



FIGURE 1 Standard position of racing numbers. Second number of registration was deleted in 1949 but could be retained on fabric-covered planes until next repainting or covering. (Airplane is Steve Wittman's original "Buster" of early 1930's, rebuilt as 85 h.p. Goodyear racer in 1947, which is now in the National Air Museum.)



FIGURE 2 Use of registration on fuselage became optional during Korean War. Note separate lettering by cockpit to indicate experimental status following deletion of second letter from registration. (Airplane is the Story homebuilt, powered by a 65 h.p. Continental engine.)

The Numbers Game

Identification markings on aircraft tell you a great deal if you know how to read them. Changes constantly taking place in numbering system

Numbers, paint, and airplanes have been getting together in a bewildering array for over half a century now. These are not the arbitrary applications that they may sometimes appear to be. There is a system behind each one, but usually only one system is understood by a particular pilot group or category. This article will touch lightly on several that the person with average aviation interests is apt to encounter on a visit to the municipal airport.

The first numbers displayed to the public on airplanes were the large numerals used to identify the individual machines in the early flying meets and air races starting in 1910. At that time the numbers were usually painted on the vertical tail surfaces because the birdcage fuselages of the time did not have solid sides.

The use of large numbers to identify racers continues to this day with a standardized pattern—verti-

cally on each side of the fuselage and chordwise on the upper left and lower right wings so that they can be read as the planes pass the pylons in a vertical bank on a left-hand circuit (Fig. 1).

In earlier days, the numbers were assigned for each race but now each U.S. racer has its own number assigned to it by the racing association.

These racing numbers were about all that were to be seen on U.S. civil

Combination Of These Markings Proposed

FAA's proposal 60-5 would require fuselage markings, as shown on the Piper Caribbean (top), and also identification on the underside of the left wing, such as carried on the Cessna Skylark at the bottom



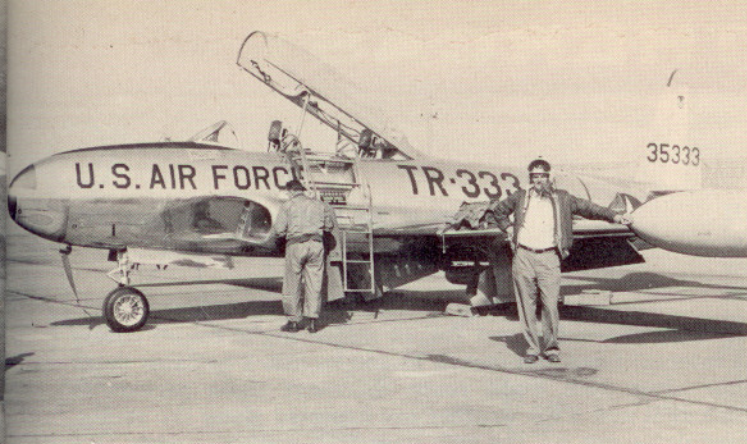


FIGURE 3 A numerical coincidence. Author Peter Bowers prepares for flight in a USAF T-33, serial number 53-5333 as indicated by tail number. TR on fuselage identifies airplane as a T-33; the three threes are the last digits of the tail serial number

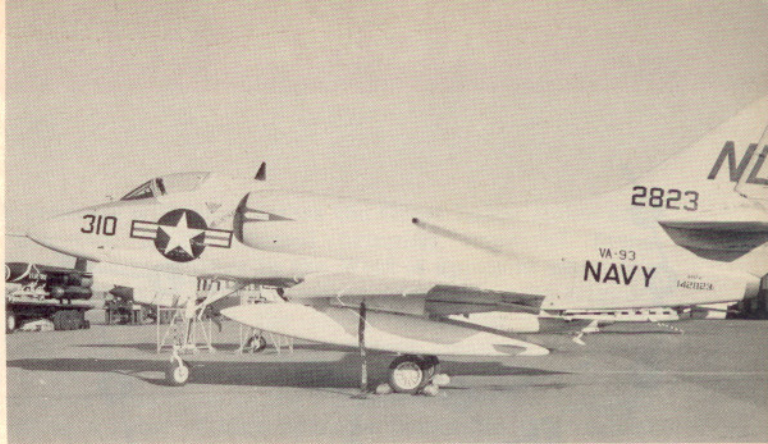


FIGURE 4 Navy's numbering system is different from the Air Force. This Navy Douglas A4D has NG group markings on the fin above 2823, which matches last four digits of full serial number 142823. The 310 on nose indicates the plane is the 10th one of the 3rd squadron in the group

airplanes until January, 1927. International civil aircraft markings had been adopted at Versailles in 1919, but while the United States went along with some of the rules adopted at the time, it did not subscribe to the licensing and registration requirements. Each nation was assigned a basic identifying letter—"G" for Great Britain, "F" for France, and "N" for the United States—to be followed by a combination of four letters. These really made alphabet soup of the airplanes, with the full registration as large as possible on the upper and lower wing surfaces and the sides of the fuselage and the national letter on each side of the vertical tail and on each side of the horizontal tail both top and bottom. Through the years these have been reduced in size and the letter deleted from the tail.

This five-letter system was modi-

fied for many countries in 1929 to an arrangement of two national identification letters and three registration. Canada now uses CF for the prefix instead of the old G-CA, the second and third letters originally having stood for Canada in the British Empire registrations. This left an effective combination of only two letters, which could accommodate only 26 times 26 airplanes, or 676, at which point the original system broke down. Mexico is unique in using two double prefixes, XA and XB.

The U.S. did not adopt licensing and registration requirements until the end of 1926, although an unofficial letter system based on the world standard had been used for a short time starting in 1923. The new U. S. system started with the national letter "N" followed by a second letter indicating the status of the airplane—"X" for Experimental, "R" for Re-

stricted, and "C" for Commercial or unlimited license, followed by a registration number. On some airplanes not allowed to fly out of the country because of various restrictions, the "N" was deleted. Aircraft merely registered but not licensed used only the number. These numbers appeared on each side of the rudder and on the upper right and lower left wing, where they remain on many planes at the present time. The "Registered Only" category disappeared in the early 1930's and all airplanes have subsequently carried at least one let-

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by PETER M. BOWERS

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Identification marking of civil aircraft in the United States can now be done in one of two ways, depending upon which Federal regulation the plane owner chooses to follow.

If he elects to mark his aircraft in accordance with Parts 1.102 and 1.103 of the Civil Air Regulations, the identifying letters and numerals, which are a minimum of 20 inches high, are affixed on the upper side of the right-hand wing and the under side of the left wing. The same marking, two inches or more high, must be carried on both sides of the upper half of the vertical tail. (In the event there is no vertical tail, such as the

Beechcraft *Bonanza*, the marking is placed on the fuselage.)

A Special Civil Air Regulation, SR-412B, allows the owner an alternative. He may place the identification on both sides of the fuselage or on the vertical tail fin. (The letters and numerals must be a minimum of 12 inches high.) If he selects this method, no additional markings on either the tail or wings are required. SR-412B expires Dec. 31, 1960. Unless a new regulation is adopted, aircraft owners must follow Parts 1.102 and 1.103 to comply with the law.

FAA now has pending a substitute rule, Draft Release 60-5, which would

retain the fuselage marking and, in addition, require the number to appear on the under side of the left wing. (Part 1.102 requires the number to appear on the upper side of the right wing and the under side of the left wing.)

The proposed rulemaking was announced in the Federal Register on March 31, 1960, but at this writing no regulation has been announced. FAA recently revealed that more than 400 individuals and associations had filed comments on the proposal, with a large number opposing any change in the identification marking system.

Numbers Game

(Continued from page 39)

ter. In 1949, the second letter was dropped and only the "N" remained; the status of nonstandard airplanes being indicated by separate lettering such as "Experimental" or "Restricted" stenciled alongside the cockpit or entry door (Fig. 2).

As the numbers passed 10,000 in 1929, it was decided that a five-digit number was too hard to read and remember, so suffix letters, starting illogically with "E", then "H", "K", and so on, were added to registrations with a maximum of three numbers. Increased production soon used up most of the available three-number-and-letter combinations and five-number registrations without suffixes were adopted by necessity in the early 1930's, reaching a little over 30,000 by World War II. Postwar sales and new production soon threatened to bring six-digit numbers, so suffixes were again adopted and used with four-digit numbers. A few letters not previously used appeared originally

with three digits and moved right into four.

An apparent inconsistency in numbering sequence resulted from the fact that numbers were assigned in blocks to various FAA regions throughout the country for local issue. These blocks were used up at different rates, with the result that some "prewar" numbers were applied to airplanes in 1948. Another inconsistency results from the FAA policy of permitting owners to use any number they want as long as it is not on the active list at the time of application. A few old numbers, long since canceled, have been put back into circulation this way. Don't try to get anything from N-1 through 500, however. These are reserved for FAA aircraft.

In the last few years the special number fans have gotten another break—FAA now permits the use of two suffix letters. American Airlines started the practice with its first DC-7, N301AA, and many other airlines, business firms, and private individuals have followed suit by using their own initials. If you want something like N1HP for "Hot Pilot" you can get it at a cost of \$10 through the FAA Aircraft and Airman Records Section, 621 North Robinson Avenue, Oklahoma City 2, Okla.

The only major change in the application of U.S. civil aircraft registrations took place after the adoption of Air Defense Identification Zones

(ADIZ) during the Korean war. To simplify identification from jet fighters sent up to investigate unknowns, an option was given to put the registration on the side of the fuselage in letters at least one foot high. With the numbers in this location, the old style wing and tail numbers could be deleted. Both methods are legal at the present time.

The closest thing to a civil registration number to be seen on a military airplane is the serial number, which identifies an individual airplane within the entire service. Operational service markings form a complex subject that will not be discussed here. Simple numbering systems were adopted by both the U.S. Army and Navy, who identified their machines in order of procurement with large block figures painted on each side of the fuselage. The Navy usually used the prefix "A-for-Airplane" well into the 1920's while the Army began to add the prefix "S.C.-for-Signal Corps" in 1918, changing it to "A.S.-for-Air Service" after the war and to "A.C.-for-Air Corps" in 1926.

Army numbers had reached 69,000 by 1921, when the system was changed. Incidentally, that number did not mean that 69,000 Army airplanes had been built. The numbers were assigned when the airplanes were ordered, and post-armistice cancellations eliminated many of them. The new system identified the airplanes on a fiscal year procurement basis; 22-1 was the first airplane ordered in the fiscal year of 1922 (July 1, 1921 through June 30, 1922). This system is still in use.

Army combat squadrons in World War I did away with the serial number on the fuselage and used individual block numerals to identify each airplane within the squadron. This system was used after World War I and through World War II to identify training planes at various schools. Just before World War II, a letter was added to identify each base in the training command. The Navy also used airplane-on-the-field numbers rather than serial numbers to identify school machines through World War II.

The big serial number on the side of most Army fuselages got smaller and smaller in the middle and late 1920's and disappeared altogether in 1931 except for a tiny stencil near the cockpit. Pearl Harbor brought big numbers back in a modified form that is still used. The serial number was painted on each side of the vertical tail but without the first digit of the "year" number or the dash. The serial 42-200 appeared as 2200. Since four digits were used for all Army radio call numbers, low numbers were built up by adding zeroes so that 42-1 appeared as 2001. Five digits are now the minimum.

No conflict was anticipated between airplanes 42-100 and 52-100 since military airplanes were not expected to last more than ten years. The problem has appeared in recent years, however, and was met by adding the prefix letter "O-for-Obsolete" and a dash to the regular serial identification, 42-100

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At the end of World War II the Army (Air Force since 1948) came out with something extra, called "buzz numbers," added to each side of the fuselage and the underside of the wing. Two letters were used, the first to identify the type of airplane, as "T-for Trainer," "P-for-Pursuit" (later "F-for-Fighter"), and so on. The second letter identified the model number of the airplane in the particular type classification and the number consisted of the last three digits of the airplane serial number. This system is used today only on fighter, trainer, and liaison types (Fig. 3).

The Navy, meanwhile, kept right on with its consecutive numbering, reaching 9999 in 1934 and starting over again with 0001. Prewar II procurement speeded things up, and a third series, starting 00001, was in effect before Pearl Harbor. This series is still going and is approaching 150,000. The large Navy serial number disappeared from the sides of the fuselage in the 1920's and was painted in small size on the vertical fin until late World War II, when it moved back to the fuselage under the horizontal stabilizer, still in small size. For convenience, the last four digits of the serial, used as radio call letters, have been added in large highly-visible figures to the side of the vertical tail, the full serial in small figures remaining on the fuselage (Fig. 5).

Other figures appearing on current Navy planes are one or two large letters on the vertical tail that identify the operating group or aircraft carrier and a number (usually on the nose) that identifies the individual airplane within the organization.

With this information in mind, look around the next time you go to the airport and see if those numbers on the various airplanes don't take on a new meaning for you. END

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THE AUTHOR

Peter M. Bowers (AOPA 54408), author of "The Numbers Game," is one of the country's leading authorities on antique airplanes. His interesting articles in this field, such as the popular "Yesterday's Wings" which appears from time-to-time in The PILOT, are authoritative and accurate and show the results of painstaking research. Aircraft markings rank high among his interests. Pete Bowers' aviation career really started back in 1928, when he received a ride in an OX-5-powered Travel Air as a 10th birthday present, but he did not solo an airplane until 20 years later. The delay, according to Pete, was not of his choosing. He started taking flying lessons at the age of 16, but school, finances and other complications delayed his soloing until he was about 30. Pete is an engineer at Boeing Airplane Company at Seattle, Wash. He is secretary of the Seattle Unit of AOPA.