What's in an N-Number?

Hayden Hamilton, Editor AAHS

A recent query to the American Aviation Historical Society (www.aahs-online.org) asked the question, "What is the origin of the "N" in United States civil aircraft registrations?" How did the U.S. end up with "N" instead of "US," or some other designation, as the prefix on our civilian aircraft? After all, Sweden has "SE", Great Britain uses "G", Germany has "D" (Deutschland), and France is "F". And while we are considering this question, where do the C, L, R, X and S prefix designations (NC12345, NX123B, NS123) as seen on some aircraft come from?

1919 Commission Internationale de Navigation Aerienne

The origins of the "N' in the U.S. registration can be traced back to the Commission Internationale de Navigation Aerienne (CINA - the Convention for the Regulation of Air Navigation) established as part of the Paris Peace Conference immediately following World War I. A part of this conference was the adoption of the *Convention for the Regulation of Air Navigation* that laid the foundation of the system of international aircraft identification still in use today. In these proceedings, the first letter(s) of the identification designating national origin are set as in the examples described above. Each major participating country was allowed a single identifying letter and to specify their own designation letter. The U.S. delegation was allocated "N."

The convention stated that:

> "The nationality mark shall be represented by capital letters in Roman characters. The registration mark shall be represented by a group of four capital letters; each group shall contain at least one vowel, and for this purpose the letter Y shall be considered a vowel. *The complete group of five letters shall be used as a call sign for the particular aircraft in making or receiving signals by wireless telegraphy or other methods of communicatio*n, except when opening up communications by means of visual signals."

The nationality and registration marks are assigned in accordance with Table 1.

While the exact rationale for selecting the letter "N" has not been preserved, there are a number of stories as to why "N" was chosen. Some might be classified as "wives' tales," others seem to have a grain of truth to them. Though none have been substantiated, here are a few reasons that have been uncovered.

Table 1.

Original National Registration Assignments
1919 Convention for the Regulation of Air Navigation

US	N
BRITISH EMPIRE	G
FRANCE	F
ITALY	I
JAPAN	J
GERMANY*	D
Bolivia	C-Bxxx
Cuba	C-Cxxx
Portugal	C-Pxxx
Rumania	C-Rxxx
Uruguay	C-Uxxx
Czechoslovakia	L-Bxxx
Guatemala	L-Gxxx
Liberia	L-Lxxx
Brazil	P-Bxxx
Poland	P-Pxxx
Belgium	O-Bxxx
Peru	O-Pxxx
China	X-Cxxx
Honduras	X-Hxxx
Serbia/Croatia/Slavonia	X-Sxxx
Haiti	H-Hxxx
Siam	H-Sxxx
Ecuador	E-Exxx
Greece	S-Gxxx
Panama	S-Pxxx
Hedjaz	A-Hxxx
Nicaragua	A-Nxxx

*unclear if this was assigned at this time.

Why "N" Version 1

As early as 1914, states began to license airplanes based in their states. This was partly motivated by the prospects of increasing the state's coffers through the associated licensing fees with public justification being easy identification of aircraft being operated in a way that put life and property at risk. States pursuing this aircraft licensing direction tended to follow their existing licensing practices for personal watercraft. Maryland was the first state to enact aircraft licensing requirements sometime in late 1914. The first aircraft license issued was MAR-1. Other states soon

followed and generally used some sort of shortened alpha character followed by numbers.

U.S. delegates attending the Paris Conference and working on the Convention for the Regulation of Air Navigation were aware of the individual state's licensing efforts. In an attempt to avoid confusion with the display of a required state identification number, this group appears to have requested the letter N that it deemed would stand for the national number.

As to issue of avoiding confusion? A quick check of state names shows that states with names beginning in N are among the most prolific. If we assume that these states would use N as part of their state registration identifier, then the selection of N for a national identifier would only add to the confusion. With Utah being the only state beginning with "U," this would have been a more logical choice based on this rationale. Furthermore, this letter was not assigned at the 1919 conference, so was readily available.

Why "N" Version 2

The delegates, being very patriotic selected the letter "N" in recognition of the thirteen original states that formed the U.S. "N" was selected because it is the thirteenth letter in the alphabet.

Now one can just imagine a bunch of bureaucrats sitting around a table - probably after having consumed copious amounts of alcohol - coming up with this rationale. The only problem is that the letter "N" is the fourteenth letter in the alphabet. So what letter was excluded? Or, did these individuals just not have a firm grip on the alphabet. This version is probably best categorized as an interesting story but not the real reason "N" was selected.

Why "N" Version 3

This version is based on current events of the time. The four U.S. Navy Curtiss flying boats (designated NC-1 thru NC-4) set out on May 14, 1919, to begin the first crossing of the Atlantic by an aircraft. As we know, only NC-4 successfully completed this crossing, eventually arriving in Plymouth, England, on May 27, 1919. This first flight (albeit not nonstop) preceded the nonstop flight by Alcock and Brown by almost a month. The flight was still fresh on everyone's mind at the time the first international aviation congress convened and our delegation selected "N" in commemoration of this first flight.

This story sounds logical, particularly if none of the U.S. delegates were Navy types and were unaware that the "N" designation for the NC-4 really stood for Navy. This story like the others has not been substantiated.

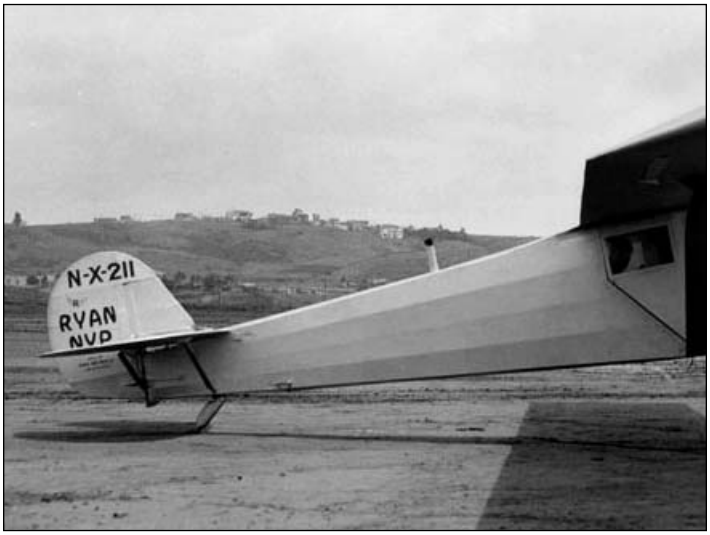
Why "N" Version 4

The letter "N" was selected to stand for North America, with "C" being assigned to Central America and "S" for South America. The U.S. ended up exclusively with "N" because Canada was part of the British Empire in 1919 and the registration convention for such colonies to use the British designation in combination with an assigned letter. Canada's designation was G-Cxxx which was changed later. Along with this story goes the postulation that the letters "US" or "USA" could not be selected because the U.S. was one of the five "super" powers designated to have only a single registration prefix. The letter "U" was unacceptable for unknown reasons, even though it was not assigned to any country during the 1919 convention.

The problem with this version is that it is rife with inconsistencies. As we can see in Table 1, the list of assigned registration letters to all the 1919 participants, Brazil was given P-Bxxx and Panama S-Pxxx, neither of which is consistent with this theory. In fact, a quick scan will show you other inconsistencies as well. Furthermore, Great Britain was quite content with the single letter "G;" so the U.S. could have just as easily accepted "U."

Why "N" Version 5

The most probable reason the U.S. was allocated "N" for its national registration mark comes from existing regulations of wireless communications in place in 1919. The International Telecommunications Union (ITU, formed in the late 1800s to provide international standards in telecommunications and still going strong today) held its first International Wireless Telegraph Conference in Berlin in 1906. Here the first *Service Regulations* were established for governing international radiotelegraphic communications. It was at this conference that S-O-S was adopted as the international radio distress call. By 1912, the proliferation of wireless radio stations, both land and ship based, had



Charles Lindbergh's Spirit of St. Louis *displays an X registration number on the Ryan NYP (New York - Paris) indicating that it was registered in the* Experimental *category in April 1927. As the aircraft was not a production design, the NX-211 registration would have been consistent with the regulations. The problem is that the use of X for* Experimental *was not officially adopted until 1929! (Photo from the Don Hall collection)*

The First Licenses

Civil registrations using the Underwriters Laboratories all-letter system, 1921 to 1923

N-AABA - Colonial Air Transport (Fokker Universal)
N-AABB - Colonial Air Transport (Fokker Universal)
N-AABC - Colonial Air Transport (Curtiss Lark)
N-ABCA - John M Larsen, New York (Avro 504K)
N-ABCB - LMC Drilling Company, Wichita (Laird Swallow)
N-ABCC - Akers Airphoto Corporation, Chicago (Avro 504K)
N-ABCD - Ninimo Black Airport Corporation, Chicago (Laird Swallow)
N-ABCE - John A Hambleton, Baltimore (Avro 504K)
N-ABCF - Loening Aero Engineering Corporation, New York (Loening Air Yacht)
N-ABCG - Diggins Aviation Company, Chicago (Curtiss JN-4)
N-ABCH - Diggins Aviation Company, Chicago (Curtiss JN-4)
N-ABCI - Aero Club of Minneapolis (Curtiss JN-4C)
N-ABCJ - John C Metzger, Chicago (Curtiss JN-4)
N-ABCK - David L Behncke, Forest Park IL (Curtiss JN-4)
N-ABCL - David L Behncke, Forest Park IL (Curtiss JN-4)
N-ABCM - E Hamilton Lee, Chicago (Curtiss JN-4D)
N-ABCN - A W Stephenson, Miles City MT (Curtiss JN-4D)
N-ABCO - Chicago Tribune, Chicago (Curtiss C-6)
N-ABCP - Brooks, Banks & Smith Corp, Framingham MA (Avro 504K)
N-ABCQ - C E Lessong, Chicago (Standard J-1)
N-ABCR - R S Thompson, Oakland CA (Standard J-1)
N-ABCS - Northbird Aviation Co, Ketchikan AK (Curtiss MF)
N-ABCT - H P Ayres, Pittsburgh PA (Curtiss MF)
N-ABCU - Vincent Astor, New York (Loening Air Yacht)
N-ABCV - Harold S Vanderbilt, New York (Loening Air Yacht)
N-ABCX - Mrs K LaParle, Chicago (Curtiss MF)
N-ABCW - George E Weaver, Chicago (Waco 4)
N-ABCY - Triangle Airways (Curtiss MF)
N-ABCZ - Continental Motors (Judson-Kantner F Boat)
N-ABDA - B D Burley, Chicago (Curtiss JN-4)
N-ABEA - L B Coombs, New York (LWF G-3)
N-ABFA - E P Hall (de Havilland DH-4)
N-ABGA - J Sorenson, Thomson IL (Curtiss JN-4D)
N-ABHA - T J Junker, El Dorado KS (Laird Swallow)
N-ABIA - G Mosny Jr, Indiana Harbor IN (Aeromarine 39-B)
N-ABJA - R R Ferguson, Chicago (Lincoln Standard)
N-ABKA - Anna M Parker, Hazelcrest IL (Curtiss JN-4D)
N-ABLA - American Airways, Cleveland (Curtiss H2-SL)
N-ABMA - Antone Brotz, Chicago (Curtiss JN-4D)
N-ABNA - Edward Hubbard, Seattle (Boeing B-1)
N-ABOA - Great Lakes Aviation Co, Cleveland (Lincoln Standard)
N-ABPA - Antone Brotz, Chicago (Lincoln Standard)
N-ABQA - W F Bridgeman, Ottumwa IA (Lincoln Standard)
N-ABSA - Victor Dallin (Laird Swallow)
N-AFOR - Stout Airplane Co, Detroit (Stout Air Pullman)
N-BMUL - R W Schroeder, Chicago (Standard J-1)
N-CAED - Spanish River Pulp & Paper Co, Ontario, Canada (Dayton-Wright FP-2)
N-MAAB - William Eaton Jr, Boston (Travel Air C-6)
N-XAAA - Walter Becker, Newark NJ (de Havilland DH-6)

created chaos in the airways as each base (or country) was creating their own call-signs for identification leading to the potential for call-sign duplication. In 1912 at the London International Radiotelegraphic Conference, the *Service Regulations* were expanded to include a protocol for international radio call-signs. In short, the following identifiers where assigned to major countries:

G - Great Britain
D - Germany
F - France
I - Italy
J - Japan
N, KDA-KZZ, Wxx - United States

The reason "N" was assigned to the U.S. was in recognition of the industry leading development and deployment of wireless communications by the U.S. Navy that had been using "N" as the prefix to its station call-sign identifiers since 1909.

Obviously, at this point in history (1912) aircraft were barely capable of carrying a pilot and passenger, much less a bulky wireless set. By 1919, when the CINA met, both aviation and wireless technology had made great advances - in part due to development associated with WWI. Aircraft were now capable of carrying wireless communication gear and the practice of including such gear was increasing. As an international protocol for identifying wireless stations already existed, the CINA simply adopted a subset of the ITU call-sign identifiers for consistency. Support of this can be seen in the CINA specifications quoted above that state aircraft are to use their registration number in wireless communications with base stations. By combining the ITU standards into the registration marks, the CINA was simply assuring clarity in wireless communication on an international basis while avoiding unnecessary redundancy.

Support for this version is found in *Aviation* magazine dated June 11, 1923 (page 639) that states:

> "Nationality Mark of American Aircraft: *Aviation* reported some time ago on the strength of a Norwegian government decree published in "Machrichten fur Luftfahrer" (the German air department bulletin) that Norway had adopted the letter "N" as its nationality mark. As this letter had previously been allotted to the United States as its aircraft nationality mark, it was editorially suggested that when this country becomes a party to the International Air Convention, the American representatives should ask to have the letter "W" allotted as our aircraft nationality mark. <u>It was pointed out that as the letter "W" was one of the international call letters allotted the United States - as is "N"</u> - such a choice would be eminently practical as well

As do many aircraft from the Golden Age of flying, this Waco SRE, s/n 5153, NC1252W seen at the 1995 EAA Convention in Oshkosh, Wis., still sports an NC registration number. The CAA dropped the use of the C, L, R, and X registration identifiers in 1948, replacing all but the C with cockpit placarding. (Photo by Al Hansen)

> as an act of homage to the Wright brothers. The National Aeronautic Association of U.S.A. now announces on the authority of the Controller General of Civil Aviation in Canada that at the third session of the International Commission for Air Navigation, the letter "E" was granted to Norway as that country's nationality mark, with the letter "N" as the first letter of the registration mark. The letter "N" therefore remains the nationality mark allotted to United States civil aircraft." [Norway never adopted the E-Nxxx allotted to it, but later standardized on LN-xxxx]

This article tends to support the supposition that the CINA adopted the ITU call-sign identifications as both "N" and "W' appear to have been allocated to the U.S. The article also implies that we quite easily could have ended up with our aircraft registration numbers beginning with "W", though not in honor of the Wright brothers.

Unfortunately, the U.S. Department of Commerce Bureau of Navigation (responsible of administering wireless radio communications from 1911-1927 didn't get with the program. They continued to require separate radio licenses in planes so equipped. During the 1920s and 1930s, they even issued separate call-sign identifiers to these stations beginning with the letter K. For example, in 1937 Amelia Earhart's call-sign on her Lockheed 10E, NR16020, was KAHQQ. It was not until the late 1940s that the practice of assigning call-signs was discontinued, though they still required a radio license for both the radio transmitter and the operator.

So, we can probably thank, indirectly, the U.S. Navy for the "N" in the U.S. aircraft registration, as some have postulated, but it wasn't because of the transatlantic crossing of the Navy-Curtiss flying boats.

"N" Mark History

Interestingly enough, the U.S. Government would not ratify the 1919 accord. It wasn't until 1926 that the issue of national aircraft registration had reached a point of visibility that forced Congress to finally act in the form of the *Air Commerce Act of 1926*. In the meantime, in 1921, the National Aircraft Underwriters Association, a service organization for the insurance industry, attempted to establish a five-letter licensing code. The code included the prefix letter "N" followed by four alpha characters (N-ABCD) in a manner similar to that currently used by a number of countries including Great Britain (G-ABCD). This system was purely voluntary and had no governmental backing or support. Due to a lack of support from either the government or by manufacturers, only 33 planes were registered by the end of 1922. The system had been abandoned by 1925. While the exact number of aircraft registered with this system probably never exceeded 50, there are aircraft from this period that appeared with registrations in this form.

In May 1926, the Federal Government finally got its act together with its first attempt at organization via the *Air Commerce Act* that became effective in January 1, 1927. This system essentially implemented the 1919 Paris Convention relative to national identification, but deviated in that the identifying marks would be numbers 0000 through 9999 rather than four Roman letters. It further extended the system by including a classification letter to denote commercial (C), State (S), or private (P). The letter "C" was used to designate approved (airworthy) aircraft used in commerce and for airmail. The "S" included all state and federal government owned and operated aircraft. The "P" designation was created to sort out private aircraft from the "C" and "S" types, but this lasted only until March 1927. The need for the "P" designation was obviated by most states requiring aircraft operating within their boundaries to bear a "C" number. Interestingly enough, Oregon where much flying activity took place, was one of the few exceptions to this requirement. From the implementation of the *Air Commerce Act* until the late 1930s, the aircraft reg-

This Grumman TBM-3E Avenger *seen in Palm Springs in 2001, still carries its original* Limited *NL registration, even though the use of the* ***L*** *was dropped in 1948. (Photo from C.H. Hamilton collection)*

istration actually consisted of two parts – the *Identification Mark Assignment* number, and if approved for any form of formal license, the prefixes. A limit of four numbers was deemed adequate at the time to handle all possible aircraft registrations - after all, who in 1926 could imagine an aircraft population numbering more than 10,000?

By November 10, 1928, less than two years from the time the DoC started issuing licenses and *Identification Mark Assignments*, the 10,000th number had been issued and the DoC ruled that, since issuance of numbers above 9,999 would "unnecessarily incumber the wings of planes, a reissue has been started with the addition of a capital letter "E" following the numbers."

A provision in the 1926 Act also allowed for identification of aircraft that did not meet minimum airworthiness requirements. These aircraft were termed Identified Aircraft and were to wear *Identification Mark Assignment* (IMA) numbers, usually without the N. It was possible to register such aircraft under this provision up until March 1939.

The National Air and Space Museum (NASM) has an on-going Pre-1946 U.S. Civil Aircraft Register Project. In their research of the Department of Commerce records, the earliest document found specifically referring to aircraft markings in a registration file was dated April 20, 1927, when the Department of Commerce sent a letter to the Ludington Exhibition Co., Inc., in Philadelphia. The letter states, in part,

> Enclosed herewith is your "Identification Mark Assignment" together with a metal identification plate. The identification mark which has been assigned to you must be prominently displayed on your aircraft in accordance with the provisions of Section 41 of the Air Commerce Regulations. The metal plate must be permanently affixed to the fuselage in a prominent place, in order that it may be readily inspected. No letter or other mark or symbol of any kind shall immediately precede or follow the identification mark thus displayed on your aircraft.

The first commercial aircraft license issued in the United States was C-26, issued to Wendrell Pavey of Madison & Edwards Roads, Cincinnati, Ohio, for a Standard J-1. At this point in time, the Department of Commerce was actually issuing metal plates with both the IMA and Manufacturers Serial Numbers (or substitute numbers, if none existed), although this practice quickly came to an end, and the CAA required manufacturers or builders to affix permanent data plates.

The requirement for the display of the "N" portion of the identification number was only required on aircraft being operated internationally. If the aircraft was locally based and operated, it was only required to display the "C", "S" or "P" number. It is possible to locate aircraft photographs from this period in which the "N" is not displayed, though this practice appears to be the exception rather than the rule. The requirement to use "N" on aircraft operated within U.S. boundaries did not come into play in 1948.

The third Boeing 100 was acquired by Paul Mantz from the Boeing School of Aeronautics at Oakland, California, in 1936 for airshow and movie work. Registered NR873H, the aircraft flew for many years for Mantz and was sold to Kermit Weeks after Mantz's death. The aircraft was crushed in 1992 when Hurricane Andrew blew a hangar roof down on it but is currently being restored to flying condition in Nevada. This photo of NR873H was taken at Burbank Airport in July 1937. (Emil Strasser collection courtesy of Gerry Liang)

In 1929, the *Air Commerce Act* was amended to modify the identification number convention. Under the new plan, a combination of three numbers and an alpha suffix of: E, H, K, M, N, V, W, or Y was approved. This new block of identification numbers were consumed by the end of 1934! Class prefixes were expanded to include "R" for restricted and "X" for experimental aircraft. A class prefix of "G" for gliders was implemented as well. This class prefix was canceled in 1937 when sailplanes and gliders were placed in the same class as powered aircraft. The "S" class for government-owned aircraft was also dropped in 1937.

By September 1, 1929, the DoC recognized the need to refine their procedures. They acknowledged, in a document issued that date, that "some confusion exists amongst owners as to the privilege of using the international symbol "N" on aircraft, licenses will be issued to cover international operation, except in accordance with Air Commerce Regulations, effective September 1, 1929, planes licensed for experimental purposes shall not display the letter "N". Hereafter, licenses (other than experimental) will not be issued as C-100, or R-100, but as NC-100 or NR-100, etc. Owners of planes, except experimental, may paint the international symbol "N" on the wings and tail for operation in the United States, but will not be required to do so. The symbol, however, must be applied before the plane is operated either temporarily or regularly in a foreign country." This rule was later amended and the prefix "NC-" became standard. It is important to note that the "dash" character was

regarded as a part of the registration. The Civil Aeronautics Authority (CAA) continued to adhere to this policy as late as July 1934.

On August 14, 1933, the CAA took a policy stance with regard to numbers issued to aircraft. Up until the post-World War II surplus boom, they were remarkably religious about issuing one and only one number for each aircraft built. In the August 1933 document they went so far as to state "the Department has consistently refused to assign new numbers to aircraft when there has been sufficient identification, of even salvaged aircraft, to connect it with some aircraft of which we have a record, and to which a number has been previously assigned." Had they adhered to this rule, life would have been much simpler for generations of aviation historians and researchers that followed!

In 1935, visionaries stepped in with claims that increasing registration numbers from four to five numerals, increasing the block from 10000 to 99999, would provide a more than adequate number of identification numbers. Unfortunately, even these were beginning to show signs of being gobbled up by the beginning of World War II. The responsibility of administering aircraft identification registrations passed to the Civil Aeronautics Administration portion of the CAA that was formed in 1938. The CAA expanded the registration structure in 1946 to include three and four numerals with other letter suffixes - the letters "I" and "O" were excluded to eliminate possible confusion with the numbers 1 and 0. The block of numbers from 46000 to 79999 was generally reserved for war-surplus aircraft. The class prefix of "L" for limited type certification was also created but lasted only until 1948.

By December 9, 1938, the last of the formerly *Identified* aircraft (primarily older aircraft for which no ATC has been issued, homebuilt, and aircraft not intended to be operated outside the confines of the state in which they were domiciled) had been attrited. However, when an classified aircraft did not pass inspection, the CAA came up with a new convention for covering these. They would order the removal of the "C" from the "NC-" prefix, and thus the aircraft would become N-11471. This has led many researchers on a merry chase. These were not licenses at this point; they were *Identification Marks*.

The class prefixes of "C", "R", "X" and "L" were eliminated by amendment to the Civil Aeronautics Regulations (CARs) on June 14, 1948, with only the "N" being used. By 1953 the need to expand the available number of registration slots caused a rule change to include double alpha suffixes with up to three numerals. The letters "R", "X" and "L" were replaced in 1948 with the requirement of a *Restricted*, *Experimental*, or *Limited* sign be prominently displayed at the cockpit entrance. This applied to all new registration issued after December 31, 1948. Recertification of aircraft in the "NL" category, which was defined as military aircraft modified for limited civil use, was extended after an August 31, 1948 deadline - mainly to accommodate air racer owners at the Cleveland Air Races. The CARs extended the deadline to remove the "C", "R", "X", or "L" characters to January 1, 1951.

Now the Fun Begins

What really makes all of this challenging is that none of these rules appear to be cast in stone and examples of exceptions abound. For example, it is possible today to find examples of many of these particular rules. At air shows one can see Golden Age era aircraft with NC registrations, and war birds sporting NL and NX registration identifiers.

Even the Federal Government does not follow their own specifications. The Federal Government initially reserved identification numbers 1 through 26 for their aircraft. This was later expanded to 1 through 300. The original N1 designation was assigned to a Department of Commerce de Havilland DH-4. This aircraft wore the N1 registration even though to conform to its owner's rules it should have carried the identification of NS1.

Because of the Department of Commerce's practice of reassigning numbers after the sale, export or destruction of an aircraft, the N1 number also shows up later on a government Northrop Alpha 2, a Ford 5-AT, a Lockheed 12-A, a Douglas DC-3 and is currently on a Gulfstream G-IV. Furthermore, you can find private aircraft sporting registration numbers in this designated range (N2 and N3 are registered to Cessna Commercial Aviation Finance Corporation, but possibly leased to the government).

Since World War II, special request registrations became popular leading to a proliferation of low-number plus suffix registrations. For a fee, one could have just about anything as long as it was available. The CAA provided regional offices with batch allocations for distribution to add to the confusion.

All of these practices have combined to make using the aircraft registration number a crude reference tool. An "N" number alone is often insufficient to determine the particulars of an aircraft. Though many aircraft have retained their original registration number through the years, a large number of these registrations have also been reallocated or simply changed with change of ownership.

This article was compiled from information provided by AAHS member Mike O'Rourke and several other American Aviation Historical Society members, *AAHS Journal Vol. 2, No.4*, documentation found on *www.Aerofiles.com* (created and maintained by former member K.O. Eckland), William T. Larkins' *Air Pictorial* article from 1954, a wealth of detailed information from Dan Hagedorn of the NASM and the current FAA aircraft registration database. The author particularly wishes to recognize AAHS member Matthew Rodina Jr. of St. Croix, U.S. Virgin Islands for pointing us in the direction of the most likely reason for the U.S. having "N" as it national aircraft registration mark.