduced in size. The maximum size was now to be 40 inches (101.60 cm) and the

Right: The national aircraft insignia was prominently displayed on the forward fuselage of the F4D-1 Skyray.


WADF
WADF
ADC
A

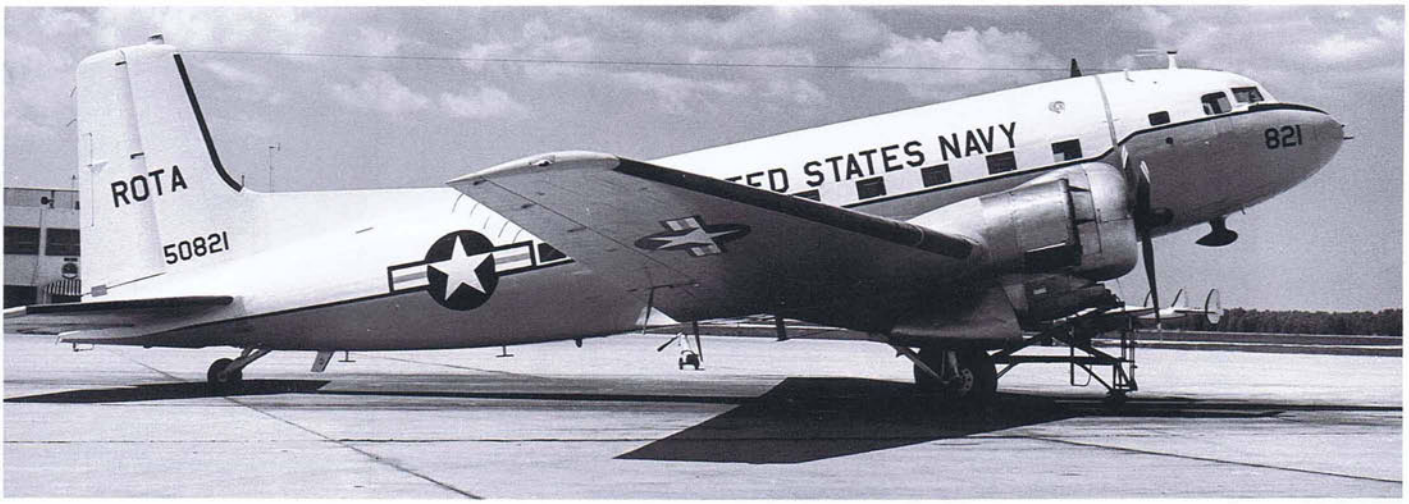
CONVENTIONAL SCHEME

INSIGNIA RED

INSIGNIA WHITE

INSIGNIA BLUE

Left: Notice the placement of the national aircraft insignia on the under surface of the swept wing of this F-4J in 1974. **Below:** The national aircraft insignia is applied to the front of the transmission housing on this SH-3F assigned to Helicopter Antisubmarine Squadron Light 33 to fill the requirement for an insignia visible from above.



Above: The wings on the C-117D were slightly swept so that the national aircraft insignia to be correct should have been applied along the fifty percent chord line. **Right:** With the introduction of tactical paint schemes, the national aircraft insignia was greatly reduced in size. **Bottom:** The national aircraft insignia on the tail boom is unusual due to the configuration of the OV-10A. Note the unusually small size of this insignia as well as those on the under surface of the wing.

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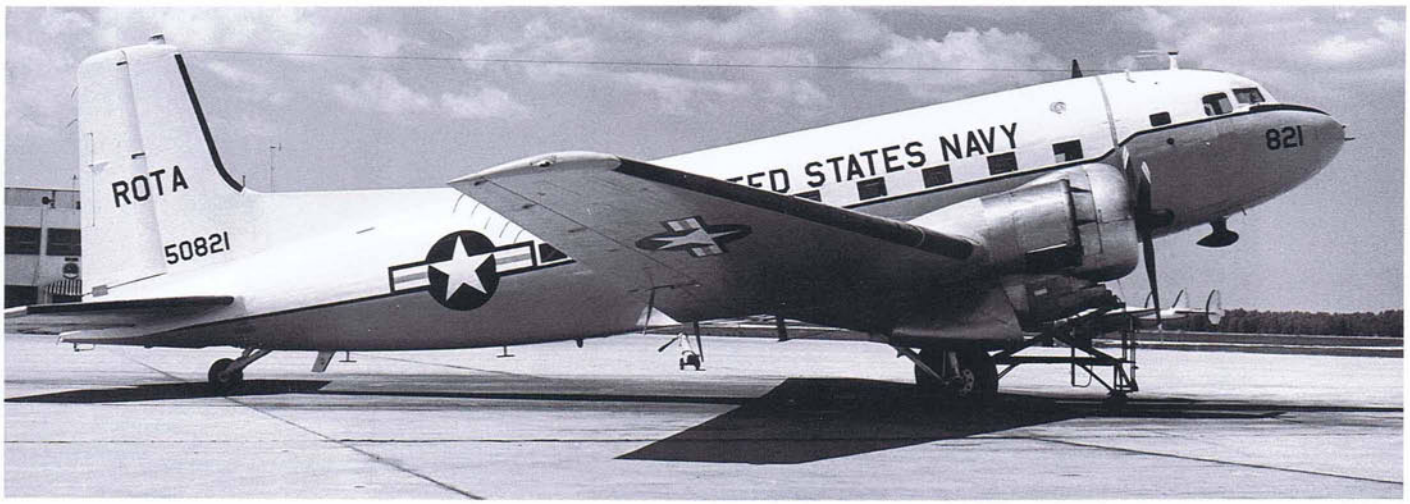

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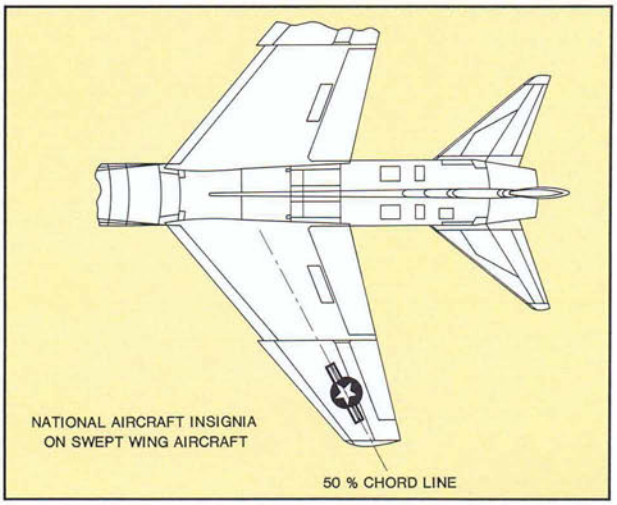
NAVY
156883


NV
8735
USS HORNET
38



Left: The proper placement of the national aircraft insignia on the wings of swept wing aircraft is shown on this A-7E. **Left bottom:** It is only in cases such as this S-2D, lowering its wings prior to a catapult launch from the USS Hornet (CVS-12), that it is possible to see the placement of the national aircraft insignia on the upper and lower wing surfaces of the same aircraft.

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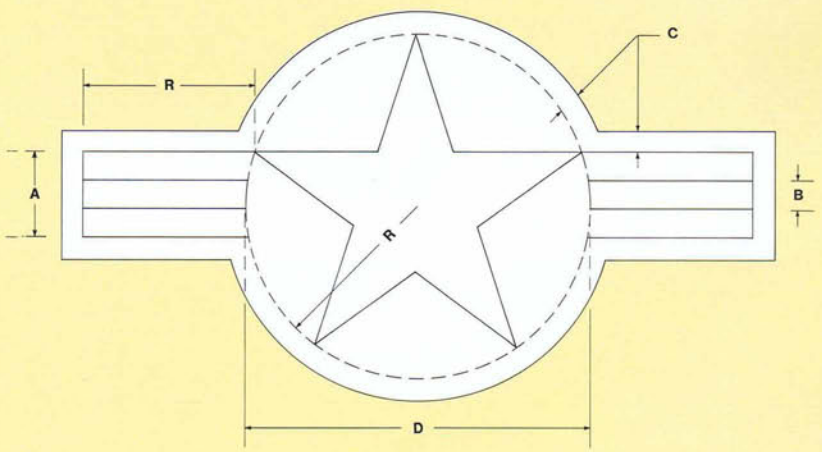
Insignia are still required on both sides of the fuselage or hull, except for helicopters and convertiplanes. As before, they can be applied so that they extend over doors and emergency exits, but cannot extend over windows or openings used in combat which would alter their appearance. On camouflaged aircraft, the fuselage insignia is to be 12 inches (30.48 cm) in diameter.

Helicopters and convertiplanes are to have four insignia applied so as to be visible from either side, above and below. If the configuration allows, a fifth insignia may be applied to the nose of helicopters for frontal identification. Symmetry of size and location is to be the same on all like-model series helicopters.

The normal glossy red, white, and blue design is to be used when the insignia is applied to aircraft not painted in a tactical paint scheme or land camouflage. When applied to an aircraft with a tactical paint scheme, those areas normally Insignia Red and Insignia Blue are to be the gray which

DIMENSIONS FOR NATIONAL AIRCRAFT INSIGNIA

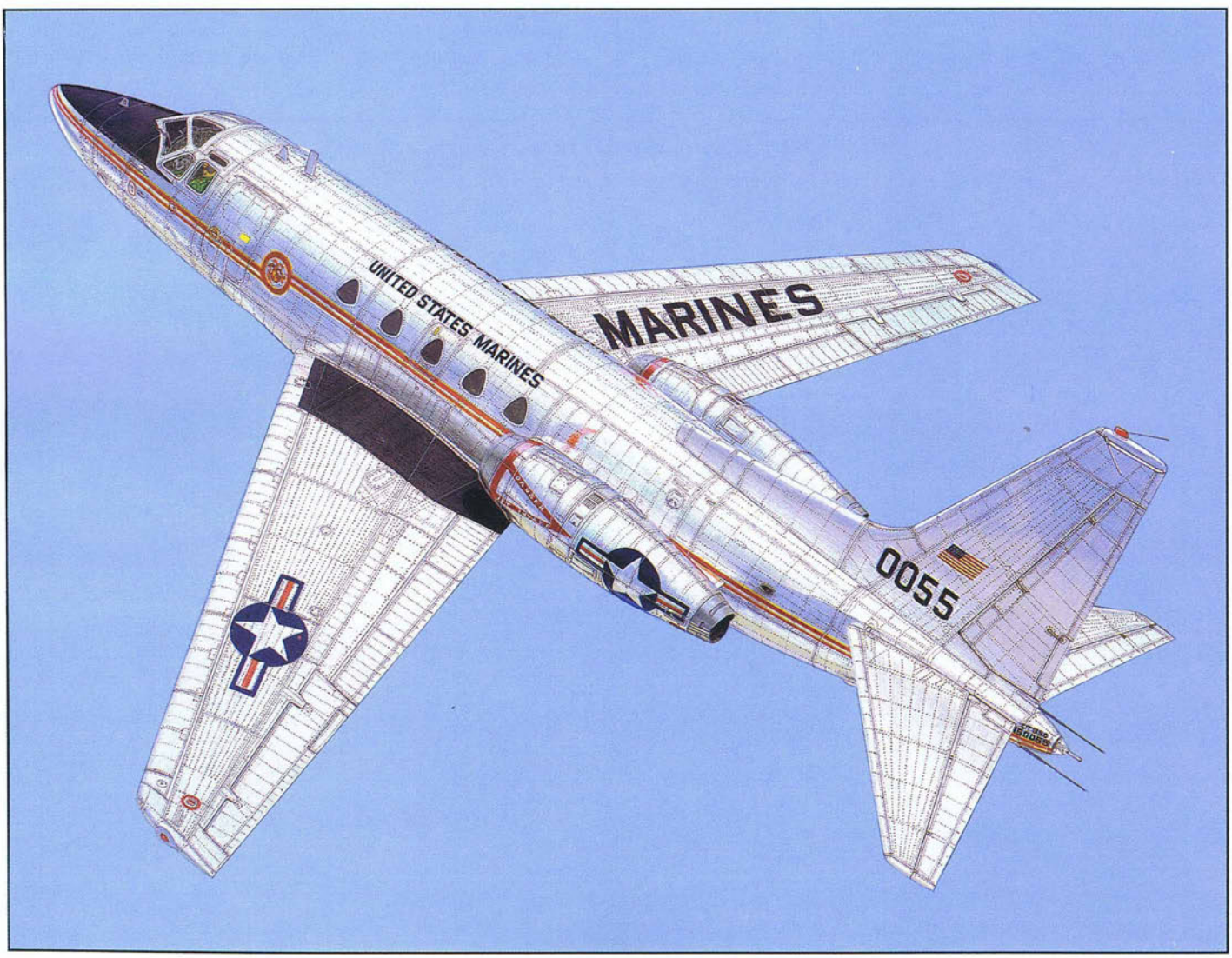


D		R		A		B		C	
10.00"	(25.40 cm)	5.00"	(12.70 cm)	2.50"	(6.35 cm)	0.83"	(2.11 cm)	0.63"	(1.60 cm)
12.00"	(30.48 cm)	6.00"	(15.24 cm)	3.00"	(7.62 cm)	1.00"	(2.54 cm)	0.75"	(1.91 cm)
15.00"	(38.10 cm)	7.50"	(19.05 cm)	3.75"	(9.53 cm)	1.25"	(3.18 cm)	0.94"	(2.39 cm)
20.00"	(50.80 cm)	10.00"	(25.40 cm)	5.00"	(12.70 cm)	1.66"	(4.22 cm)	1.25"	(3.18 cm)
25.00"	(63.50 cm)	12.50"	(31.75 cm)	6.25"	(15.88 cm)	2.08"	(5.28 cm)	1.56"	(3.96 cm)
30.00"	(76.20 cm)	15.00"	(38.10 cm)	7.50"	(19.05 cm)	2.50"	(6.35 cm)	1.88"	(4.78 cm)
35.00"	(88.90 cm)	17.50"	(44.45 cm)	8.75"	(22.23 cm)	2.92"	(7.42 cm)	2.19"	(5.56 cm)
40.00"	(101.60 cm)	20.00"	(50.80 cm)	10.00"	(25.40 cm)	3.33"	(8.46 cm)	2.50"	(6.35 cm)
45.00"	(114.30 cm)	22.50"	(57.15 cm)	11.25"	(28.58 cm)	3.75"	(9.53 cm)	2.81"	(7.14 cm)
50.00"	(127.00 cm)	25.00"	(63.50 cm)	12.50"	(31.75 cm)	4.17"	(10.59 cm)	3.13"	(7.95 cm)
55.00"	(139.70 cm)	27.50"	(69.85 cm)	13.75"	(34.93 cm)	4.58"	(11.63 cm)	3.44"	(8.74 cm)
60.00"	(152.40 cm)	30.00"	(76.20 cm)	15.00"	(38.10 cm)	5.00"	(12.70 cm)	3.75"	(9.53 cm)

contrasts with the background on which it is applied. The areas normally Insignia White are to be the background color.

On aircraft painted in the land camouflage or tactical paint scheme, the national aircraft insignia is to be a maximum of 12 inches (30.48 cm).

On land camouflaged aircraft, the areas normally Insignia Red and Insignia Blue are to be nonspecular Black. The areas normally Insignia White are to be the background color on which the design is applied.



Left: Notice how far aft the national aircraft insignia is placed on this TA-4J of Composite Squadron 12. **Right:** The national aircraft insignia shown on the upper surface of this H-3 helicopter aboard the USS Enterprise (CVN-65) is seldom seen by those on the ground.

Left bottom: Due to the configuration of the T-39G, the national aircraft insignia is placed on the engine nacelle rather than the fuselage. **Right:** Helicopters such as this CH-46D have a national aircraft insignia painted across the top of the fuselage to fill the requirement of one being visible from above. **Below:** Painted in the antisubmarine warfare paint scheme, this SH-3A has the national aircraft insignia positioned on the upper surface of the stabilizer.

Left: The small national aircraft insignia on the fuselage of the AV-8B is painted in accordance with the tactical paint scheme requirements. **Below:** The national aircraft insignia on the wing of the AV-8A of VMA-513 is located as for a straight wing aircraft.

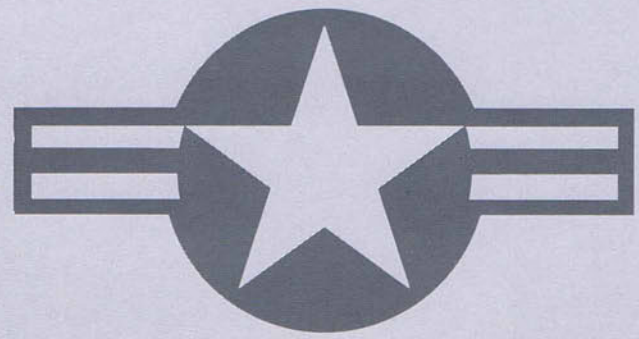
LAND CAMOUFLAGE

BACKGROUND COLOR

BLACK

Right: This close-up of a AH-1J clearly shows how the official national aircraft insignia has been simplified for application purposes. This stencil approach has not been universally adopted by the Navy or Marine Corps but significant numbers of aircraft are adorned in this fashion. **Below:** All markings, including the national aircraft insignia are applied in Black on this AH-1T.

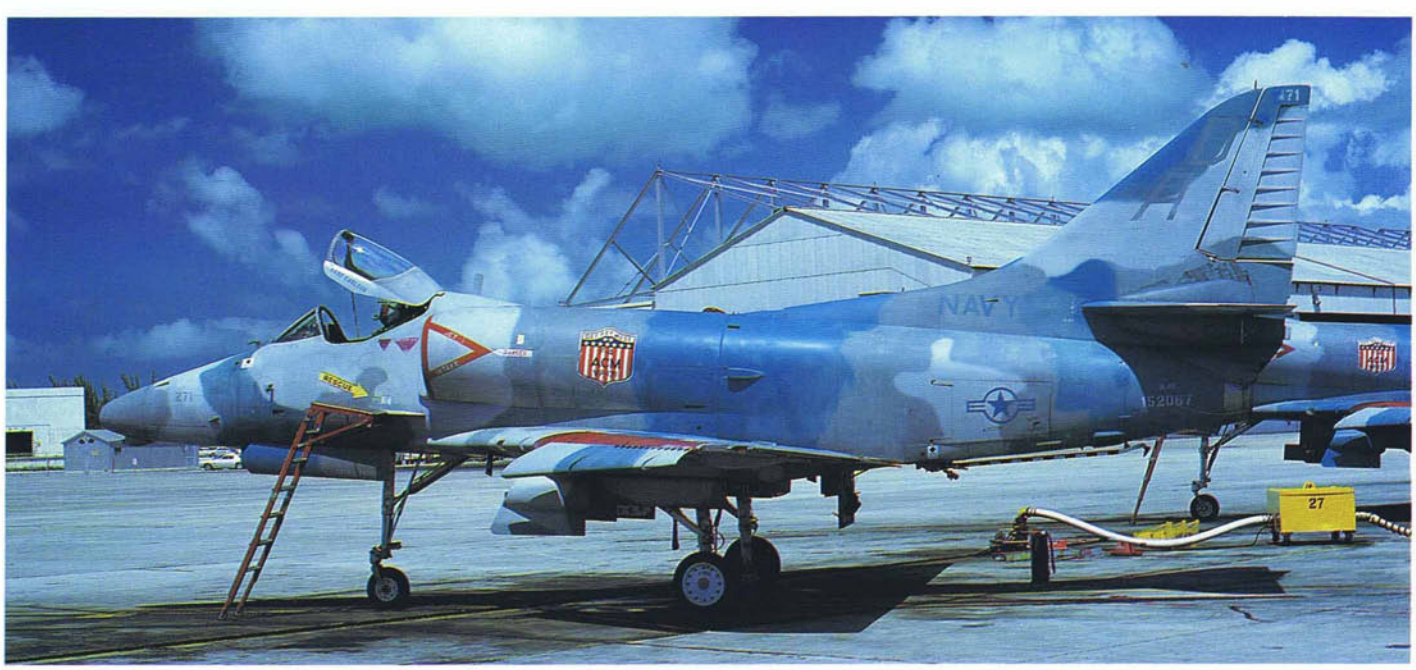
TACTICAL PAINT SCHEME



BACKGROUND COLOR

CONTRASTING GRAY

Left: VMA-311 completely changed the colors of the national aircraft insignia when developing this camouflage scheme. **Below:** VF-171 Det Key West applied the national aircraft insignia in blue to conform with this scheme.



VFA-131 painted the national aircraft insignia on the upper surface of their F/A-18A aircraft in the smallest size posible.

SECTION 3

IDENTIFICATION AND RECOGNITION MARKINGS

CHAPTER 5 1960-1969

OPNAV NOTICE 05400, *Naval Aeronautical Organization Fiscal Year 1960* (Revised January 1, 1960), showed the normally expected changes. The following units have been disestablished since the last listing shown in Volume 3.

DISESTABLISHED

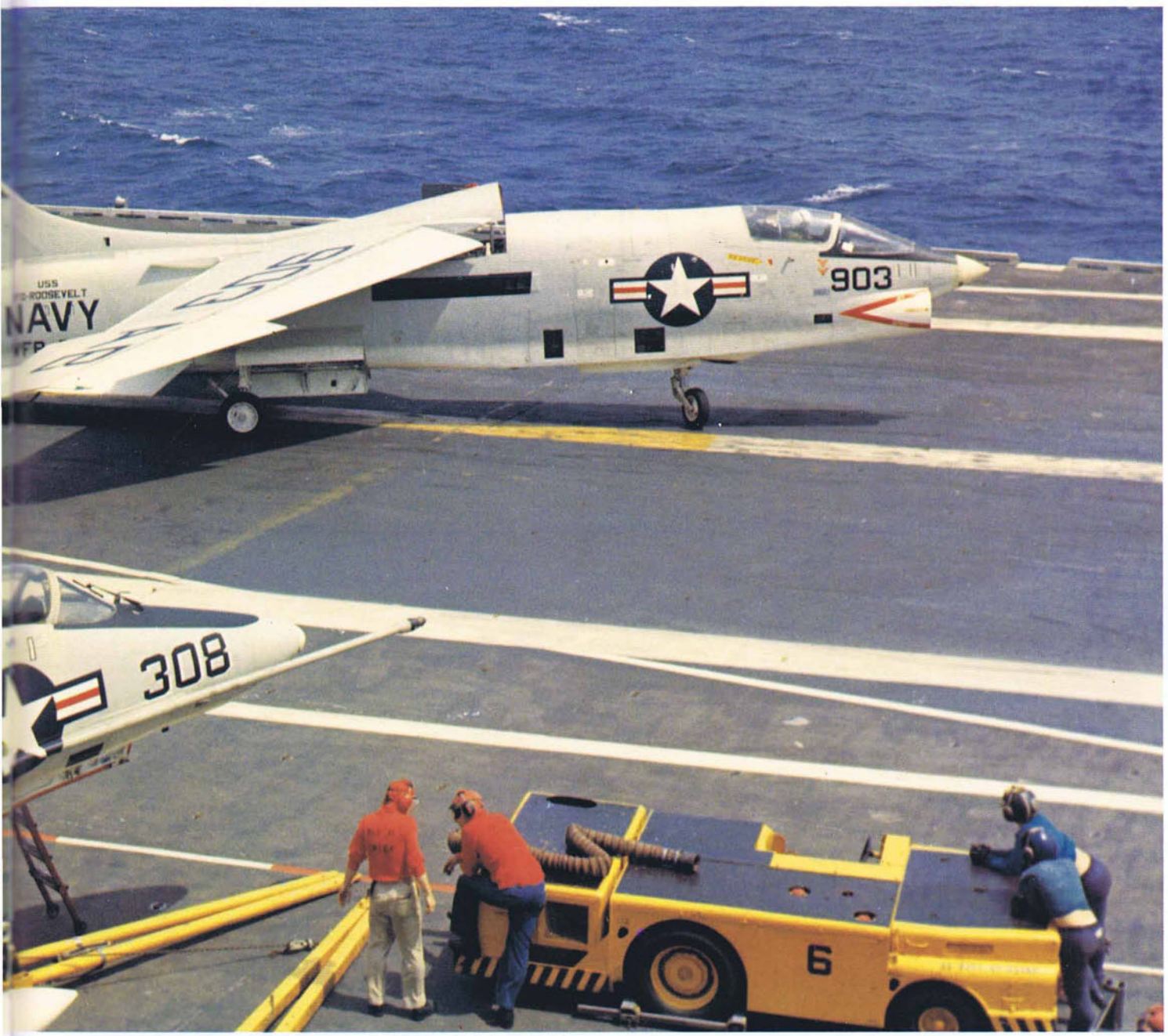
FASRON 5	FC	December 31, 1959
FASRON 104	FK	December 31, 1959
FASRON 108	FP	December 31, 1959
VA(HM)-12	ZF	
ZP-2	KB	November 30, 1959
H&MS-31	DV	January 31, 1959
H&MS-35	BM	
NAS Pensacola (BSG)	2A	
NAS Glynco (ZTG)	2G	October 2, 1959
NATTC Norman	4N	June 30, 1959

The current assignments were:

CARRIER AIR GROUPS AND SQUADRONS
AIR GROUPS

CVG-1	AB
CVG-2	NE
CVG-3	AC
CVG-4	AD
CVG-5	NF
CVG-6	AF
CVG-7	AG
CVG-8	AJ

Right: As the ninth squadron aboard the USS Franklin D. Roosevelt (CVA-42) in 1967 this VFP-62 Det 42 RF-8G is identified with Maroon tail markings. Note also the red painted area under the leading edge slat on the A-4.


903
308
6

Left: ABANDON CHUTE is painted on the bottom of this HRS-3 assigned to the rescue mission in the Tokyo area in 1960. **Bottom:** In 1960, Fleet Air Gunnery Unit (FAGU) at NAS El Centro used a checkerboard design on the tail of their F4D-1s reminiscent of the Purina Chow design.

CVG-9	NG
CVG-10	AK
CVG-11	NH
CVG-12	NJ
CVG-14	NK
CVG-15	NL
CVG-19	NM
CVG-21	NP

FIGHTER ALL-WEATHER

VF(AW)-3	PA

LIGHT PHOTOGRAPHIC

VFP-62	GA
VCP-63	PP

CARRIER AIRBORNE EARLY WARNING

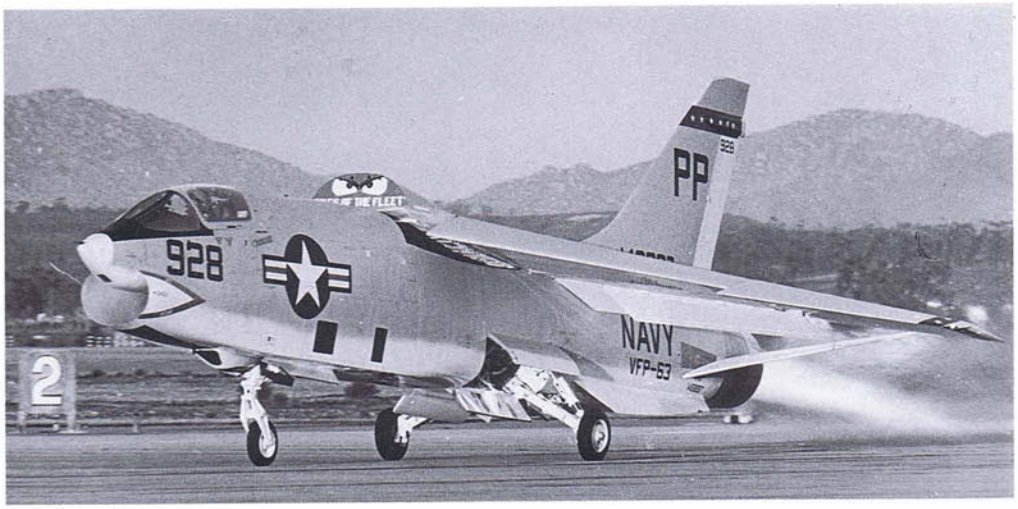
VAW-11	RR
VAW-12	GE
VAW-13	VR
VAW-33	GD

HEAVY PHOTOGRAPHIC

VAP-62	GB
VCP-61	SS

HEAVY ATTACK

VAH-1	GH
VAH-3	GJ
VAH-4	ZB
VAH-5	GK



Right: Known as the "Eyes of the Fleet", VFP-63 painted their motto and a pair of eyes on the tilted up leading edge of the wing almost in the same vein as the WW II Kilroy design. **Bottom:** An A-7B Corsair II of VA-203 painted as the CAG aircraft with all the squadron colors in addition to their own Light Blue.

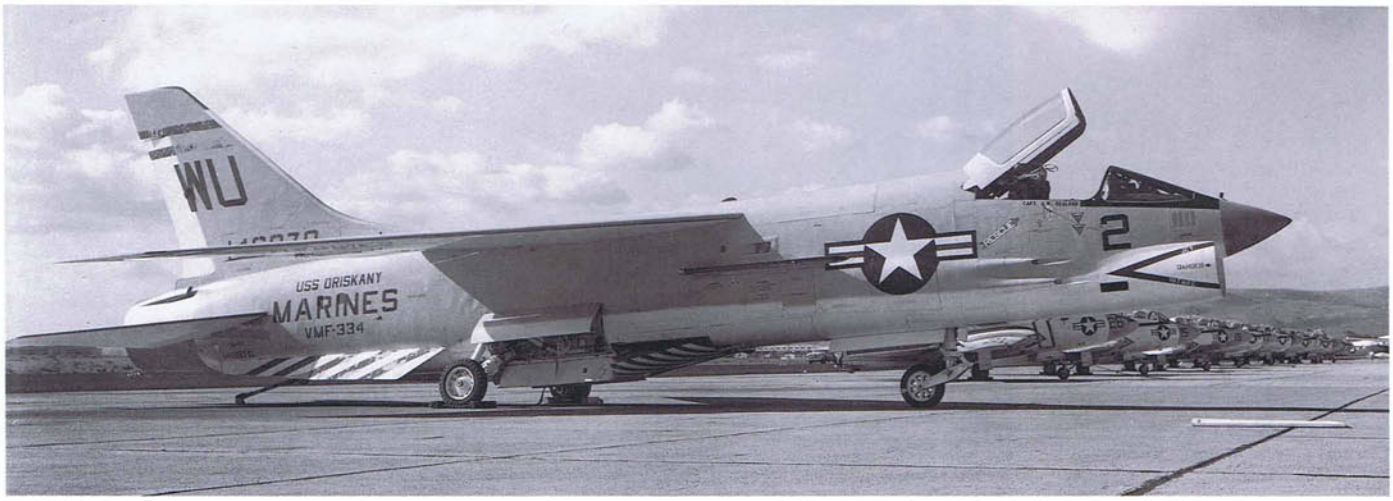
VAH-6	ZC
VAH-7	GL
VAH-8	ZD
VAH-9	GM
VAH-11	GN

ANTI SUBMARINE

VS-21	YA
VS-23	PF
VS-27	MA
VS-30	MB
VS-31	MC
VS-32	MD
VS-36	ME
VS-37	SU
VS-38	ST
VS-39	MF

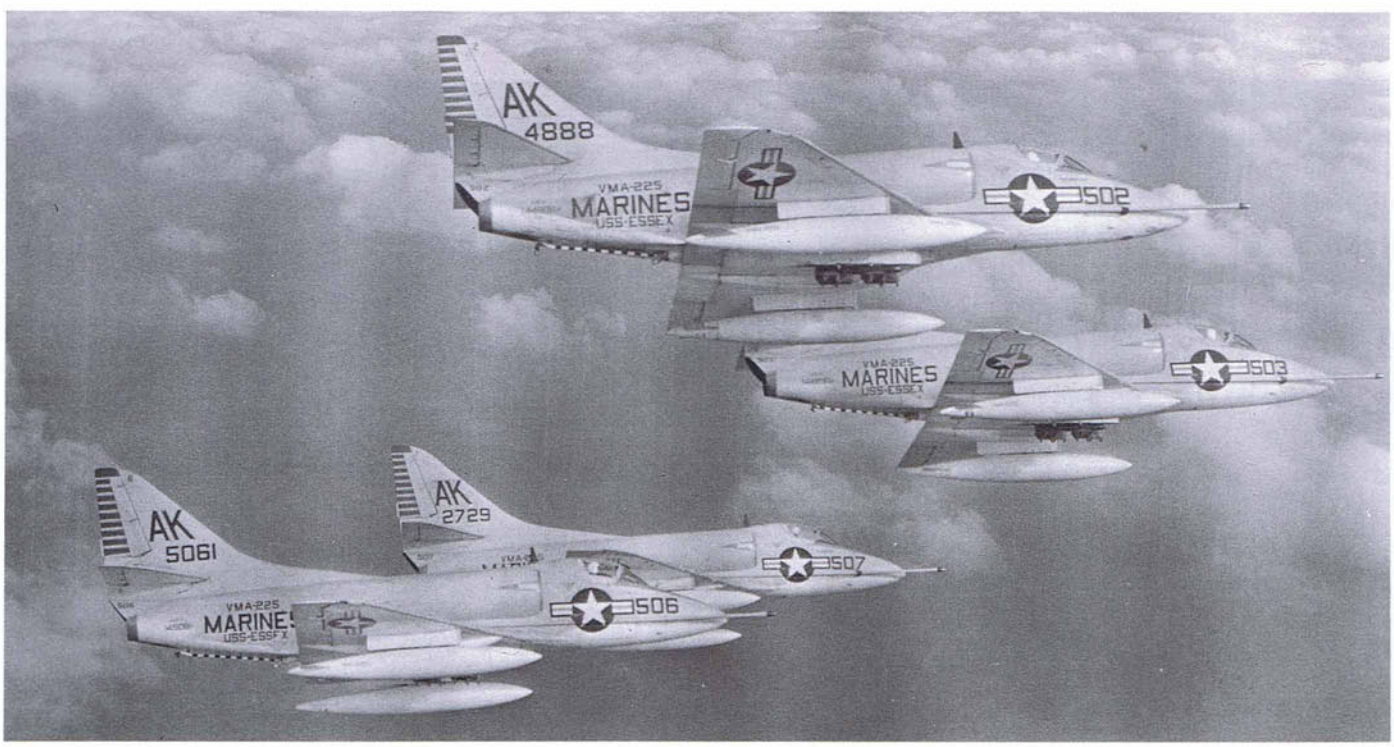
HELICOPTER ANTI SUBMARINE

HS-1	HA
HS-2	SK
HS-3	HB
HS-4	TA
HS-5	HC
HS-6	UB
HS-7	HD
HS-8	VB
HS-9	HE
HS-11	HF



Above: Large aircraft numbers were painted on the nose of helicopters to aid those on the deck in identifying specific aircraft as they approach for landing. **Above right:** A FJ-4B of VF-46 in 1961 carries the double 00 of the Air Group Commander.

Below: When assigned to CVG-10 aboard the USS Essex (CVA-9) in 1963, VMA-225 used the Air Group tail code but made sure there was no question but that it was a Marine Corps squadron.



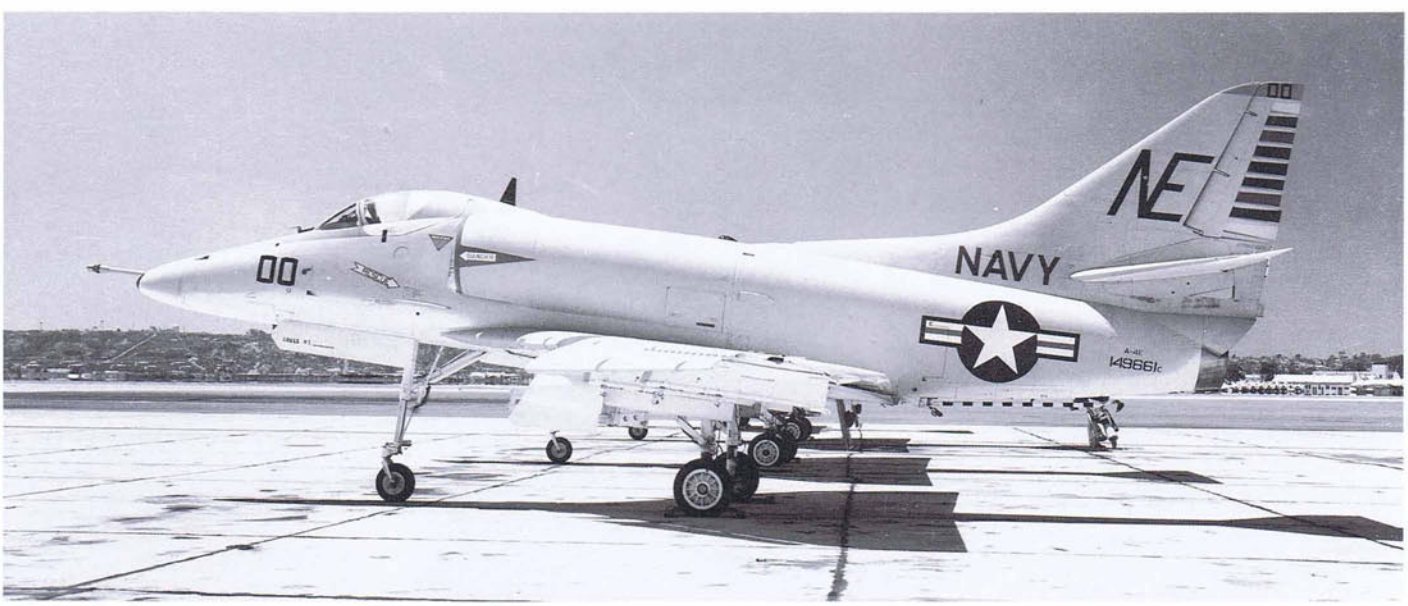
Opposite left: When VMF-334 was assigned to the USS Oriskany (CVA-62) in 1962, they continued to use their WU tail code rather than that of the on board carrier air group. **Right:** The VMF-214 detachment aboard the USS Hornet (CVS-12) in 1964 retained the squadron code rather than changing to the NV of CVSG-57. **Bottom:** In 1963, this A-4E was identified as the CAG aircraft by the 00 number and all squadron colors on the tail.

PATROL SQUADRONS

VP-1	YB
VP-2	YC
VP-4	YD
VP-5	LA
VP-6	PC
VP-7	LB
VP-8	LC
VP-9	PD
VP-10	LD
VP-11	LE
VP-16	LF
VP-17	ZE
VP-18	LG
VP-19	PE
VP-21	LH
VP-22	QA
VP-23	LJ
VP-24	LR
VP-26	LK
VP-28	QC
VP-40	QE
VP-42	RB
VP-44	LM
VP-45	LN
VP-46	RC
VP-47	RD
VP-48	SF
VP-49	LP
VP-50	SG
VP-56	LQ

AIRBORNE EARLY WARNING MAINTENANCE

AEWBARRONPAC (AIRBARSON-2) SH(SH) February 1, 1960



Left: A C-131F staff transport for the Commanding General, Fleet Marine Force Atlantic, in 1964. Notice the pennant flying over the pilot's window and the red plaque by the door with a Marine Corps emblem and three stars of a Lieutenant General. **Bottom:** The Aces of VA-152 carried this yellow stylized arrowhead in addition to the black spade design on their A-1J aircraft in 1964. The last two digits of the aircraft number are also displayed on the bottom of the rudder.

AIRBORNE EARLY WARNING

VW-1	TE
VW-2	MG
VW-3	PM
VW-4	MH
VW-11	MJ
VW-12	SJ
VW-13	MK
VW-14	VA
VW-15	ML

AIR TRANSPORT

VR-1	JK
VR-21	RZ
VR-24	JM
VRF-31	JN
VRF-32	JP

ELECTRONIC COUNTERMEASURE

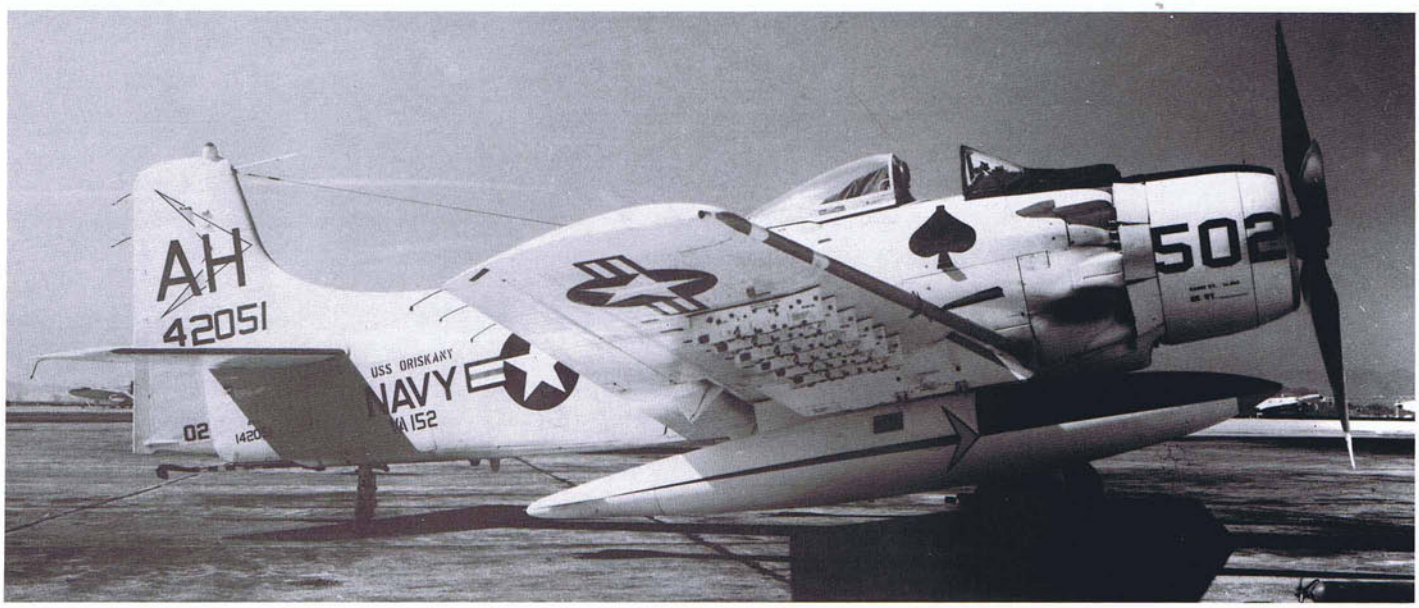
VQ-1	PR
VQ-2	JQ

UTILITY

VU-1	UA
VU-2	JE
VU-3	UF
VU-4	JF
VU-5	UE
VU-6	JG
VU-7	UH
VU-10	JH

HELICOPTER UTILITY

HU-1	UP
HU-2	HU



Right: 4P on the tail of this RC-45J shows that it is assigned to the Naval Air Technical Training Unit, Pensacola. This particular one was used to train photographers at the Photo School.
Below right: A-4C of VA-144 and VA-146 being moved to the hangar deck via the deck edge elevator of the USS Constellation (CVA-64) in 1964. Due to the configuration of the wing the identification code and aircraft numeral have to be on two lines.

AIR DEVELOPMENT

VX-1	JA
VX-3	JC
VX-4	XF
VX-5	XE
VX-6	JD

AIRSHIP

ZP-2	KB
ZP-3	KC
ZW-1	KE

MISCELLANEOUS

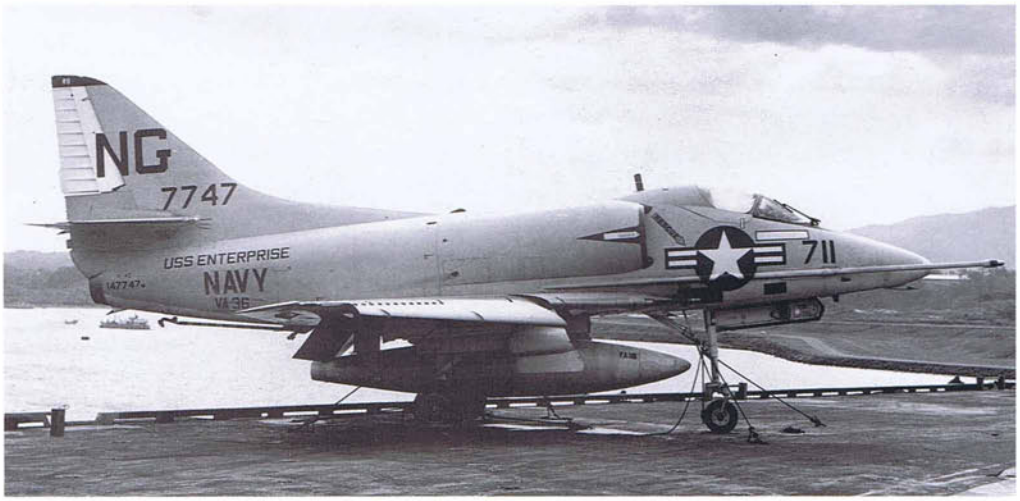
GMGRU-1	ZZ
GMSRON-2	GF
FASRON-3	FB
FASRON-9	FE
FASRON-51	FG
FASRON-102	FJ
FASRON-105	FL
FASRON-106	FM
FASRON-107	FN
FASRON-111	FR
FASRON-200	FT

FLEET MARINE FORCE AND SUPPORT UNITS

HEADQUARTERS

AIRFMFPAC	WZ
H&HS LANT	BZ
H&MS-11	TM
H&MS-12	WA

H&MS-13	YU
H&MS-14	CN
H&MS-15	YV
H&MS-16	WW
H&MS-24	EW
H&MS-26	EL
H&MS-31	DV
H&MS-32	DA
H&MS-33	WM
H&MS-35	BM



Left: So much interest is shown in the unusual and colorful paint schemes that not much attention is given aircraft such as this A-4C painted basically in accordance with the specifications. **Bottom:** In 1966, this A-1H with a Light Green tail tip and tail code NF identified VA-115 as the fifth squadron of CVW-5. The significance of the camel on the green tail is undetermined.

H&MS-36	WX

FIGHTER

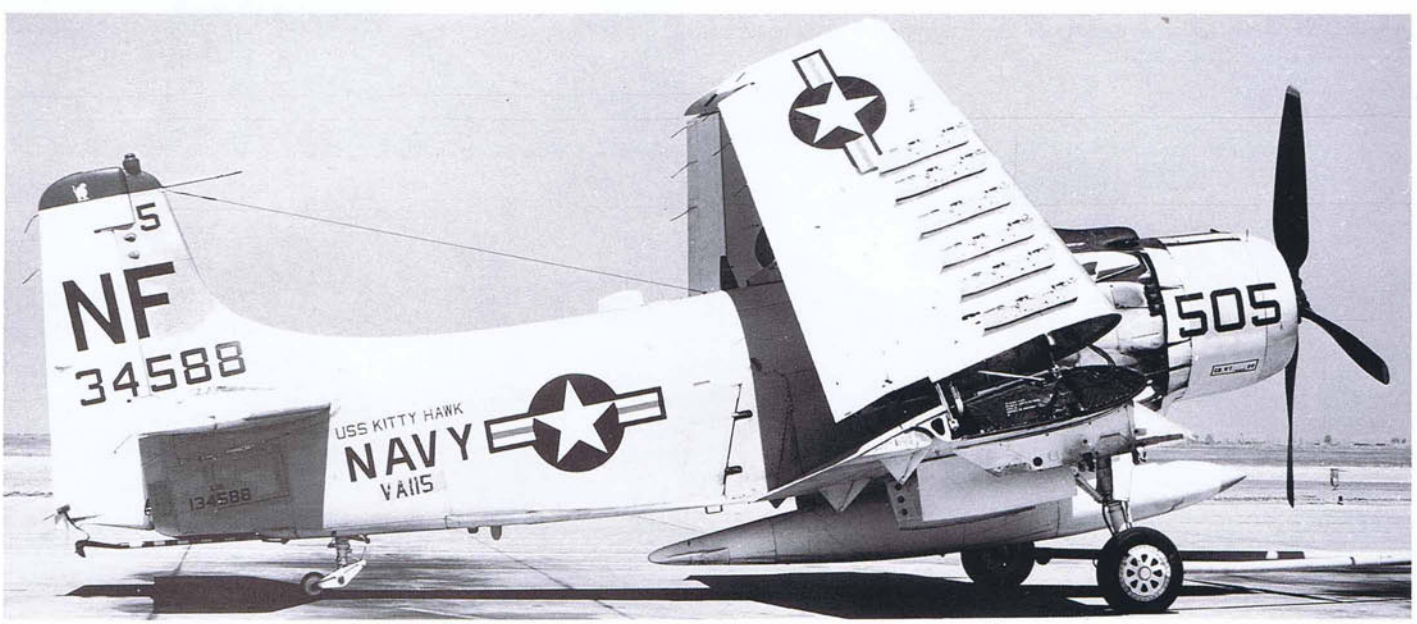
VMF-122	DC
VMF-232	WT
VMF-235	DB
VMF-251	DW
VMF-312	DR
VMF-323	WS
VMF-333	DN
VMF-334	WU
VMF-451	VM

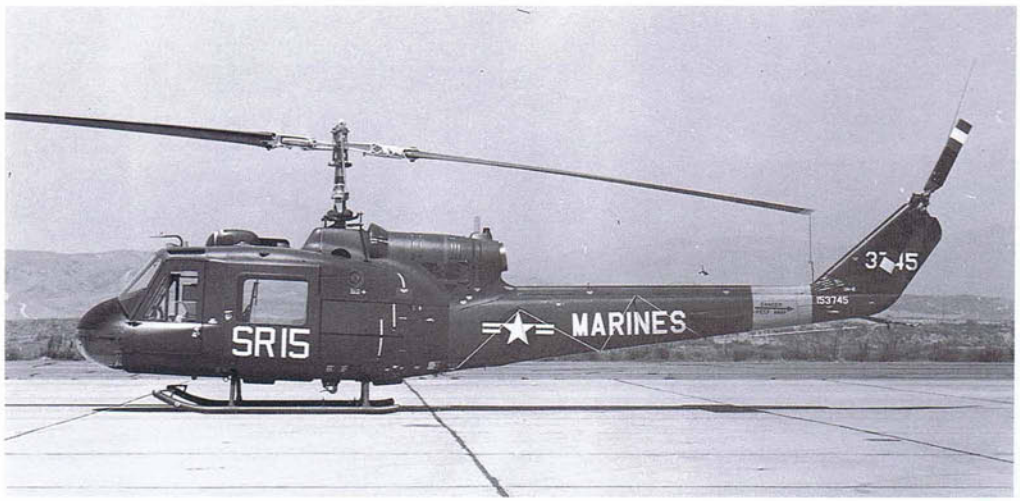
FIGHTER (ALL-WEATHER)

VMF(AW)-114	EK
VMF(AW)-115	VE
VMF(AW)-314	VW
VMF(AW)-513	WF
VMF(AW)-531	EC
VMF(AW)-542	WH

ATTACK

VMA-121	VK
VMA-211	CF
VMA-212	WD
VMA-214	WE
VMA-223	WP
VMA-224	WK
VMA-225	CE
VMA-311	WL
VMA-324	DX
VMA-331	VL
VMA-332	EA
VMA-533	ED





Right: The configuration of helicopters requires considerable variations in their markings from that specified for fixed wing aircraft. In 1966, H&MS-30 placed the "tail code" on the fuselage and the national aircraft insignia on the tail boom.

AIRCRAFT REPAIR

MARS-17	SZ
MARS-27	CZ
MARS-37	QF

OBSERVATION

VMO-1	ER
VMO-2	VS
VMO-6	WB

COMPOSITE RECONNAISSANCE

VMCJ-1	RM
VMCJ-2	CY
VMCJ-3	TN

TRANSPORT

VMR-252	BH
VMR-253	QD
VMR-352	QB
VMR-353	DZ

HELICOPTER TRANSPORT

HMR(L)-161	YR
HMR(L)-162	YS
HMR(L)-163	YP
HMR(L)-261	EM
HMR(L)-262	ET
HMR(L)-263	EG
HMR(L)-264	EH
HMR(L)-361	YN
HMR(L)-362	YL
HMR(L)-363	YZ
HMR(M)-461	CJ
HMR(M)-462	YF

HELICOPTER DEVELOPMENT

HMX-1	MX

MARINE CORPS TRAINING

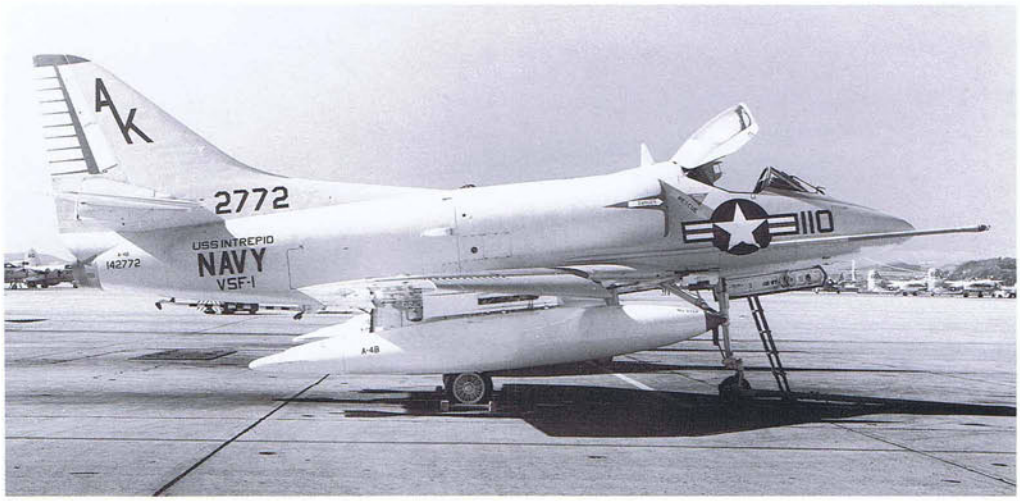
VMT-1	BE
VMT-2	SD

NAVAL BASIC TRAINING COMMAND

NAS Pensacola	Basic Training Group 9 (BTG 9)	2F
NAAS Saufley	Basic Training Group 1 (BTG 1)	2S
	Basic Training Group 5 (BTG 5)	2S
NASS Whiting	Basic Training Group 2, North Field	2W
	Basic Training Group 3, South Field	2W
	Multi engine Training Group (METG)	2W (2F)
NAS Memphis	Basic Training Group 7 (BTG 7)	2M
ALF Ellyson Helicopter Training Group (HTG)		2E

NAVAL ADVANCED TRAINING COMMAND

NAS Corpus Christi	Advanced Training Unit 301 (ATU-301)	3T
	Advanced Training Unit 501 (ATU-501)	3C
	Advanced Training Unit 601 (ATU-601)	3A
	Advanced Training Unit 611 (ATU-611)	3B
NAAS Kingsville	Advanced Training Unit 202 (ATU-202)	3E
	Advanced Training Unit 212 (ATU-212)	3F
	Advanced Training Unit 402 (ATU-402)	3G
NAAS Chase Field	Advanced Training Unit 203 (ATU-203)	3K
	Advanced Training Unit 213 (ATU-213)	3J
NAS Olathe JTTU		3U



Left: Antisubmarine Fighter Squadron 1 identified their aircraft as the senior squadron aboard the USS Intrepid (CVS-11) in 1967 with an Insignia Red "T" shape on the tail. The VSF squadrons existed for only five years. **Bottom:** The E-2C of VAW-123 were well known through the colorful design depicting their name of "Screwtops".

NAVAL AIR TECHNICAL TRAINING COMMAND

NAVTECHTRA Glynco	4B
NATTC Memphis	4M
NATTU Lakehurst	4L
NATTU Olathe	4U
NATTU Pensacola	4P
NATTU Philadelphia	4F
NAVCICScol Glynco	4G

Aircraft side numbers were to be the last three digits of the Bureau Number, except for VF aircraft, which were to use the numbers 101 to 199.

NAVAL AIR RESERVE TRAINING COMMAND

NAS Atlanta	7B
NAS Dallas	7D
NAS Glenview	7V
NAS Grosse Ile	7Y
NAS Los Alamitos	7L
NAS Minneapolis	7E
NAS New Orleans	7X
NAS New York	7R
NAS Oakland	7F
NAS Olathe	7K
NAS Seattle	7T
NAS South Weymouth	7Z
NAS Willow Grove	7W
NARTU Anacostia	6A
NARTU Jacksonville	6F
NARTU Lakehurst	6N
NARTU Memphis	6M
NARTU Norfolk	6S

Right: When assigned to a carrier, Marine Corps squadrons frequently apply the ship name to their aircraft. This man is checking the tension bar which will break when the catapult has built up sufficient power to launch the aircraft. **Bottom:** VA-152, aboard the USS Oriskany (CVA-34) in 1967, identified their A-1J with a yellow stylized arrowhead and tail tip with a Black spade.

A complete redesignation of squadrons within the Training Command took place on May 1, 1960. It has not been determined if there was a complete break, with new squadrons being designated without regard to previous designations. However, at this time it appears that the following is the correct lineage.

NAVAL BASIC TRAINING COMMAND

NAS Pensacola		
VT-4 (BTG-9)	2F	May 1, 1960
NAAS Saufley		
VT-1 (BTG-1)	2S	May 1, 1960
VT-5 (BTG-5)	2S	May 1, 1960
NAAS Whiting		
VT-2 (BTG-2)	2G	May 1, 1960
VT-3 (BTG-3)	2W	May 1, 1960
VT-6 (METG)	2P	May 1, 1960
ALF Ellyson		
HT-8 (HTG)	2E	

NAVAL ADVANCED TRAINING COMMAND

NAS Corpus Christi		
VT-30 (ATU-301)	3T	May 1, 1960
VT-29 (ATU-501)	3C	May 1, 1960
VT-31 (ATU-601)	3A	May 1, 1960
VT-28 (ATU-611)	3B	May 1, 1960
NAAS Kingsville		
VT-21 (ATU-202)	3E	May 1, 1960
VT-22 (ATU-212)	3F	May 1, 1960
VT-7 (BTG-7)	2K(2M)	January 1, 1963
VT-23 (ATU-222)	3H	May 1, 1960
NAAS New Iberia (MERIDIAN, MISSISSIPPI)		
VT-9	2M	October 16, 1961
VT-27 (ATU-402)	3G	July 1, 1960
NAAS Chase Field		
VT-24 (ATU-203)	3K	May 1, 1960
VT-25 (ATU-213)	3J	May 1, 1960
VT-26 (ATU-223)	3L	May 1, 1960

Left: The colorful plaid markings on this A-4B vividly depicts the squadron name "Clansmen" on this VA-46 aircraft. **Bottom:** A Grumman US-2C with the target towing/drone control paint scheme in 1967.

MIL-I-18464C(Wep), *Insignia and Markings for Naval Weapons Systems*, dated April 11 1960, made several changes to the recognition markings, as follows:

Individual helicopters assigned to the ASW mission were now to have a one-digit or two-digit fuselage marking applied to the top, centered on the transmission fairing of the fuselage, in addition to the side and bow locations previously required.

Aircraft painted in the carrier and special patrol aircraft schemes were now to have the maintenance markings in glossy Orange Yellow, in lieu of Black on the white underside of the aircraft.

Radio call numbers, consisting of not less than the last four digits of the aircraft serial number, were now required to be applied on all aircraft except those which did not have any radio equipment. These numbers were to be applied to both sides of the vertical stabilizer and rudder assembly, or to each outboard side in the case of twin tails. On helicopters, when required, or if space limitations did not permit on other aircraft, these numbers were to be applied aft along the fuselage, or aft along each side, or the outboard side of the tail boom, as applicable. These numerals were to be the largest size possible of the standard sizes 12, 16, 20, 24, 30, and 36 inches (30.48, 40.64, 50.80, 60.96, 76.20, and 91.44 cm), but in no case less than 12 inches (30.48 cm).

Anti submarine Carrier Air Groups (CVSG) were established on April 1, 1960. These Groups were slowly phased out during the 1960s, with the last one being disbanded on June 30, 1973.

OPNAV INSTRUCTION 3561.2C, *Visual Identification System for Naval Aircraft*, dated May 11, 1960, added the following side numbers and squadron colors for CVSG Air Groups and associated squadrons:

First Squadron	10 – 29	Insignia Red
Second Squadron	30 – 59	Orange Yellow
HS Squadron	60 – 69	Light Blue

Change 1, dated June 7, 1960, modified these numbers to:

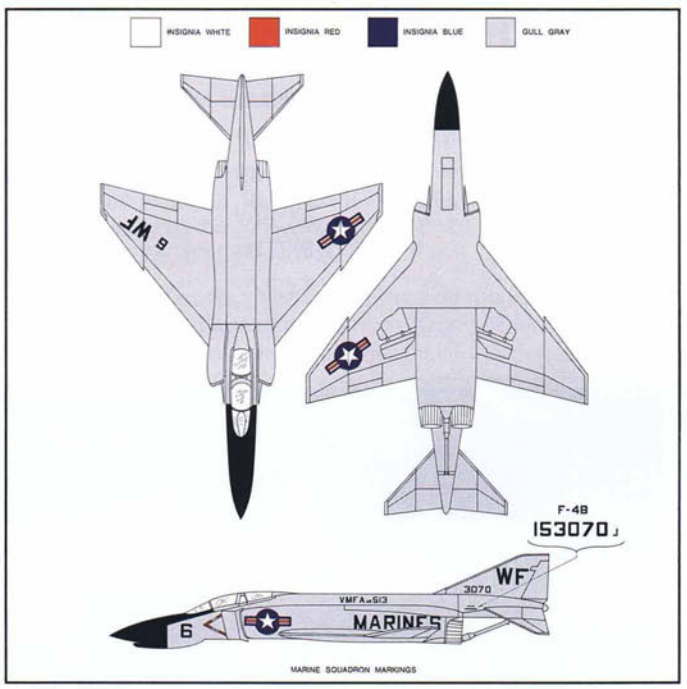
Second Squadron	30 – 49	Orange Yellow
HS Squadron	50 – 69	Light Blue

Change 2, dated December 6, 1960, changed the squadron designation Light Photographic to Photographic in the listing for squadrons as shown in the basic instruction.

Right: Not only does this A-1H of VA-145 display the Griffon and sword from their squadron insignia but it also carries the Tonking Gulf Yacht Club logo on the aft fuselage. **Bottom:** The "Red Rippers" of VF-11 were the senior fighter squadron aboard the USS Forrestal (CVA-59) in 1967. Due to the shape of the fuselage of the F-4B, the Boars head of the squadron insignia is well removed from the shield which should be directly below.

Due to increased tension over the divided city of Berlin, five patrol squadrons and thirteen carrier anti submarine squadrons of the Naval Air Reserve were called to active duty on October 1, 1961. CNO message 311433Z, dated August 31, 1961, assigned these squadrons the following Visual Identification Letters for this active duty period. Home base designations are shown in parentheses. These units were chosen with consideration for the readiness of the units, and to minimize the impact on any one area, by spreading the recall geographically.

VS-935	CP(7W)
VS-751	CQ(6N)
VS-837	CR(7R)
VS-915	CS(7Z)
VS-733	CT(7Y)
VS-821	CU(7X)
VS-861	CV(6S)
VP-832	LS(7R)
VP-933	LT(7W)
VP-741	LU(6F)



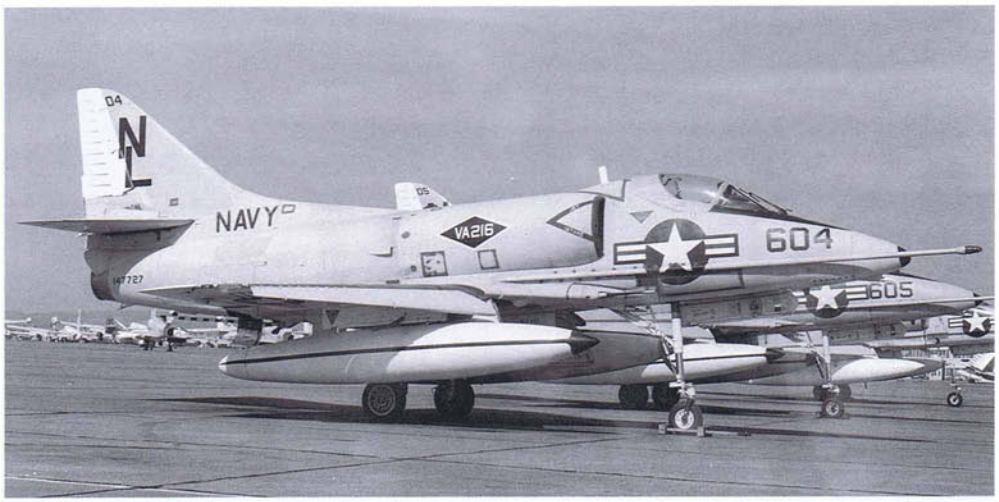
Left: The 600 block number and Black tail on this A-4C of VA-76 is difficult to explain as there were only two VF and three VA squadrons aboard in 1967. The embarked RVAH and VFP detachments should have used these markings. **Bottom:** The Jolly Roger emblem has been used by VF-84 since the squadron was formed in July 1955. Prior to that time it had been the official insignia of a completely different squadron dating back to WW II. The yellow fuselage stripe with stylized birds on these F-4B also dates back to the earliest days of this squadron when it flew the FJ-3 Fury.

VP-661	LV(6A)
VP-872	PS(6G)
VS-771	ST(7L)
VS-772	SU(7L)
VS-873	SV(6G)
VS-872	SW(6G)
VS-891	SX(7T)
VS-721	SY(7V)

These squadrons remained on active duty until August 1, 1962.

In mid 1962, Pacific Fleet VAH squadrons began to use the tail code letters of their parent Carrier Air Group.

The system of designating Naval aircraft that had been in existence since 1922 was finally changed on September 18, 1962, with the issue of BuWeps Instruction 13100.7, *Designating, Redesignating, and Naming Military Aircraft*. For a description of this system and the new designations, see Appendix A.



Right: The A-4C of VA-216 assigned to Carrier Air Group 15 in 1968 are clearly identified by the squadron designation on a Black diamond. **Bottom:** In addition to the normal markings found on a antisubmarine helicopter, notice the squadron insignia location and the numerous rescue markings on this SH-3H.

Sometimes the requirements of rapid and positive identification and camouflage are in conflict. In these cases the requirements spelled out in the directives on marking and insignia were to take precedence. This precedence was referred to again in MIL-I-18464D(Wep), *Insignia and Markings for Naval Weapons Systems*, dated October 26, 1962, when describing the application of the unit identifying letters on the tail. On tactical type aircraft with white rudders, if space limitations permitted, an effort was to be made to avoid applying the unit identifying letters on the white finish. The size of the letters was not to be changed in any event.

Reflecting the jet age, the painting of propeller spinners was no longer required as a means of identifying squadrons within a Carrier Air Group.

Amendment 3, to MIL-I-18464D(Wep), dated September 30, 1963, made several changes, including four changes to the size of the letters and numerals to be used in the marking of Naval aircraft.

The unit aircraft numeral on the fuselage was changed so that the numerals were the largest possible of the following sizes: 12, 16, 20, 24, 30, or 36 inches (30.48, 40.64, 50.80, 60.96, 76.20, 91.44 cm). They could not exceed fifty percent of the height of the projection of the fuselage side at the point of application.

The size of the unit aircraft numeral on the upper surface of the right wing was modified from 24 inches (60.96 cm) to a minimum height of 16 inches (40.64 cm), and to be the largest possible of the following sizes: 16, 20, 24, or 30 inches (40.64, 50.80, 60.96, or 76.20 cm).

The size of the unit identifying letters on the upper surface of the right wing was changed from 30 and 36 inches (76.20 and 91.44 cm) to a minimum height of 20 inches (50.80 cm), and to be the largest possible of the following sizes: 20, 24, 30 or 36 inches (50.80, 60.96, 76.20 or 91.44 cm). The width of individual strokes was no longer specified to be 4 inches (10.16 cm).

The unit identifying letters on the vertical tail were modified from 30 and 36 inches (76.20 and 91.44 cm) to a minimum height of 20 inches (50.80 cm), and to be the largest possible of the following sizes: 20, 24, 30 or 36 inches (50.80, 60.96, 76.20 or 91.44 cm). The width of the indi-

Left: The Black Panther insignia of VA-35 shown on this A-6A in 1969 is one of the oldest in the Navy. Perhaps that explains why it was displayed so much oversize. **Bottom:** This F-8J of VF-191 in 1969 is painted as the CAG aircraft aboard the USS Oriskany (CVA-34).

vidual strokes was no longer specified at 4 inches (10.16 cm). In case of double letters, the width of each letter could still be reduced to accommodate the letters to the shape of the tail surface, retaining maximum clarity, visibility, and symmetry. The width of the individual strokes was to be reduced accordingly.

The squadron designation on the fuselage of all models, except transports, was to appear on both sides of the fuselage, just forward of the empennage, and centered under the branch of service marking. If this was not practicable, due to space limitations, the squadron designation could now be applied in an aft location designated by cognizant commands.

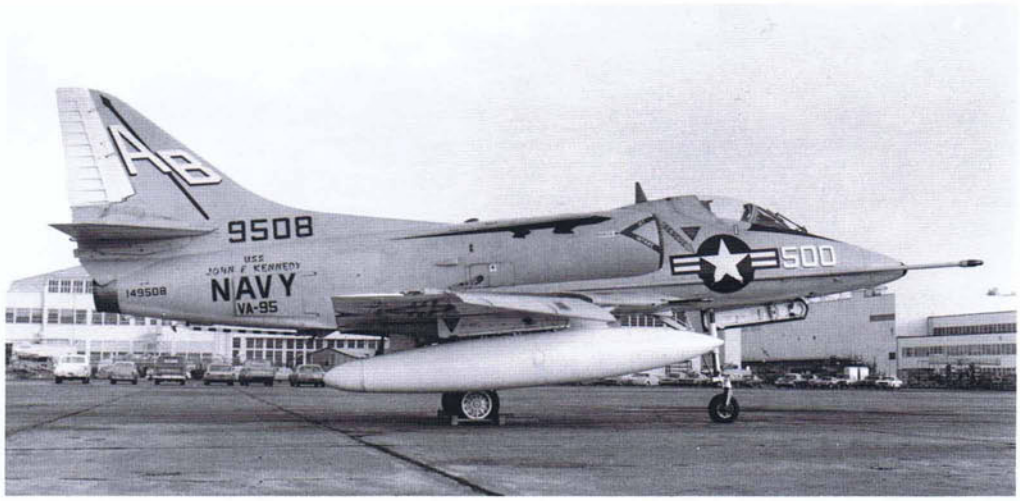
The size of the American flag applied to Naval Attaché (ALUSNA) aircraft was modified from that previously specified for C-47 (R4D) and larger aircraft. On smaller aircraft, the length of the flag was not to exceed seventy-five percent of the chord at one-half the height of the vertical surface from the horizontal surface. On smaller aircraft with twin vertical stabilizers, such as the SBN, the length of the flag was not to exceed seventy-five percent of the chord at one-half the height of the vertical surface.

On December 20, 1963, Attack Carrier Air Groups (CVG) were redesignated Attack Carrier Air Wings (CVW). The Replacement Air Groups (RAG), which had been established in 1958, became Combat Readiness Air Groups (CRAG) on April 1, 1963. Popularly known by their short titles during the respective periods, their official designation throughout was RCVG. When the Groups became Wings, CRAG became CRAW and RCVG became RCVW.

MIL-I-18464E(Weps), *Insignia and Markings for Naval Weapons Systems*, dated May 20, 1964, among other things changed the instructions concerning the spacing of the block letters to be applied to the exterior of Naval aircraft. The space between characters was now specified to be a constant one-sixth, rather than twenty-five percent, of the height of the letter or numeral and measured from that point on each of the characters which is nearest the other.

Wing tip floats, on P-5s only, were to have a 1-inch (2.54 cm) Insignia White stripe painted on the inboard side centered on the float water line and parallel to the load water line of the aircraft.

Small maintenance or service markings on all aircraft were to be Orange Yellow in lieu of black or white, unless specified otherwise.



Right: VA-95 applied a stylized green lizard on their A-4Cs in keeping with their nickname the "Green Lizards"
Bottom: This T-34B was used by a Naval Aviation Officer Procurement Team to visit colleges and universities in Florida and South Georgia in the late 1960s.

Large seaplanes and amphibians assigned to the search and rescue missions were to have the word RESCUE painted in glossy Black superimposed on the Orange Yellow portion of the upper wing surface. Centered aft of the word RESCUE were to be the appropriate identification numerals and/or letters in characters 36 inches (91.44 cm) in height. The search and rescue numerals and/or letters were to be painted on the bottom of the hull between the bow and the main step, extending from chine to chine. The top of the characters was to be at the port chine of the hull. These characters were to be nonspecular Orange Yellow with a 2-inch (5.08 cm) glossy Black border. The search and rescue numbers and/or letters applied within the Orange Yellow rectangle, on the side of the hull, were to be approximately two-thirds the height of the rectangle.

Helicopters assigned to the search and rescue mission were to have the word RESCUE painted in glossy Black at the widest part of the top (aft of the enclosure) and bottom of the fuselage in the largest vertical block letters that space would permit. The words ABANDON CHUTE were also to be applied to the bottom of the fuselage, in an appropriate location so as to be readily visible from below. The letters for these markings were to be the largest size possible which could be accommodated on the helicopter, selected from the standard sizes, 12, 16, 20, 24, 30, and 36 inches (30.48, 40.64, 50.80, 60.96, 76.20, and 91.44 cm).

MIL-M-25047B(ASG), dated September 28, 1964, *Markings for Airplanes, Airplane Parts, and Missiles (Ballistic Missiles Excluded)*, was a new directive as far as naval aviation was concerned. In the consolidation with the previous Air Force directive of the same name, all of the previous Navy marking requirements were included.

Loose items were to be marked in a contrasting color with the aircraft serial number. This included such items as life rafts; tool kits peculiar to the airplane; aircraft covers such as engine covers, dust covers, etc.; equipment specifically calibrated for the airplane, such as drift meters, tuning units, etc.; and jettisonable equipment such as canopies, wing tanks, and ejection seats. Ejection seats were to have the abbreviation of the occupant, such as PLT, CO-PLT, or NAV, applied.

On January 18, 1966, the commanding officer of Helicopter Anti submarine Squadron 6 (HS-6) requested authority from the Bureau of Naval Weapons to paint the words ABANDON CHUTE in 12-inch (30.48 cm) white letters on the bottom of their SH-3A aircraft between the APN-130

Left: This 1962 photo shows a slightly different drone control scheme on a Pacific Missile Range TV-2 with a Regulus II KD-2D guided missile.

antenna and the sonar well. This request was granted an interim approval by Commander Fleet Air San Diego, and when forwarded by Commander Naval Air Force, U.S. Pacific Fleet, it was recommended that this marking be approved for all helicopters engaged in SAR missions.

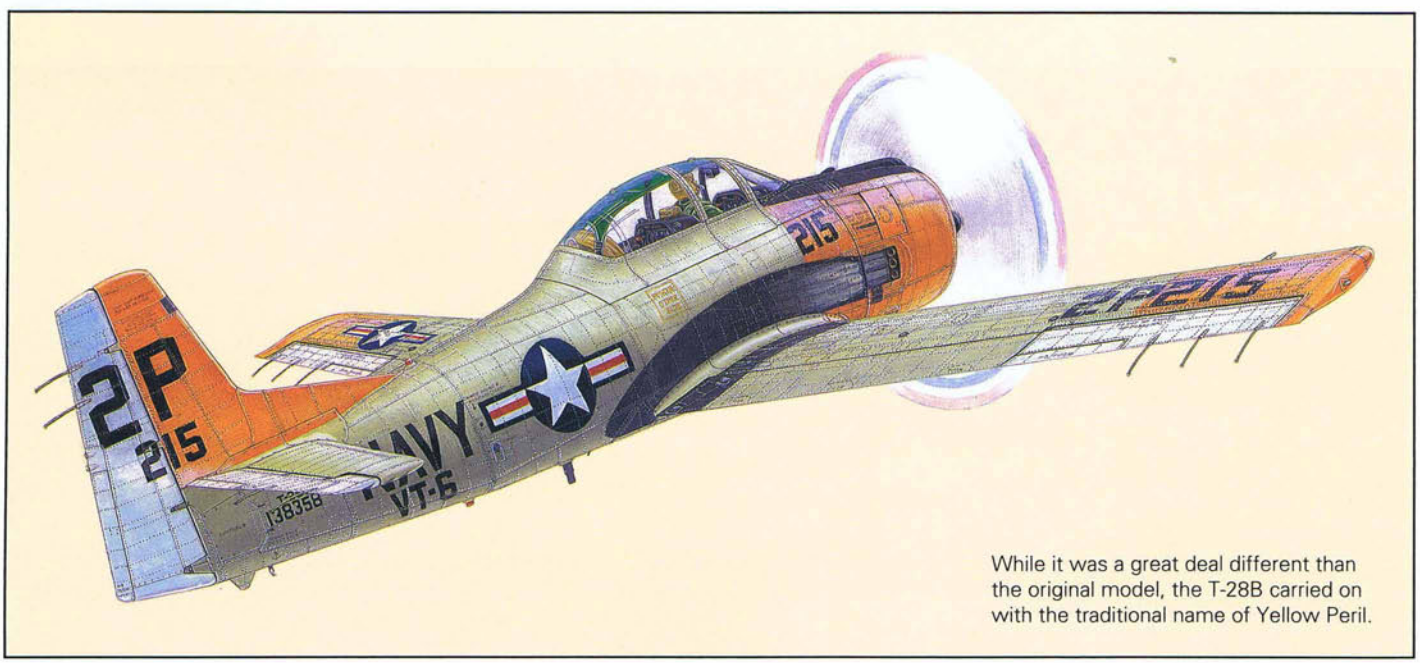
Amendment 2, to MIL-I-18464E(Weps), dated December 16, 1964, brought a new mandatory marking to Naval aircraft. The contractors' production control blocks were designated by applying a lowercase letter on the fuselage immediately following the aircraft serial number, using the letter "a" for the first block. Consecutive changes were to be designated in order by the letters "b" through "z." If additional change markings were required, the following double letter series was to be used: "aa," "ab" through "az," "ba," "bb" through "bz," etc. These production control block letters were to be one-half the height of the aircraft serial number. These production block markings were mandatory.

Patrol aircraft were exempted from the restriction of markings applied to the undersurface, if these surfaces were painted white. These restrictions now read that patrol aircraft finished in Light Gull Gray on the undersurface were to have the branch of service markings and unit identifying letters and numerals applied in nonspecular white.

The Visual Identification System for Naval Aircraft was moved from OPNAV INSTRUCTION 3561.2C to OPNAV INSTRUCTION 3710.7D, *NATOPS Manual, General Flight and Operating Instructions*, dated May 1, 1967. No changes were made in the designations.

On September 25, 1967, the Chief of Naval Operations directed that the American flag applied to the vertical tail surfaces of ALUSNA, or other designated aircraft, was now to be located on both sides of the vertical stabilizer, above all other markings of significance. The flag was to be positioned horizontally, with the blue field uppermost. On the right side, the blue field was to be forward and the stripes extending aft. In other words, the flag was to always be applied so that the stripes appear to be trailing aft, as though it were an actual flag.

While OPNAV INSTRUCTION 3710.7D authorized the assignment of particular colors to particular squadrons by the Force, Wing or Group, on November 16, 1967, the Chief of Naval Operations, following a request for the use of



While it was a great deal different than the original model, the T-28B carried on with the traditional name of Yellow Peril.

Right: In the early 1960s, the Basic Training Group used this high visibility scheme on the F9F-8Ts of VT-4.

Insignia Blue for use of VAW squadrons, directed that the applicable directives be revised to allow the color Insignia Blue to be assigned to the seventh squadron in the Air Wing. Following this action, Naval Air Systems directed that the instructions for Squadron Designation Color Markings be modified to add Insignia Blue for a seventh squadron or unit and that VAW, VFP, VA(AW), etc., be deleted after the heading "Other Squadrons."

The identification of Naval Air Reserve aircraft was modified on December 19, 1967, by the Chief of Naval Air Reserve Training with the issue of CNARESTRA Instruction 3561.1G. The markings specified in MIL-I-18464, *Insignia and Markings for Naval Weapons Systems*, were mandatory and were to be strictly adhered to, with the following exceptions applicable to Naval Reserve Training Command aircraft.

Aircraft which were flown by both Navy and Marine Corps squadrons were still to carry the NAVY/MARINE branch of service, regardless of how the aircraft were divided for maintenance or operational purposes. At activities where Marine personnel operated and maintained an aircraft model exclusively, the branch of service marking was to be MARINES or UNITED STATES MARINES, as appropriate.

Station names which previously had been allowed as an optional additional marking by MIL-I-18464F(WP), dated July 12, 1965, were no longer authorized.

Some changes in unit location, designation or visual identification markings were given as follows:

NAS Minneapolis	to	NAS Twin Cities	7E
NAS Oakland	to	NARU Alameda	7F(6G)
NARTU Anacostia	to	NARTU Washington	6A

During search and rescue operations, particularly over water, frequently the only item recovered would be one of the external fuel tanks. Often, in the course of an extensive search over a large area, several such tanks would be recovered. Stenciling of tanks for identification purposes would determine whether or not they were attached to the missing aircraft. Therefore, all externally-carried fuel tanks in the Naval Air Reserve were to be stenciled with black paint. This marking was to include the station number/letter symbol in two places, one outboard forward and one inboard aft. Centerline tanks were also to be stenciled in the same manner. This marking was to be a minimum of 3 inches (7.62 cm) in length and not to exceed 4 inches (10.16 cm) in height.

Tactical aircraft were to be identified numerically by numbers within the blocks listed below for the aircraft types indicated.

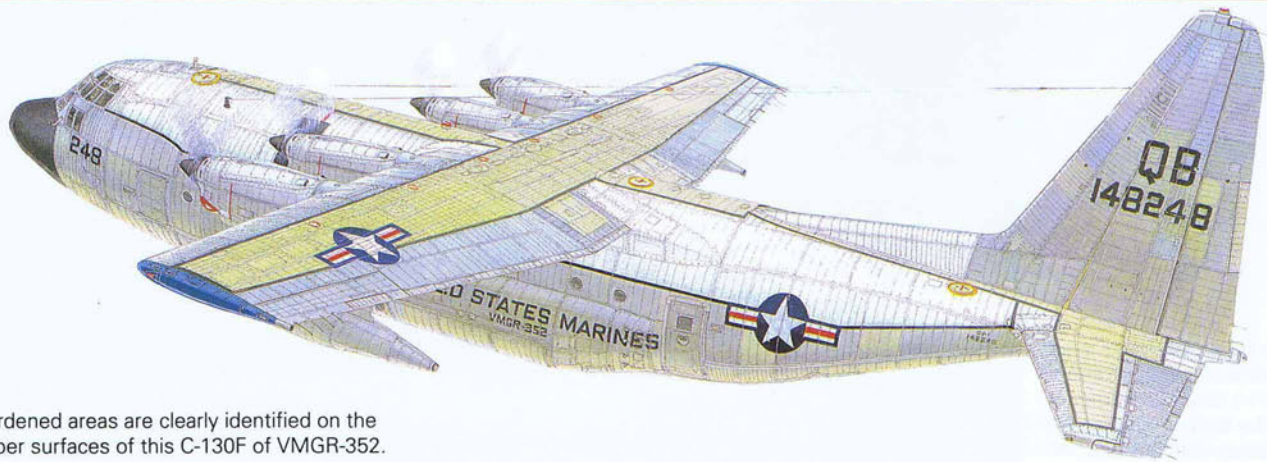
Aircraft Type	Numbers
VF/VA	1 – 149
VS	151 – 199
VP	201 – 225
HS	301 – 325
Marine Helo	401 – 499
Marine VO	501 – 549

Nontactical aircraft, i.e., VR, VT (both multi-engine and single-engine), VU, HU, and HT were to be assigned a unit numeral to consist of the last three digits of the bureau number.

Political tension caused by the capture of the USS Pueblo by North Korea caused six reserve squadrons to be called to active duty on January 27, 1968. These squadrons were issued Visual Identification System designations for the time they were on active duty. When the problem was resolved, these squadrons returned to their inactive duty reserve status. Units and dates were as shown.

SQUADRON	DEACTIVATED	TAIL CODE
VA-831	October 18, 1968	MA
VF-661	October 11, 1968	MA
VF-931	October 18, 1968	MA
VA-776	October 18, 1968	NR
VA-873	October 12, 1968	NR
VF-703	October 26, 1968	NR

Amendment 2, to MIL-I-18464F(AS), *Insignia and Markings for Naval Weapons Systems*, dated March 11, 1968, authorized the duplication of the markings specified in the basic publication in other areas of the aircraft. This was to be at the discretion of cognizant commands as an operational aid, provided such markings were not prohibited by camouflage requirements or other considerations, or in



Hardened areas are clearly identified on the upper surfaces of this C-130F of VMGR-352.

conflict with the markings prescribed in MIL-I-18464 in the area selected.

The marking for "NAVAL ATTACHÉ" now also applied to "NAVAL MISSION," that is, either a "NAVAL ATTACHÉ" or "NAVAL MISSION" marking could be applied, as applicable.

Change 1, to OPNAV INSTRUCTION 3710.7D, Chapter III, dated May 7, 1968, once again changed the squadron color for units within CVW (Air Wings) and Associated Squadrons to:

SQUADRON	NUMBER	COLOR
First squadron	101 – 102 – etc.	Insignia Red
Second squadron	201 – 202 – etc.	Orange Yellow
Third squadron	301 – 302 – etc.	Light Blue
Fourth squadron	401 – 402 – etc.	International Orange
Fifth squadron	501 – 502 – etc.	Light Green
Sixth squadron	601 – 602 – etc.	Black
Seventh squadron	701 – 702 – etc.	Insignia Blue
Eighth squadron	801 – 802 – etc.	Maroon
Ninth squadron	901 – 902 – etc.	Maroon

MIL-M-25047C(ASG), *Markings and Exterior Finish Colors for Airplanes, Airplane Parts, and Missiles (Ballistic Missiles Excluded)*, dated June 18, 1968, authorized the use of decalcomanias for all insignia and markings required by this specification, for both internal and external application. However, decalcomanias were not to be applied over brazier head rivets.

Decalcomanias were now available for letters and numerals. These characters were produced in four major size groupings, with several sizes in each group, as follows:

Small: 1, 2, 3, 4, 5, and 6 inches (2.54, 5.08, 7.62, 12.70, and 15.24 cm)

Medium: 9, 12, 15, 18, and 21 inches (22.86, 30,48, 38.10, 45.72, and 53.34 cm)

Large: 24, 30, 42, and 48 inches (60.96, 76.20, 106.68, and 121.92 cm)

Characters larger than 48 inches (121.92 cm) came in increments of 12 inches (30.48 cm) each. Dimensions for letters 2 inches (5.08 cm) in height or less were compatible to the nearest 1/16 inch (.1588 cm) fractional dimension to retain the basic one-third ratio for height, width and stroke; e.g., for letters 1 inch (2.54 cm) in height, 15/16 inch (2.38 cm) would be a commensurate dimension for letter width 5/8 inch (1.58 cm) and a stroke of 3/16 inch (.48 cm).

For lighter-than-air aircraft, special letters and numeral sizes of 40 and 54 inches (101.60 and 137.16 cm) in height were available.

Loose equipment was now to be identified with the radio call numbers in lieu of the aircraft serial number. All other requirements remained in effect.

Naval Speed Letter OP-511/pap, dated December 1, 1969, changed the instructions in OPNAV INSTRUCTION 3710.7D regarding the side numbers and color codes for CVSGs to the same system as used by the CVWs, unless otherwise directed by fleet commanders. These were now:

Squadron	Side No.	Color
First VS Squadron	101 thru 109	Insignia Red
Second VS Squadron	201 thru 209	Orange Yellow
Third VS Squadron	301 thru 309	Light Blue
First HS Squadron	401 thru 409	International Orange
Second HS Squadron	501 thru 509	Light Green
Air Group Spares (as required)	601 thru 609	Black
Air Group Spares (as required)	701 thru 709	Insignia Blue
Air Group Spares (as required)	801 thru 809	Maroon
Air Group Spares (as required)	901 thru 909	Maroon

During the previous ten years, the following units were disestablished on the dates shown:

DISESTABLISHED

CVG-10	AK	November 20, 1969
GMGRU-1	ZZ	December 1960
GMSRON-2	GF	
VF(AW)-3	PA	March 1963
FAGUPAC	TR	February 29, 1960
FASRON-3	FB	June 30, 1960

Right: This UH-46A of Helicopter Combat Support Squadron 5 is one of a limited number of Navy helicopters finished in the land camouflage scheme.

FASRON-9	FE	March 31, 1960
FASRON-51	FG	March 31, 1960
FASRON-102	FJ	June 30, 1960
FASRON-105	FL	May 15, 1960
FASRON-106	FM	June 30, 1960
FASRON-107	FN	June 30, 1960
FASRON-111	FR	March 31, 1960
FASRON-200	FT	June 30, 1960
VAH-8	ZD	January 17, 1968
VAH-21	SL	June 16, 1969
VP-2	YC	September 30, 1965
VP-7	LB	October 8, 1969
VP-18	LG	October 10, 1968
VP-21	LH	November 21, 1969
VP-28	QC	October 1, 1969
VP-42	RB	September 26, 1969
VRF-31	JN	October 1, 1968
VRF-32	JP	1961 *
VX-3	JC	March 1, 1960
ZP-1	KE	1961 *
ZP-2	KB	
ZP-3	KC	October 31, 1961
VFP-62	GA	May 1, 1968
VAP-62	GB	October 15, 1969
VW-2	MG	July 1, 1961
VW-3	PH	June 30, 1960
VW-11	MJ	October 7, 1965
VW-12	SJ	February 1, 1960
VW-13	MK	July 30, 1965
VW-14	VA	February 1, 1960
VW-15	ML	April 15, 1961
VMF(AW)-114	EK	July 1, 1963
VMT-1	BE	December 4, 1967
VMGR-353(VMR-353)	DZ(DZ)	March 31, 1963
NAS Oakland	7F	June 30, 1961

* Precise date unknown.

Since the previous chart, numerous changes in unit designations had also taken place. Six Anti submarine Carrier Air Groups and other units had been established and disestablished as shown:

TITLE		ESTABLISHED	DISESTABLISHED
CVG-13	AE	August 21, 1961	October 1, 1962
RCVSG-52	AS	June 1, 1960	December 15, 1969
RCVSG-55	NU	September 1, 1960	September 27, 1968
CVSG-57	NV	January 1, 1960	September 30, 1969
CVSG-58	AV	June 6, 1960	May 31, 1966
CVSG-60	AW	May 2, 1960	October 1, 1968
CVSG-62	AX	September 25, 1961	October 1, 1962
VO-67	MR	February 15, 1967	July 1, 1968

With the reorganization of ASW assets and the formation of CVSGs, the individual VS and HS squadrons shown in previous charts were assigned to specific CVSG, and all squadrons in a given group carried the same tail codes. By the end of 1960-61, this composition was as follows:

PACIFIC FLEET

CVSG-51 RA (RAG)
- VS-41
- HS-10

CVSG-53 NS
- VS-21 (YA)
- VS-29 April 1, 1960
- HS-6 (UB)

CVSG-55 NU
- VS-23 (PF)
- VS-25 September 1, 1960
- HS-4 (TA)

CVSG-57 NV
- VS-37 (SU)
- VS-35 January 3, 1961
- HS-2 (SK)

CVSG-59 NT
- VS-38 (ST)
- VS-33 January 3, 1961
- HS-8 (VB)

ATLANTIC FLEET

CVSG-50 AR (RAG)
- VS-30 (MB)
- HS-1 (HA)

CVSG-52 AS
- VS-31 (MC)
- VS-28 June 1, 1960
- HS-11 (HF)

CVSG-54 AT
- VS-32 (MD)
- VS-22 MAY 8, 1960
- HS-5 (HC)

CVSG-56 AU
- VS-27 (MA)
- VS-24 May 25, 1960
- HS-3 (HB)

CVSG-58 AV
- VS-36 (ME)
- VS-26 June 1, 1960
- HS-7 (HD)

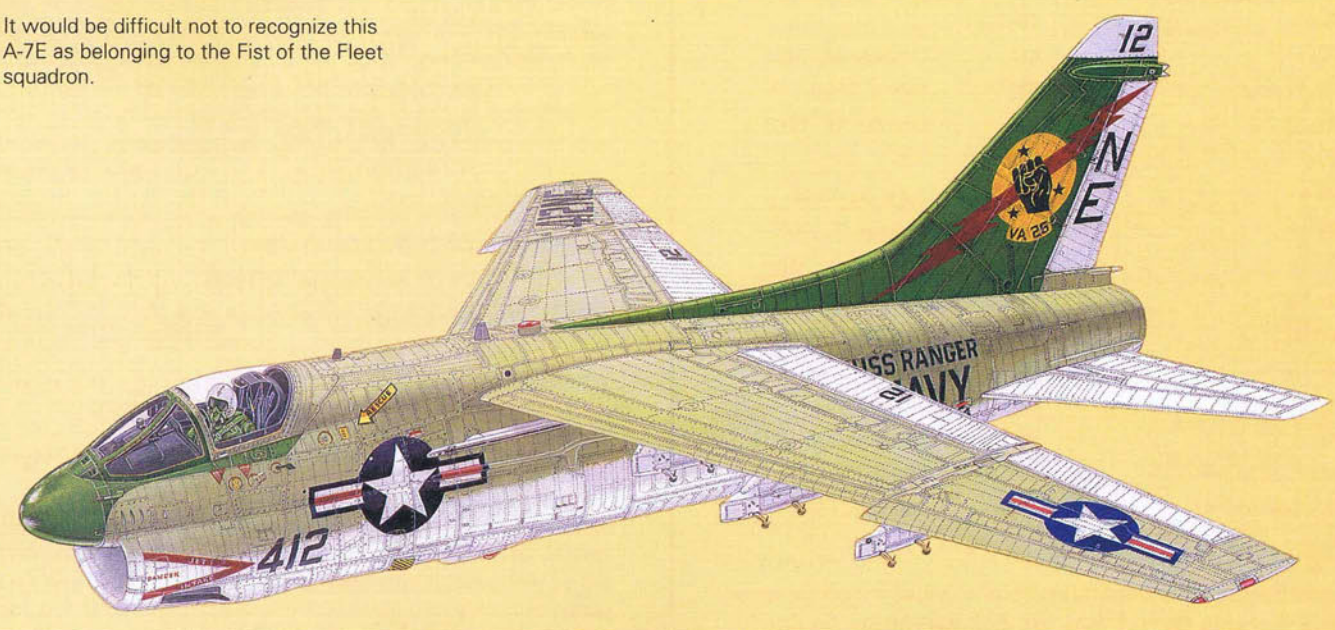
CVSG-60 AW
- VS-39 (MF)
- VS-34 May 2, 1960
- HS-9 (HE)

CVSG-62 AX September 25, 1962
- VS-20
- VS-42
- HS-13

The following new units had been established.

VU-8	GF	
CVG-16	AH	September 1, 1960
Oceanographic Air Survey Unit	JB	July 1, 1965
HU-4	HT	July 1, 1960

It would be difficult not to recognize this A-7E as belonging to the Fist of the Fleet squadron.



Opposite left: VA-81 has been recognized for years by a stylized Orange arrowhead on the tail of their aircraft. Orange shadow has been added to all the recognition letters and numbers in this 1976 photo. **Right:** This VC-118B was assigned to Headquarters Marine Corps as a VIP transport in 1976 and is now part of the Marine Corps Museums collection. **Bottom:** The Visual Identification Code of UU was stylized by VMO-2 into a pair of horse shoes for use on their OV-10A Bronco.

Marine Corps aviation had also undergone numerous changes. In some cases the squadron designation changed more than once. It should be remembered that these changes in Marine Corps squadrons are only a change of mission and that the squadron lineage continues on so long as the squadron number is maintained. In keeping with the form used in previous volumes, previous designations and their tail codes are shown in parentheses. Dates show when the squadron was redesignated or a new squadron was formed. The following Marine Corps squadrons changed their designation more than once within the ten-year period.

VMF(AW)-122	(VMF-122)	DC(DC) October 10, 1962
VMF-212	(VMA-212)	WD(WD) July 1, 1963
VMF(AW)-212	(VMF-212)	WD(WD) March 1, 1968
VMF(AW)-232	(VMF-232)	WT(WT) March 1, 1965
VMF(AW)-235	(VMF-235)	DB(DB) February 1, 1962
VMF(AW)-312	(VMF-312)	DR(DR) August 1, 1963
VMF(AW)-323	(VMF-323)	WS(WS) July 19, 1962
VMF(AW)-324	(VMA-324)	DX(DX) February 1, 1961
VMF-324	(VMF(AW)-324)	DX(DX) October 8, 1961
VMF(AW)-333	(VMF-333)	DN(DN) February 1, 1966
VMF(AW)-334	(VMF-334)	WU(WU) February 1, 1966
VMF(AW)-451	(VMF-451)	VM(VM) July 1, 1961
HMM-361	(HMR(L)-361)	YN(YN) February 1, 1962
HMM-362	(HMR(L)-362)	YL(YL) February 1, 1962
HMM-363	(HMR(L)-363)	YZ(YZ) February 1, 1962
HMM-364	(HMR(L)-364)	YK(YK) February 1, 1962

The following squadrons were established or activated on the dates shown, and then redesignated as shown in the following table.

VAH-10	ZR May 1, 1961
VAH-13	GP January 3, 1961
VMAT-201	KB March 31, 1968
VMAT-202	KC 1967
HMMT-301	SP April 1, 1966
HMR(L)-364	YK September 1, 1961
VMO-3	VT August 1, 1966
VMO-5	UV December 15, 1966

CHAPTER 6 1970-1979

As of February 1, 1970, Naval Aeronautical Organization, OPNAV NOTICE 05400, showed the following unit assignments. The date on which new designations took place is shown in column four.

CARRIER AIR WINGS AND SQUADRONS

CARRIER AIR WINGS

CVW-1	(CVG-1)	AB	December 20, 1963
CVW-2	(CVG-2)	NE	December 20, 1963
CVW-3	(CVG-3)	AC	December 20, 1963
CVW-5	(CVG-5)	NF	December 20, 1963
CVW-6	(CVG-6)	AE(AF)	December 20, 1963
CVW-7	(CVG-7)	AG	December 20, 1963
CVW-8	(CVG-8)	AJ	December 20, 1963
CVW-9	(CVG-9)	NG	December 20, 1963
CVW-11	(CVG-11)	NH	December 20, 1963
CVW-14	(CVG-14)	NK	December 20, 1963
CVW-15	(CVG-15)	NL	December 20, 1963
CVW-16	(CVG-16)	AH	December 20, 1963
CVW-17		AA	November 1, 1966
CVW-19	(CVG-19)	NM	December 20, 1963
CVW-21	(CVG-21)	NP	December 20, 1963
RCVW-4	(CVG-4)	AD	December 20, 1963
RCVW-12	(CVG-12)	NJ	December 20, 1963

ANTI SUBMARINE CARRIER AIR GROUPS

CVSG-50	AR	June 30, 1960
CVSG-51	RA	June 30, 1960
CVSG-53	NS	April 1, 1960
CVSG-54	AT	May 18, 1960
CVSG-56	AU	May 25, 1960

Right: As the number one fighter squadron aboard the USS Ranger (CV-61) in the mid 1960s, VF-154 painted the tips of the wings, horizontal stabilizers and bombracks Insignia Red. The tail stripe is Orange.

Left: The Insignia Red lightning bolt and nose number in the 100 block show that VF-161 was the senior squadron aboard the USS Midway (CVA-41) in 1971.

Left: The medium lift Marine reserve helicopter squadron HMM-764 at NAS Los Alamitos flew these CH-46A helicopters in 1970.

CVSG-59		NT	April 1, 1960

ANTI SUBMARINE FIGHTER

VSF-1		NA	July 1, 1965
VSF-3		SK	April 1, 1967

LIGHT ATTACK

VAL-4		UM	January 3, 1969

PHOTOGRAPHIC

VFP-63	(VCP-63)	PP(PP)	July 1, 1961
VAP-61	(VCP-61)	SS(SS)	July 1, 1961

CARRIER AIR EARLY WARNING WING

CAEWW-12	(VAW-12)	GE(GE)	April 1, 1967
RVAW-110		TT	March 7, 1967
VAW-111	(VAW-11)	RR(RR)	April 20, 1967

TACTICAL ELECTRONIC WARFARE

VAQW-13		TR	September 15, 1968
VAQ-33	(VAW-33)	GD(GD)	February 1, 1968
VAQ-129	(VAH-10)	TR(ZR)	November 1, 1968
VAQ-130	(VAW-13)	VR(VR)	October 1, 1968
VAQ-131	(VAH-4)	ZB	November 1, 1968
VAQ-132	(VAH-2)	ZA	November 1, 1968

HEAVY ATTACK

VAH-8	ZD	
VAH-21	SL	September 1, 1968
VAH-24	SK	
VAH-123	NJ	

RECONNAISSANCE ATTACK

RVAH-1	(VAH-1)	GH(GH)	September 1, 1964
RVAH-3	(VAH-3)	GJ(GJ)	July 1, 1964
RVAH-5	(VAH-5)	GK(GK)	March 1, 1964
RVAH-6	(VAH-6)	GS(ZC)	September 23, 1965
RVAH-7	(VAH-7)	GL(GL)	December 1, 1964
RVAH-9	(VAH-9)	GM(GM)	June 5, 1964
RVAH-11	(VAH-11)	GN(GN)	July 1, 1966
RVAH-12		GP	May 3, 1965
RVAH-13	(VAH-13)	GR(GP)	November 1, 1964
RVAH-14		GQ	February 1, 1968

Other VAH squadrons show letters of parent CVW.

HELICOPTER ATTACK SQUADRON LIGHT

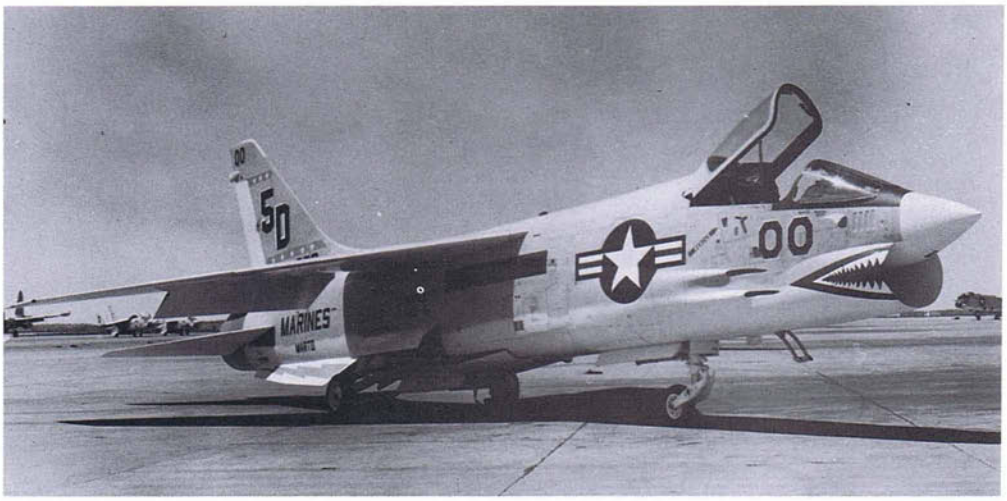
HAL-3		April 1, 1967

HELICOPTER COMBAT SUPPORT

HC-1	(HU-1)	UP(UP)	July 1, 1965
HC-2	(HU-2)	HU(HU)	July 1, 1965
HC-3		SA	September 1, 1967
HC-4	(HU-4)	HT(HT)	July 1, 1965
HC-5		TD	September 1, 1967
HC-6		HW	September 1, 1967
HC-7		VH	September 1, 1967

PATROL SQUADRONS

VP-1	YB
VP-4	YD
VP-5	LA
VP-6	PC
VP-8	LC
VP-9	PD
VP-10	LD
VP-11	LE
VP-16	LF
VP-17	ZE
VP-19	PE
VP-22	QA



Right: A good example of how tail codes change. The 5D on this F-8K in 1970 showed it was assigned to NAS Dallas. However, in 1980 this code was assigned to MCAS New River with no code for Marine Corps units at Dallas. **Bottom:** This EKA-3B of VAQ-131 aboard the USS John F. Kennedy (CVA-67) in 1970 has stripes around the aft fuselage to quickly identify it as a tanker aircraft.

VP-23	LJ	
VP-24	LR	
VP-26	LK	
VP-30	LL	June 30, 1961
VP-31	RP	June 30, 1961
VP-40	QE	
VP-44	LM	
VP-45	LN	
VP-46	RC	
VP-47	RD	
VP-48	SF	
VP-49	LP	
VP-50	SG	
VP-56	LQ	

AIRBORNE EARLY WARNING

VW-1	TE	
VW-4	MH	

FLEET LOGISTICS SUPPORT

VR-1	JK	
VR-21	RZ	
VR-24	JM	
VR-30	RW	

FLEET TACTICAL SUPPORT

VRC-40	CD	July 1, 1960
VRC-50	RG	October 1, 1966

FLEET AIR RECONNAISSANCE

VQ-1	PR	
VQ-2	JQ	
VQ-3	TC	July 1, 1968
VQ-4	HL	July 1, 1968

FLEET COMPOSITE

VC-1	(VU-1)	UA(UA)	July 1, 1965
VC-2	(VU-2)	JE(JE)	July 1, 1965
VC-3	(VU-3)	UF(UF)	July 1, 1965
VC-4	(VU-4)	JF(JF)	July 1, 1965
VC-5	(VU-5)	UE(UE)	July 1, 1965
VC-6	(VU-6)	JG(JG)	July 1, 1965
VC-7	(VU-7)	UH(UH)	July 1, 1965

Left: While the instructions for the Visual Identification System have always stressed clarity, in this case the ND of CVWR-30 has been stylized into a well recognized design which uses the Greek alphabet Delta to depict the letter D with the letter N modified to conform to the Delta shape. **Bottom:** In 1970, VA-34 painted their A-6A CAG bird with all the squadron colors on the rudder. Due to the length of the ship name, it had to be applied on two lines.

VC-8	(VU-8)	GF(GF)	July 1, 1965
VC-10	(VU-10)	JH(JH)	July 1, 1965

AIR DEVELOPMENT

VX-1		JA
VX-4		XF
VX-5		XE

AIRSHIP

ZP-1	(ZW-1)	KE(KE)	January 3, 1961

ANTARCTIC DEVELOPMENT

VXE-6	(VX-6)	JD(JD)	January 1, 1969

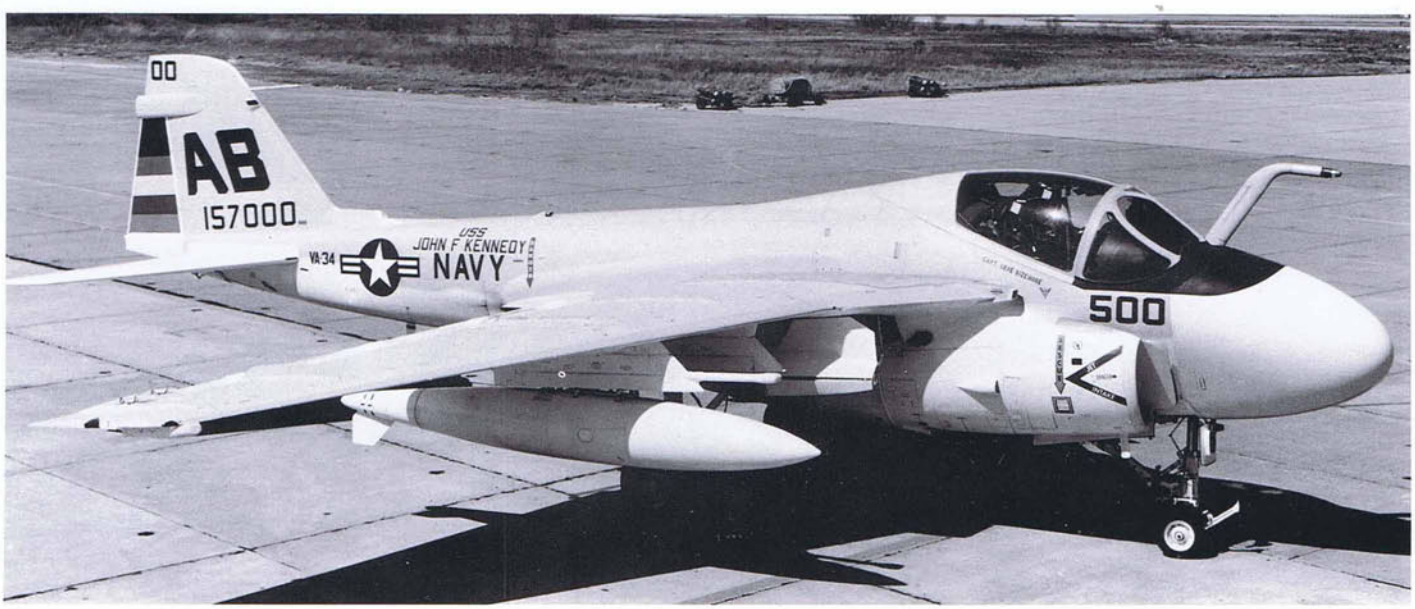
OCEANOGRAPHIC DEVELOPMENT

VXN-8	(Oceanographic Survey Unit)	JB(JB)	July 1, 1967
Blue Angels		BA	

FLEET MARINE FORCE AND SUPPORT UNITS

HEADQUARTERS

HSFMFPAC	(AIRFMFPAC)	WZ(WZ)	
HSFMFLANT	(H&HS LANT)	BZ(BZ)	
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-16		WW	
H&MS-24		EW	
H&MS-26		EL	
H&MS-30		SR	March 1966
H&MS-31		EX	November 1, 1966
H&MS-32		DA	
H&MS-33		WM	
H&MS-36		WX	



Right: This T-39D was used in 1971 as a rapid high priority transport by the Marine Corps. Notice the Marine Corps seal on the tail.

H&MS-40		HR	June 30, 1969
H&MS-56		VZ	January 31, 1967
MAMS-17	(MARS-17)	SZ(SZ)	January 1, 1964
MAMS-27	(MARS-27)	CZ(CZ)	January 1, 1964
MAMS-37	(MARS-37)	QF(QF)	January 1, 1964

FIGHTER ATTACK

VMFA-115	(VMF(AW)-115)	VE(VE)	January 1, 1964
VMFA-122	(VMF(AW)-122)	DC(DC)	July 1, 1965
VMFA-212	(VMF(AW)-212)	WD(WD)	August 10, 1968
VMFA-232	(VMF(AW)-232)	WT(WT)	September 8, 1967
VMFA-235	(VMF(AW)-235)	DB(DB)	September 30, 1968
VMFA-251	(VMF-251)	DW(DW)	October 30, 1964
VMFA-312	(VMF(AW)-312)	DR(DR)	February 1, 1964
VMFA-314	(VMF(AW)-314)	VW(VW)	August 1, 1964
VMFA-323	(VMF-323)	WS(WS)	July 1, 1964
VMFA-333	(VMF(AW)-333)	DN(DN)	June 20, 1968
VMFA-334	(VMF-334)	WU(WU)	August 1, 1967
VMFA-451	(VMF(AW)-451)	VM(VM)	February 1, 1968
VMFA-513	(VMF(AW)-513)	WF(WF)	August 1, 1963
VMFA-531	(VMF(AW)-531)	EC(EC)	August 1, 1963
VMFA-542	(VMF(AW)-542)	WH(WH)	November 2, 1962

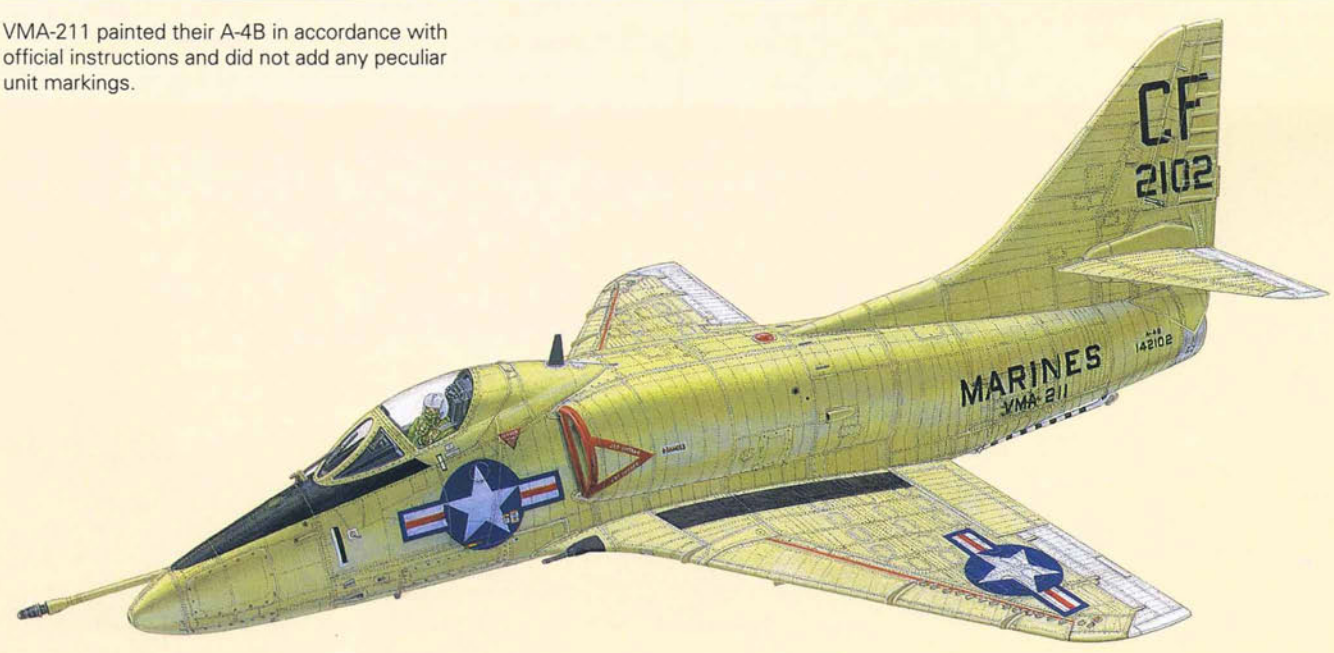
ATTACK

VMA-211		CF	
VMA-214		WE	
VMA-223		WP	
VMA-311		WL	
VMA-324	(VMF-324)	DX(DX)	October 8, 1961
VMA-331		VL	

ALL-WEATHER ATTACK

VMA(AW)-121	(VMA-121)	VK(VK)	February 14, 1969
VMA(AW)-224	(VMA-224)	WK(WK)	November 1, 1966
VMA(AW)-225	(VMA-225)	CE(CE)	April 5, 1966
VMA(AW)-242	(VMA-242)	DT(DT)	October 1, 1964
VMA(AW)-332	(VMA-332)	EA(EA)	August 20, 1968
VMA(AW)-533	(VMA-533)	ED(ED)	July 1, 1965

VMA-211 painted their A-4B in accordance with official instructions and did not add any peculiar unit markings.



Top: VA-82 was one of the few squadrons to carry the nickname on their aircraft, but their Corsair IIs were so marked for years as shown on this A-7E. **Above:** Notice the unusual placement of the aircraft number on the inner surface of the flaps of this A-4E. **Below:** Aboard the USS Coral Sea (CVA-43) in 1971, VA-22 painted their A-7E CAG aircraft with their blue stripe as number three squadron and added the colors for all the other squadrons in the wing.

OBSERVATION

VMO-1	ER
VMO-2	VS
VMO-6	WB

COMPOSITE RECONNAISSANCE

VMCJ-1	RM
VMCJ-2	CY
VMCJ-3	TN

AERIAL REFUELER/TRANSPORT

VMGR-152	(VMR-253)	QD(CD)	February 1, 1962
VMGR-252	(VMR-252)	BH(BH)	February 1, 1962
VMGR-352	(VMR-353)	QB(QB)	February 1, 1962

HELICOPTER LIGHT

HML-167		TV	April 1, 1968
HML-267	(VMO-5)	UV(UV)	March 15, 1968
HML-367	(VMO-3)	VT(VT)	March 15, 1968

Above: When assigned to the USS Forrestal (CVA-59) in 1972, VMFA-531 used the stylized letters AA of CVW-17 but used the yellow lightning bolt from their skull design across the letters.

HELICOPTER MEDIUM

HMM-161	(HMR(L)-161)	YR(YR)	February 1, 1962
HMM-162	(HMR(L)-162)	YS(YS)	February 1, 1962
HMM-163	(HMR(L)-163)	YP(YP)	February 1, 1962
HMM-164		YT	July 1, 1964
HMM-165		YW	July 1, 1965
HMM-261	(HMR(L)-261)	EM(EM)	February 1, 1962
HMM-262	(HMR(L)-262)	ET(ET)	February 1, 1962
HMM-263	(HMR(L)-263)	EG(EG)	February 1, 1962
HMM-264	(HMR(L)-264)	EH(EH)	February 1, 1962
HMM-265		EP	September 30, 1962
HMM-364	(HMR(L)-364)	YK(YK)	February 1, 1962
HMM-365		YM	July 1, 1963

HELICOPTER HEAVY

HMH-361	(HMM-361)	YN(YN)	June 20, 1968
HMH-362	(HMM-362)	YL(YL)	August 21, 1969
HMH-363	(HMM-363)	YZ(YZ)	January 23, 1969
HMH-461	(HMR(M)-461)	CJ(CJ)	February 1, 1962
HMH-462	(HMR(M)-462)	YF(YF)	February 1, 1962
HMH-463		YH	March 1, 1966

HELICOPTER DEVELOPMENT

HMX-1		MX	

MARINE CORPS TRAINING

HMMT-302		SQ	November 1, 1966
HMMT-401		HP	
HMMT-402		HQ	June 30, 1969
HMMT-301		SP	April 1, 1966
HMHT-301	(HMMT-301)	SP(SP)	May 1, 1968
VMT-103	(VMT-2)	SD(SD)	July 1, 1966
VMT-203		KD	December 5, 1967
VMFAT-101		SB	January 3, 1969
VMFAT-201	(VMFT-201 & VMAT 201)	KB(KB)	April 1, 1968
VMAT-102		SC	January 1, 1969
VMAT(AW)-202	(VMAT-202)	KC(KC)	January 15, 1968

NAVAL BASIC TRAINING COMMAND

NAS Pensacola			
VT-4	(BTG-9)	2F	May 1, 1960
NAAS Saufley			
VT-1	(BTG-1)	2S	May 1, 1960
VT-5	(BTG-5)	2S	May 1, 1960
NAAS Whiting			
VT-2	(BTG-2)	2G	May 1, 1960
VT-3	(BTG-3)	2W	May 1, 1960
VT-6	(METG)	2P	May 1, 1960
ALF Ellyson			
HT-8	(HTG)	2E	July 1, 1960

NAVAL ADVANCED TRAINING COMMAND

NAS Corpus Christi			
VT-30	(ATU-301)	3T	May 1, 1960
VT-29	(ATU-501)	3C	May 1, 1960
VT-31	(ATU-601)	3A	May 1, 1960
VT-28	(ATU-611)	3B	May 1, 1960
NAAS Kingsville			
VT-21	(ATU-202)	3E	May 1, 1960
VT-22	(ATU-212)	3F	May 1, 1960
VT-7	(BTG-7)	2K	July 1, 1960
VT-23	(ATU-222)	3H	May 1, 1960
NAS Meridian (NAAS New Iberia 1960-1964)Z			
VT-9		2M	October 16, 1961
VT-27	(ATU-402)	3G	July 1, 1960
NAAS Chase Field			
VT-24	(ATU-203)	3K	May 1, 1960
VT-25	(ATU-213)	3J	May 1, 1960
VT-26	(ATU-223)	3L	May 1, 1960

Above: In 1973, VA-153 was the first attack squadron aboard the USS Oriskany (CV-34) as shown by the 300 block side numbers and Light Blue tail markings.

NAVAL AIR TECHNICAL TRAINING COMMAND

NAVTECHTRA Glynco	4B
NATTC Memphis	4M
NATTU Lakehurst	4L
NATTU Olathe	4U
NATTU Pensacola	4P
NATTU Philadelphia	4F
NAVCICScol Glynco	4G

Aircraft side numbers were to be the last three digits of the Bureau Number, except for VF aircraft, which were to use the numbers 101 to 199.

NAVAL AIR RESERVE TRAINING COMMAND

NAS Atlanta	7B
NAS Dallas	7D
NAS Glenview	7V
NAS Grosse Ile	7Y
NAS Los Alamitos	7L
NAS Minneapolis/Twin Cities	7E
NAS New Orleans	7X
NAS New York	7R
NAS Olathe	7K
NAS Seattle	7T
NAS South Weymouth	7Z
NAS Willow Grove	7W
NARTU Anacostia	6A
NARTU Jacksonville	6F
NARTU Alameda (Oakland)	6G(7F)
NARTU Lakehurst	6N
NARTU Memphis	6M
NARTU Norfolk	6S

RCVW-4 was disestablished on June 1, 1970. However, the following squadrons continued to use the Visual Identification Letters AD: VA-42, VA-43, VA-45, VA-174, VF-101, and VF-101 Det Oceana. VF-101 Det Oceana moved to NAS Key West later that year and became VF-101 Det Key West. At the same time, RCVW-12 was also disestablished. The following squadrons continued to use the tail letters NJ: VF-121, VF-124, VF-126, VA-122, VA-126, VA-127, VA-128, and VAH-123.

RCVSG-50 was disestablished on February 17, 1970. The tail letters AR were retained by the following squadrons: VS-30 and HS-1. RCVSG-51 was disestablished on June 30, 1971. The tail letters RA were retained by VS-41 and HS-10.

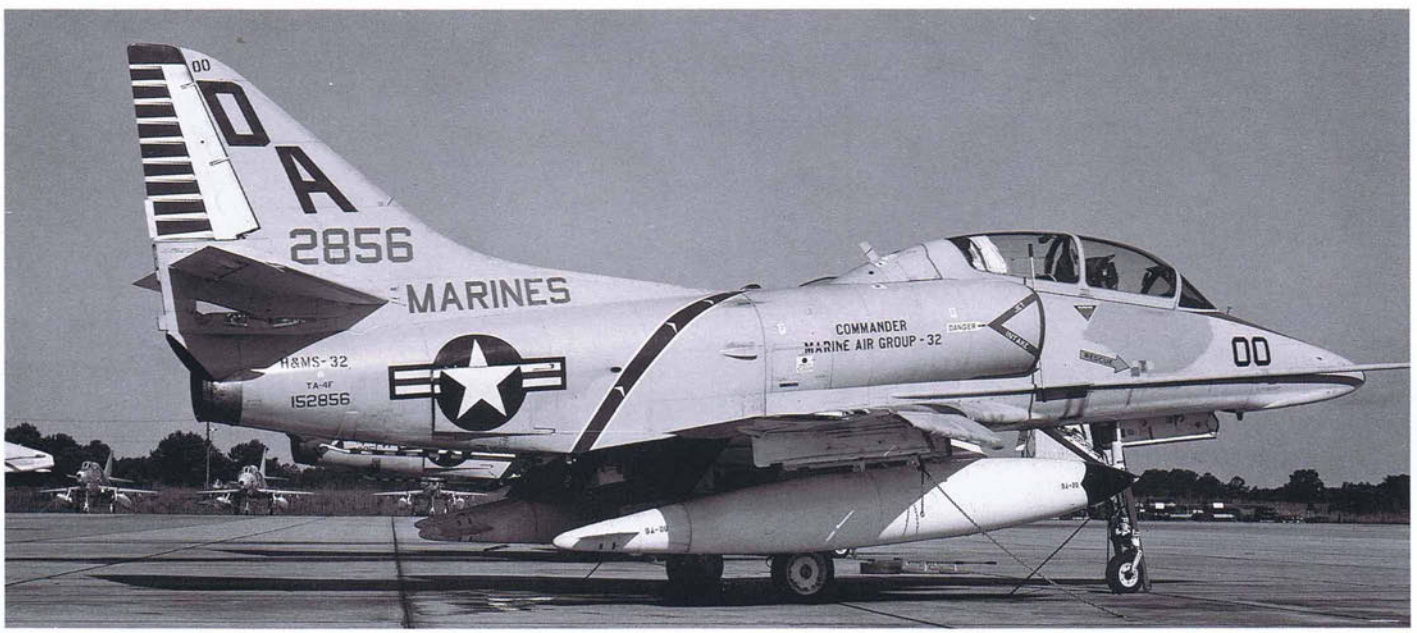
These squadrons, and others assigned to the training mission, continued to use these tail letters through the period covered in this volume. A listing of the squadrons which have been identified as being in this mission is included in the 1990 organization list at the end of this chapter.

OPNAV INSTRUCTION 3710.7F, Appendix A, dated May 27, 1971, modified the side number designations for Air Wing (CVW), Air Groups (CVSG), and Associated Squadrons to blocks of 100 numbers for each of the nine squadrons, starting with the basic number rather than 101, 102, etc. This made possible the 00 identification associated with the Air Group Commander's aircraft.

The Fourth Marine Aircraft Wing (Reserve) changed the Unit Identification Letters from the number/letter designation assigned to the Training Command to the two-letter system used by all fleet units, in accordance with CNO letter OP511 D-3/PAP, dated January 12, 1972.

OPNAV NOTICE C5400 *Naval Aeronautical Organization*, dated January 7, 1975, shows that the Naval Air Training Commands had now been assigned single-letter Unit Identification codes in lieu of the number/letter series. The letters ran from "G" through "L." Reserve bases and Technical Training bases still utilized the number/letter combinations.

Right: During this period the Playboy Bunny became a well known symbol on the aircraft of VMCJ-2. **Below:** In 1972, Headquarters and Maintenance Squadron 32 applied these imaginative and colorful markings to the MAG-32 Commanding Officer's TA-4F.
Bottom: With the national aircraft insignia on the rear of the fuselage and a oversize improperly located squadron insignia, VMA-324 had to place MARINES on the base of the fin of their A-4M in 1972.



Left: The first QF-4B assigned to the Naval Missile Center, Point Mugu, had this distinctive scheme in 1972. **Below:** Notice the absence of markings on the under surface of this A-7A painted in the carrier attack paint scheme in 1973. **Bottom:** The International Orange diamonds on the A-7C of VA-86 identifies the Sidewinder squadron as being the second VA squadron aboard the USS America (CA-66) in 1973. The diamond on top of the fuselage is outlined in Black to make it stand out against the gray.

The colorful scheme used by VMFA-451 when aboard the USS Forrestal (CV-59). Notice that the stylized identification letters are not used on the wing.

Amendment 1, to MIL-I-18464G(AS), *Insignia and Markings for Naval Weapons Systems*, dated August 14, 1975, once again changed the colors for designating the squadrons within the Carrier Air Group. They were now:

SQUADRON	COLOR
VAW	Insignia Blue
First VF Squadron	Insignia Red
Second VF Squadron	Orange Yellow
First VA Squadron	Light Blue
Second VA Squadron	International Orange
Third VA Squadron	Light Green
RVAH/VFP	Black
VAQ	Maroon
VS Squadron	Dark Green
HS Squadron/HC Detachment	Magenta

These colors were to be either glossy or nonspecular, depending upon whether the aircraft was painted with a non-camouflage scheme or camouflaged. At this time several of the specified colors were not listed in Federal Specification 595a *Colors* as nonspecular colors. They were defined as matching the corresponding glossy colors, except that they were to be lusterless.

OPNAV INSTRUCTION 3710.7H, Appendix A, *Aircraft Visual Identification System*, dated September 11, 1975, once again modified the side numbers. In order to achieve correlation between the electronic (IFF/SIF) and visual identification of each aircraft, combat and combat support aircraft were to be numbered using octal numbers, i.e., only the numerals 0 through 7. Air Wings (CV) and Associated Squadrons were now listed in the following manner:

SQUADRON	NUMBER	COLOR
VAW	010 – 021	Insignia Blue
First VF Squadron	100 – 117	Insignia Red
Second VF Squadron	200 – 217	Orange Yellow
First VA Squadron	300 – 317	Light Blue
Second VA Squadron	400 – 417	International Orange
Third VA Squadron	500 – 517	Light Green
RVAH/VFP	600 – 607	Black
VAQ	610 – 617	Maroon
VS Squadron	700 – 715	Dark Green
HS Squadron/HC Detachment	730 – 745	Magenta

Composite, Development and Combat Support squadrons and units other than those mentioned above numbered their aircraft with one, two or three octal numbers. Readiness Training squadrons with aircraft employing the Automatic Carrier Landing System used three-digit octal numbers on their aircraft. Other activities still identified their aircraft by the last three digits of the Bureau Number.

OPNAV INSTRUCTION 3710.7J, dated February 21, 1978, added HSL Detachments to the squadrons assigned side numbers 730 – 745 and Magenta as their identification color.

Letters to designate Naval Air Training aircraft were now to be the letters A through F.

The following units had been disestablished during the previous ten years.

DISESTABLISHED

*	RCVW-4	AD	June 1, 1970
**	RCVW-12	NJ	June 1, 1970
	CVW-16	AH	June 30, 1971
	CVW-19	NM	June 30, 1977
	CVW-21	NP	December 1975
#	CVSG-50	AR	February 17, 1971
##	CVSG-51	RA	June 30, 1970
	CVSG-53	NS	June 30, 1973
	CVSG-54	AT	July 1, 1972
	CVSG-56	AU	June 30, 1973
	CVSG-59	NT	June 30, 1973
	CVSGR-70	AW	March 17, 1970
	CVSGR-80	NW	March 17, 1970
	VSF-1	NA	January 2, 1970
	VSF-3	SK	
	VAP-61	SS	July 1, 1971

VAL-4	VM	April 10, 1972
VAW-111	RR	October 29, 1976
VAQW-13	TR	July 1, 1972
VAH-24	SK	
VAH-123	NJ	February 1, 1971
RVAH-1	GH	January 29, 1979
RVAH-3	GJ	August 17, 1979
RVAH-5	GK	September 30, 1977
RVAH-6	GS	October 20, 1978
RVAH-7	GL	September 28, 1979
RVAH-9	GM	September 30, 1977
RVAH-11	GN	June 1, 1975
RVAH-12	GP	July 2, 1979
RVAH-13	GR	June 30, 1976
RVAH-14	GQ	May 1, 1974
HC-2	HU	September 30, 1977
HC-7	VH	June 30, 1975
VW-1	TE	July 1, 1971
VW-4	NH	April 1975
VR-1	JK	September 30, 1978
VR-21	RZ	March 30, 1977
VC-4	JF	April 30, 1971
HSFMFPAC	WZ	
HSFMFLANT	BZ	December 30, 1972
H&MS-33	WM	December 15, 1970
H&MS-40	HR	May 1, 1972
H&MS-47	MZ	1975 (*)
H&MS-56	VZ	July 15, 1971
VMA-324	DX	August 29, 1974
VMA-543	MD	April 1, 1974
VMA (AW)-225	CE	June 15, 1975
VMF-351	MC	May 22, 1976
VMF-511	MK	August 31, 1972
VMFA-334	WU	December 30, 1971
VMFA-542	WH	June 30, 1970
VMO-6	WB	December 31, 1976
VMO-8	QN	August 1, 1976
VMCJ-1	RM	September 2, 1975
VMJ-4	MJ	December 31, 1973
VMR-216	MV	December 31, 1972
HML-765	MR	June 30, 1976
HMM-265	EP	November 13, 1970
HMM-364	YK	April 13, 1971
HMM-365	YM	March 1, 1971
HMM-766	QS	October 1, 1976
HMM-768	QJ	1976 (*)
HMM-777	QM	
HMHT-301	SP	March 31, 1972
HMMT-302	SQ	March 31, 1972
HMMT-401	HP	May 1, 1972
HMMT-402	HQ	May 1, 1972
VMT-103	SD	May 31, 1972
VMFAT-101	SB	
VMFAT-201	KB	September 30, 1974
VT-1	F(2S)	October 1, 1976
VT-5	F(2S)	October 1, 1976
VT-29	D(3C)	December 31, 1976
VT-30	3T	
NAS Los Alamitos	7L	
NAS Minneapolis	7E	
NAS New York	7R	June 30, 1971
NAS Olathe	7K	January 30, 1970
NAS Seattle	7T	July 1, 1970
NAS Lakehurst	6N	1977 (*)

* The tail code letters are retained by VF-121, VF-124, VF-126, VA-122, VA-125, VA-127, VAH-123 and VA-128.

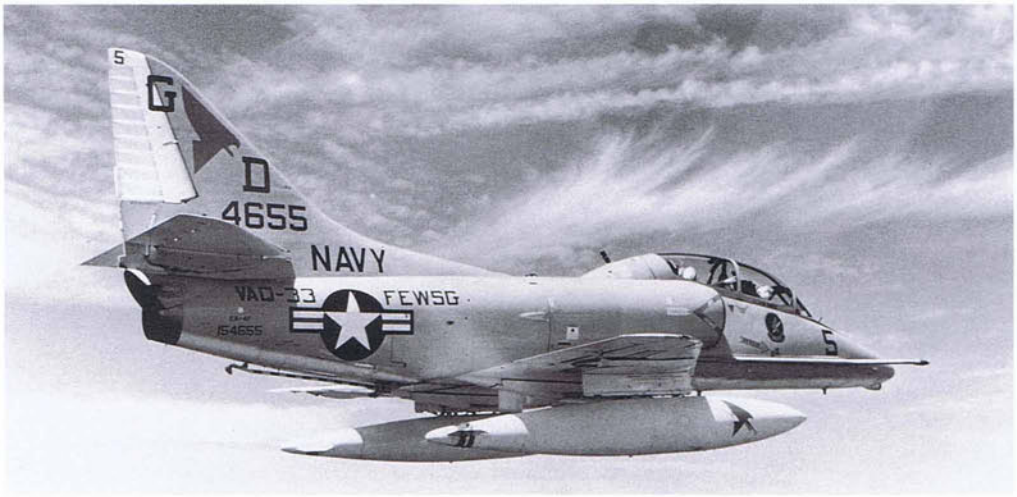
** The tail code letters are retained by VA-42, VA-43, VA-45, VA-174, VF-101 and VF-101 Det Oceana.

\# The tail code letters are retained by VS-30 and HS-1.

The tail code letters are retained by HS-10 and VS-41.

(*) Precise date unknown.

Opposite Left: VW-4 identified their WP-3A on the nose with the hurricane symbol used on maps and the signal flags for hurricane on the tail. **Above:** The blue fuselage stripe with white stars first adopted by VMF-451 on their FJ-2 in 1954 has continued to be a distinctive marking of their aircraft. **Right:** VA-205 A-4L identified as the third VA squadron in the CAW by the Light Green markings. In accordance with the instructions, the belly tank is identified with the squadron number as well as its color. **Bottom:** Dark Blue and Orange tails identified the A-4M of VMA-331 the "Bumble Bees" at MCAS Beaufort, SC in 1973.



Left: The diving hawk on the tail and drop tank taken from the squadron insignia identify this EA-4F as belonging to Tactical Electronic Warfare Squadron 33, a component of Fleet Electronic Warfare Support Group. **Next Page Right:** A good example of how clearly identifiable letters of the Visual Identification System have been modified is the CVW-17 AA on this RA-5C. **Bottom:** This TA-4J of VA-45 the "Blackbirds" is identified as the fifth squadron of RCAVW-4 by the side numbers in the 500 block and Light Green markings on the nose, tail, and drop tanks. Notice the Blackbird insignia just aft of the intake warning chevron.

On March 17, 1970, CVSGR-70 and CVSGR-80 were formed under the heading Anti-submarine Carrier Air Groups, Reserve. One group was established on the East Coast, with the other on the West Coast. These were consolidated under the title, Anti submarine Helicopter Wing, Reserves (HELWIGRES) on January 1, 1976.

Two Marine Corps squadrons were activated and deactivated during this period, as shown below.

TITLE		ACTIVATED	DEACTIVATED
HMMT-401	HP	January 12, 1970	May 1, 1972
HML-268	RL	September 15, 1972	September 30, 1977

OPNAV NOTICE C5400 *Naval Aeronautical Organization*, dated April 1, 1980, shows numerous changes had taken place within the previous ten years. Among others, the Naval Air Reserve began to use the double-letter designation for its squadrons. The Reserve Air Wings applied their own designation to their carrier-based squadrons. Other types, such as VP and VR squadrons, were also assigned dual letter designations, as shown in the table. This eliminated the problem of having to repaint aircraft to conform to the system used in the fleet, in the event units were called to active duty.

As has been done in previous tables, the date a new squadron entered the system is shown in the right-hand column, as is the date for a change of designation. A previous designation and/or tail code is shown in parentheses.

CARRIER AIR WINGS AND SQUADRONS

CARRIER AIR WINGS

CVW-1	AB
CVW-2	NE
CVW-3	AC
CVW-5	NF
CVW-6	AE
CVW-7	AG
CVW-8	AJ

CVW-9	NG	
CVW-11	NH	
CVW-14	NK	
CVW-15	NL	
CVW-17	AA	
CVWR-20	AF	April 1, 1970
CVWR-30	ND	April 1, 1970

ANTI SUBMARINE HELICOPTER WING, RESERVE

HELEWINGRS	NW	January 1, 1976
HAL-4		
HAL-5		
HS-74		
HS-75		
HS-84		
HS-85		

PHOTOGRAPHIC

VFP-63	PP	

CARRIER AIRBORNE EARLY WARNING

CAEWW-12	GE	
RVAW-110	TT	

TACTICAL ELECTRONIC WARFARE

VAQ-33	GD	
VAQ-129	September 1, 1970	
VAQ-130	VR	

HELICOPTER COMBAT SUPPORT

HC-1	UP	
HC-3	SA	
HC-6	HW	
HC-9		August 1, 1975
HC-11	VR	October 1, 1977
HC-16	BF	November 1, 1974

HELICOPTER MINE COUNTERMEASURE SQUADRONS

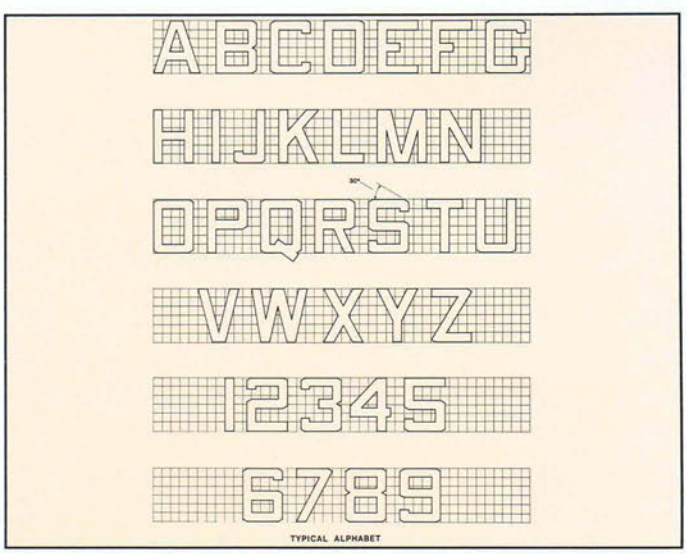
HM-12	DH	April 1, 1971
HM-14	BJ	May 12, 1978
HM-16	GC	

HELICOPTER ANTI SUBMARINE LIGHT

HSL-30	(HC-4)	HT(HT)	March 1, 1972
HSL-31	(HC-5)	TD(TD)	March 1, 1972
HSL-32		HV	August 17, 1973
HSL-33		TF	July 31, 1973
HSL-34		HX	September 27, 1974
HSL-35		TG	January 15, 1974
HSL-36		HY	September 26, 1975
HSL-37		TH	July 3, 1975

PATROL

VP-1	YB
VP-4	YD
VP-5	LA
VP-6	PC
VP-8	LC
VP-9	PD
VP-10	LD



TYPICAL ALPHABET

Left: VF-202 applied a modified Texas flag design to the rudder of their F-4N to show they were a reserve squadron from NAS Dallas. **Bottom:** The colorful squadron insignia of VA-212 dominated the paint scheme of their A-4F in 1975.

VP-11	LE
VP-16	LF
VP-17	ZE
VP-19	PE
VP-22	QA
VP-23	LJ
VP-24	LR
VP-26	LK
VP-30	LL
VP-31	RP
VP-40	QE
VP-44	LM
VP-45	LN
VP-46	RC
VP-47	RD
VP-48	SF
VP-49	LP
VP-50	SG
VP-56	LQ

PATROL, RESERVE

VP-60	LS	November 1, 1970
VP-62	LT	November 1, 1970
VP-64	LU	November 1, 1970
VP-65	PG	November 1, 1970
VP-66	LV	November 1, 1970
VP-67	PL	November 1, 1970
VP-68	LW	November 1, 1970
VP-69	PJ	November 1, 1970
VP-90	LX	November 1, 1970
VP-91	PM	November 1, 1970
VP-92	LY	November 1, 1970
VP-93	LH	July 1, 1976
VP-94	LZ	November 1, 1970

FLEET LOGISTIC SUPPORT

VR-24	JM

Right: An EA-6B fully identified as belonging to Carrier Tactical Electronic Warfare Squadron 131, a component of Carrier Air Wing 9, embarked aboard the USS Constellation (CV-64).
Bottom: The "Gunslingers" of VA-105 had a colorful scheme in 1975 for their aircraft. The band around the rear of the fuselage of this KA-6D is believed to be an identification for a tanker aircraft.

FLEET TACTICAL SUPPORT

VRC-30	(VR-30)	RW(RW)	October 1, 1978
VRC-40		JK	
VRC-50		RG	

FLEET LOGISTIC SUPPORT, RESERVE

VR-51	RV	November 1, 1970
VR-52	JT	June 24, 1972
VR-55	RU	April 1976
VR-56	JU	July 1, 1976
VR-57	RX	November 1, 1977
VR-58	JV	November 1, 1977

FLEET AIR RECONNAISSANCE

VQ-1	PR
VQ-2	JQ
VQ-3	TC
VQ-4	HL

FLEET COMPOSITE

VC-1	UA
VC-2	JE
VC-3	UF
VC-5	UE
VC-6	JG
VC-7	UH
VC-8	GF
VC-10	JH
VC-12	JY 1974 (*)
VC-13	UX 1974 (*)

AIR TEST AND EVALUATION

VX-1	JA
VX-4	XF
VX-5	XE

ANTARCTIC DEVELOPMENT

VXE-6	XD

OCEANOGRAPHIC DEVELOPMENT

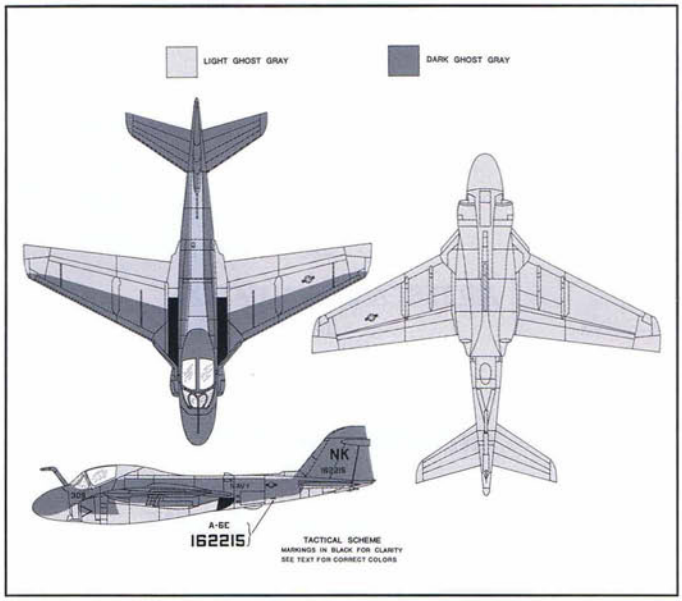
VXN-8	JB

NAVAIRSYCOM

TEST PILOT SCHOOL	TPS
BLUE ANGELS	BA

(*) Precise date unknown

Left: It is an unusual combination of numbers on this A-6A. The 04 on the rudder is the short version of the aircraft number and not of the Bureau number. **Bottom:** The "Knightriders" carried a distinctive design of lance and helmet on their A-6E. The Navy E is depicted in an unusual manner.



FLEET MARINE FORCE AND SUPPORT UNITS

HEADQUARTERS

MWHS-1	(MAMS-17)	SZ(SZ)	
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-16		WW	
H&MS-24		EW	
H&MS-26		EL	
H&GMS-27	(MAMS-27)	CZ(CZ)	May 14, 1976
H&MS-29		FK	May 1, 1972
H&MS-31		EX	
H&MS-32		DA	

Right: The aircraft of the Air Group Commander lends itself to some of the most colorful paint schemes as they pick up all the identification colors for the squadrons assigned. They are further identified by the 00 on the tail derived from the aircraft number. These three A-7Es are good examples from the mid 1970s. **Below:** The squadron C.O.s A-7E of the "Fighting Red Cocks" (VA-22) was a CAG aircraft in 1975. **Bottom:** The VA-94 CAG bird illustrates that more than one squadron could have an aircraft painted as the CAG during the same period.

Left: An A-7A of VA-304 is identified by the aircraft number in the 400 block and International Orange tail markings as belonging to the second attack squadron in CVWR-30. **Bottom:** In 1975, VA-147 had a colorful scheme on the rear of their A-7Es with squadron insignia, name, recognizable design and ship assignment in addition to the required markings.

H&MS-36		WX	
H&GMS-37	(MAMS-37)	QF(QF)	January 25, 1977

FIGHTER ATTACK

VMFA-115		VE	
VMFA-122		DC	
VMFA-212		WD	
VMFA-232		WT	
VMFA-235		DB	
VMFA-251		DW	
VMFA-312		DR	
VMFA-314		VW	
VMFA-323		WS	
VMFA-333		DN	
VMFA-451		VM	
VMFA-531		EC	

ATTACK

VMA-211		CF	
VMA-214		WE	
VMA-223		WP	
VMA-231		CG	May 15, 1973
VMA-311		WL	
VMA-331		VL	
VMA-513	(VMFA-513)	WF(WF)	July 1, 1970
VMA-542		CR	January 12, 1972

ALL-WEATHER ATTACK

VMA(AW)-121		VK	
VMA(AW)-224		WK	
VMA(AW)-242		DT	
VMA(AW)-332		EA	
VMA(AW)-533		ED	

OBSERVATION

VMO-1		ER	
VMO-2		UU(VS)	April 1, 1974

TACTICAL ELECTRONIC WARFARE

VMAQ-2	(VMCJ-2)	CY(CY)	July 1, 1975

TACTICAL RECONNAISSANCE

VMFP-3	(VMCJ-3)	RF(TN)	July 1, 1975

Right: The Black tail stripes and 600 side number identifies this VFP-63 Det 2 RF-8A as belonging to the sixth squadron aboard the USS Franklin D. Roosevelt (CV-42) in 1975. **Below:** VFP-63 operated their F-8E with this scheme in 1973. The correct tail color at that time for aircraft in the 600 block was Black. **Bottom:** A bit of humor was added by VFP-63 at this time by modifying their tail code PP into two question marks.

Left: In the mid 70s, the Commander Fighter Airborne Early Warning Wing, Pacific Fleet had this colorful scheme on his personal TA-4J. The fuselage stripe and two stars represent the shoulderboard rank insignia on the uniform of a Rear Admiral. **Bottom:** A RA-5C Vigilante of RVAH-1 carrying the tail designation of CVW-8 aboard the USS America (CV-66). Note the Smoking Tiger insignia on the side of the engine nacelle.

AERIAL REFUELER/TRANSPORT

VMGR-152	QD	
VMGR-252	BH	
VMGR-352	QB	

HELICOPTER ATTACK

HMA-169	SN	September 30, 1971
HMA-269	HF	February 22, 1971
HMA-369	SM	April 1, 1972

HELICOPTER LIGHT

HML-167	TV
HML-267	UV
HML-367	VT

HELICOPTER MEDIUM

HMM-161	YR
HMM-162	YS
HMM-163	YP
HMM-164	YT
HMM-165	YW
HMM-261	EM
HMM-262	ET
HMM-263	EG
HMM-264	EH
HMM-265	EP
HMM-268	YQ

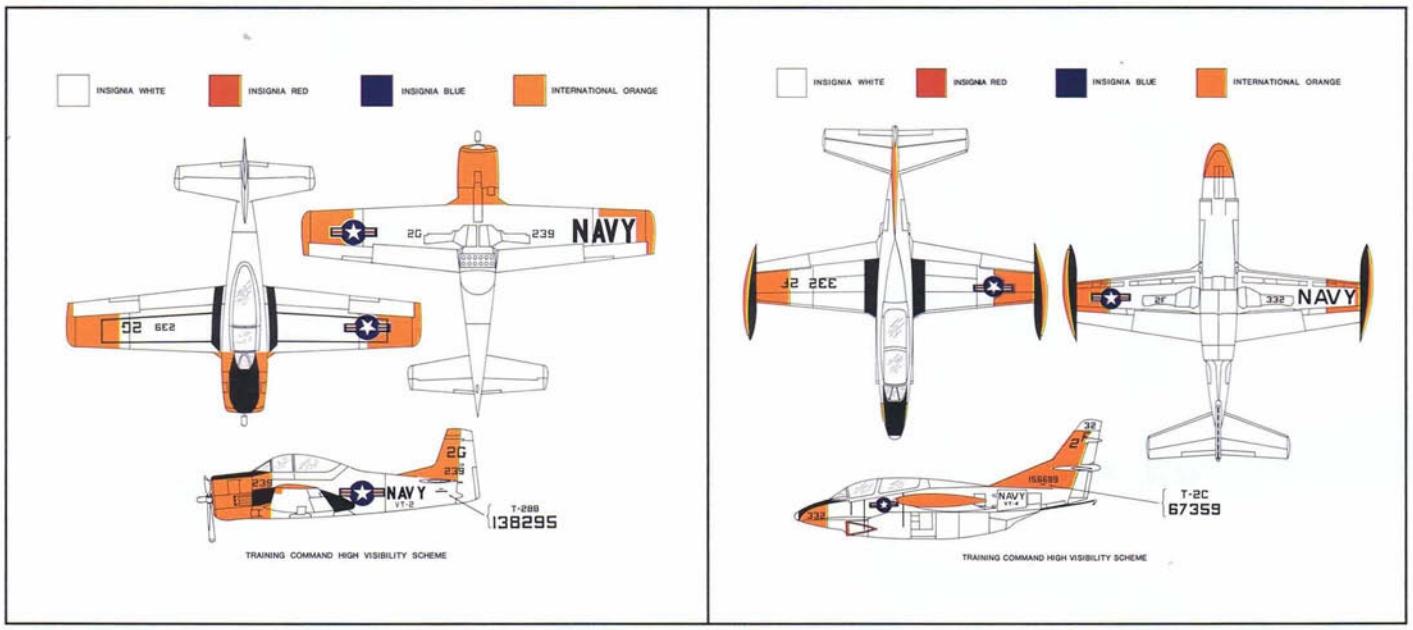
HELICOPTER HEAVY

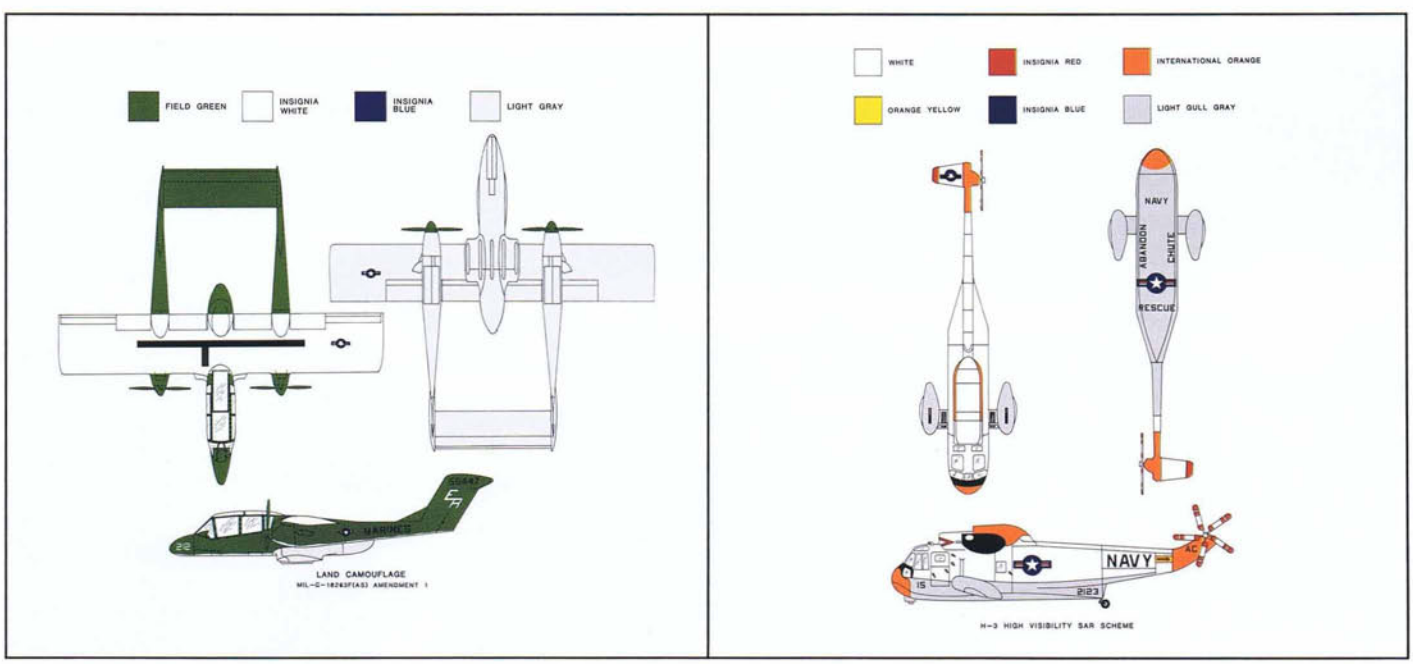
HMH-361	YN
HMH-362	YL
HMH-363	YZ
HMH-461	CJ
HMH-462	YF
HMH-463	YH

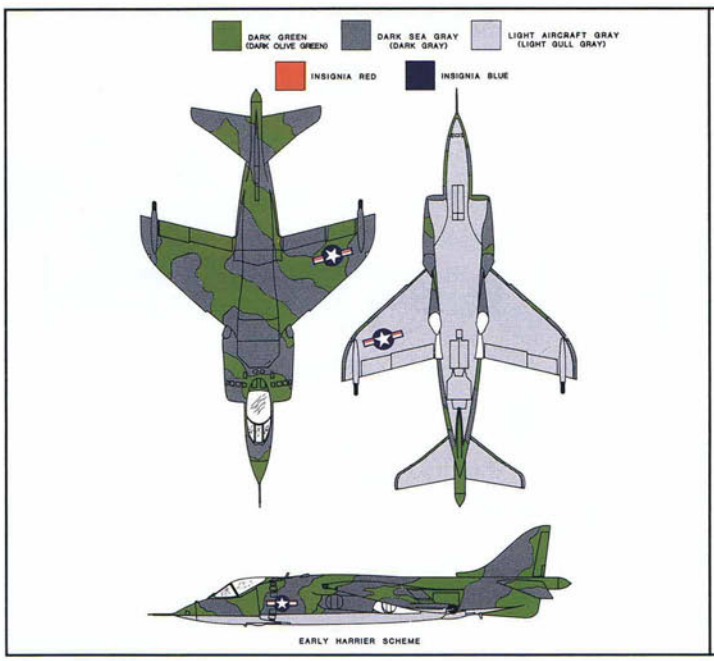
HELICOPTER DEVELOPMENT

HMX-1	MX

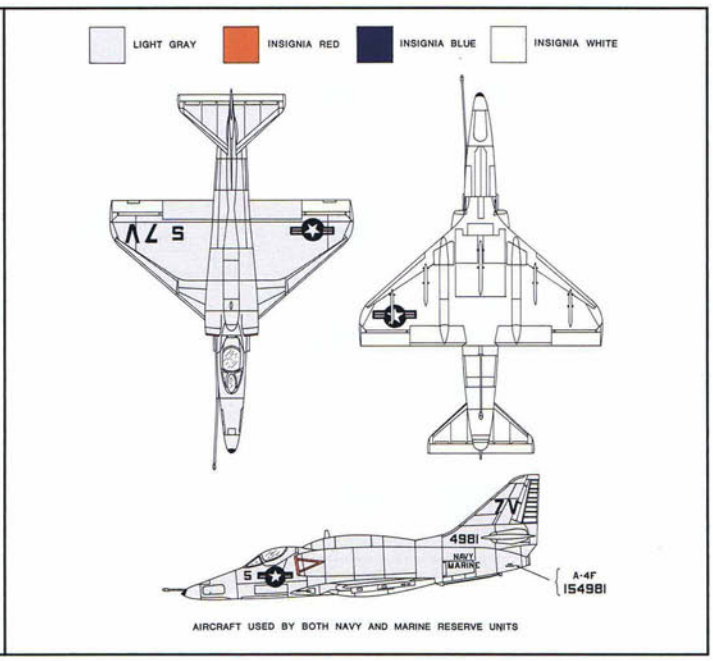
Right: Unit assignment can not always be determined from the aircraft markings. This RF-8A assigned to the USS Constellation in 1978 is a good example of lacking squadron identification.





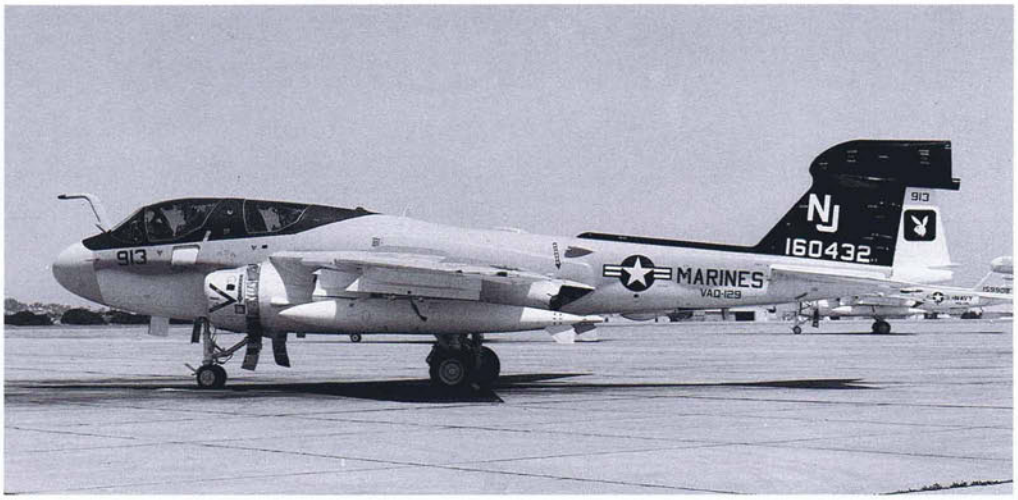


EARLY HARRIER SCHEME



AIRCRAFT USED BY BOTH NAVY AND MARINE RESERVE UNITS

Opposite left: MARINES is displayed on the upper surface of this AV-8A for the first time since the early 1930s. The effectiveness of the camouflage paint scheme is diminished by all the red and black markings. **Right:** This EA-6B presents a confusing combination of markings. It is the first Prowler assigned to VMAQ-2 as shown by the rabbit on the tail and MARINES but still carries the markings of VAQ-129 where the training was being conducted. **Opposite bottom left:** VAQ-138 "Wizards" applied their name, trident symbol, and squadron number to the drop tank as well as the crew names under the edge of the cockpits of their EA-6B.



MARINE CORPS TRAINING

HMT-204	(HMHT-401 HP & HMMT-402 HQ)	GX	May 1, 1972
HMT-301	(H&MS-30)	SU(SR)	March 31, 1972
VMAT-203	(VMT-203)	KD(KD)	May 1, 1972
VMAT-102		SC	
VMAT(AW)-202		KC	
VMFAT-101		SH(SB)	March 6, 1973

FOURTH MARINE AIRCRAFT WING

(Activated July 1, 1962, but used the Air Station Number/ Letter designation until January 1972).

H&MS-41		MY	
H&MS-42		MW	
H&MS-46		QY	
H&MS-49		QZ	
VMA-124		QP	
VMA-131		QG	
VMA-133		ME	
VMA-134		MF	
VMA-142		MB	
VMA-322		QR	
VMF-321		MG	
VMF(AW)-112		MA	
VMO-4		MU	
VMGR-234	(VMR-234)	QH(QH)	January 1, 1976
HMA-773		MP	
HMH-769		MS	
HMH-772		MT	
HML-767	(HMM-767)	MM(MM)	December 15, 1967
HML-771		QK	
HML-776		QL	
HMM-764		ML	
HMM-768		QJ	
HMM-770		MN	
HMM-774		MQ	

NAVAL AIR TRAINING COMMAND

TRAINING WING ONE

NAS Meridian	A	
VT-7	A(2K)	
VT-9	A(2M)	
VT-19	A	August 2, 1971

TRAINING WING TWO

NAS Kingsville	B	
VT-21	B(3E)	
VT-22	B(3F)	
VT-23	B(3H)	
JTTU	B	

TRAINING WING THREE

NAS Chase Field	C	
VT-24	C(3K)	
VT-25	C(3J)	
VT-26	C(3L)	

TRAINING WING FOUR

NAS Corpus Christi	D	
VT-27	D(3G)	
VT-28	D(3B)	
VT-31	D(3A)	

TRAINING WING FIVE

NAS Whiting Field	E	
VT-2	E(2G)	
VT-3	E(2W)	
VT-6	E(2P)	
HT-8	E(2E)	
HT-18	E	March 1, 1972

TRAINING WING SIX

NAS Pensacola	F	
NAS Saufley Field		
VT-4	F(2F)	
VT-10	F(2N)	
VT-86	F	June 5, 1972

NAVAL AIR TECHNICAL TRAINING

NATTC LAKEHURST	4L
NAS MEMPHIS	4M

NAVAL AIR RESERVE TRAINING COMMAND

Atlanta	7B
Dallas	7D
Detroit (Grosse Ile)	7Y
Glenview	7V
New Orleans	7X
South Weymouth	7Z
Washington, DC (Anacostia)	7N(6A)
Willow Grove	7W

NAVAL AIR RESERVE UNIT

Jacksonville	6F
Alameda	6G
Memphis	6M
Norfolk	6S

Above: With such a colorful scheme there should be no doubt but what this A-6E belonged to VA-65 of CVW-7. **Bottom:** Marine Fighter Attack Squadron 212 carried their squadron insignia on the tail of their F-4J. The design is in keeping with their nickname "Crusaders" from the days they flew the F8U/F-8.

MARTD'S/MARINE SUPPORT

HQMC	5A
MCAS Beaufort	5B
MCAS Cherry Point	5C
MCAS Futenma	5P
MCAS El Toro	5T
MCAS Yuma	5Y

NAVAL AIR STATIONS

Patuxent River	7A
Norfolk	7C
Jacksonville	7E
Brunswick	7F

Right: VR-52 Detroit Detachment C-118B aircraft displayed the American flag on both sides of the vertical fin and rudder. **Bottom:** The white characters outlined in Black produced a sharp contrast to the Light Gray on VMFA-115 F-4J aircraft.

Whidbey Island	7G
Alameda	7J
Memphis	7K
Point Mugu (Los Alamitos)	7L
North Island	7M
Key West	7Q

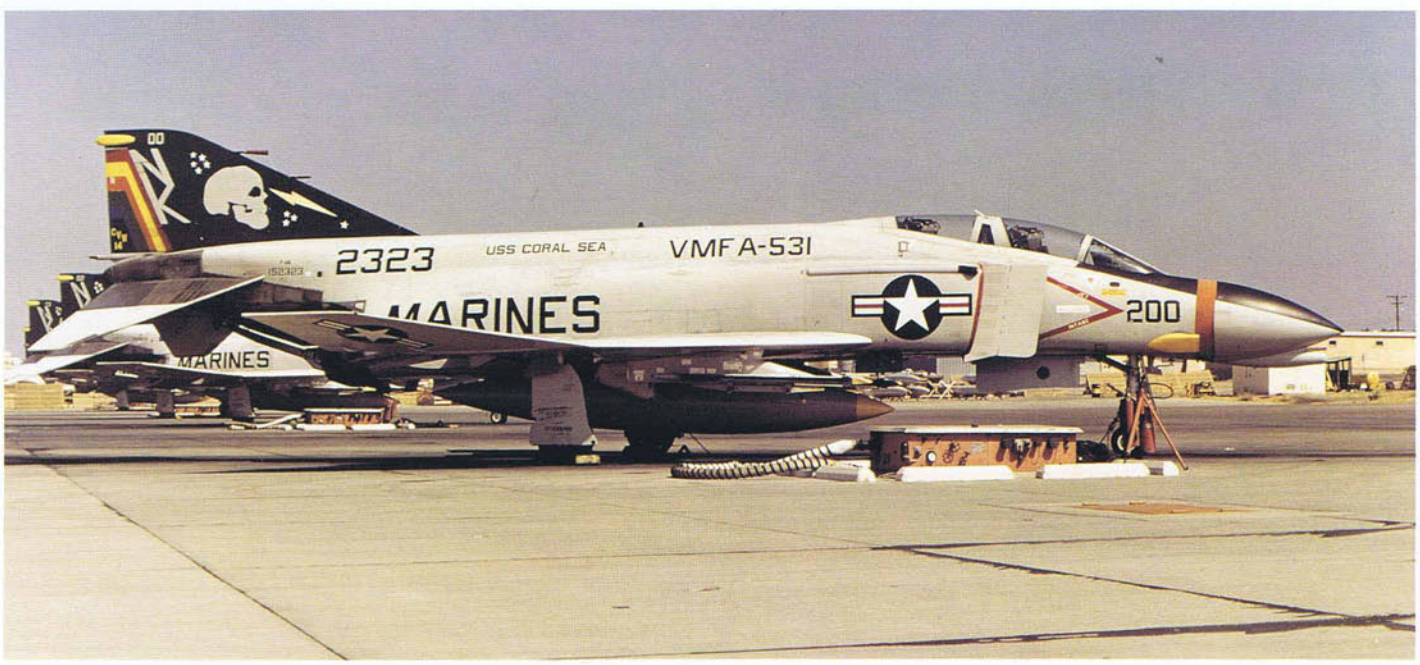
NAVWPNCEN

China Lake	7P

NAVY SUPPORT (OUT OF CONUS)

NAF Atsugi	8A
NAS Cubi Point	8B
NAF Sigonella	8C
NAVSTA Rota	8D
NAVSTA Roosevelt Roads	8E
NAF Mildenhall	8G
COMFLTACT Okinawa	8H
NAVSTA Guam	8J
HQ CMEF (Bahrain)	8K

Left: Patrol squadron 17 used a white "shadow" to make the aircraft number and tail code stand out against the Light Gull Gray background. Notice the squadron insignia on the forward fuselage. **Below:** A F-4N of VMFA-531 with their own tail code and full ghost design. **Bottom:** When the squadron was aboard the USS Coral Sea (CV-43) they used the tail code for CVW-14 and modified their ghost symbol on the tail.



Right: This F-4J of Commander Attack Carrier Air Wing Fifteen carried one of the most colorful CAG aircraft paint schemes. Note that the tail feathers of the eagle represent the colors of the squadrons comprising the wing.
Below and bottom: These two photos illustrate the difficulty of trying to depict all of the changes in aircraft painting. The two schemes on the A-4M of VMA-311 span the years 1978 to 1983.

CHAPTER 7 1980-1989

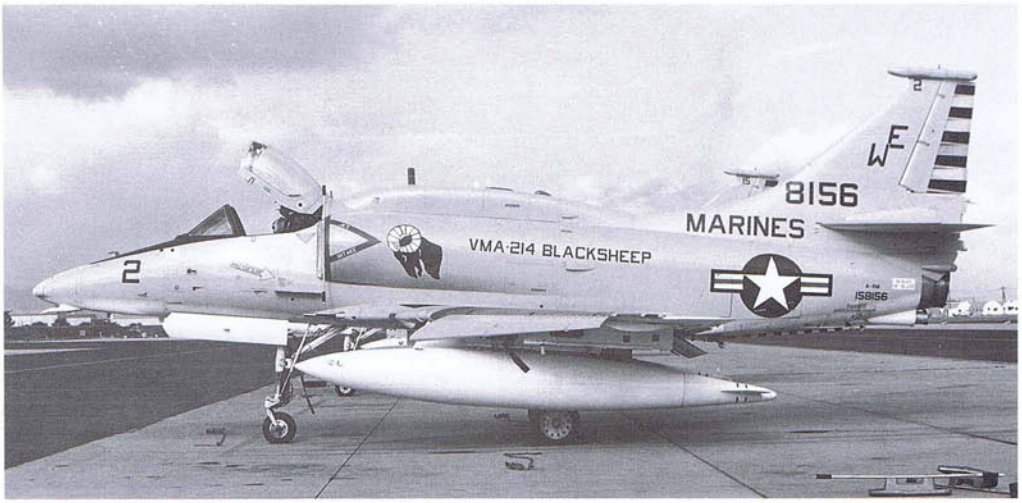
Reflecting the continuing change in Carrier Air Wing composition, OPNAV INSTRUCTION 3710.7K, Appendix A, Change 1, dated March 5, 1982, specified the following side numbers and colors for Air Wings and Associated Squadrons.

SQUADRON	SIDE NUMBER	COLOR
First VF Squadron	100 – 114	Insignia Red
Second VF Squadron	200 – 214	Orange Yellow
First VA Squadron	300 – 315	Light Blue
Second VA Squadron	400 – 415	International Orange
Third VA Squadron (Strike)	500 – 512	Light Green
VAW	600 – 603	Insignia Blue
VAQ	604 – 607	Maroon
HS/HC(H-3)	610 – 617	Magenta
VS Squadron	700 – 713	Dark Green
VFP	115 – 117	Black

The introduction of MIL-STD-2161(AS) on April 18, 1985, brought about a complete listing of exterior markings for US naval aircraft. As in the past, all letters and numerals applied to the exterior of an aircraft are to be of the modified vertical block type, uniform in shape and size. The width of the individual strokes forming them is to be one-sixth of the height. The space between characters is also to be one-sixth of the height. All characters are to be 1 inch (2.54 cm) in height, unless otherwise specified or there is space limitations. If space is limited, the letters and numerals may be reduced to 1/2 inch (1.27 cm) in height, with their widths, and the width of the individual strokes, reduced proportionately. Decalcomanias can be used, but only small maintenance markings can be used on supersonic aircraft, and in no case can decalcomanias be applied over brazier head rivets.

Right: Another variation of high visibility markings on aircraft with a tactical paint is seen on these VFA-87 Hornets. With two tails to work with, the squadron has painted the Visual Identification code on the inboard surface and their Indian Head design on the outboard surface of each tail.

Left: The Black tail with CY and the Playboy Bunny on this EA-6B of VMAQ-2 in 1980 were a well known squadron marking in the Marine Corps for a number of years.



Opposite left: Proud of their heritage, VMA-214 used a picture as well as their nickname to be sure everyone knew who they were. The blacksheep on the squadron insignia however does not have horns. **Right:** VF-213 utilized the twin tails of their F-14 Tomcat to apply the tail code on the inboard side and the squadron Lion symbol and stars on the outboard side of each tail.

Experimental aircraft are to be marked as far as practicable as specified for operational aircraft. They are to have U.S. NAVY applied on the upper surface of the right wing and on the lower surface of the left wing, in a similar location to the national aircraft insignia on the opposite wing. The height of the letters is to be the largest possible size that can be accommodated on the aircraft, selected from the standard sizes 12, 16, 20, 24, 30, and 36 inches (30.48, 40.64, 50.80, 60.96, 76.20, 91.44 cm).

The identification markings for research aircraft are not within the scope of this specification.

Target aircraft are to have the national aircraft insignia and identification markings applied in the normal positions insofar as practicable. If there are space limitations, the size of letters may be reduced proportionately. The word TARGET is to be applied along the left side of the forward and aft sections of the fuselage, the right side of the mid-section of the fuselage, the top surface of each wing assembly and horizontal tail surface, inboard from the wing tips, and on the right side near the top of each vertical tail surface.

The following markings are mandatory for all US Navy and US Marine Corps aircraft.

ITEM	FIXED WING	ROTARY WING
National Aircraft Insignia	Wing and Fuselage	Fuselage
Branch of Service	Wing and Fuselage	Fuselage
Model Designation	Fuselage	Fuselage
Airplane Serial Number	Fuselage	Fuselage
Unit Aircraft Number	Fuselage	Fuselage
Squadron Designation	Fuselage	Fuselage
Unit Identifier	Vertical Fin	Aft Pylon or Upper Tail Boom
Station or Unit Name	Vertical Fin	As Specified
Radio Call Numbers	Vertical Fin	Aft Pylon or Upper Tail Boom
Warning Markings	As Specified	As Specified

The size and exact location for these markings is given in the appropriate dimensioned drawings for each aircraft in MIL-STD-2161(AS). It should be readily apparent that, due to the number of various aircraft types and models, it is beyond the scope of this book to show all the drawings.

All identifying information placed on the undersurface of the wing is to be so applied that it can be read from left to right when standing in front of and facing the aircraft. On swept-back and variable sweep wings, all characters are to be applied symmetrically along the fifty percent constant chord line. Insofar as is practicable, all letters and numerals are to be positioned on the fuselage and vertical tail surface(s), so as to be perpendicular to the fuselage reference line.

The branch of service is to be applied to all aircraft operated by the Navy and Marine Corps, on both sides of the fuselage, just forward of the empennage. On aircraft operated by US Navy and US Naval Reserve activities, the normal marking consists of the word NAVY; however, UNITED STATES NAVY may be used on cargo/transport aircraft. On aircraft operated by the US Marine Corps and US Marine Corps Air Reserve, the marking consists of the word MARINES. On aircraft operated jointly by the US Navy and US Marine Corps, or by Reserve components, the designation is to be the single word NAVY. The lettering is to be the largest possible size which can be accommodated on the aircraft, selected from the following standard sizes: 12, 16, 20, 24, 30, and 36 inches (30.48, 40.64, 50.80, 60.96, 76.20, and 91.44 cm). When applied to aircraft painted in the land camouflage or tactical paint scheme, the branch of service will be a maximum of 12 inches (30.48 cm) high. On these aircraft the branch of service is placed on the fuselage only.

The squadron designation, consisting of letters and numbers, identifies the squadron to which an aircraft is assigned. It is to be placed on both sides of the fuselage, just forward of the empennage, and centered under the branch of service marking. If this is not practical, due to space limitations, the squadron marking may be applied in an aft location designated by the cognizant command. On low-wing transports, the squadron designation is to be applied along the centerline on both sides of the fuselage just forward of the empennage. On high-wing transports, the branch of service marking is to be placed on the fuselage either under the wing or aft of the trailing edge of the wing. The squadron designation is to be centered symmetrically under this marking. If this is not practical, it is to be placed aft along the fuselage below the centerline.

The model designation and airplane serial number are to be located centrally on both sides of the fuselage, under

VA-75	VMA-311	VA-45/VF-45	VF-213
VQ-3	VF-84	VT-22	VR-55
VMF-323/VMFA-323	VC-10	VRC-30	VA-46
HSL-34	VF-2	VAW-121	VAK-308

HM-14

VF-154

VAQ-136

HMM-162

VF-193/VF-142

VMF-235/VMFA-235

VXN-8

HC-5

VA-34

VP-4

VX-4

VP-24

VS-22

HSL-31/HC-5

HS-7

HMH-361

Opposite left: The Naval Air Reserve Unit at NAS Alameda, CA operated their RA-3B with the standard carrier attack scheme. **Right:** The Lockheed XH-51A was operated in this nonregulation paint scheme while under joint Army/Navy evaluation.

HS-11

VMA-332/VMA(AW)332

VC-6

VT-7

VF-74

VPU-1

VAQ-130

VP-50

VS-32

VA-305/VFA-305

VAW-114

HT-18

VMA-(AW)225

VA-85

VA-42

HAL-4 TO HCS-4

Left: This VS-73 reserve squadron S-2E is identified on the rear of the engine nacelle in addition to the AW on the tail, as being a component of Reserve Antisubmarine Warfare Carrier Air Group 70.

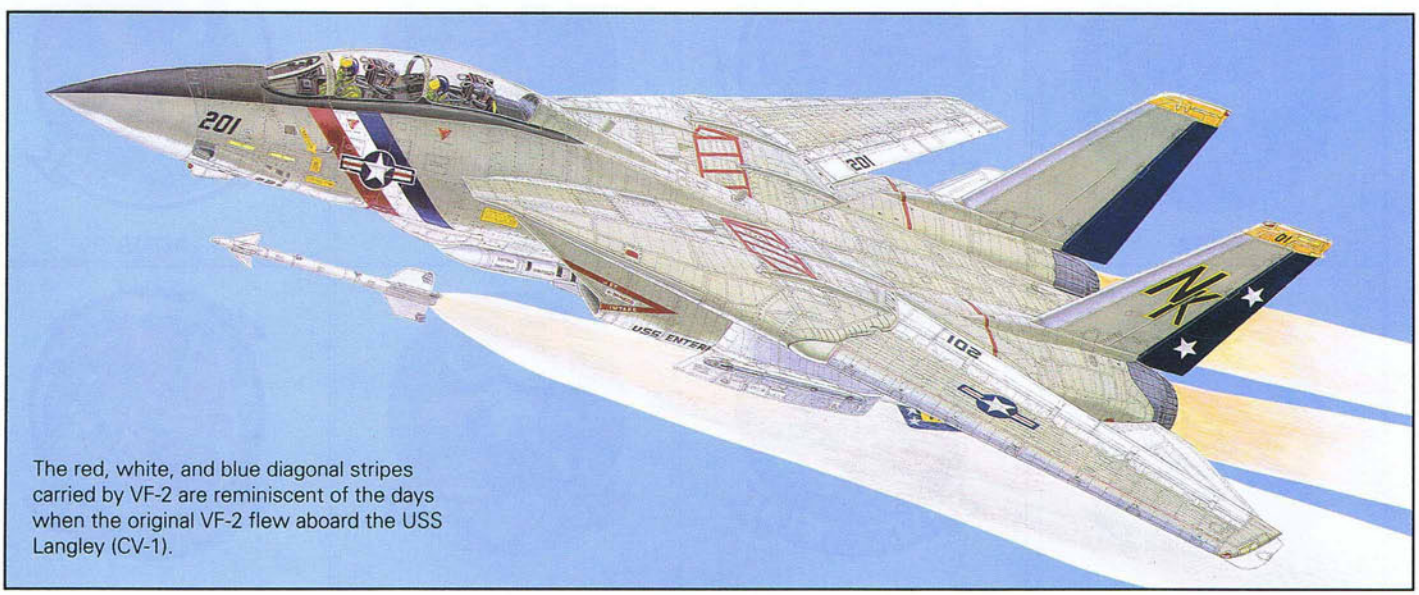
the horizontal stabilizer. Transport aircraft having twin booms are to have these markings centrally located on the outboard side of each main boom, between the national aircraft insignia and the horizontal stabilizer. The airplane serial number is to be symmetrically located 2 inches (5.08 cm) below the model designation in numerals 4 inches (10.16 cm) high. The model designation numerals and letters are to be 2 inches (5.08 cm) in height.

The unit aircraft number consists of numerals only to designate the number of the airplane within the unit. When specified by CNO directives, the last three digits of the bureau serial number are used as the unit aircraft number. CNO directives permit tactical aircraft to be marked with the last four digits of the bureau serial number to differentiate it from another aircraft having the same last three digits.

The unit aircraft number is to be located on the bow of the aircraft on both sides of the fuselage. The numbers are to be a minimum of 12 inches (30.48 cm) and the largest possible of the standard sizes which can be applied, but not to exceed fifty percent of the height of the projection of the fuselage side at the point of application.

The unit identifier consists of letters only, assigned in accordance with CNO directives, to designate the squadron or group the aircraft is assigned to. This "tail code" is to be applied to both sides of the vertical tail surfaces above the horizontal stabilizer, centered on the vertical surfaces. On multiple tail surfaces, the marking is to be applied on the outboard sides only. An effort should be made to avoid applying the unit identifier on rudders finished in White (17925); however, the specified height of the letters must be maintained. The letters are to be a minimum of 10 inches (25.40 cm) and are to be the largest possible of the following standard sizes: 20, 24, 30, and 36 inches (50.80, 60.76, 76.20, and 91.44 cm). In case of double letters, the width of each letter may be reduced to accommodate the letters to the shape of the tail surfaces. Maximum clarity, visibility, and symmetry must be maintained.

In the case of shore-based aircraft where no unit identifiers are assigned, this marking is to consist of the name of the air station, e.g., Norfolk, El Toro, etc., or abbreviation of the unit's title, e.g., VAW-120, in lieu of the unit identifier. If applied on the vertical tail surfaces, it is not to be applied on the fuselage. The size of the letters is to be such that the station or unit name can be accommodated on the vertical tail surfaces in the location specified in the dimensioned drawings. If necessary due to space limitations, the station or unit name may be divided to occupy two lines. If two lines are used for station names, there is to be no dash



The red, white, and blue diagonal stripes carried by VF-2 are reminiscent of the days when the original VF-2 flew aboard the USS Langley (CV-1).

Right: The Chief of Naval Air Training had this colorful scheme applied to his TA-4J. So as not to be confused with a CAG aircraft, he used three zeros in addition to his two stars as a Rear Admiral. **Bottom:** Not being familiar with the organizational structure can cause some problems with markings on aircraft such as this F-4S of VMFA-321. In addition to the squadron name and their Hells Angels insignia, it is marked with its parent organization MAG-41 DET A.

between words and the letters on the second line are to be centered below those on the top line.

Reserve aircraft may have the name of the home station placed on both sides of the fuselage just forward of the empennage, and centered under the branch of service marking. On transport aircraft, in cases where the branch of service marking is placed along the fuselage above the windows, the station name is to be placed along the centerline on both sides of the fuselage, just forward of the empennage. This is to be in addition to the station letter on both sides of the vertical fin and rudder of all reserve aircraft. The letters used for the station identification are to be one-half the size of the branch of service marking.

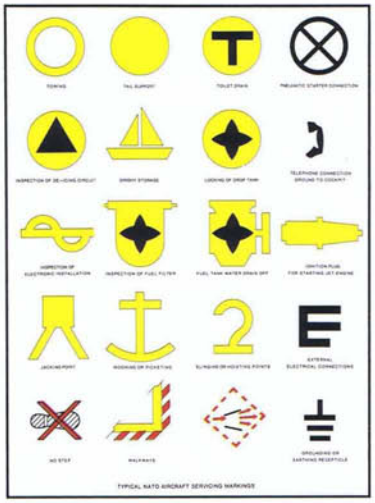
Each aircraft, except primary trainers not having radio equipment, is to have a radio call number painted on each side of the vertical stabilizer, or in the case of multiple tails, the outboard side only. This designation is to be discernible from a distance of 50 yards (45.72 m). The radio call number consists of at least the last four numbers of the bureau number. On rotary wing aircraft, or if space limitations do not permit on other aircraft, these numbers are to be applied aft along the fuselage, or aft along each side of the tail boom, as applicable. The numerals are to be the largest size possible of the following standard sizes: 12, 16, 20, 24, 30, and 36 inches (30.48, 40.64, 50.80, 60.96, 76.20, and 91.44 cm), but in no case less than 12 inches (30.48 cm) in height. On aircraft painted in the land camouflage or tactical paint scheme, the radio call number is to be a maximum of 12 inches (30.48 cm) in height.

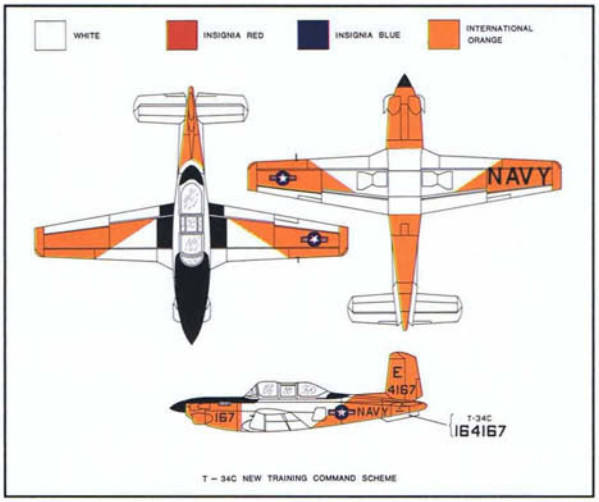
The above recognition type markings apply to aircraft with either the land camouflage or tactical paint scheme, except requirements for color and size of some markings differ when applied to these aircraft.

All of these markings applied to aircraft in the land camouflage scheme are to be nonspecular black (37038). For the major warning markings, the background color is to be Black, with lettering in the color of the land camouflage scheme.

All of these exterior markings applied to aircraft in the tactical paint scheme are to be applied in a contrasting shade of gray. The color used depends on the gray colors used for the specific tactical paint scheme and the location of the marking.

If the tactical paint scheme is comprised of only two colors, the contrasting color specified is the color used in the





Bottom: In addition to the identification provided by the large 6G on the tail, this TA-3B carries the legend Naval Air Reserve Unit Alameda on the fuselage under NAVY. **Bottom opposite right:** Visual Identification letters and aircraft number are no longer applied to the upper surface of the right wight. The red area under the flaps is beginning to be visible as the flaps are deployed on this S-3A.

scheme which is not located in the area where the marking is applied. This requirement applies except when the two colors used in the scheme are Gray (36320) and Gray (36375). In this case, all markings are to be Blue (35237). If the tactical paint scheme is comprised of three colors, the following guidelines apply:

a. If the background is the darkest gray, medium gray is used for the marking.

b. If the background color is the medium gray, the darkest gray is used for the marking.

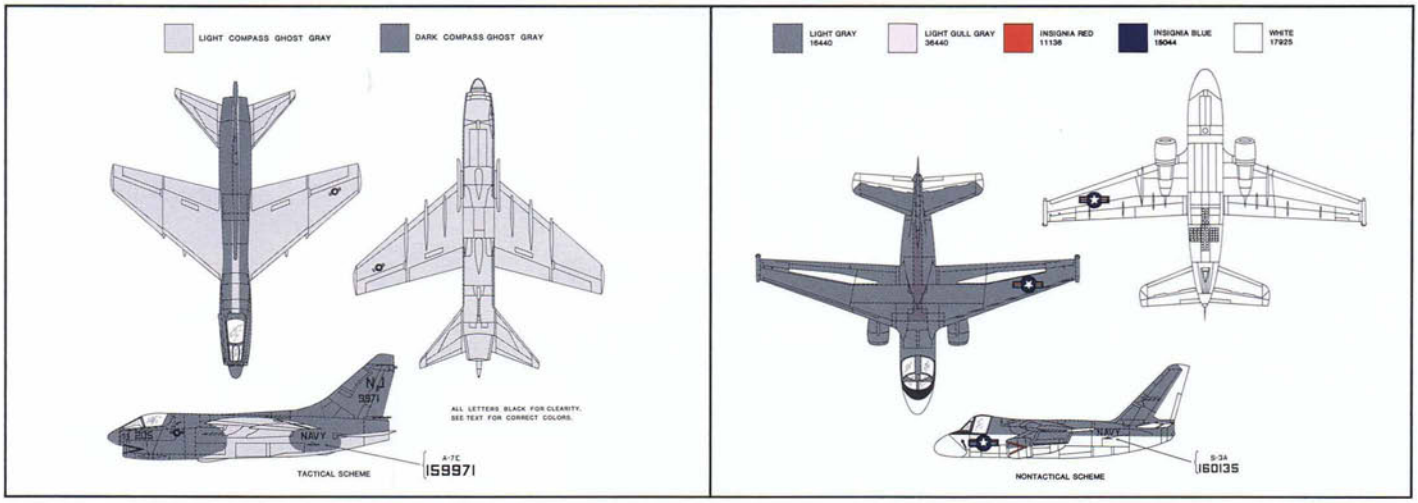
c. If the background color is the lightest gray, the medium gray is used for the marking.

MODEX numbers applied to aircraft with the tactical paint scheme are to be Gray (36081) instead of the colors specified above.

When aircraft are assigned air evacuation or hospital duty, it is mandatory that they be identified with the hospital red cross marking. This marking is to be centered on both sides of the vertical tail surface above the horizontal stabilizer in the space normally allotted to the unit identifier. It is also to be placed on the upper surface of the right wing, with the center of the marking at a distance from the wing tip equal to one-third of the distance from the fuselage to the wing tip, and in a similar location to the national insignia on the opposite wing. On the undersurface of the right wing, it is located symmetrically between the national insignia and fuselage. This marking consists of a Geneva Red Cross in glossy Insignia Red on a glossy White (17925) circle. The cross consists of five squares, arranged in the form of a symmetrical cross, centered inside the white circumscribed circle. The length of the cross arms is to be 15/19 of the diameter of the circumscribed circle. The circle is to be 2/3 of the mean chord of the vertical tail surface.

The names of the regular aircraft pilot and/or the aircraft crew chief may be applied inside the nosewheel door of camouflaged and non-camouflaged aircraft at the option of the type commander. If used, the names are to be block lettering 2 inches (5.08 cm) high in Black on a White background.

Aircraft assigned to a Naval Attaché (ALUSNA) or Naval Mission are marked in the same manner, using the appropriate title. UNITED STATES NAVY is placed in the same location as for transport aircraft. The lettering is to be the largest possible size which can be accommodated on the aircraft, selected from the following standard sizes: 12, 16,



20, 24, 30, and 36 inches (30.48, 40.64, 50.80, 60.96, 76.20, and 91.44 cm).

The ALUSNA markings may be deleted on the basis of local diplomatic or other important considerations. The ALUSNA markings on the fuselage consist of the words UNITED STATES NAVAL ATTACHÉ TO (name of country). For the benefit of foreign personnel, the same wording in the language of the country to which the attaché is accredited is to be placed approximately 2 inches (5.08 cm) below the American wording. This foreign language inscription is to be applied under the supervision of personnel who have a thorough knowledge of the foreign language involved. In the event that there is more than one form of script of the foreign language, the selection is to be determined by the foreign country. All letters are to be painted or stenciled in white on a dark background or in black on a light background. This inscription is to be forward on the aircraft approximately under the pilot's cockpit on both sides of the fuselage. For the C-1A and larger aircraft, the American inscription is to be located above the centerline of the fuselage and the foreign inscription below the centerline. For smaller aircraft, the American and foreign inscription is to be located just below the pilot's window.

On C-1A and larger aircraft, the lettering of the American and foreign inscription is to be 4 inches (10.16 cm) high. For smaller aircraft, the size of the lettering is to be reduced proportionately.

The wing marking for naval attaché aircraft consists of an American flag[2]. This flag is to be located on the underside of the left wing, approximately under the national aircraft insignia on the top surface of the left wing. The branch of service marking is not to be used on the wing for ALUSNA aircraft. The flag is to be centered and applied so that an observer on the ground, with the airplane approaching, will view the flag with the blue field forward and to his left, with the stripes extending outboard. If more positive identification is required because of local conditions or other considerations, an additional American flag may be applied to the top side of the right wing on an interim basis. This flag is to be removed when local conditions permit. The flag size is to be the same as that applied to the underside of the left wing and located approximately over the national aircraft insignia on the underside of the right wing.

2 See The Official Monogram US Navy & Marine Corps Aircraft Color Guide 1950-1959, Vol-3, Monogram 1991 by John M. Elliott.

Left: A line up of reserve squadron P-3 showing the colorful tail designs of VP-60, VP-65, VP-67, VP-69, VP-90, and VP-91. **Bottom:** A F-5E aggressor aircraft flown by Marines at the Navy Fighter Weapons School but not a Marine Corps aircraft.

The American flag is in the proportion of 1.0 in width to 1.9 in length. In all cases, the largest size flag which can be accommodated on the wing is to be used. In no case can the width exceed seventy-five percent of the distance between the leading edge of the wing and the aileron cutout at the point of application.

The Naval Attaché marking on the vertical tail surface consists of an American flag. When authorized, it is to be located on both sides of the rudder or vertical stabilizer above all other markings of significance. The flag is to be centered on the surface and placed horizontally and in such a manner that the union is uppermost on both sides of the vertical tail surfaces. For aircraft having multiple vertical tail surfaces, the flag is to appear only on the two outboard sides. The flag is always to be placed with the blue field forward and the stripes extending aft on both sides of the aircraft, so that the stripes appear to be trailing.

The following standard sizes are specified for American flag markings used on Navy aircraft:

19 x 36 inches	48.26 x 91.44 cm
21 x 40 inches	53.34 x 101.60 cm
25 x 48 inches	63.50 x 121.92 cm
31.4 x 60 inches	79.37 x 152.40 cm

Under no circumstance will the flag or national insignia/emblem of any country other than the United States of America be displayed on any Navy aircraft.

Headquarters and Maintenance Squadron 31, based at MCAS Beaufort, South Carolina, had a primary mission as an adversary squadron for the 2nd Marine Aircraft Wing and other fleet units. To provide a more realistic training environment for the fighter and attack aircrews, and to enhance squadron Esprit de Corps, the squadron on April 2, 1986, requested permission to add a 15-inch (38.10 cm) red star to the tails of the six TA-4F aircraft assigned. The star was to be placed on the upper half of the vertical tail, where it would not interfere with the currently approved squadron identification markings. Even though these aircraft were painted in the Tactical Paint Scheme, the star was to be glossy Insignia Red outlined with a 1/2-inch (1.27 cm) glossy Insignia White border. This request was approved by Chief of Naval Operations letter, to Commander, Naval Air Systems Command, 506C4/6U403132, dated May 21, 1986.

After the Chief of Naval Operations message 011809Z, dated July, 1986, approved a P-3 generic paint scheme concept, Naval Air Systems Command 252027Z of July directed the following changes be made to all US Navy P-3 aircraft.

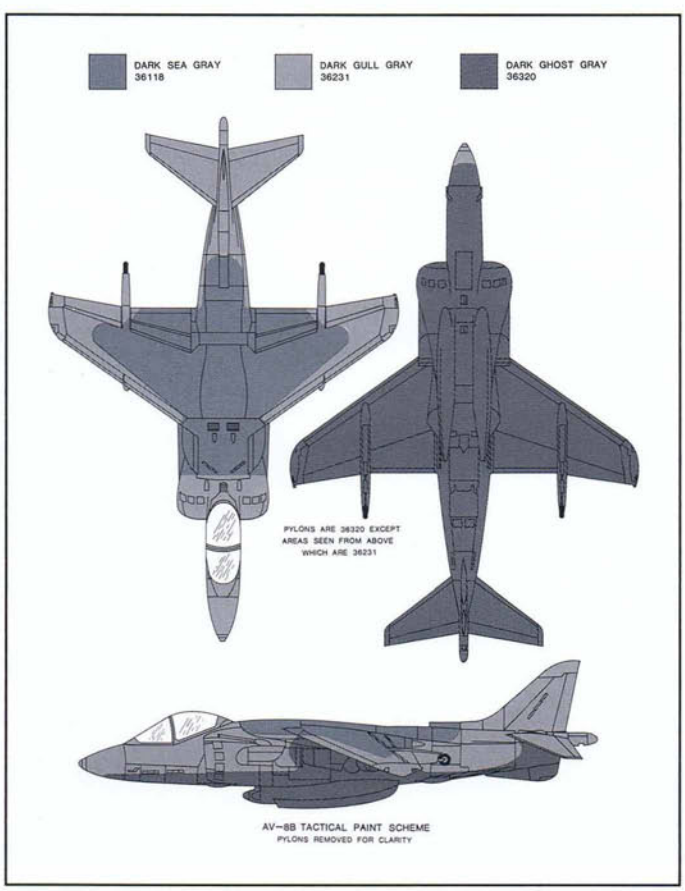
a. Eliminate all markings, i.e., tail feathers, Bureau Numbers, from the vertical stabilizer.

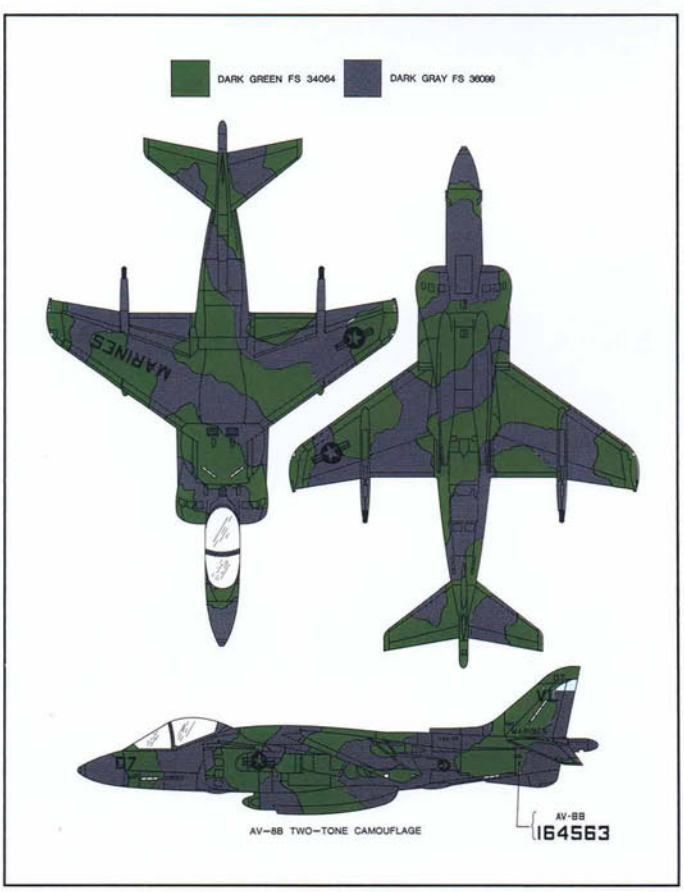
b. Eliminate unit aircraft numbers from the aircraft nose.

c. Eliminate any other squadron unique emblems/markings.

d. Add an aircraft number to the inner surface of the nose wheel door.

Above: This Cessna T-47A carries an unusual set of markings. While it has the national aircraft insignia and NAVY, it also shows a civilian number on the tail reflecting the civilian contractor who conducts this phase of the training program.





CHAPTER 8 1990-1993

As this study of US naval aircraft markings is brought to a close, the following tables provide the latest information, as of March 3, 1993, pertaining to the Visual Identification System codes and the units being identified by them.

The numerous units that were disestablished/deactivated during the 1980s and the early years of the 1990s are shown below, with the date the transaction took place.

DISESTABLISHED

CTW-3	C	August 31, 1992
CVW-6	AE	April 1, 1992
CVW-10	NM	June 1, 1988
CVW-13	AK	January 1, 1991
VAW-127	GE	September 30, 1991
VFP-63	PP	June 30, 1982
VAQ-142	GD	March 31, 1991
RVAW-110	TT	May 1, 1983
HC-9	NW	July 31, 1990
HM-16	GC	January 2, 1987
HSL-31	TD	July 31, 1992
HSL-36	HY	September 30, 1992
VR-53	RT	September 30, 1982
VR-54	JS	February 28, 1981
VC-1	UA	September 30, 1992
VC-2	JE	September 30, 1980
VC-3	UF	September 30, 1980
VC-5	UE	August 31, 1992
VC-7	UH	September 30, 1980
VP-19	PE	August 31, 1991
VP-44	LM	May 31, 1991
VP-48	SF	August 31, 1991
VP-50	SG	June 30, 1992
VP-56	LQ	June 30, 1991
VP-MAU(Brunswick)	LB	June 30, 1991
VP-MAU(Moffett)	PS	August 17, 1991
VT-9	A	November 1, 1987
VT-24	C	September 18, 1992
VT-25	C	September 18, 1992
VT-26	C	May 22, 1992
MAG-29	FK	June 5, 1986
HMM-770	MN	1980/1981
VMA-133	ME	September 30, 1992

Right: The second of two All Weather Hornet squadrons in the Marine Corps, VMFA (AW)-242 utilized both the inner and outer tail surfaces of their F/A-18D to display their unit markings.

Left: The red tail tip and aircraft number do not go together on this F-14A of the "Sun Downer" squadron. Is there an airplane that hasn't had eyes and a mouth applied?

Left: A North American T-39N used to train radar operators, but operated by a civilian contractor as shown by the aircraft registration number. **Bottom:** A F-16N in one of the numerous paint schemes used at Top Gun. While it carries MARINES on the fuselage, it in reality is not a Marine Corps aircraft.

VMA-322	QR	June 30, 1992
VMA-331	VL	September 30, 1992
VMAQ-4	RM	September 30, 1992
VMFA-333	DN	March 31, 1992
VMFA-531	EC	March 31, 1992
VMFAT-102	SC	October 1, 1987
VMAT(AW)-202	KC	September 30, 1986
VMFP-3	RF	October 1, 1990

The most recent issue available of OPNAV NOTICE 5400 *Naval Aeronautical Organization*, dated October 1, 1990, and known published unit changes since that date, have been used to develop the following table of active Navy and Marine Corps units.

CARRIER AIR WINGS AND SQUADRONS

CARRIER AIR WINGS

CVW-1	AB	
CVW-2	NE	
CVW-3	AC	
CVW-5	NF	
CVW-7	AG	
CVW-8	AJ	
CVW-9	NG	
CVW-10	NM	November 7, 1986
CVW-11	NH	
CVW-13	AK	March 1, 1984
CVW-14	NK	
CVW-15	NL	
CVW-17	AA	
CVWR-20	AF	
CVWR-30	ND	

ANTISUBMARINE HELICOPTER WING, RESERVE

HELWINGRES	NW	
HCS-4(HAL-4)		October 1, 1989
HCS-5		
HM-18		October 1, 1986
HM-19		January 9, 1989
HS-75		
HS-85		
HSL-74(HS-74)		January 1, 1985
HSL-84(HS-84)		March 1, 1984
HSL-94		

CARRIER AIRBORNE EARLY WARNING WING

CAEWW-12	GE	
VAW-120		
VAW-121		
VAW-122		
VAW-123		
VAW-124		

Right: This F/A-18A of VMFA-531 is carrying live missiles over the Sea of Japan in 1990 for a live intercept. Note the color scheme used on live missiles rather than the training weapons normally seen. **Bottom:** When reestablished in 1991, VMFA (AW)-225 requested their old tail code letters and squadron insignia. This adds to the difficulty for the unwary to pick up on a break in their lineage.

VAW-125		
VAW-126		
VRC-40	JK	

FLEET ELECTRONIC WARFARE SUPPORT GROUP

COMFEWSG	GD	
VAQ-24		
VAQ-33		
VAQ-34		
VAQ-35		June 1, 1991
VAQ-141		
VAQ-142		June 1, 1988

HELICOPTER COMBAT SUPPORT

HC-1	UP	
HC-2		April 1, 1987
HC-3	SA	
HC-4	HC	May 6, 1983
HC-5	RB	February 3, 1984
HC-6	HW	
HC-8	BR	December 3, 1984
HC-11	VR	
HC-16	BF	

HELICOPTER MINE COUNTER-MEASURE SQUADRONS

HM-12	DH	
HM-14	BJ	
HM-15	TB	January 2, 1987

HELICOPTER ANTISUBMARINE LIGHT

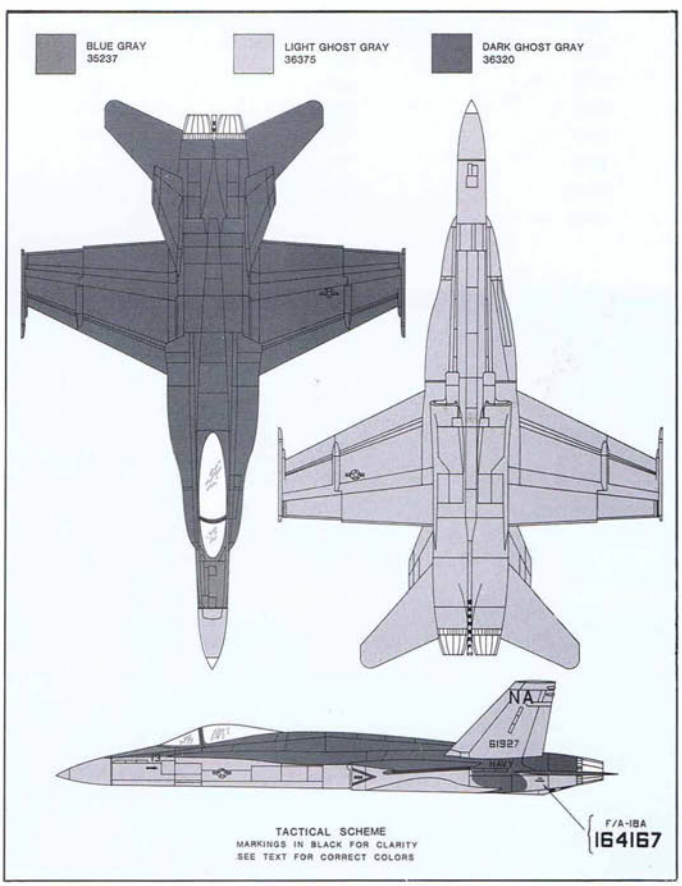
HSL-30	HT	
HSL-32	HV	
HSL-33	TF	
HSL-34	HX	
HSL-37	TH	
HSL-40	HK	October 4, 1985
HSL-41	TS	January 21, 1983
HSL-42	HN	October 5, 1984
HSL-43	TT	October 12, 1984
HSL-44	HP	August 21, 1986
HSL-45	TZ	October 3, 1986
HSL-46	HQ	April 7, 1988
HSL-47		September 25, 1987
HSL-48	HR	September 7, 1989
HSL-49	TS	March 23, 1990

PATROL

VP-1	YB
VP-4	YD
VP-5	LA
VP-6	PC
VP-8	LC
VP-9	PD
VP-10	LD
VP-11	LE

Left: The tail markings on this VMFA-312 F/A-18A carry on the long "Checkerboard" tradition that began at the end of WW II.

VP-16	LF	
VP-17	ZE	
VP-22	QA	
VP-23	LJ	
VP-24	LR	
VP-26	LK	
VP-30	LL	
VP-31	RP	
VP-40	QE	
VP-45	LN	
VP-46	RC	
VP-47	RD	
VP-49	LP	
VPU-2	SP	July 1, 1982



PATROL, RESERVE

VP-60	LS	
VP-62	LT	
VP-64	LU	
VP-65	PG	
VP-66	LV	
VP-67	PL	
VP-68	LW	
VP-69	PJ	
VP-90	LX	
VP-91	PM	
VP-92	LY	
VP-93	LH	
VP-94	LZ	

FLEET LOGISTIC SUPPORT

VR-22	JL	October 15, 1984
VR-24	JM	
VRC-30	RW	
VRC-50	RG	

FLEET LOGISTIC SUPPORT, RESERVE

VR-46	JS	March 1, 1981
VR-48	JR	October 1, 1980
VR-51	RV	
VR-52	JT	
VR-54		June 1, 1991
VR-55	RU	
VR-56	JU	
VR-57	RX	
VR-58	JV	
VR-59	RY	October 1, 1982
VR-60	RT	October 3, 1983
VR-61	RS	October 1, 1982
VR-62	JW	July 1, 1985

FLEET AIR RECONNAISSANCE

VQ-1	PR	
VQ-2	JQ	
VQ-3	TC	
VQ-4	HL	
VQ-5	SS	April 15, 1991
VQ-6	ET	August 8, 1991

FLEET COMPOSITE

VC-6	JG	
VC-8	GF	
VC-10	JH	

Right: While the national aircraft insignia is low visibility, the squadron designation, name, aircraft number, modex and scorpion design all are highly visible so there will be no mistaking this VFA-113 aircraft.

FIGHTER COMPOSITE

VFC-12(VC-12)	JY(JY)	April 22, 1988
VCF-13(VC-13)	UX(UX)	April 22, 1988

AIR TEST AND EVALUATION

VX-1	JA
VX-4	XF
VX-5	XE

ANTARCTIC DEVELOPMENT

VXE-6	XD

OCEANOGRAPHIC DEVELOPMENT

VXN-8	JB

NAVAIRSYCOM

TEST PILOT SCHOOL	TPS

FLEET MARINE FORCE AND SUPPORT UNITS HEADQUARTERS

MWHS-1	SZ
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-16	WW
H&MS-24	EW
H&MS-26	EL
H&GMS-27	CZ
H&MS-31	EX
H&MS-32	DA
H&MS-36	WX
H&GMS-37	QF

FIGHTER ATTACK

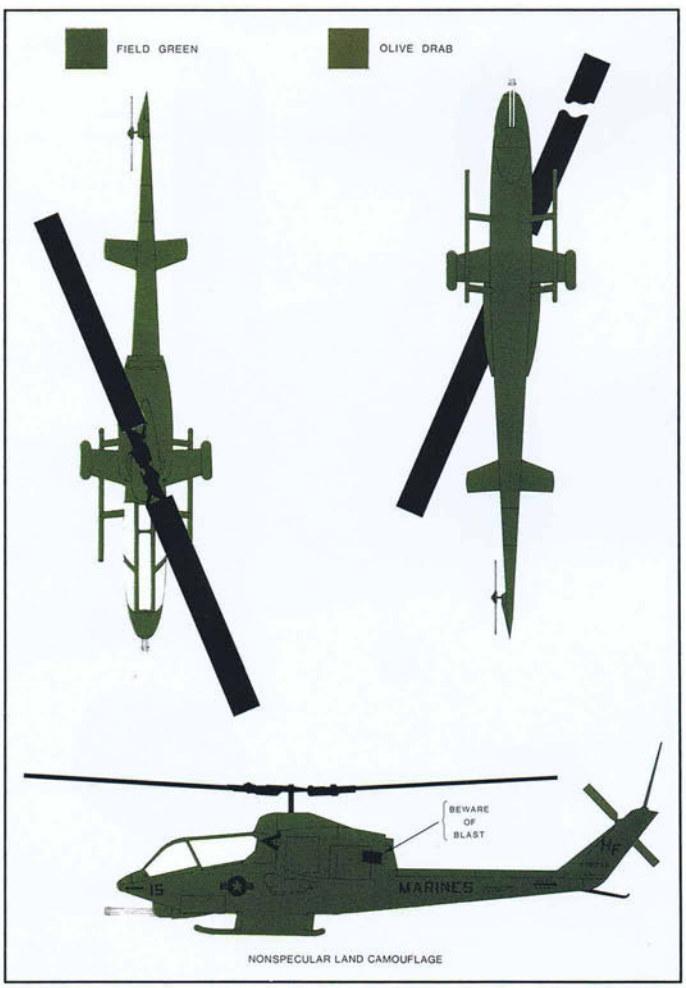
VMFA-115	VE	
VMFA(AW)-121(VMA(AW)-121)	VK(VK)	December 8, 1989
VMFA-122	DC	
VMFA-212	WD	
VMFA-225	CE	July 1, 1991
VMFA-232	WT	
VMFA-235	DB	
VMFA(AW)-242(VMA(AW)-242)	DT(DT)	December 14, 1990
VMFA-251	DW	
VMFA-312	DR	
VMFA-314	VW	
VMFA-323	WS	
VMFA-451	VM	
VMFA-533(VMA(AW)-533)	ED(ED)	October 1, 1992

ATTACK

VMA-211	CF
VMA-214	WE
VMA-223	WP
VMA-231	CG
VMA-311	WL
VMA-513	WF
VMA-542	CR

ALL-WEATHER ATTACK

VMA(AW)-224	WK
VMA(AW)-242	DT
VMA(AW)-332	EA



NONSPECULAR LAND CAMOUFLAGE

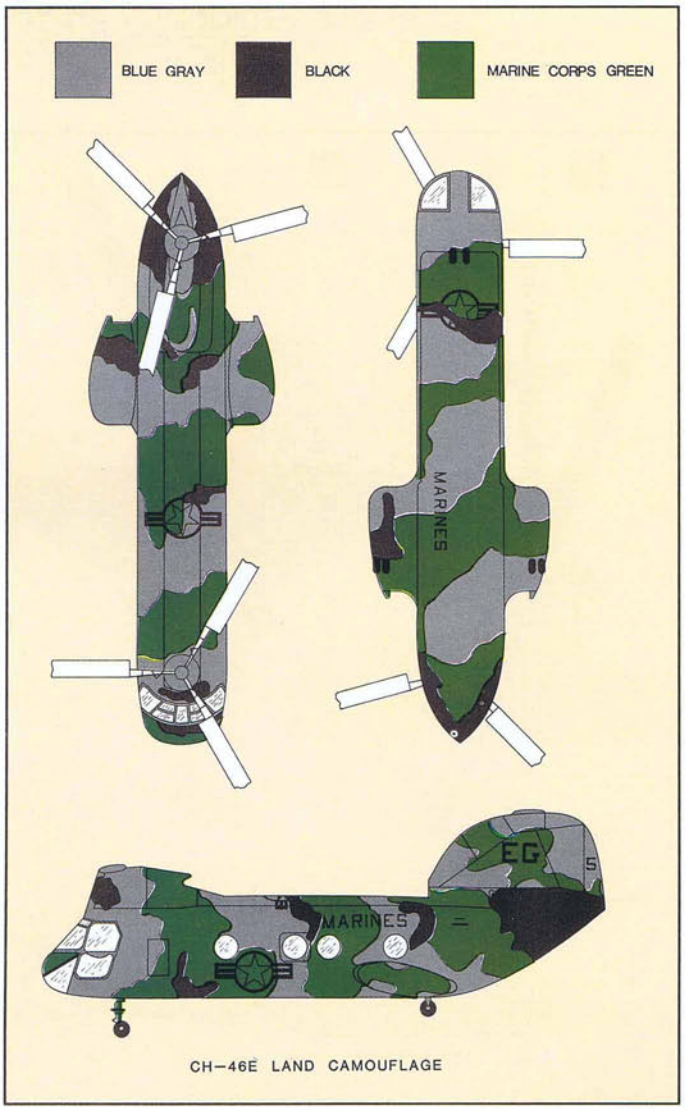
Left: While nonregulation, the squadron markings applied by VMFA-333 to their F/A-18As added a little color to the drab tactical paint scheme and carried on a long tradition of Shamrocks on the Tripple Trey aircraft.

OBSERVATION

VMO-1	ER	
VMO-2	UU	

TACTICAL ELECTRONIC WARFARE

VMAQ-1	CB	July 1, 1992
VMAQ-2	CY	



CH–46E LAND CAMOUFLAGE

VMAQ-3	MD	July 1, 1992
VMAQ-4	RM	October 1, 1992

AERIAL REFUELER/TRANSPORT

VMGR-152	QD	
VMGR-252	BH	
VMGR-352	QB	

HELICOPTER LIGHT ATTACK

HML/A-167(HML-167)	TV	1983
HML/A-169(HMA-169)	SN	1983
HML/A-267(HML-267)	UV	1983
HML/A-269(HMA-269)	HF	1983
HML/A-367(HML-367)	VT	1983
HML/A-369(HMA-369)	SM	1983

HELICOPTER MEDIUM

HMM-161	YR	
HMM-162	YS	
HMM-163	YP	
HMM-164	YT	
HMM-165	YW	
HMM-166	YX	September 13, 1985
HMM-261	EM	
HMM-262	ET	
HMM-263	EG	
HMM-264	EH	
HMM-265	EP	
HMM-266	ES	April 26, 1983
HMM-268	YQ	
HMM-364	PF	
HMM-365	YM	

HELICOPTER HEAVY

HMH-361	YN	
HMH-362	YL	
HMH-363	YZ	
HMH-461	CJ	
HMH-462	YF	
HMH-463	YH	
HMH-464	EN	April 1981
HMH-465	YJ	December 1, 1981
HMH-466	YK	November 30, 1984

HELICOPTER DEVELOPMENT

HMX-1	MX	

MARINE CORPS TRAINING

HMT-204	GX	
HMT-301	SU	
HMT-303	QT	April 30, 1982
HMT-302	UT	November 20, 1987

Right: The aircraft number, squadron designation and nickname of VFA-15 are highly visible while the Visual Identification letters and Griffin design are not, illustrating the common practice of deviating from the prescribed paint scheme.

VMAT-203	KD	
VMATAW-202	KC	
VMFAT-101	SH	
VMFAT-102	SC	
VMFT-401	WB	August 13, 1987
VMGRT-253	GR	October 1986

FOURTH MARINE AIRCRAFT WING

HQ 4TH MAW	EZ	
H&MS-41	MY	
H&MS-42	MW	
H&MS-46	QY	
H&MS-49	QZ	
HMA-773	MP	
HMA-775	WR	
HMH-769	MS	
HMH-772	MT	
HML-771	QK	
HML-767	MM	
HML-776	QL	
HMM-764	ML	
HMM-774	MQ	
VMA-124	QP	
VMA-131	QG	
VMFA-112(VMF(AW)-112)	MA(MA)	1983
VMFA-134(VMA-134)	MF(MF)	
VMFA-142(VMA-142)	MB(MB)	December 21, 1990
VMFA-321(VMF-321)	MG(MG)	1983
VMGR-234	QH	
VMGR-452	NY	September 9, 1988
VMO-4	MU	

NAVAL AIR TRAINING COMMAND
TRAINING WING ONE

NAS Meridian	A	
	VT-7	A
	VT-19	A

This CH-46E of HMM-364 illustrated the lack of contrast in the land camouflage scheme between the various markings and the Field Green aircraft.

Left: Even with the tactical paint scheme, VMFA-323 in 1989, continued to use high visibility markings including their colorful tail design.

TRAINING WING TWO

NAS Kingsville	B	
	VT-21	B
	VT-22	B
	VT-23	B
	JTTU	B

TRAINING WING FOUR

NAS Corpus Christi	D	
	VT-27	D
	VT-28	D
	VT-31	D

TRAINING WING FIVE

NAS Whiting Field	E	
	VT-2	E
	VT-3	E
	VT-6	E
	HT-8	E
	HT-18	E

TRAINING WING SIX

NAS Pensacola	F	
	VT-4	F
	VT-10	F
	VT-86	F

NAVAL AIR TECHNICAL TRAINING

NATTC LAKEHURST	4L
NAS MEMPHIS	4M

NAVAL AIR RESERVE TRAINING COMMAND

Atlanta	7B
Dallas	7D
Detroit	7Y
Glenview	7V
New Orleans	7X
South Weymouth	7Z
Washington, DC	7N
Willow Grove	7W

NAVAL AIR RESERVE

Jacksonville	6F
Alameda	6G
Memphis	6M
Norfolk	6S

MARTD'S/MARINE SUPPORT

HQMC	5A
MCAS Beaufort	5B
MCAS Cherry Point	5C
MCAS El Toro	5T
MCAS Futenma	5F
MCAS Iwakuni	5G
MCAS New River	5D
MCAS Yuma	5Y

NAVAL AIR STATIONS

Alameda	7J
Brunswick	7F
Cecil Field	7U
Fallon	7H
Jacksonville	7E
Key West	7Q
Lemoore	7S
Memphis	7K
Moffett Field	7T
Norfolk	7C
North Island	7M
Oceana	7R
Patuxent River	7A
Point Mugu	7L
Whidbey Island	7G

NAVWPNCEN

China Lake	7P

NAVAIRTESTCEN

Patuxent River	SD

NAVY SUPPORT

NAS Cubi Point	8B
NAS El Centro	8N
NAS Guantanamo	8F
NAF Atsugi	8A
NAF Mayport	8U
NAF Mildenhall	8G
NAF Misawa	8M
NAF Sigonella	8C
NAVSTA Guam	8J
NAVSTA Roosevelt Roads	8E
NAVSTA Rota	8D
COMFLTACT Okinawa	8H
HQ CMEF (Bahrain)	8K

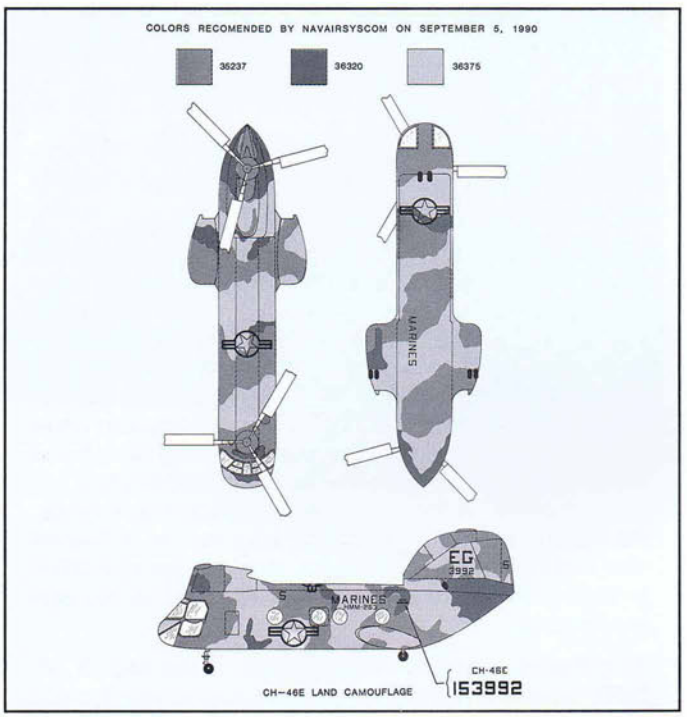
Right: All markings except the aircraft number and tail code are low visibility on this F/A-18A of VMFA-314 equipped with training AIM-9 Sidwinder missiles. **Bottom:** A F-4S of VF-302 with a modified Ferris-Heatley scheme that was evaluated in 1983/84 period.

A bit of color returned to the patrol aircraft in the Atlantic Fleet with the issue of Commander Patrol Wings Atlantic message 251321Z on September 25, 1990. This message authorized the painting of squadron Visual Identification System letters, squadron insignia, and aircraft side numbers on aircraft painted with a tactical paint scheme.

On the vertical tail surface, the squadron Visual Identification System letters are to be 30-inch (76.20 cm) high block letters. A squadron insignia may be applied to both sides of the vertical tail surface, but, if used, is not to exceed 1,000 sq. in. (6451.60 cm^2). When used alone, the identification letters or squadron insignia are to be centered on the vertical tail surface. If used together, the unit identification is to be above the squadron insignia and the combination is to be centered on the vertical tail surface. If necessary, the block letters can be reduced in width as required.

Aircraft side numbers are authorized on both sides of the fuselage below the pilot and copilot side windshields. These numbers are to be 20-inch (50.80 cm) block numbers centered laterally on a vertical line centered on the side windshields. Vertically the numbers are to be centered on a horizontal line 20 inches (50.80 cm) below the side windshields.

All of these newly authorized markings are to be applied in Blue Gray (35237).



SECTION 4

MAINTENANCE AND SAFETY MARKINGS

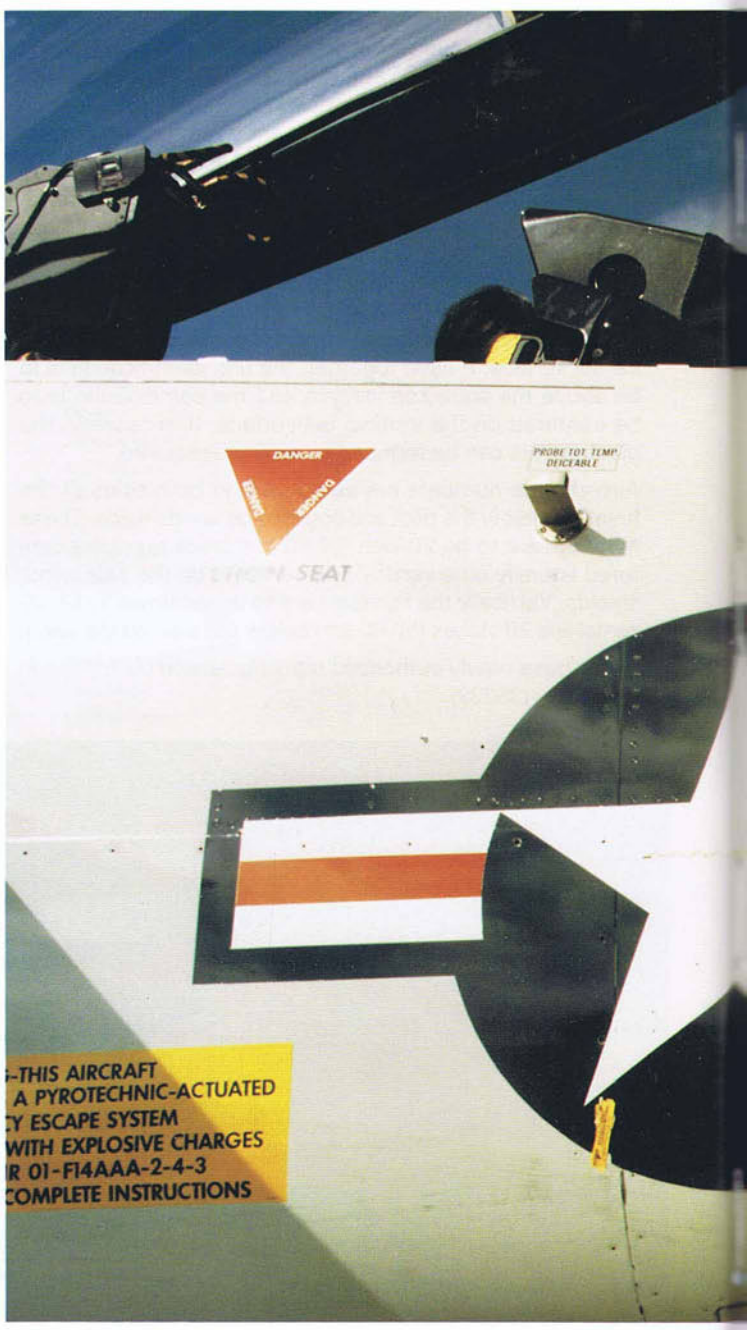
CHAPTER 9 1960-1969

When MIL-I-18464C(Wep) was issued on April 11, 1960, the title was changed to *Military Specification for Insignia and Markings for Naval Weapons Systems.*

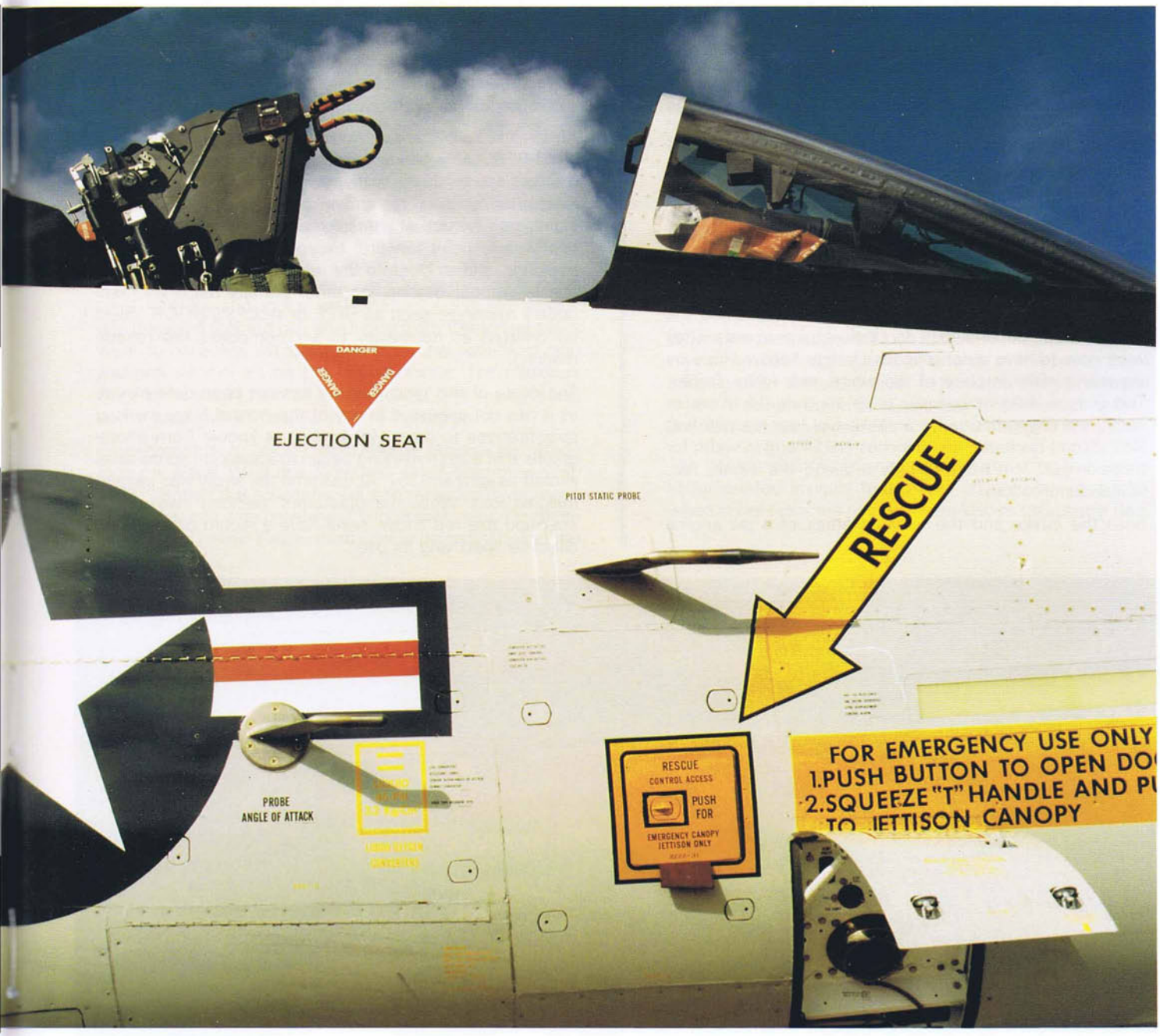
The normal procedure for markings on aircraft was for glossy markings on noncamouflaged aircraft and nonspecular markings to be applied to aircraft painted in nonspecular color schemes. However, the application of the small maintenance markings could be either glossy or nonspecular. Orange Yellow was to be used in lieu of Black for small maintenance markings on aircraft finished in white on the underside, in accordance with the carrier aircraft and special patrol plane color scheme. MIL-I-18464C(Wep) further authorized, at the discretion of cognizant commands, the warning and danger markings to be applied in fluorescent Red Orange removable paint, provided the application of such markings did not interfere with the camouflage requirements.

Amendment 1, to MIL-I-18464C(Wep), dated August 16, 1960, required a warning sign to be located adjacent to any actuating mechanism which could cause damage to the weapons system from improper or out-of-sequence operation.

MIL-C-18264C(Wep), *Military Specification for Colors, Exterior, Naval Aircraft, Requirements for,* dated December 27, 1961, brought back the colorful propeller tip markings. Propellers on multi-engine aircraft were to be painted on both sides from the tip to 3 inches (7.62 cm) from the tip with glossy Insignia White, followed by a 6-inch (15.24 cm) strip of glossy Insignia Red, followed by another 3-inch (7.62 cm) strip of Insignia White. The remainder of the blade was to be Black, except where both of the following conditions could be met:



Right: This F-14 tomcat is a good example of the red hazard warning and yellow safety markings to be found on U S naval aircraft prior to the introduction of Tactical Paint Schemes.


DANGER
DANGER
DANGER
EJECTION SEAT
PITOT STATIC PROBE
RESCUE
PROBE
ANGLE OF ATTACK
RESCUE
CONTROL ACCESS
PUSH
FOR
EMERGENCY CANOPY
JETTISON ONLY
FOR EMERGENCY USE ONLY
1.PUSH BUTTON TO OPEN DO
2.SQUEEZE "T" HANDLE AND PU
TO JETTISON CANOPY

Left: The manufactures block designator has reached the end of the alphabet on this A4D-2N. Markings indicating the stabilizer position, which usually are not visible, clearly show as do the alternating black and white stripes on the tail hook. **Bottom:** Not all aircraft had as many visible maintenance markings as this F-4B which illustrates the volume of markings that could be found on an aircraft.

(a) Corrosion protection was not required.

(b) The blades were so situated as to produce no glare or excessive brightness in the pilot's eyes.

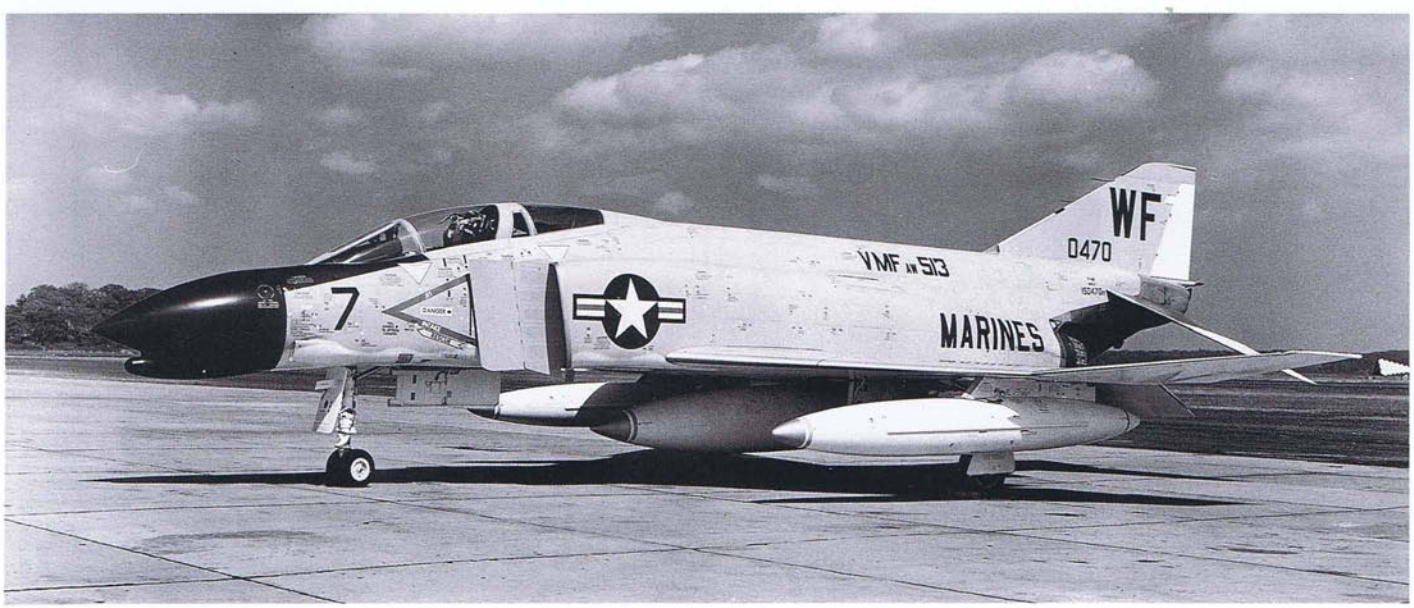
In the event the second requirement could not be met, the Insignia Red and Insignia White were to be replaced with nonspecular Bright Red and nonspecular White on the rear face of the blades only. Propeller blades on single-engine aircraft were to be painted on the front side in the same manner as for multi-engine aircraft. The rear face, however, was to be nonspecular Black. Spinners, hubs and domes, except on aircraft finished in the land camouflage, were to be nonspecular Black.

Amendment 1, dated September 20, 1962, modified the painting of propeller blades on single-engine aircraft. They were now to have a nonspecular Orange Yellow stripe on the rear surface in place of the white, red, white stripes. This Orange Yellow stripe was to be 4 inches (10.16 cm) in width, starting at the tip for propellers of less than 15 feet (457.20 cm) diameter, and 6 inches (15.24 cm) in width for those larger. The front surface retained the white, red, white identification.

Both the intake and the exhaust areas of a jet engine present a danger area when the engine is operating. MIL-I-18464D(Wep), dated October 26, 1962, specified that the areas of the fuselage, nacelle or pod, or combinations thereof, adjacent to the sides of the jet engine exhaust, be marked with the words BEWARE OF BLAST.

An Orange Yellow arrow, outlined in Black, with the black word RESCUE superimposed on it, was to be applied on the fuselage to clearly mark each external exit emergency release or handle. This arrow could be applied either by painting or the use of a decalcomania. The head of the arrow was to point forward, except in the case of vertical markings, and as close to the release mechanism as practicable without overlapping other primary markings. Secondary markings, such as STEP or ACCESS DOOR, could be omitted as necessary to accommodate the rescue marking.

The origin of this rescue arrow has not been determined, as it has not appeared in any of the normal Navy marking specifications to date. However, it is known from photographs that such a marking began to appear on some naval aircraft as early as 1957. At that time the arrow was painted Insignia Red. While manufacturers' painting instructions specified this red arrow, none have a record of any Navy directive specifying its use.



Right: A space has been left clear in the high visibility painted area of the rudder for the identification of paint and dopes used in finishing this UC-45J. **Bottom:** The jet intake warning is applied to both the fuselage and wing leading edge of this F9F-8T. The vertical lines are to guide the pilot's feet as he climbs out.

The size of letters applied to external surfaces was modified. If space requirements prohibited the use of 1-inch (2.54 cm) high letters and numerals, they could be reduced to 1/2-inch (1.27 cm), with their width and the width of the individual strokes forming them being reduced proportionally.

On aircraft having wing access panel latches and safety straps, the inside of the lever and wing area under the latch safety strap was to be painted a glossy Insignia Red. No red color was to be visible when the latches and straps are properly secured.

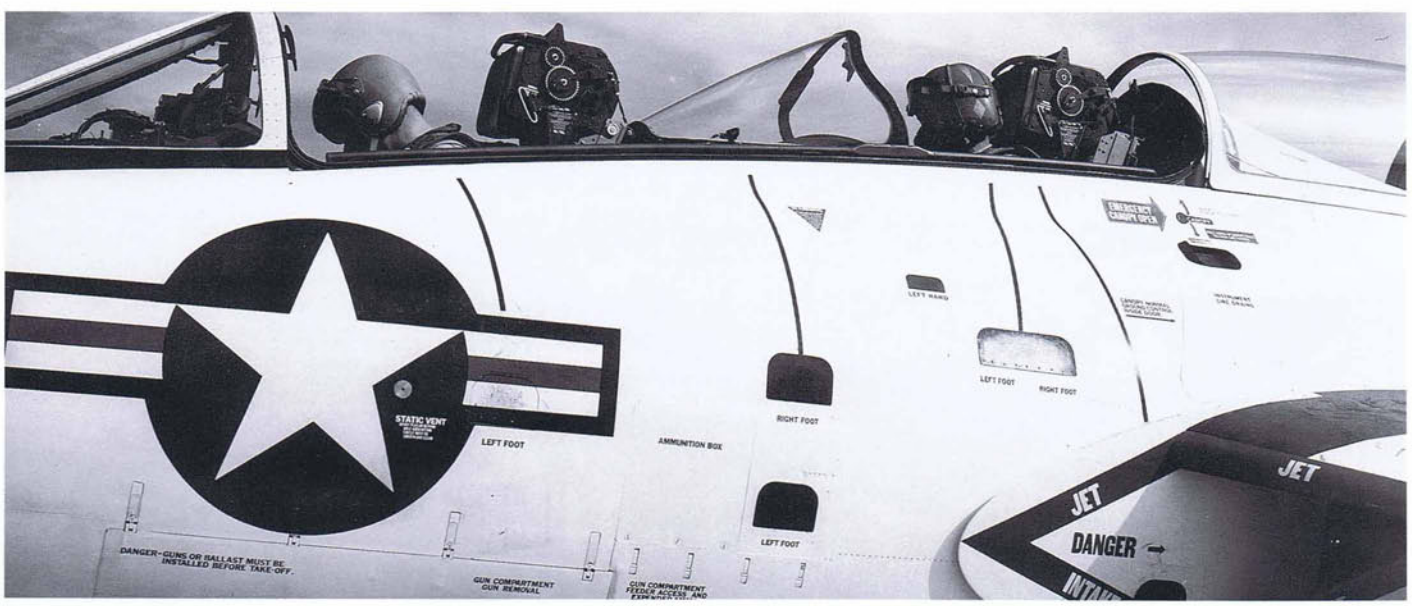
All externally carried fuel tanks were to be marked in Black paint, with the station numeral/letter symbol in two places, one outboard forward and one inboard aft. Centerline tanks were to have one symbol forward on the right-hand side and one symbol aft on the left-hand side. The markings were to be a minimum of 3 inches (7.62 cm) in length and not to exceed 4 inches (10.16 cm) in height.

Amendment 3, to MIL-I-18464D(Wep), *Insignia and Markings for Naval Weapons Systems*, dated September 30, 1963, clarified the helicopter tail boom markings on those aircraft painted with permanent fluorescent paint. On these aircraft the Orange Yellow band was to be omitted, and the warning arrow and legend were to be painted in Black on the fluorescent paint. In the event temporary fluorescent paint was used, it was to be applied over the Orange Yellow band, but the red warning arrow and legend were to remain visible in a rectangle of appropriate size.

Safety and servicing markings were consolidated into MIL-M-25047B(ASG), *Military Specification; Marking for Airplanes, Airplane Parts, And Missiles (Ballistic Missiles Excluded)*, dated September 28, 1964. This directive was not used by Naval aviation prior to this issue. Under this directive the propeller warning sign inside the fuselage was changed to read DANGER PROPELLER in place of the previous BEWARE PROPELLER.

Whenever practicable, a 2-inch (5.08 cm) Insignia Red stripe was to be painted around the outside of the power plant housing of jet aircraft, in order to mark the plane of rotation of the turbine wheel, as a warning to personnel against possible turbine wheel failure when the engine is running.

The interior surfaces of speed brakes and wing flaps were to be painted Insignia Red. Areas covered by wing flaps when in the retracted position were also to be Insignia Red.



Left: The manufacturer's block designator have used all the letters of the alphabet and started over with a second letter. Should all letters be used in this series, the sequence would start over with BA. Note the warning STAY CLEAR OF AREA BENEATH ARRESTING HOOK. **Bottom:** An A-4M of VMA-331 with their "Doodle Bug" insignia on the fuselage. Note the red inner surface of the flaps and leading edge slots.

In cases where walkways do not contrast in color with adjacent areas, the walkway was to be bounded by a nonspecular Black line for a light background and a nonspecular White line for a dark background. This line was to be 1/2-inch (1.27 cm) wide and marked with the word WALKWAY at sufficiently frequent intervals to indicate the walkway area. Steps were to be suitably indicated at all points on the aircraft.

To assist rescue operations, the word BATTERY was to be painted in red letters 1-inch (2.54 cm) high on battery access doors. The notation BATTERY LOCATION _____ (with the exact location) was to be placed on the left side of the fuselage. The fore and aft location of the marking was to be approximately in line with the trailing edge of the wing. The vertical location of the marking was to be at a point 2 to 3 feet (60.96 to 91.44 cm) off the ground with the airplane in the wheels-up position and resting on the ground, or in the case of airplanes with fixed landing gear, with the landing gear washed out. In the event that windows, enclosures, etc., interfered, the marking was to be placed as near to this location as practicable.

Honeycomb panels (thin skin) for wing upper surfaces were to be distinctly marked by a 11/2-inch (3.81 cm) wide stripe of hash marks; each hash mark was to be 2 inches (5.08 cm) long, measured along the stripe, with 2 inches (5.08 cm) between marks. The individual stripes were to be at forty-five degrees and painted Yellow.

On aircraft having engines staggered in the wing, a propeller warning marking similar to that painted on the fuselage was also to be placed on the cowling of the next inboard engine in order to mark the propeller plane of rotation.

MIL-A-25165B(ASG), dated October 5, 1964, superseded MIL-I-6142. The new title was *Military Specification, Aircraft Emergency Escape System, Identification of.* This directive specified that aircraft equipped with cartridge-actuated ejection seats, canopy, hatch, etc., be marked with reflective red triangles. The words EJECTION SEAT, or ESCAPE CAPSULE, were to be placed under the triangles in letters 1-inch (2.54 cm) high. The triangles were to be located on each side of the fuselage at approximately the midpoint of the canopy for fighter and similar type aircraft, and be conspicuously located at each crew station. The following information was to be applied, either by painting or with a decal, in Black letters 3/4-inch (1.90 cm) in height beneath the triangles on an Orange Yellow background: WARNING — THIS AIRCRAFT CONTAINS A CARTRIDGE-ACTUATED EMERGENCY ESCAPE SYSTEM EQUIPPED

Right: An ejection seat warning triangle and rescue arrow are prominently displayed on this A-4L.**Bottom:** In an effort to keep the white surface clean, this SH-3A has had the area impinged upon by the jet exhaust painted Black. Note the numerous rescue arrows.

WITH EXPLOSIVE CHARGES. See (applicable aircraft) -2 AIRPLANE T.O. _____ OR NAVAER _____ FOR COMPLETE INSTRUCTIONS.

In the event a multiplace aircraft was equipped with ejection seats for certain crew stations, and with cartridge-actuated escape provisions other than ejection seats at other crew stations, the markings specified in the above paragraph were to be conspicuously located on the exterior of the aircraft at each crew entrance to the ejection seat equipped crew station. The crew stations not equipped with ejection seats were to have the same data applied at the entrance to a crew station, except that the words CARTRIDGE-ACTIVATED DEVICES in lieu of the words EJECTION SEAT or ESCAPE CAPSULE were to be applied under the triangles.

Exits suitable for air, ground, and ditching escape were to have the words EMERGENCY EXIT centered in the most visible location on the exit. Exits that were not suitable for all three types of escape were to be marked EMERGENCY EXIT, followed by the words AIR USE ONLY, GROUND USE ONLY, or DITCHING USE ONLY, as applicable.

Small handles or levers used to actuate doors or hatches were to be identified by alternate Orange Yellow and Black stripes, 1/8-inch (.317 cm) in width, painted on the background of the panel. Large levers or exit controls were to be painted with alternate stripes of Orange Yellow and Black 1/8-inch (.317 cm) to 1/4-inch (.635 cm) in width. Background striping was applied at a forty-five degree angle from the vertical, slanted from upper right to lower left.

Operating handles and levers for dinghy (raft) release and flotation controls were striped with alternating Orange Yellow and Black lines. The title and operating instructions were also in Orange Yellow. The letters used for the title had to be at least 1-inch (2.54 cm) high, while those used in the operating instructions could not be less than 1/2-inch (1.27 cm) high. If the control was in the form of a switch, then the size of the letters could be reduced to a size appropriate to the location.

All normal, external canopy release accesses on jet aircraft were to be painted Orange Yellow. The external canopy release locations were to be identified by an Orange Yellow reflective arrow, and appropriate instructions for releasing the canopy from the outside were to be painted or placarded.

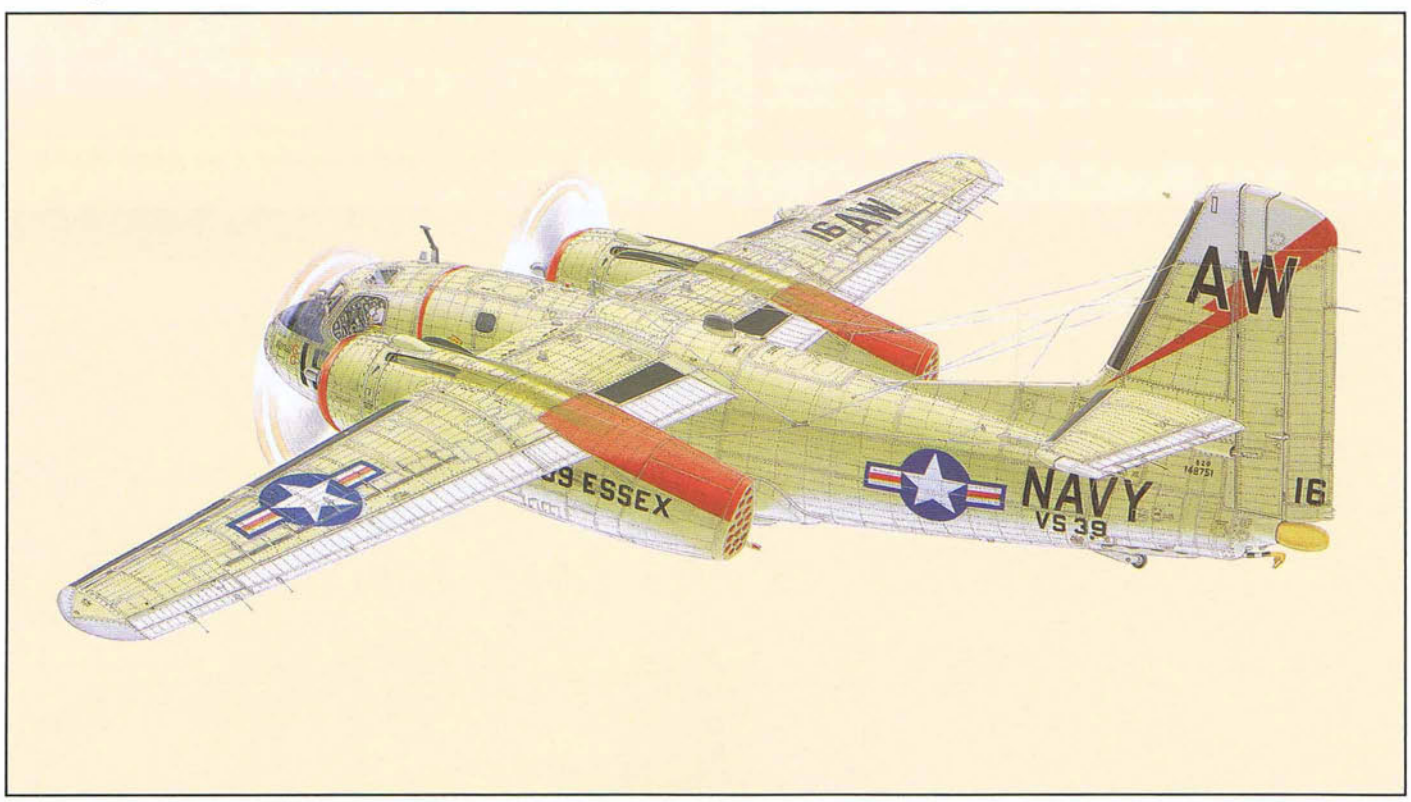
Left: Numerous servicing markings can be seen on this F-4. The placard of weights is for the catapult crew to know how much power will be needed to safely launch the aircraft. The legend on the radome is STATIC VENT DO NOT PLUG OR DEFORM HOLE – AREA WITHIN CIRCLE MUST BE SMOOTH AND CLEAN. **Bottom:** Notice the large area on top of each engine nacelle which have been painted Black due to the engine exhaust problem.

On the side of the fuselage, opposite the canopy release device and located in approximately the same position, appeared the instruction **RESCUE**—EMERGENCY ENTRANCE CONTROL ON OTHER SIDE. These instructions were applied on an Orange Yellow background with Black lettering of sufficient size to be easily read.

Amendment 2, to MIL-M-25047B(ASG), dated May 23, 1966, required aircraft equipped with arresting hooks to have a warning sign painted on both sides of the fuselage. This sign was to be located in the proximity of the hook point when in the retracted position, and be clearly visible to maintenance personnel approaching from either side of the aircraft or when working under the aircraft. The letters and arrows were to be nonspecular Bright Red superimposed on a stripe of nonspecular Insignia White. The letter height and the arrow width was to be 2 inches (5.08 cm), and the arrow was to be approximately 4 inches (10.16 cm) in length.

Amendment 1, to MIL-M-25047C(ASG), dated November 12, 1968, now required walkways that did not contrast in color with adjacent areas to be bounded by a 2-inch (5.08 cm) line: nonspecular Black for a light background and nonspecular White lines on a dark background.

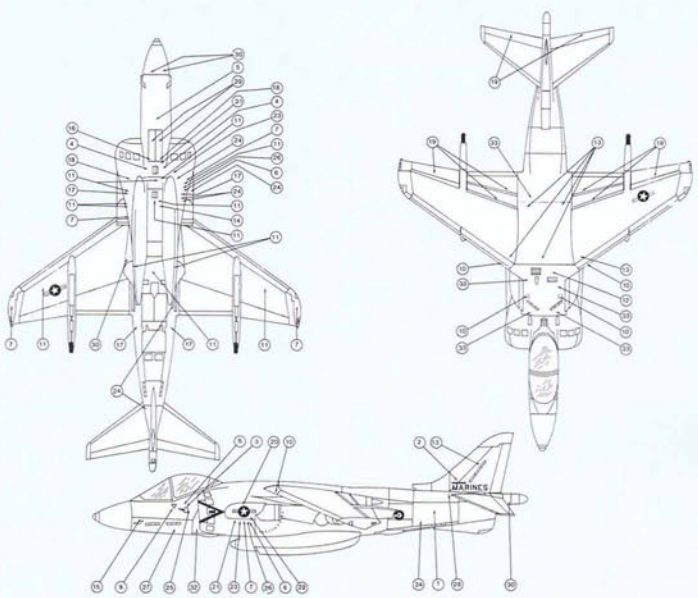
Amendment 1, to MIL-A-25165B(ASG), *Aircraft Emergency Escape System, Identification of*, dated May 29, 1969, changed the dimensions for the Orange Yellow and Black striping on emergency release handles. The width of the stripes was now to be a ratio of three to one, Orange Yellow to Black. The Orange Yellow stripes were to be 3/16-inch (.476 cm), 3/8-inch (.952 cm), or 3/4-inch (1.90 cm) wide, with the Black stripes 1/16 inch (.158 cm), 1/8-inch (.317 cm), or 1/4-inch (.635 cm) wide.



Right: Some of the small lettering applied to the camouflage scheme on the TAV-8A is difficult to read at a distance from the aircraft.

Decal and stencil data
Harrier AV-8B

1 Ale 39 safety
2 Bureau number
3 Canopy handle instructions
4 Caution hydraulic actuated assembly
5 Caution
Do not push drains with pitot static pressure aplied
6 Defuel key
7 Earth symbol & ground (earth) here
8 Warning
This aircraft contains a cartirdge-actuated emergency escape system equipped with explosive charges.
See applicable maintenance manual for complete instructions
9 Explosive seat warning triangle
10 Fire
Access
11 Fuel symbol
12 GTS/APU exhaust
13 Hoist symbol
14 Hose failure indicator
15 Warning
Hot pitot-static probe
16 Identification plate

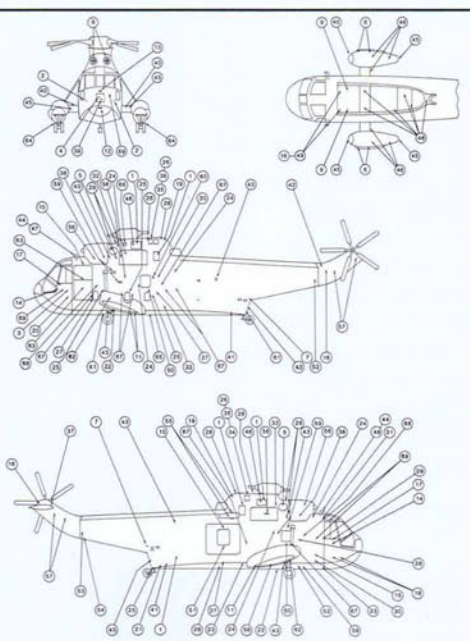


TYPICAL MAINTENACE INSTRUCTIONS

17 Jacking symbol
18 Nitrogen symbol & nitrogen
19 No step
20 No. 1 Hydraulic
Reservoir fluid level
21 No. 1 System G.S.E. connections hydraulic hand pump
22 No. 1 Hydraulic reservoir nitrogen service reservoir bleed
23 0-156 (MIL-L-23699)
24 Oil/hydraulic symbol
25 1. Push to open 2. Run fwd and pull
26 Refuel/defuel
27 Warning
Assure rudder pedals are not actuated during servicing in door 8
28 Stabilizer settings
29 Warning
Do not retract landing gear unless this door is attached to strut or removed from aircraft
30 Warning
Jet blast
31Warning
NLG door opening valve
Keep clear of doors during operation
32 Warning
Stand clear
33 Water fill port
34 Ground symbol & 115/200 V 40 HZ, 3ø

Decal and stencil data

1 Access panel
2 Air intake drain
3 Antenna comp exhaust
4 Battery comp vent
5 Beware of blast
6 Bilge pump access
7 Blade stowage fitting
8 Caution electrical wiring. Do not modify fiberglass
9 Cowl latch under
10 Cut for emergency rescue
11 Drain screw under
12 Electronics compartment
13 Electronics compartment air intake
14 Electronics compt exhaust
15 Emergency air discharge & heater fuel vent
16 Engine lubricating oil
17 Exit release-press button-turn handle pull out window
18 External electrical connections
19 Fire bottle sight gage access
20 Fire extinguishing system
21 Fuel dump
22 Fuel strainer drain under
23 Fuel tank sump drain under
24 Fuel tank vent
25 Fueling (gravity)
26 Fueling (pressure)
27 Grounding or earthing recptical
28 Hand hold
29 Heater exhaust
30 Heater fuel drain under
31 Heater intake port
32 Hold handle in open position when closing platform
33 HYD drain
34 HYD refil utility



TYPICAL MAINTENCE INSTRUCTIONS

35 HYD refill primary
36 Hydraulic oil
37 Identification of rework
Facility & applied finish
38 Incase of fire
Fight fire here
39 Inspection of battery
40 Jack and JIG point under
Jack Point Center STA. 221
41 Jacking point
42 Long pin down to lock
Long pin down to stow
Long pin up to unlock
Tail pylon fold
Pull pins, fold to right
43 Mooring or picketing
44 No hand hold
45 No push
46 No step
47 No. 1 pitot static tube
48 No. 2 pitot static tube
49 Oil filler inside
50 Pull tab exit release
51 Pull handle for emergency release
52 Push
Pull
53 Pylon fold warning decal
54 Pylon latch
55 Rescue hoist cap 600 lbs max
56 Service platform
57 Slinging or hoisting point
58 Sonar dome drain
59 Step
60 Thermal discharge
Indicator eng fire ext
61 Tire pressure 70-76 lbs tail wheel
62 Tire pressure 90-95 lbs main wheels
63 To open-press button turn handle
64 Towing
65 Trans drain
66 Transmission refil access panel oil MIL-L-23699
67 Vent
68 Warning
Do not climb aircraft with engine operating
69 When washing aircraft avoid spraying intakes and exhausts

CHAPTER 10 1970-1993

Amendment 1, to MIL-C-18263F(AS), *Colors, Exterior, Naval Aircraft: Requirements for,* dated March 9, 1972, changed the requirement for painting propellers of single-engine, land-based, observation aircraft. The rear of the propeller blades were now to be painted nonspecular Black, with a 4-inch (10.16 cm) band of nonspecular Orange Yellow at the tip. The tip on the front face of the blade was to be painted glossy Insignia White from the tip to 3 inches (7.62 cm) from the tip, followed by a 6-inch (15.24 cm) stripe of glossy Insignia Red, followed by another 3-inch (7.62 cm) stripe of Insignia White. The remainder of the blade was to be Field Green.

With the introduction of MIL-STD-2161(AS), and the numerous number of safety and maintenance type markings involved, I have listed all of them, rather than leave any confusion as to which ones may or may not still be in effect.

There are numerous markings applied to US naval aircraft that are mandatory in nature. I have grouped them together in the following paragraphs. Further on you will find those strictly of a maintenance and safety nature, followed by some optional markings that may be applied.

The areas of the leading edge of the wing, fuselage, nacelle or pod, or combination thereof, which are adjacent to the sides of a jet engine intake are to be marked with warning chevrons and signs. The chevron is to be applied so that the ends of the outer sides contact the edges of the intake at points which are three-quarters of the diameter, or three-quarters of the short axis, of the intake port. The apex of the chevron is to be located at a distance 4 feet (121.92 cm) outboard along the leading edge of the wing, or forward or aft if applied on the fuselage, or aft if applied on the nacelle or pod, from the center of the intake. The arms of the chevron are to be 3 inches (7.62 cm) in width and marked in Insignia Red, except for tactical paint scheme or land camouflage aircraft. Superimposed on one arm is the word JET and on the other arm the word INTAKE in Insignia White

Right: The danger area of the tail rotor on this SH-2F is clearly marked with the fuselage band, yellow and red stripes on the horizontal stabilizer and red and white bands on the rotor blades.

Left: When ready for flight, there should be no red warning areas showing on the surface of the aircraft such as the red inner surface of the fold down access ladder on this A-6A.

Left: Two yellow rescue arrows are applied high on the fuselage of this P-3C (update) to lead rescuers to the top escape hatch. **Bottom:** The area to be cut for access to the crew working area and rescue arrows can be seen on this P-3C of Patrol Squadron 8.

(17925). The letters are to be 2 inches (5.08 cm) in height. The word DANGER and an arrow are to be applied along the leading edge of the wing, or on the fuselage, nacelle, or pod, as applicable. The letters and arrow are Insignia Red superimposed on a stripe of Insignia White (17925) 3 inches (7.62 cm) in width. The height of the letters and length of the arrow are to be 2 inches (5.08 cm). These colors do not apply to aircraft painted with land camouflage or tactical paint scheme. These dimensions are to be adhered to in general; however, they may be varied if there are space limitations or other considerations.

The areas of the fuselage, nacelle, or pod, or combination thereof, which are adjacent to the sides of a jet engine exhaust are to be marked with the words BEWARE OF BLAST.

Matched sets of main rotor blades are to have individual identification stripes painted on both sides of the blade from the tip to 2 inches (5.08 cm) from the tip. This stripe is to be Insignia White (17925) for one blade, Insignia Red (11136) for the second blade, and Light Green (14187) for the third blade. An additional nonspecular Orange Yellow (33538) stripe is to be applied inboard of the 2-inch (5.08 cm) stripe on both sides of the blade extending from a line 2 inches (5.08 cm) from the tip to a line 8 inches (20.32 cm) from the tip.

Unmatched sets of main rotor blades are to have nonspecular Orange Yellow warning stripes applied to both sides of the blades from the tip to 6 inches (15.24 cm) from the tip.

The marking of rotor blades on aircraft painted in the tactical paint scheme or land camouflage is dependent on whether they can be overpainted by field units so as not to effect the balance. If this is not possible, the blades will not be color coded.

Tail rotor blades are to be painted with a series of color bands as follows:

a. A 6-inch (15.24 cm) band of nonspecular Insignia Red.

b. A 6-inch (15.24 cm) band of nonspecular Insignia White (17925).

c. A 6-inch (15.24 cm) band of nonspecular Insignia Red.

d. A nonspecular Black band to within 6 inches (15.24 cm) of the hub.

e. A 6-inch (15.24 cm) band of nonspecular Insignia Red.

Right: With the entire engine nacelle of this C-130 of VXE-6 painted in the Arctic high visibility scheme, the maintenance instructions have to be applied on a white background. Notice all the instructions on the propeller blades. **Bottom:** This Tomcat, just starting a catapult launch, shows the intake warning only on the outboard side and does not identify the entire duct area.

Helicopters having tail rotor blades revolving in the vertical plane are to have a warning sign painted on both sides of the tail boom. This marking is to consist of a 33-inch (83.82 cm) wide glossy Orange Yellow band encircling the tail boom. Centrally superimposed on this band is to be a glossy Insignia Red arrow of appropriate size, with the arrow pointing aft. Above the arrow is to be the word DANGER, and below the arrow the words KEEP AWAY. The letters are to be glossy Black and approximately 2 inches (5.08 cm) high.

On helicopters with tail rotor guards and/or stabilizers, the tail rotor guard and/or stabilizer are to have warning markings applied to prevent ground personnel from accidentally running into them. The markings are to consist of 2-inch (5.08 cm) wide alternating stripes of glossy Orange Yellow and glossy Insignia Red.

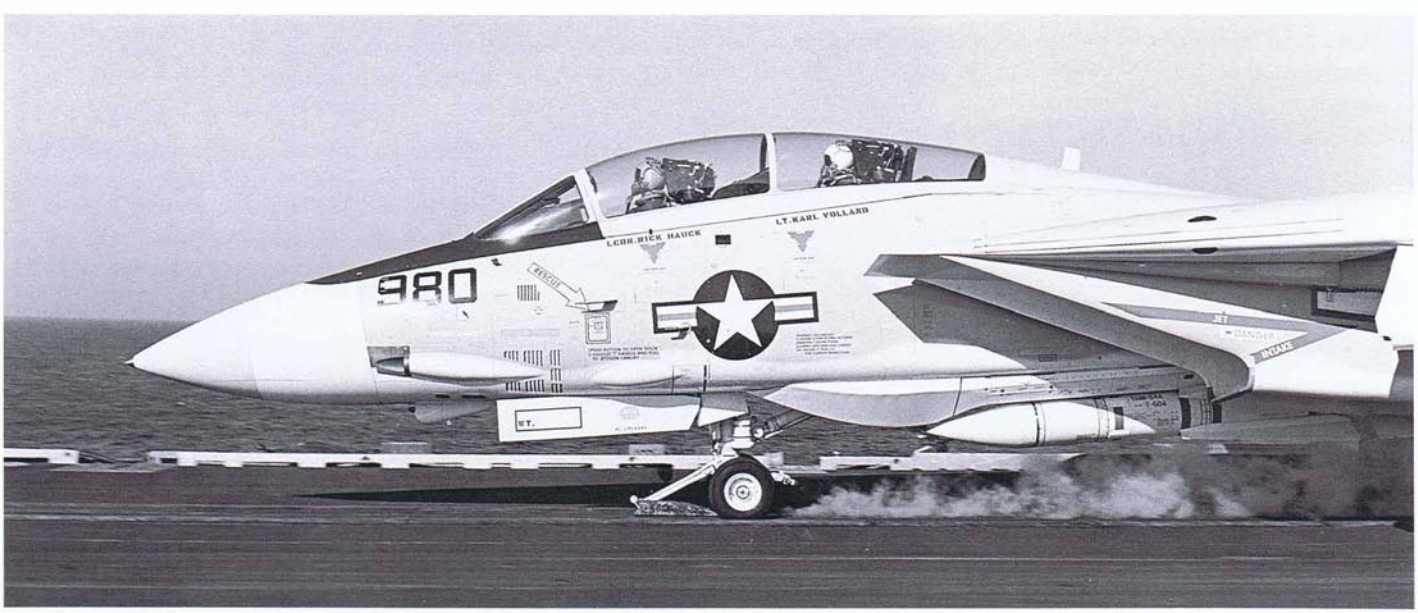
Propeller blades on multi-engine aircraft are to be painted on both sides from the tip to 3 inches (7.62 cm) from the tip with glossy Insignia White (17925), followed by a 6-inch (15.25 cm) stripe of glossy Insignia Red, followed by another 3-inch (7.62 cm) stripe of glossy Insignia White. The remainder of the blade is to be nonspecular Black. The black finish may be eliminated on blades that meet the following conditions:

a. Corrosion protection is not required.

b. The blades are so situated as to produce no glare or excessive brightness in the pilot's or copilot's eyes in cases where the blades rotate in a plane aft of the pilot's seat.

If the blades are so situated as to produce glare or excessive brightness in the pilot's or copilot's eyes, the colors remain the same but are to be nonspecular and applied on the rear of the blades only. Propeller blades on single-engine aircraft are painted on the front side in the same manner as for multi-engine blades; however, the rear face is to be nonspecular Black with a 4-inch (10.16 cm) band of nonspecular Orange Yellow at the tip for blades of less than 15 feet (457.20 cm) diameter or a 6-inch (15.25 cm) wide band of nonspecular Orange Yellow on those larger diameter blades.

The outer surface of the fuselage which is in the plane of the propeller is to be marked with a glossy Insignia Red stripe 3 inches (7.62 cm) wide completely encircling the fuselage. This band is to stop at the bottom of the blue stripe on aircraft with the white solar heat top. The word PROPELLER reading vertically from top to bottom, on both sides, is to be superimposed on this stripe in glossy Insignia White (17925) letters 2 inches (5.08 cm) in height, at sufficiently frequent intervals to indicate the dangerous



Left: Numerous service markings can be seen on the nose as well as on the folded tail rotor pylon of this CH-53.

area. The sign DANGER and an arrow are to be applied perpendicular to and centered with respect to the word PROPELLER, with one sign on each side with the arrow pointing toward the stripe. The letters and arrows are to be glossy Insignia Red and superimposed on a glossy Insignia White (17925) stripe 3 inches (7.62 cm) in width. The height of the letters and length of the arrows is to be 2 inches (5.08 cm).

Aircraft having engines staggered in the wing are to have a marking similar to that described in the previous paragraph placed on the cowling of the next inboard engine to mark the plane of rotation of the propeller.

Airplanes having bomb bays, hatches, or other openings within 6 feet (182.88 cm) of each side of the propeller arc which may be used as means of egress from the plane, and where there is danger of personnel walking into propellers, are to have warning stripes and signs placed on the interior surface in line with the propeller to warn personnel regarding the proximity of the propellers. A glossy Insignia Red stripe 3 inches (7.62 cm) wide, extending on both sides from the center of the fuselage to the lowest extremity of the exit when open, is to have the word PROPELLER in glossy Insignia White (17925) 2-inch (5.08 cm) high letters superimposed, reading vertically from top to bottom on both sides of the fuselage. This warning is to be applied at sufficiently frequent intervals to indicate the dangerous areas. The signs:

DANGER ⇒ ⇐ DANGER

PROPELLER PROPELLER

are to be applied perpendicular to and centered with respect to the word PROPELLER, with one sign on each side of the stripe and with the arrow pointing toward the stripe. The letters and arrows are to be glossy Insignia Red and are to be superimposed on a stripe of glossy Insignia White (17925) 3 inches (7.62 cm) in width. The height of the letters and length of the arrows are to be 2 inches (5.08 cm).

Aircraft having arresting hooks are to have a warning sign painted on both sides of the fuselage located in proximity to the hook point when in the retracted position. This marking must be clearly visible to maintenance personnel.

The shank of arresting hooks is to be painted with alternating 4-inch (10.16 cm) wide bands of glossy Black and glossy Insignia White (17925) for maximum visibility. The arresting hook point must never be painted. On aircraft with tactical paint scheme, the bands are to be the lightest and darkest gray/blue used in applying the tactical paint scheme to the aircraft.

The following loose and jettisonable equipment is to be marked in a contrasting color with the radio call numbers, using a stencil or other suitable marking: life rafts, tool kits peculiar to the airplanes, aircraft covers (engine covers, dust covers, etc.).

All exits to be used in an emergency are to be identified by the words EMERGENCY EXIT, RESCUE, AUXILIARY EXIT, or other appropriate wording, followed by applicable instructions or symbols. These markings are to be glossy and visible in the dark. The standard application is glossy Black letters on a glossy Orange Yellow background. However, in some cases the reverse combination may be specified. The lettering and markings are to be placed so as to be easily read, with all lettering of Gothic type. Exit release signs are to have 2-inch (5.08 cm) high lettering, while the lettering of instructions is to be at least 1-inch (2.54 cm) high.

Each cutout area of the aircraft is to be marked with the words CUT HERE FOR EMERGENCY RESCUE. The words are to be applied on the inside of the area parallel with and immediately adjacent to the broken band. The cutout area is to be marked with corner markings if the area encloses the fuselage skin only.

Handles and levers used to actuate doors on hatches are to be identified by alternating Orange Yellow and Black stripes in a width ratio of 3 to 1. The Orange Yellow stripes are to be widths of 3/16, 3/8, or 3/4-inch (0.476, 0.952, or 1.90 cm), with the Black stripes 1/16, 1/8, or 1/4-inch (0.158, 0.357, or 0.635 cm). The background striping is to be applied at a forty-five degree angle from the vertical, slanted from upper right to lower left.

Right: Due to the high location of the engines on the SH-2F, it is necessary to put the exhaust warning markings on the under side of the engine pod.
Bottom: A modified version of the jet intake warning markings is used on this A-4M of Marine Attack Squadron 223. This was a common style for this marking on Skyhawks.

The fire access panel in the engine cowling is to be identified by a rectangle of a continuous glossy Insignia Red line not less than 1-inch (2.54 cm) wide. The words FIRE PANEL in red letters are to be placed inside this rectangle.

Axe, crowbar, fire extinguisher, and asbestos gloves, when carried and accessible from the outside of the aircraft, are to have their positions shown by the words AXE STOWED HERE, or the applicable name, in 1-inch (2.54 cm) high letters. This may be further identified by the use of a silhouette of the item.

When a first-aid kit is accessible from the outside through an emergency exit or access panel, a glossy Insignia Red Greek cross on a glossy Insignia White (17925) background is to be placed on the fuselage adjacent to the exit or panel.

The ejection seat system is to be marked with a glossy Insignia Red triangle. A triangle is to be placed over each crew entrance to indicate that the aircraft has such a system. The applicable words EJECTION SEAT or ESCAPE CAPSULE are to be applied in 1-inch (2.54 cm) high letters under the triangle. Triangles are to be located on each side of the fuselage at approximately the midpoint of the canopy for fighter, fighter-trainer, and similar aircraft. Under the triangle, the following warning is to be applied in 3/4-inch (1.91 cm) high letters, using either paint or decal, on a glossy Orange Yellow background: WARNING — THIS AIRCRAFT CONTAINS A CARTRIDGE-ACTUATED EMERGENCY ESCAPE SYSTEM EQUIPPED WITH EXPLOSIVE CHARGES.

On aircraft equipped with cartridge-actuated escape provisions, other than ejection seats at certain crew stations, along with ejection seats at other stations, the markings located on the exterior of the aircraft at each crew entrance not equipped with ejection seats are to read CARTRIDGE-ACTUATED DEVICES instead of ESCAPE CAPSULE or EJECTION SEAT under the triangle. In the event all crew members use the same entrances, both notes are to be printed under the triangle with the warning.

Aircraft equipped with cartridge-actuated escape systems, such as hatch jettisoning systems, equipment stowage systems, etc., but not means to forcibly separate crew members from the aircraft, are to have the marking read CARTRIDGE-ACTUATED DEVICES.

Normal external canopy release access on jet aircraft is to be painted glossy Orange Yellow. External release locations are to be identified by a glossy Orange Yellow arrow. Release instructions from the outside are to be painted in

Left: The dark hard area walkway along the spine of this S-3A, is clearly visible against the lighter gray of the fuselage. **Bottom:** It is readily apparent on this A-7E that the rescue arrow points to a specific location such as the canopy release and not just to a general area.

glossy Black. A reflective placard is to be applied near the canopy on the side of the fuselage opposite the canopy release to show the location of the release. Each external exit emergency release or handle is to be identified by a RESCUE arrow applied on the fuselage. Other markings, such as STEP or ACCESS DOOR, may be omitted to accommodate this rescue marking, if necessary.

Markings to identify escape hatches, doors, and exits on the interior of aircraft are to be painted glossy Orange Yellow with glossy Black lettering. Retroreflective material may be used for these markings to facilitate identification in the dark. An intermittent glossy Orange Yellow band is to mark the periphery of the personnel escape exit. The segments of the band are to have a minimum width of 1-inch (2.54 cm) and a maximum length of 2 inches (5.08 cm) divided equally, if possible and practicable, between the door mounting and the escape door itself. Where the lining would cover the identification marking band on the inside of the aircraft, the marking is to be continued onto the lining.

The words EMERGENCY EXIT are to be painted or stenciled in glossy Orange Yellow on the hatch, floor or exit or any covering thereof in the most readily visibly location. Preferably, the letters should be 2 inches (5.08 cm) high, but cannot be less than 1-inch (2.54 cm) wide.

Handles, releases, catches and knobs for inside hatches and exit doors and their soundproofing (or lining) are to be painted glossy Orange Yellow. Suitable descriptive wording, readily visible, is to be painted or stenciled on the door or structure of the aircraft, whichever is nearer the emergency release, to identify and explain its operation. These instructions are to be at least 1/2-inch (1.27 cm) high and preferably 1-inch (2.54 cm) high, using standard English terminology such as PULL, PUSH, TURN or SLIDE. Exits which are adequate for air, ground and ditching escape are to have the words EMERGENCY EXIT centered in the most visible location on the inside of the door or hatch. Exits which are not adequate for the above three methods of escape are to be marked EMERGENCY EXIT, and for specific usage, GROUND USE ONLY, GROUND AND DITCHING USE ONLY, etc.

Markings identifying escape hatches, doors and exits on the outside of the aircraft are to be glossy Orange Yellow. On yellow surfaces, glossy Black is to be used. Retroreflective material may be used for these markings to facili-

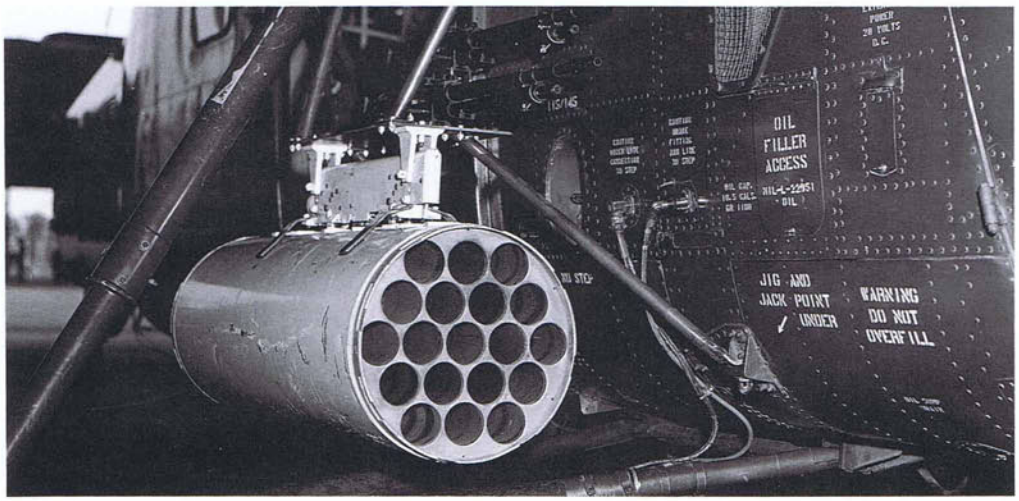
Right: The bars in front of the jet intakes of this A-4L of reserve squadron VC-13 are handles on the intake cover which is painted red for visibility and to insure their removal prior to running the engine. **Bottom:** RVAH-12 painted the area within the arms of the jet intake warning in red to increase its visibility even though the intake was so high off the ground.

tate identification in the dark. All external releases for operation of emergency exit panels are to be marked EXIT RELEASE on the outside of the aircraft to facilitate quick identification. The wording that describes the operation of the exit release is to be in standard English terminology, such as PULL, PUSH, TURN, or SLIDE. The letters used are to be at least 1-inch (2.54 cm) high and preferably 2 inches (5.08 cm) high.

Secondary openings, such as auxiliary exits, windows and navigator's domes, are usually smaller than primary openings, making entrance or exit more difficult. If the structure immediately surrounding secondary openings is free from heavy structural members, such as bulkheads and the main longitudinal member, and free from oxygen, fuel and oil lines and battery leads, it is to be marked with a glossy Orange Yellow broken band. The band is to be located at the extreme boundary of the above described area both inside and outside the fuselage. Segments of the broken band are to be 1/2-inch (1.27 cm) wide, 1-inch (2.53 cm) long and approximately 12 inches (30.48 cm) apart. Where the band will be covered with soundproofing, the soundproofing (or lining) is to be marked also. CUT HERE FOR EMERGENCY RESCUE is to be printed or stenciled inside of, parallel with, and adjacent to the broken band identifying the area on the outside of the aircraft where forced entry can be made for rescue purposes. CUT HERE FOR EMERGENCY EXIT is to be painted in a similar location inside the aircraft. Letters are to be 1-inch (2.54 cm) high. This lettering may also be stenciled on the soundproofing or lining, if necessary.

Areas which may be cut through for rescue when entrance or exit cannot be made in any other manner are to be marked with painted or stenciled corner markings on the inside and outside of the fuselage to mark the limits of these areas. These areas should be as close to normal stations of personnel as possible, except that they are not to be placed where personal injury to occupants would probably result from forced entry. The horizontal and vertical bars of the corner markings are to be 3 inches (7.62 cm) long and 1-inch (2.54 cm) wide. CUT HERE FOR EMERGENCY RESCUE, in letters 1-inch (2.54 cm) high, is to be painted or stenciled in the center of the four corner markings on the outside of the aircraft and CUT HERE FOR EMERGENCY EXIT, in letters 1-inch (2.54 cm) high, is to be place in a similar location inside the aircraft.

There are numerous maintenance markings applied to the external surface of US Navy aircraft. Many of these are specified in international agreements and must be applied to



Left: An UH-34 at MCAS Quantico during evaluation of rocket pods on helicopters. The multitude of white servicing instructions stand out against the Dark Green fuselage. **Bottom:** Unlike RVAH-12, RVAH-5 only painted the jet intake warning design in red. This illustrates how a specific marking can be interpreted differently by two squadrons both with the same type aircraft.

all aircraft that deploy overseas. The location of these markings will vary with airframe configuration, but each marking is to be displayed to provide the following:

a. Rapid identification of each required servicing point.

b. Identification of the type of ground servicing required.

c. Hazard warning or safety precautions which will prevent injury to personnel or damage to aircraft equipment.

d. Rapid entry or exit from vehicle under emergency conditions.

These markings may be applied by paint or decals. When they are painted, stencils incorporating capital letters and Arabic numerals not to exceed 11/4-inch (3.18 cm) in height are to be used, as opposed to freehand application. All lettering is to be glossy Black when applied on aluminum, gray or white surfaces. When applied to aircraft finished in the land camouflage scheme, the color varies depending on the area of the scheme to which it is applied. All maintenance-type markings are to be nonspecular Black on aircraft finished in the land camouflage scheme. Major warning-type markings are to have a nonspecular Black background, with the lettering in the land camouflage color of the area in which it is applied. On aircraft finished in TPS, the lettering is to be a shade of gray depending on the shade of gray used in that location.

The location of each marking is to be dependent on the existing available space. It may be situated on the equipment concerned, directly below, adjacent to, or on applicable access panels. In the event the service point or marking is concealed, arrows may be used to point out the location of the service point or markings. The arrow should bear a brief identification of the purpose for which it is applied.

Service point marking symbols are not to exceed 4 inches (10.16 cm) in width or height. In areas that will not accommodate this size, a smaller size marking may be used, consistent with existing available space.

All grounding points on all US Navy aircraft are to be marked with decalcomania or printing as shown.

The notation BATTERY is to be painted in glossy Insignia Red letters 1-inch (2.54 cm) high on battery access doors. The notation BATTERY LOCATION _____ (with the exact location) is to be placed on the left side of the fu-

Right: Notice all of the rescue arrows and maintenance markings on this SH-3A of Helicopter Antisubmarine Squadron 4. **Bottom:** The Naval Air Reserve Unit at NAS Alameda had this bright scheme on their TA-4Js. The large red area at the engine intake is a screen guard to prevent foreign objects being sucked into the engine when running. It was removed prior to flight.

selage when viewed from the rear of the aircraft. The fore and aft location of the marking is to be approximately in line with the trailing edge of the wing. The vertical location of the marking is to be a point 2 to 3 feet (60.96 to 91.44 cm) off the ground with the airplane in the wheel-up position and resting on the ground, or in the case of airplanes having fixed landing gear (helicopters), with the landing gear washed out. In the event of interference with windows, enclosures, etc., the marking is to be placed as near to the aforementioned location as practicable. In addition to these markings, all battery locations on the interior of the aircraft are to have the word BATTERY or BATTERIES, as the case may be, permanently and conspicuously affixed to the battery casing or compartment. The marking is to be in 1-inch (2.54 cm) high letters.

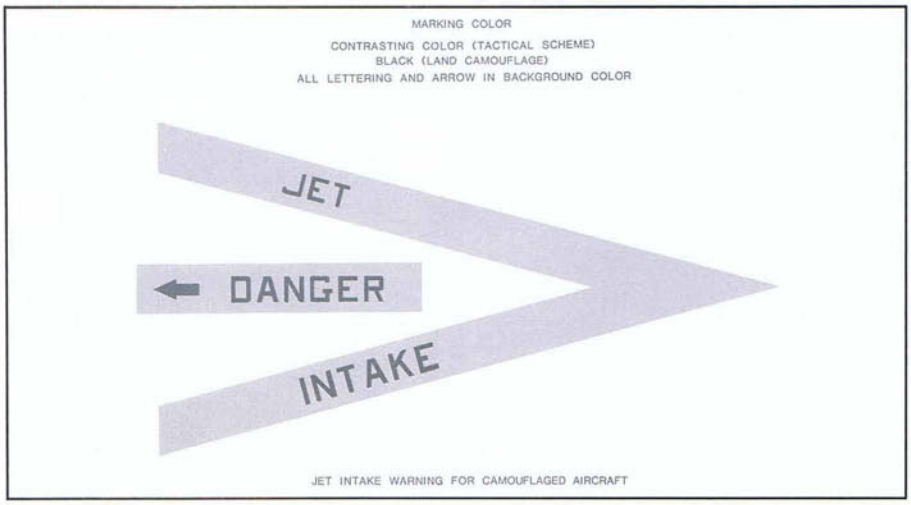
Instrument static openings are not to have any finish applied within a 1-inch (2.54 cm) diameter circle around the opening. A glossy Insignia Red 1/2-inch (1.27 cm) wide circular band is to be applied around this area. The following instructions are also to be applied adjacent to the band: INSTRUMENT STATIC OPENING — DO NOT COVER.

Aircraft having wing fold warning flags are to have the flags painted glossy Insignia Red.

The following note of caution in glossy Black letters is to be placed at points where it is necessary to break electrical connections when folding back or removing wings or removing tail surfaces, etc.: CAUTION, DISCONNECT ELECTRICAL WIRING BEFORE REMOVING PART.

All tanks on the aircraft are to have notations indicating tank capacity, type of liquid, and level restrictions. Tank markings are to be the same color as that used on attaching lines. Additional data, such as coolant mixture, water-alcohol mixture, and grade of liquid are to be stenciled near the filler caps in letters 1/2-inch (1.27 cm) high in the same color as that used to indicate tank capacity. This stenciling is to read USE _____ OCTANE FUEL OR BETTER or USE GRADE _____ OR BETTER, as applicable.

Filler caps for fuel and oil tanks, and other external parts and attachments for which identification is necessary and desirable, are to be painted the color assigned to the applicable fitting and are to be indicated by appropriate markings. Where flush-type pressure fueling caps are installed, three radial nonspecular Black lines, 3/8-inch (0.95 cm) wide by 1-inch (2.54 cm) long, are to be so located as to form extensions to the lines on the cap when the cap is in the locked position. The type and grade of fuel to be



Bottom: Operating instructions for the rescue of crew members was clearly identified on this F-14A in 1983.

employed in the aircraft are to be indicated adjacent to the filler caps.

Lift points, hand grips, caution legends, baggage compartment, life raft stowage, etc., are to be indicated by appropriate wording in glossy Black adjacent to the applicable point or area.

On aircraft which have wing access panel latches and safety straps, the inside lever and wing area under the latch safety strap are to be painted glossy Insignia Red in such a manner that no red will show when the latches and straps are properly secured.

A glossy Black warning sign is to be located adjacent to any actuating mechanism which can cause damage to the weapons systems from improper or out-of-sequence operation.

Flush-type (female receptacle) grease fittings, recessed set screws, or depressed adjustments, such as may be found on rotor controls and drive shafts, but which require periodic servicing or inspection, are to be identified with a circumscribed band of glossy Orange not to exceed 1-inch (2.54 cm) in width.

In cases where walkways do not contrast in color with adjacent areas, they are to be bounded by a camouflage Black (37038) line for a light background or a camouflage White (37925) line for a dark background. This line is to be 1/2-inch (1.27 cm) wide, and marked with the word WALKWAY at sufficiently frequent intervals to indicate the walkway area. Steps are to be suitably indicated at all points on the aircraft.

Honeycomb panel (thin skin) areas on upper wing surfaces are to be distinctly marked by a 11/2-inch (3.81 cm) wide stripe of hash marks. Each hash mark is to be 2 inches (5.08 cm) long, measured along the stripe, with 2 inches (5.08 cm) between marks. The marks are to slope forty-five degrees.

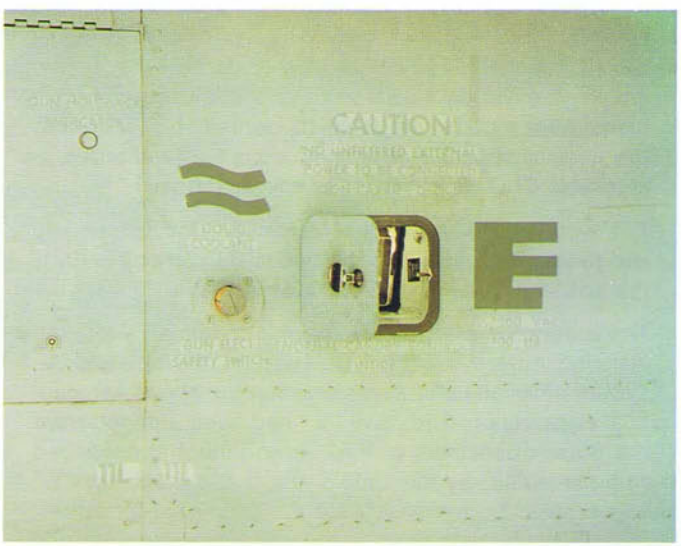
The preceding instructions are applicable to aircraft not painted in the land camouflage or tactical paint scheme. Aircraft painted in the land camouflage scheme are to have the markings applied in nonspecular Black. Major warning markings are to have the background black with the lettering in the color of the land camouflage scheme. Aircraft painted in the tactical paint scheme are to have all exterior markings applied in a contrasting shade of gray, the color used being dependent on the gray colors used

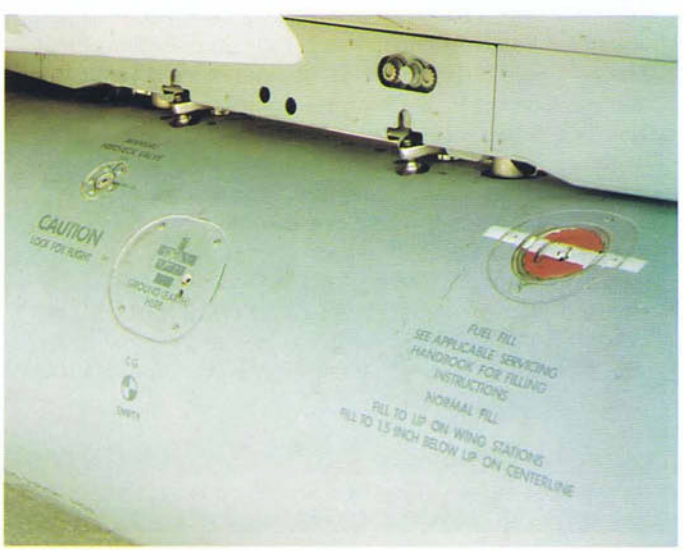
Right: This Phantom II well illustrates the variety of safety and service markings to be found on an aircraft in the early 1960s. **Below left:** Subdued markings are still clearly visible at close range for the safety of the ground crew working on and around the aircraft. **Below right:** Typical safety markings and NATO symbols applied to an aircraft painted in the Tactical Paint Scheme. **Bottom left:** While most safety markings are in subdued colors, the hazard to ground personnel from the venting of liquid oxygen is emphasized by inner surfaces of the rectractable door being painted red. **Bottom right:** The white stripe across the red fuel cap provides a quick visual check that the cap is securely closed and fastened.

for the specific tactical paint scheme and the location of the markings.

The sizes of these markings, when used on aircraft with land camouflage or tactical paint schemes, are the same sizes as previously specified.

The type commander may approve the deviations to the paint scheme for one aircraft. However, deviations for more than one aircraft must have prior approval by NAVAIR 5164 and possibly the CNO.





SECTION 5

MERITORIOUS RECOGNITION MARKINGS

CHAPTER 11 1960-1993

Military Specification MIL-I-18464C(Wep), dated April 11, 1960, continued to carry the following paragraph: "Aircraft units are authorized to display Naval Aviation insignia in an appropriate location on aircraft, as fleet commanders may prescribe, in accordance with the requirements of applicable Chief of Naval Operations directives. No other crests, emblems, individual squadron insignia, campaign and commemorative replicas, etc., shall be painted on or affixed to the exterior structure of aircraft, except as authorized in applicable CNO directives, or as specified herein."

This wording first appeared in March 30, 1956, and continued to be a part of the specification until October 27, 1971, the last time MIL-I-18464G(AS) was issued.

The application of squadron insignia to aircraft was now included in the instructions pertaining to the size and design of individual unit insignia within the Naval Aeronautical organization. The Navy "E" had been dropped from the Bureau directives in 1952, even though it continued to be awarded. By the 1960's, the Battle Efficiency "E" had evolved from a fleet wide Bureau award for squadrons of similar type to an award within major commands under Chief of Naval Operations guidance. Competition was now within each of the following seven commands: Naval Air Force Atlantic, Naval Air Force Pacific, Fleet Marine Force Atlantic, Fleet Marine Force Pacific, Air Training Command, Reserve Air Training, and Marine Air Training. Within these commands, competition was to be within type, in order to eliminate problems due to squadrons with dissimilar missions competing against each other. Requirements within one command were not necessarily the same as those of another command. This awarding of the "E" without instructions concerning the size and placement of the award on an aircraft resulted in some strange combinations of sizes and letters denoting areas of special proficiency. However, it appears that

Right: While the safety and maintenance markings are subdued, these EA-6Bs carried the individual aircraft number as well as their "E" and "S" awards as high visibility markings.


12
NK
ES

Left: An A-4E of VA-72 launching from the USS Independence (CVA-62) carries a record of numerous strike missions during the Vietnam war. **Bottom:** The "Knightriders" of VA-52 were easily identified by the helmet and lance on their aircraft. But in 1973 added unique way to display the "E" on their A-6As.

the shipboard regulations were followed as to the "E" being white for gunnery, and a white "A" being used for antisubmarine weapons and operations. No record of this period has been found to authorize a "B" for bombing or an "R" for rockets, although such markings have been seen on aircraft. Mainly, it was left up to the squadron commanding officer to decide the size and location for the "E" on his aircraft. As in the past, the provision remained for a hash mark for succeeding consecutive awards, with a gold "E" in lieu of a white "E" and five hash marks. The period for which the award was given varied between commands.

Due to the lack of instructions for the early years, it appears that the Chief of Naval Operations Annual Aviation Safety Award began in 1960. Competition for the Safety Award was among the same major commands as for the "E." At this time, the award consisted of a bronze plaque engraved with the unit designation.

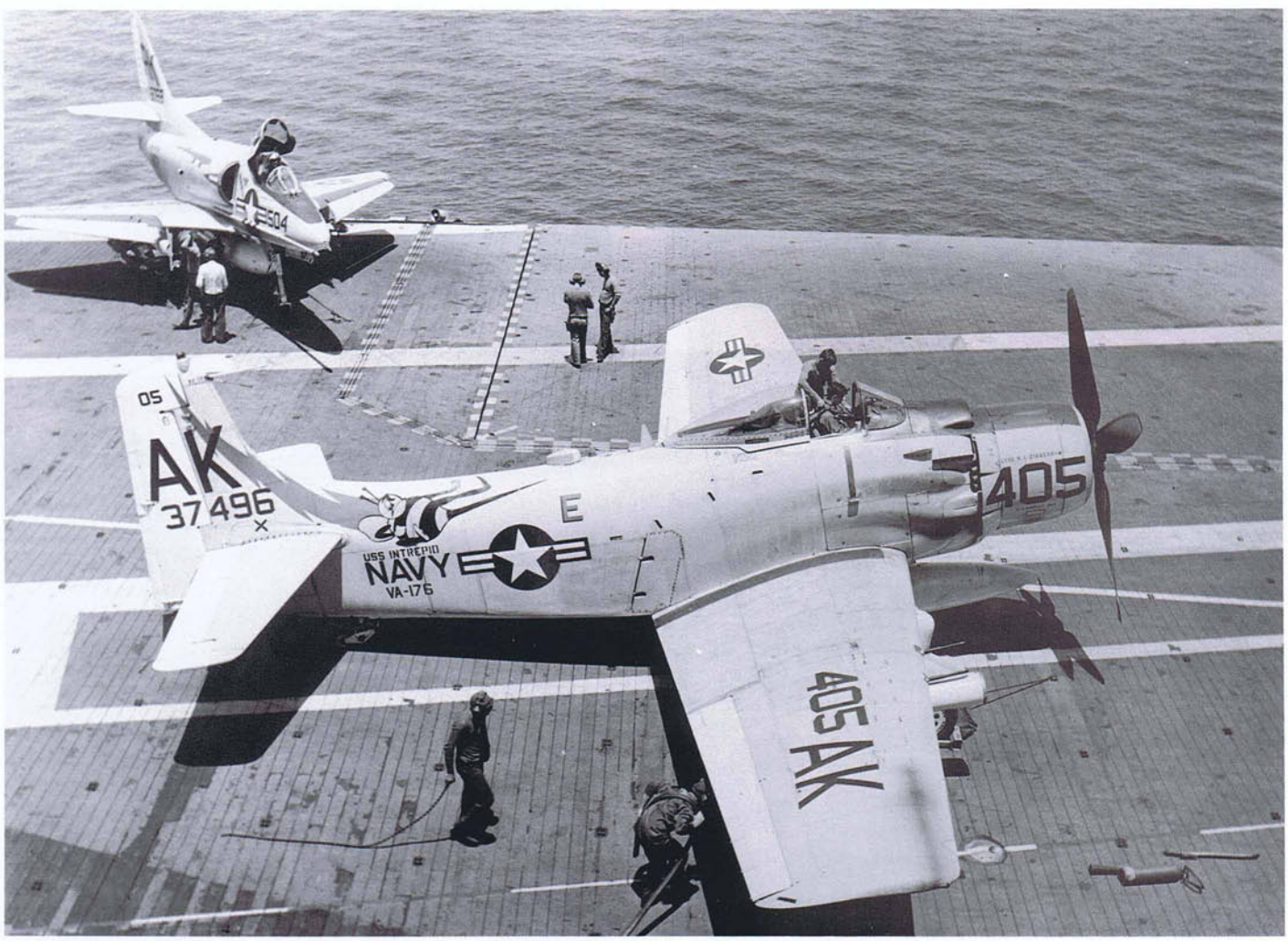
The idea of displaying an "S" on the aircraft of the award winning squadron was first proposed by the Commanding Officer of VS-35 in the fall of 1968. CNO letter OP-514B Serial 4018P51, dated April 15, 1969, authorized VS-35 to display an "S" on their aircraft after having just won the award for the second consecutive year. The use of hash marks for subsequent consecutive awards was authorized at this time. The award could be displayed through the calendar year subsequent to the year for which it was awarded. The "S" was specified to be of an appropriate size, but not to exceed 6 inches (15.20 cm) in height, and to be placed under the squadron insignia, if an insignia were used. The letter was to be a standard vertical block letter. It was to be either glossy Black or glossy White, depending on the background upon which it was applied. The color used was to be the one of greatest contrast in order to provide maximum visibility.

With the introduction of MIL-STD-2161(AS), the instructions were modified for both the "E" and "S" awards. Those squadrons authorized to display the "E" on their aircraft for the length of one competitive cycle were to apply it with glossy White (17925), except in cases where the aircraft is painted with a tactical paint scheme or land camouflage. When applied to an aircraft in the tactical

Right: Along with all the required markings, VA-65 prominently displayed their squadron insignia and Navy E on their A-6A Intruder. **Below:** During the days of colorful and imaginative paint schemes, VA-176 proudly displayed their red "E" on their A-1H while aboard the USS Intrepid (CVS-11).

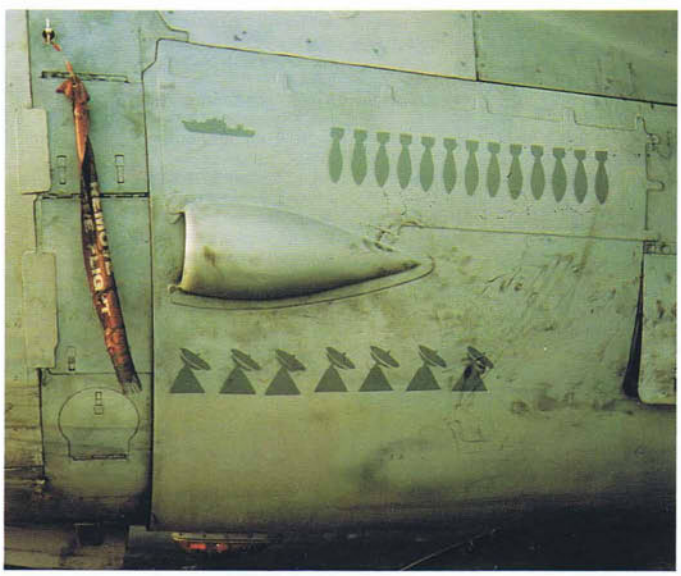
paint scheme, the color is to be Gray (36081), and on a land camouflage aircraft, Black (37038) is to be used. The requirements as to shape and style remained the same, but the size was increased to 8 inches (20.32 cm) in height. The "E" is to be applied to the right side of the aircraft in the vicinity of the cockpit. Hash marks for consecutive awards were still authorized.

Squadrons winning the CNO Aviation Safety Award can display an "S" on their aircraft through the calendar year for which the award was won. A hash mark is authorized for consecutive awards. The "S" is to be applied in glossy White (17925) or glossy Black (17038), and of an appropriate height not to exceed 8 inches (20.32 cm). It is to be located under the squadron insignia, if used, and is not to interfere with required markings. For aircraft with a tactical paint scheme, the color of the "S" is to be Gray (36081), while Black (37038) is to be used for aircraft in land camouflage. The "S" is to be of a vertical block design.

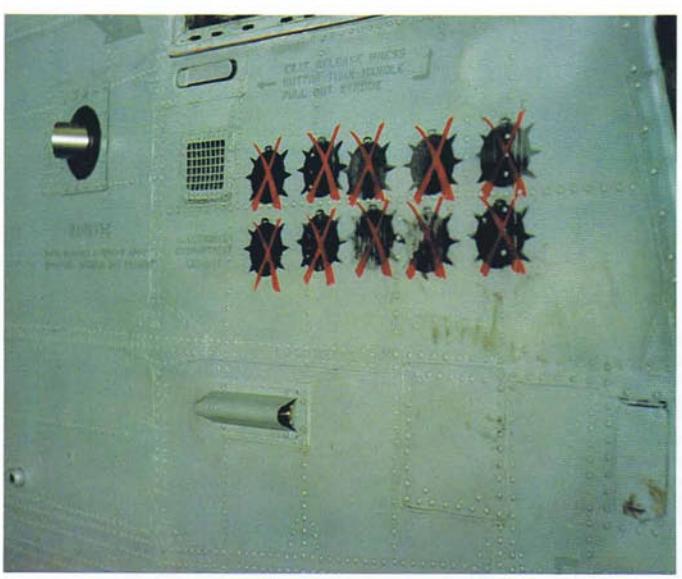


Left: With all the color and identification markings on the aft portion of the fuselage, the Safety "S" is almost missed in its location well aft of the rescue arrow on this A-7E Corsair II. **Below left:** The one Iraqi helo destroyed during Desert Storm is recorded on this F-14A of VF-1 from the USS Ranger (CV-61). **Below right:** The C.O. of VMF-323 identified his 1986 strikes against Surface to Air Missile (SAM) sites in Libya with these symbols. **Bottom:** During 1986, VA-27 displayed both the "E" for excellence and the Safety "S" on their A-7Es.

Right: VA-72 represented sorties by these camels, though none were shot. **Below:** Normal bombing sorties plus nine specific missile sites and one ship were recorded by VA-145. **Below right:** Lt. Horadan recorded these SAM strikes while with VAQ-137.



Below: The ten mine symbols are a vivid depiction of the mine clearing missions performed by HS-9. **Below right:** The numerous missions flown by VA-46 is evident by the "score board" on the side of the C.O.s A-7E. Many symbols were used during Desert Storm to record missions flown. This represents but a few as most squadrons had their own unique design.



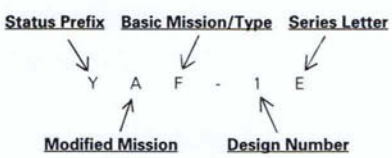
APPENDIX A
NEW SYSTEM OF NAVAL AIRCRAFT DESIGNATION

The system of designating US naval aircraft used since 1922 came to an end with the issuing of the Bureau of Weapons Instruction 13100.7, dated September 18, 1962. This directive required all naval aircraft to be redesignated under the system ordered by the Department of Defense on July 6, 1962. The apparent necessity of a single system of aircraft designation was a side effect of the concept of commonality being pursued by the Secretary of Defense. Under the new system, the aircraft manufacturer is no longer identified.

The new system basically was the then current Air Force system. While there were relatively few changes made by the Air Force, the Navy made a complete change. Aircraft models all started with the numeral 1, except for those aircraft on hand which were used by both services, in which case the existing Air Force designation applied. Thus, the FJ-3 became the F-1C, while the SNB-5P became the RC-45J. On the other hand, while the F4H-1 became the F-4B, the Air Force F-110A became the F-4C. It must be emphasized that the placement of the dash is critical to distinguish aircraft under the new system from those under the previous Navy system. For example, the F4B-4 was a Boeing biplane fighter of the mid 30's, while the F-4B was an early version of the Phantom II. To help people through the transition period, both designations were applied to naval aircraft for several years, with the old being placed below the new and enclosed in parentheses.

The new system consisted of a Status Prefix Symbol (letter), a Basic Mission Symbol (letter), a Design Number (numeral), a Modified Mission Symbol (letter), a Series Letter, and a Type Symbol (letter). The status letter, if applicable, indicates aircraft being used for experimentation and special or service test. This letter is placed at the immediate left of the modified mission letter or the Mission/Type Symbol, if no modified mission letter is applicable. The Modified Mission Symbol consists of a prefix letter placed at the immediate left of the basic mission or type letter. A basic mission letter denotes the primary function or capability of an aircraft. The symbol is an additional letter which designates helicopters and VSTOL aircraft. An aircraft identified by a Type Symbol, such as "H" for helicopter, is further identified by only one mission symbol whether it is the Basic Mission or a Modified Mission Symbol. The Basic Mission Symbol and Design Number are separated by a dash. A Design Number is assigned for each basic mission or type. New design numbers are assigned when an existing aircraft is redesigned to an extent that it no longer reflects the original configuration or capability. A Series Letter is assigned to each series change of a specific basic design. To avoid confusion, the letters "I" and "O" are not used as series letters. The Series Letter is always in consecutive order, starting with "A."

A typical designation would be:



This was the Y/FJ-4B under the Navy system.

TABLE I
STATUS PREFIX SYMBOLS

Letter/Title	Description
G Permanently Grounded	An aircraft permanently grounded, utilized for ground instruction and training.
J Special Test, Temporary	Aircraft on special test programs by authorized organizations, or on bailment contract having a special test configuration, or whose installed property has been temporarily removed to accommodate the test. At completion of the test, the vehicle will be returned either to its original configuration or to standard operational configuration.
N Special Test, Permanent	Aircraft on special test programs by authorized activities or on bailment contract, whose configuration is so drastically changed that return of aircraft to its original configuration or conversion to standard operational configuration is beyond practicable or economical limits.
X Experimental	Aircraft in a developmental, experimental stage, where basic mission and design number have been designated but not established as a standard vehicle for service use.
Y Prototype	Aircraft procured in limited quantities to develop the potentialities of the design.
Z Planning	Designations used for identification purpose during the planning or predevelopment stage.

When BUWEPS Instruction 13100.7 was issued on September 18, 1962, describing the new system of designating aircraft, it did not contain Status Prefix descriptions that covered Navy aircraft in the Test Aircraft Category. This required Project Development and Board of Inspection and Survey aircraft to be designated by a Y, and an * model designation prefix, respectively. This was rectified by Chief of Naval Operations letter Op-501B/js, dated April 9, 1963, which stated in part: "The following is to be added at the end of the "J" and "N" Status Prefix statements above.

"Aircraft in the Process of Board of Inspection and Survey (BIS), Preliminary Evaluation (PE), are considered in the Special Test, Temporary Category."

"SPECIAL TEST, PERMANENT Aircraft are designated by the Status Prefix Symbol "N." A number of Navy PROJECT DEVELOPMENT Aircraft are in SPECIAL TEST, PERMANENT Category."

TABLE II
MODIFIED MISSION SYMBOLS

Letter/Title	Description
A Attack	Aircraft modified to search out, attack, and destroy enemy land or sea targets, using conventional or special weapons. Also used for interdiction and close air support missions.
C Cargo/ Transport	Aircraft modified for carrying cargo and/or passengers.
D Director	Aircraft capable of controlling a drone aircraft or a missile.
E Special Electronic Installation	Aircraft possessing Electronic Countermeasure (ECM) capability or having electronic devices to permit employment as an early warning radar station.
H Search/ Rescue	Aircraft having special equipment for performance of search and rescue missions.
K Tanker	Aircraft having special equipment to provide in-flight refueling of other aircraft.
L Cold Weather	Aircraft modified for operation in the arctic and antarctic regions; includes skis, special insulation, and other ancillary equipment required for extreme cold weather operations.
M Missile Carrier	Aircraft modified for carrying and launching guided and nonguided missiles as part of the weapon system.
Q Drone	Aircraft capable of being controlled from a point outside the aircraft.
R Reconnaissance	Aircraft having equipment permanently installed for photographic and/or electronic reconnaissance missions.
S Anti submarine	Aircraft modified so that it can now function to search, identify, attack, and destroy enemy submarines.
T Trainer	Aircraft specifically equipped or modified for training purposes.
U Utility	Aircraft having a small payload utilized or modified to perform miscellaneous missions, such as carrying cargo or passengers, towing targets, etc.
V Staff	Aircraft having accommodations such as chairs, tables, lounge, berths, etc., for the transportation of staff personnel.
W Weather	Aircraft having meteorological equipment permanently installed.

TABLE III
BASIC MISSION AND TYPE SYMBOLS

Letter/Title	Description
A Attack	Aircraft designed to search out, attack, and destroy enemy land or sea targets, using conventional or special weapons. Also used for interdiction and close air support missions.
B Bomber	Aircraft designed for bombing enemy targets.
C Cargo/ Transport	Aircraft designed for carrying cargo and/or passengers.
E Special Electronic Installation	Aircraft possessing ECM capability or having electronic devices to permit employment as an early warning radar station.
F Fighter	Aircraft designed to intercept and destroy other aircraft and/or missiles.
*H Helicopter	A rotary-wing aircraft designed with the capability of flight in any plane; e.g., horizontal, vertical, or diagonal.
K Tanker	Aircraft designed for in-flight refueling of other aircraft.
O Observation	Aircraft designed to observe (through visual or other means) and report tactical information concerning composition and disposition of enemy forces, troops, and supplies in an active combat area.
P Patrol	Long range, all weather, multi-engine aircraft operating from land and/or water bases, designed for independent accomplishment of the following functions: anti submarine warfare, maritime reconnaissance, and mining.
S Anti submarine	Aircraft designed to search out, detect, identify, attack, and destroy enemy submarines.
T Trainer	Aircraft designed for training personnel in the operation of aircraft and/or related equipment, and having provisions for instructor personnel.
U Utility	Aircraft used for miscellaneous missions, such as carrying cargo and/or passengers, towing targets, etc. These aircraft include those having a small payload.
*V VTOL and STOL	Aircraft designed for vertical take-off or landing with no take-off or landing roll, or aircraft capable of take-off and landing in a minimum prescribed distance.
X Research	Aircraft designed for testing configurations of a radical nature. These aircraft are not normally intended for use as tactical aircraft.
*Z Airship	A self-propelled lighter-than-air aircraft.

* Type Symbols

TABLE IV
REDESIGNATION OF NAVAL AIRCRAFT
Effective September 18, 1962

ATTACK SERIES

Current	Former
A-1E	AD-5
EA-1E	AD-5W
EA-1F	AD-5Q
A-1G	AD-5N
A-1H	AD-6

A-1J	AD-7
A-2A	AJ-1
YA-3A	Y/A3D-1
A-3A	A3D-1
YEA-3A	Y/A3D-1Q
EA-3A	A3D-1Q
YRA-3A	Y/A3D-1P
A-3B	A3D-2
EA-3B	A3D-2Q
YRA-3B	Y/A3D-2P
RA-3B	A3D-2P
TA-3B	A3D-2T
YA-4A	Y/A4D-1
A-4A	A4D-1
YA-4B	Y/A4D-2
A-4B	A4D-2
YA-4C	Y/A4D-2N
A-4C	A4D-2N
A-4E	A4D-5
YA-5	Y/A3J-1
A-5A	A3J-1
A-5B	A3J-2
RA-5C	A3J-3
A-6A	A2F-1
EA-6A	A2F-1H

BOMBER SERIES

Current	Former
UB-26J	JD-1
DB-26J	JD-1D

CARGO/TRANSPORT SERIES

Current	Former
RC-45J	SNB-5P
TC-45J	SNB-5
C-47	R4D-5
EC-47H	R4D-5Q
LC-47H	R4D-5L
SC-47H	R4D-5S
TC-47H	R4D-5R
VC-47H	R4D-5Z
C-47J	R4D-6
EC-47J	R4D-6Q
LC-47J	R4D-6L
SC-47J	R4D-6S
TC-47J	R4D-6R
VC-47J	R4D-6Z
TC-47K	R4D-7
VC-54N	R5D-1Z
C-54P	R5D-2
VC-54P	R5D-2Z
C-54Q	R5D-3
VC-54Q	R5D-3Z
C-54R	R5D-4R
C-54S	R5D-5
VC-54S	R5D-5Z
C-54T	R5D-5R
C-117D	R4D-8
LC-117D	R4D-8L
TC-117D	R4D-8T
VC-117D	R4D-8Z
C-118B	R6D-1
VC-118B	R6D-1Z
C-119F	R4Q-2
C-121J	R7V-1
EC-121K	WV-2
YEC-121K	Y/WV-2
WC-121N	WV-3
EC-121L	WV-3E
EX-121M	WV-2Q
C-130F	GV-1U
KC-130F	GV-1
LC-130F	C-130BL
C-130G	C-130E
C-131F	R4Y-1
C-131G	R4Y-2
C-140C	UV-1
C-1A	TF-1
EC-1A	TF-1Q
C-2A	NEW COD

SPECIAL ELECTRONIC INSTALLATION SERIES

Current	Former
E-1B	WF-2
E-2A	W2F-1

FIGHTER SERIES

Current	Former
F-111B	TFX
F-1C	FJ-3
DF-1C	FJ-3D
MF-1C	FJ-3M
DF-1D	FJ-3D2
YF-1E	Y/FJ-4
F-1E	FJ-4
YAF-1E	Y/FJ-4B
AF-1E	FJ-4B
F-2C	F2H-3
F-2D	F3H-4
YF-3B	Y/F3H-2
F-3B	F3H-2
MF-3B	F3H-2M
F-3C	F3H-2N
F-4A	F4H-1P
F-4B	F4H-1
RF-4B	F4H-1P
YF-6A	Y/F4D-1
F-6A	F4D-1
DF-6A	F4D-1D
YF-7A	Y/F2Y-1
YF-8A	Y/F8U-1
F-8A	F8U-1
DF-8A	F8U-1D
QF-8A	F8U-1KD
YRF-8A	Y/F8U-1P
RF-8A	F8U-1P
TF-8A	F8U-1T
F-8B	F8U-1E
YF-8C	Y/F8U-2
F-8C	F8U-2
YF-8D	Y/F8U-2N
F-8D	F8U-2N
YF-8E	Y/F8U-2NE
F-8E	F8U-2NE
DF-8F	F8U-1
DF-9F	F9F-5KD
F-9F	F9F-6
DF-9F	F9F-6D
QF-9F	F9F-6K
QF-9G	F9F-6K2
F-9H	F9F-7
F-9J	F9F-8
YAF-9J	Y/F9F-8B
AF-9J	F9F-8B
YTF-9J	Y/F9F-8T
TF-9J	F9F-8T
RF-9J	F9F-8P
F-10A	F3D-1
F-10B	F3D-2
EF-10B	F3D-2Q
MF-10B	F3D-2M
TF-10B	F3D-2T2
YF-11A	Y/F11F-1
F-11A	F11F-1

HELICOPTER SERIES

Current	Former
UH-1E	HU-1E
UH-2A	HU2K-1
UH-2B	HU2K-1U
YSH-3A	Y/HSS-2
SH-3A	HSS-2
VH-3A	HSS-2Z
TH-13L	HTL-4
TH-13M	HTL-6
TH-13N	HTL-7
UH-13P	HUL-1
HH-13Q	HUL-1G
UH-13R	HUL-1M
CH-19E	HRS-3
UH-19F	HO4S-3
HH-19G	HO4S-3G
UH-25B	HUP-2
UH-25C	HUP-3
LH-34D	HUS-1L
YSH-34G	Y/HSS-1
SH-34G	HSS-1
UH-34D	HUS-1
VH-34D	HUS-1Z
UH-34E	HUS-1A
HH-34F	HUS-1G
SH-34H	HSS-1F
YSH-34J	Y/HSS-1N
SH-34J	HSS-1N
CH-37C	HR2S-1
UH-43C	HUK-1
OH-43D	HOK-1
TH-43E	HTK-1
CH-46A	HRB-1
QH-50A	DSN-1
QH-50B	DSN-2
QH-50C	DSN-3
XH-51A	NEW (Rigid Rotor)

OBSERVATION SERIES

Current	Former
O-1B	OE-1
O-1C	OE-2

PATROL SERIES

Current	Former
P-2D	P2V-4
P-2E	P2V-5F
DP-2E	P2V-2FD
EP-2E	P2V-5FE
SP-2E	P2V-5FS
P-2F	P2V-6
MP-2F	P2V-6M
TP-2F	P2V-6T
P-2G	P2V-6F
YP-2H	Y/P2V-7
P-2H	P2V-7
SP-2H	P2V-7S
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YP-3A	Y/P3V-1
P-3A	P3V-1
QP-4B	P4Y-2K
P-5A	P5M-1
SP-5A	P5M-1S
TP-5A	P5M-1T
P-5B	P5M-2
SP-5B	P5M-2S

ANTI SUB SERIES

Current	Former
S-2A	S2F-1
YS-2A	Y/S2F-1
TS-2A	S2F-1T
S-2B	S2F-1S
S-2C	S2F-2
RS-2C	S2F-2P
US-2C	S2F-2
S-2D	S2F-3
S-2F	S2F-1S1

TRAINER SERIES

Current	Former
T-1A	T2V-1
YT-2A	Y/T2J-1
T-2A	T2J-1
T-2B	T2J-2
T-28A	T-28A
T-28B	T-28B
DT-28B	T-28D
T-28C	T-28C
T-33	TV-2
DT-33B	TV-2D
DT-33C	TV-2KD
T-34B	T-34B
YT-34B	Y/T-34B
T-39D	T3J-1

UTILITY SERIES

Current	Former
U-1B	UC-1
U-6A	L-20A
U-11A	UO-1
HU-16C	UF-1
LU-16C	UF-1L
HU-16D	UF-2
HU-16E	UF-2G

VERTICAL TAKE-OFF SERIES

Current	Former
X-22A	VTOL

AIRSHIP SERIES

Current	Former
EZ-1B	ZPG-2W
SZ-1B	ZPG-2
EZ-1C	ZPG-3W

On August 5, 1964, Change 1 to BuWeps Instruction 13100.7 made the following changes to the description of the Modified Mission Symbol E and Basic Mission and Type Symbols E and F.

Modified Mission Symbol E was now to read: "Aircraft equipped with electronic devices for employment in the following roles:

a. Electronic countermeasures.
b. Airborne early warning radar.
c. Airborne command and control including communications relay aircraft.
d. Tactical data communications link for all non autonomous modes of flight."

The Basic Mission and Type Symbol E was changed to:

"Aircraft equipped with electronic devices requiring employment in the following roles:

a. Electronic countermeasures.
b. Airborne early warning radar.
c. Airborne command and control including communications relay aircraft.
d. Tactical data communications link for all non autonomous modes of flight."

The following was added to Basic Mission and Type Symbol F: "... includes multi purpose aircraft also designed for ground support missions; for example, interdiction and close air support."

APPENDIX B
BLUE ANGELS

Continuing the study of the nonregulation paint schemes and paint used on the Blue Angel aircraft during the 1960s we find the Grumman F11F Tigers were painted with a mixture of one part Insignia White 17875 to two parts Insignia Blue 15044. With all the variables in paint batches, it would be impossible to assign any relevant number to this color. Yet, the yellow markings were painted with Orange Yellow 13538. Grumman Aircraft Engineering Corporation Drawing 98 RDF 113 A identified as "Final Finish (Rework) F11F-1 Blue Angel" specifies the changes to be made from the scheme applied to fleet aircraft. The overall aircraft was to be painted Blue Angel Blue with their distinctive markings in Yellow. The red surfaces of wing slats, flaps and speed brakes were to remain as on fleet aircraft, as were the white wheel wells. The landing gear struts, however, were to be painted Blue Angel Blue. The leading edge of the wings, stabilizer, fin and inlet ducts were to be polished aluminum. The aluminized Corogard areas on fleet aircraft were retained. As in the past, the bulk of the lettering applied to the Tigers was of a nonregulation size and style.

In keeping with the changes in the fleet, the Blue Angels switched to the F-4J Phantom II in 1969. This terminated the long Grumman period and began the McDonnell Douglas era. This also inaugurated a period of specified manufacturers paint by their product number. While Yellow was still specified to match 13538, it was identified as De Soto Company number 826-L-001. The Blue was identified as De Soto number 823-L-722. As had been done in the past, the various markings were nonregulation in size and shape.

In 1972, the Phantom II was replaced by the Douglas designed A-4 Skyhawk. The drawings prepared by the Naval Air Rework Facility, NAS Pensacola, for the painting of these aircraft show that they were to be painted overall using Finch Paint and Chemical Company Blue Gloss number 643-14-14. This was to include the interior surfaces of flaps, spoilers, speedbrakes and landing gear doors. The interior of intake ducts, landing gear struts, landing gear wheels, and landing gear actuators (less piston rods) were to retain the glossy Insignia White 17875. The tips of wings, stabilizer and fin, as well as the distinctive markings and lettering, were to be Finch Co. paint number 643-13-6. The leading edge of inlet ducts and wings were to be left unpainted while the leading edge of the vertical and horizontal stabilizers were coated with aluminized polyurethane.

While all this sound very official, and would lead a person to believe that this scheme could be easily duplicated, the facts are otherwise. During the period 1974 to 1986, under controlled conditions, six aluminum plates were painted at the time a Blue Angel aircraft was being processed through the shops. The following chart shows the variation in the Munsell numbers for the various years. This should, at last, end any discussion as to the "exact color" for a specific Blue Angel aircraft.

DATE	MUNSELL No.	
1974	4.64PB	2.45/5.47
1980	5.68PB	1.77/2.30
1982	5.70PB	1.85/7.62
1983	5.70PB	2.12/6.49
1984	5.10PB	2.07/6.44
1986	5.64PB	1.19/7.24

To further confuse the issue, a copy of a letter from the Blue Angel Public Affair Officer dated August 27, 1980, recently provided by Robert Candler, states that "'Ameron' Jet-glo enamel dark blue satin blue/flight blue stk. no. 572-511 and 'Ameron' Wildcat yellow/carnival yellow stk. no. 574-570 was being used on their aircraft." It is assumed that all of the above names were synonymous for the given color numbers.

After a long tour, the A-4 Skyhawk was finally phased out in 1986 and replaced by the McDonnell Douglas F/A-18 Hornet. With the advent of the Hornet, the paper trail becomes more difficult. Repeated requests by the author to McDonnell Douglas for information have been ignored. However, another letter provided by Mr. Candler from his Representative in Congress, based on information from a Blue Angel spokesman, advises that Pratt & Lambert now provides the paint but the letter fails to mention any names or numbers by which the colors can be ordered. The author is deeply grateful to Mr. Candler for his assistance and appreciative that it was not necessary to seek Congressional action to obtain the remainder of the data in this series.

Top: The special paint scheme for the Blue Angels Hornets is recognized world wide. The yellow stripe on top of the fuselage shows to advantage in this photo. **Above:** Always popular, the Blue Angels insignia has changed little through the years.

Top: The aircraft paint scheme has remained quite consistent with the Blue Angels but with variations necessary due to the configuration of the aircraft being flown. This shows the scheme as applied to the F-11F-1/F-11A.
Above: While nonregulation, the scheme applied to the F/A-18 will always be loved and recognized by the general public.

APPENDIX C
COLORS FOR US NAVAL AIRCRAFT

During the period January 1, 1960, to December 31, 1992, there have been a greater variety of paint colors used on US Navy and Marine Corps aircraft than in any comparable previous period. The introduction of MIL-STD-2161(AS) introduced many of these colors. Due to this large number of colors, not all are identified with paint samples in this volume. However, all are identified in the accompanying chart, and samples of those missing colors can be found in the previous Volume 3.

Federal Standard 595B COLORS USED IN GOVERNMENT PROCUREMENT has been used as the reference to continue the tracking of colors through the earlier systems. This standard was issued December 15, 1989, to supersede the earlier Federal Standard 595A COLORS. The five-digit identification system has been continued, with new colors being added as necessary. It was the original intent that color names would no longer be used upon the issue of Federal Standard 595A. Cross references were provided to show what was intended to be the same color as in the earlier system, which of course had to use the color names. As everyone was familiar with these names, they continued to be used in general conversation, with the five-digit number being used for identification purposes in official directives or when ordering paint. As new colors were introduced, names were assigned unofficially which have become as firmly entrenched as the earlier ones. When some of these colors were introduced in the painting of Navy/Marine Corps aircraft, these unofficial names were carried over. Unfortunately, the new colors do not have names and are only identified by their five-digit number. There have been names given to some of the newer colors, such as Dark Gunship Gray (36081), Gunship Gray (36230), Dark Ghost Gray (36320), and Light Ghost Gray (36375), which can be found in other publications. These names, however, have not been adopted by the color standard nor are they used in any of the Navy directives. Therefore, you will not find these names in the text of this volume, but just the five-digit number to identify the color. They have, however, been included in the following table for those who wish to track color names.

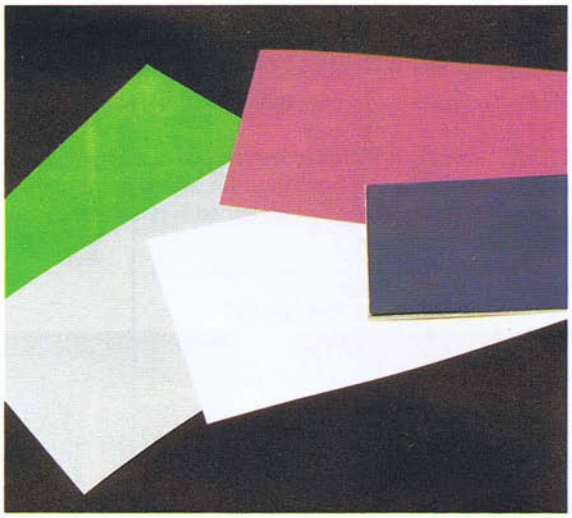
There is some confusion in the directives with the color 35237. In some instances it is referred to as blue, while in others as medium gray. In all cases, 35237 applies to a blue gray color.

In an effort to present a complete and accurate record of colors used on US naval aircraft, all colors in this volume, as in the previous three, are identified by their number in the Munsell color system. These numbers have been derived through laboratory analysis rather than through visual comparison.

In the chart on the following pages, the right-hand column gives the Munsell number for the colors still being used that can be traced back to the 1933 Bureau of Aeronautics color master. The Army/Navy Aeronautic Bulletins 157 and 166 were introduced in 1943 and identified the colors with a three-digit system. These were basically a direct carry-over from the previous two-digit system and their Munsell numbers show little change. In 1950, Federal Standard TT-C-595 was introduced in an effort to consolidate all of the various Federal color standards being used by various branches of the Federal government, and to establish a four-digit color number system. This, in turn, was replaced with Federal Standard 595A, and now 595B. The left three columns show this 595B series of numbers, their Munsell number, and color name, where applicable. As the various systems were introduced, a cross-reference was issued to show the previous number(s) which the current number superseded. In some cases, two color numbers were combined under the new number, and several of the earlier colors were dropped during the compilation of TT-C-595, making a direct comparison impossible. There have been numerous attempts to determine which color most nearly matches a previous color. Due to the numerous variations found in old color samples, variation in viewing conditions, expertise of the viewer, and other variables, I have made no such attempt to second-guess these matches, but have relied on the published documents as to what was intended.

Fed Spec 595B	Munsell 595B Series		
10049	1.4YR	2.38/3.25	
11136	5.6R	3.9/10.1	
12197	8.6R	5.0/12.9	
13538	9.6YR	7.7/13.3	
14079	3.17GY	2.81/1.79	
14097	5.57GY	3.59/2.64	
15044	6.0PB	2.6/1.6	
16081	1.2BG	3.8/0.2	
16440	7.9Y	6.77/0.55	
16473	8.8BG	6.9/06	
17038	3.8Y	2.4/0.1	
17043	4.2Y	4.30/5.1	
17178	2.2B	8.3/0.2	
17875	2.0BG	9.3/0.3	
17925	8.47GY	9.47/0.37	
26081	10.0G	3.7/03	
27038	3.2B	2.5/0.1	
28913	7.4R	5.3/17.3	
28915	9R	6.49/23.0	
31136	5.5R	3.9/11.7	
34064	0.34GY	3.09/0.96	
34088	6.644	3.95/1.80	
34087	4.7Y	3.6/2.1	
34095	4.1GY	3.42/2.45	
34151	1.1GY	4.2/3.5	
35044	7.7PB	2.4/1.7	
35237	7.18B	5.42/1.53	
36081	3.12BG	3.68/0.33	
36099	8.54B	3.66/1.08	
36118	3.3PB	4.1/1.1	
36231	9.9BG	5.3/0.4	
36320	1.88PB	5.98/1.73	
36375	2.31PB	6.51/1.45	
36440	4.2GY	7.1/0.3	
36473	4.78BG	7.67/0.87	
36495	6.31BG	7.92/0.38	
37038	2.7G	2.3/0.0	
37142	2.8RP	4.31/8.61	
38901	1.46G	5.57/12.69	

1. Also called Dark Gray
2. Combined with ANA 1775 to make 17038
3. Not carried over to TT-C-495
4. Color master no longer available
5. Combined with ANA 620 to make
6. Also called Coin Gray



Original paint and color samples were used in matching all the color paint chips found in this volume. A sample of these originals are shown right.

COLORS FOR NAVAL AIRCRAFT
1911 – 1993

Color Name	Fed Spec TT-C-595	Munsell ANA Series		ANA Bulletin 157/166	Munsell 1933 Series	
Maroon	1010/1015	1.4YR	2.38/3.25	510		
Insignia Red	1105	7.65R	3.13/11.5	509	7.5R	3.23/11.7
International Orange	1205	9.3R	4.49/13.7	508	9.3R	4.87/12.5
Orange Yellow	1310/1315	1.2Y	7.13/13.05	506	1.4Y	7.72/15.05
Presidential Olive Green						
Field Green						
Insignia Blue	1510	4.9PB	1.25/2.95	502	5.8PB	1.16/3.9
Engine Gray(1)	1610	2.7B	3.10/0.35	513	7.6B	3.14/0.5
Light Gray						
Aircraft Gray	1645	2.4B	6.68/08	512	0.4PB	6.82/0.9
Black Jet	1775	0.9PB	1.34/0.45	515	2.0PB	0.68/0.6
	1770(2)	0.8PB	0.68/0.5	622		
Gold						
Aluminum	1760				5B	7.58/0.3
Insignia White	1755	4.2GY	8.93/0.6	511	4.5GY	9.34/0.5
Insignia White						
Seaplane Gray	(3)	(4)		625		
Instrument Black	2710	2.4PB	2.30/0.4	514	1.5PB	1.75/0.4
Fluorescent Red Orange	(3)	(4)		633		
Fluorescent Yellow Orange	(3)		(4)	634		
Bright Red	3115	5.2R	4.16/10.65	619		
Dark Olive Green						
Olive Drab						
Olive Drab	3412	7.0Y	3.62/1.5	613		
Marine Corps Green						
Interior Green	3430	3.3GY	4.55/3.6	611		
Insignia Blue	3505	5.7PB	2.47/1.55	605		
Blue Gray						
Gunship Gray Dark						
Dark Gray						
Dark Sea Gray	3610	3.7PB	3.94/0.95	603		
Dark Gull Gray	3615	7.3B	5.36/0.5	621		
Dark Ghost Gray						
Light Ghost Gray						
Light Gull Gray	3635	4.55GY	7.08/0.27	620		
Light Gray	(5)	2.4GY	6.51/0.5	602		
Gull Gray(6)						
Light Gray						
Black	3725	3.2PB	2.28/0.1	604		
Magnolia						
Fluorescent Green						

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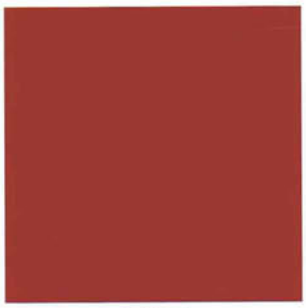
Trombecky	84T, 141T
Tunney, James	90B
US Marine Corps	17T, 21B, 22M, 22B, 34T, 35T, 35M, 67M, 81M, 96B, 98T, 101T, 115T, 119T, 121T, 125T, 140T, 148T, 161B, 170B, 184T
Weathers, Joseph H.	42M, 183T
Wilburn, Bryan H.	153B, 162T

Throughout this series, colors have been identified by the appropriate Munsell number and the government system in effect at the time under discussion. The widely used Munsell system consists of three groups of numbers representing the three basic qualities of color — hue, lightness and color intensity. While it is an exact system of color identification, the system can appear difficult for the untrained.

The current Federal Standard 595B ***Color***, on the other hand, consists of five digits. The first digit represents the degree of gloss. 1 being a glossy color, 2 a semigloss and 3 a nonspecular or flat color. The second digit in the number represents the selected color classification. While the last three digits indicate the approximate order of increasing reflectance and have been assigned nonconsecutively to provide space between colors for future use.

10049



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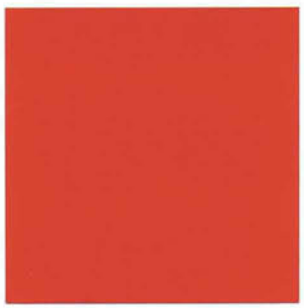

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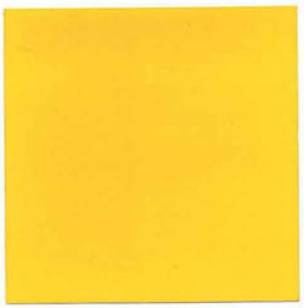

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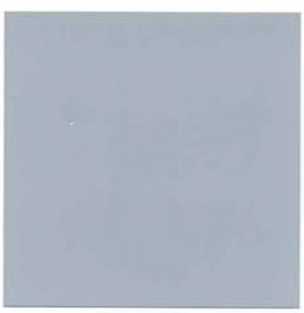

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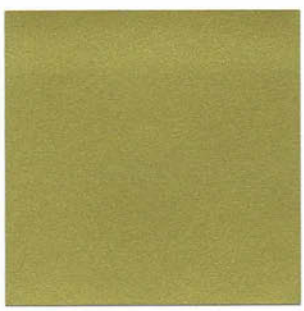

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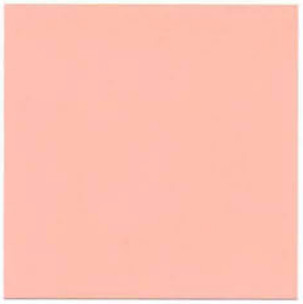

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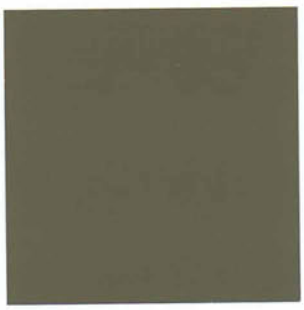

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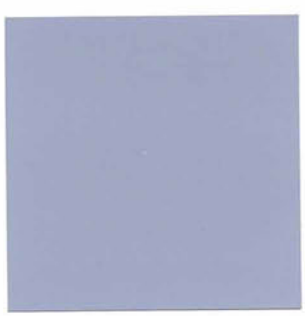

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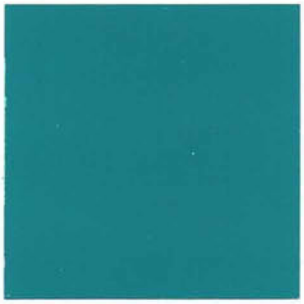
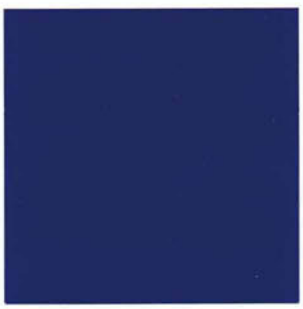


38901

BLUE ANGELS 1974

BLUE ANGELS 1980

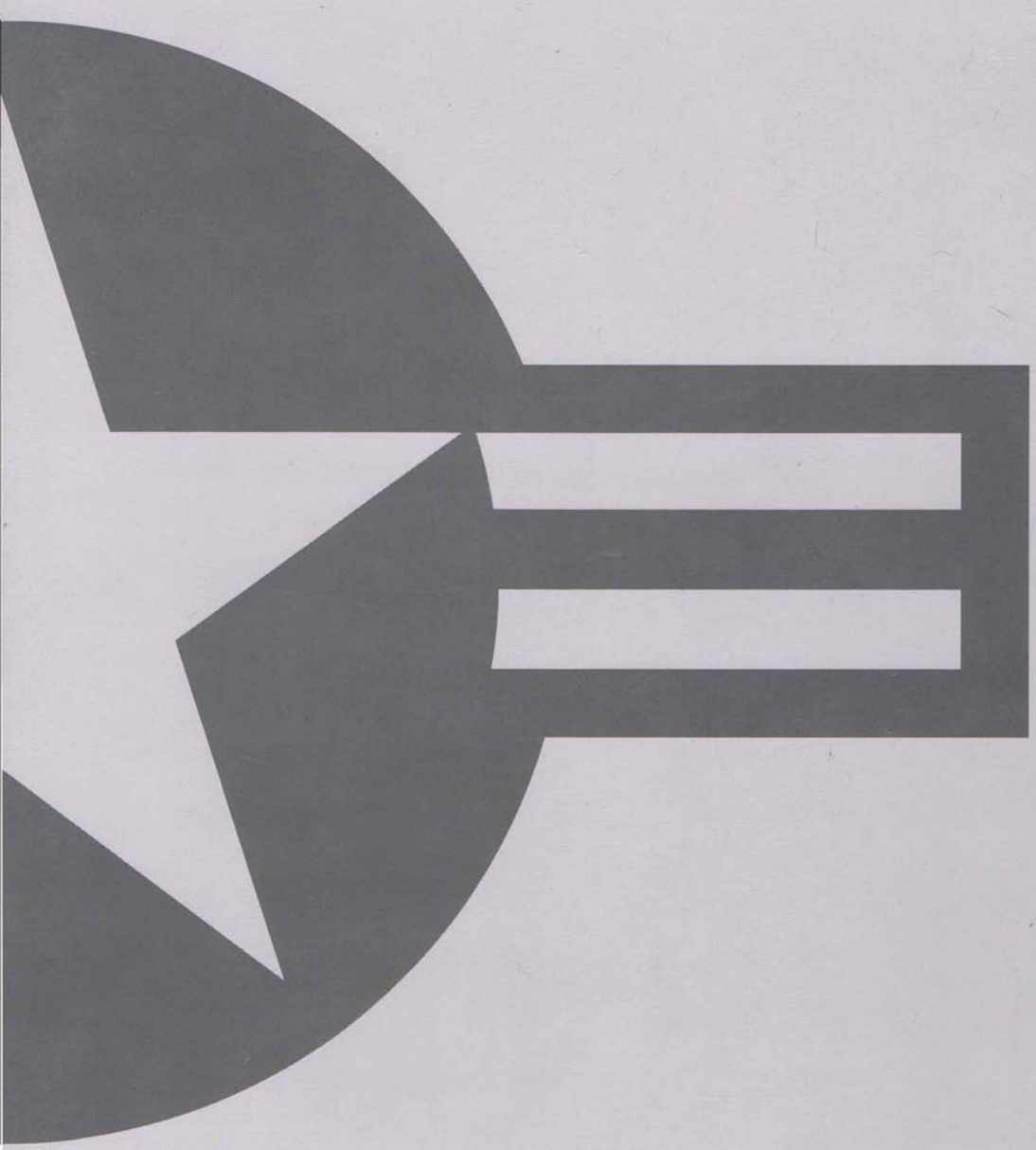


BLUE ANGELS 1982

BLUE ANGELS 1983

BLUE ANGELS 1984

BLUE ANGELS 1986



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