

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 45

[Docket No. 20424; Amdt. No. 45-13]

Size of Registration Marks

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Final rule.

SUMMARY: The amendments require the display of registration marks, N-numbers, at least 12 inches high on certain fixed-wing aircraft in place of the smaller marks previously allowed by Federal Aviation Regulations. The amendments are needed to provide better visual identification of those aircraft. The rule is intended to improve air traffic flow at airports, discourage violations, and improve enforcement of Federal Aviation Regulations regarding low-flying aircraft.

To avoid undue cost of compliance to aircraft owners and manufacturers, an aircraft displaying small marks before the effective date of the amendments and an aircraft manufactured after November 2, 1981, but before January 1, 1983, will be allowed to continue to display those marks until the aircraft is repainted or the marks are restored, repainted, or changed. These amendments do not change existing rules on the use of special marking procedures for: (1) Small aircraft used for exhibition purposes; (2) small aircraft built at least 30 years ago; (3) unusually configured aircraft; and (4) aircraft issued an experimental certificate for operating as either exhibition or amateur-built aircraft.

EFFECTIVE DATE: November 2, 1981.

FOR FURTHER INFORMATION CONTACT: Mr. Joseph A. Sirkis, Regulatory Projects Branch, AVS-24, Safety Regulations Staff, Associate Administrator for Aviation Standards, Federal Aviation Administration, 800 Independence Avenue, SW., Washington, D.C. 20591; Telephone (202) 755-8716.

SUPPLEMENTARY INFORMATION:

Background

On December 31, 1960, the FAA began to require 12-inch-high registration marks, N-numbers, to be displayed on the sides of airplane fuselages. The use of these marks had been advocated by the U.S. Air Force and air traffic controllers. The Air Force advocated the side markings as a means of decreasing the collision hazard associated with air-to-air identification of aircraft. Air

traffic controllers also advised that these marks facilitate visual identification of aircraft, which aids in safer aircraft traffic control at airports. At the same time, underwing marks were considered and rejected as being costly and ineffective.

In 1977, the size of N-numbers was reduced to 3 inches for small fixed-wing aircraft with speeds not greater than 180 knots. This was in response to a petition for rulemaking submitted by the Experimental Aircraft Association (EAA) to improve the aesthetic appearance of small general aviation aircraft. Based on the facts at hand and since there were no substantive objections from the Department of Defense, law enforcement agencies, or the public sector, the amendment was adopted.

After fixed-wing aircraft began to display 3-inch marks, the FAA began to receive complaints from private citizens, law enforcement agencies, the U.S. Customs Service, and the Department of Defense. Air Traffic Service reports and field inspectors' reports also began to show instances in which aircraft displaying these small marks could not be identified. These complaints established that operational efficiency has been affected by aircraft displaying small numbers and that positive and timely visual identification at busy general aviation airports has been compromised.

Because of these concerns, on July 24, 1980, Notice of Proposed Rulemaking No. 80-11 was issued (45 FR 50810; July 31, 1980), proposing reinstatement of the 12-inch marks on certain aircraft. The comment period was extended 60 days, to November 28, 1980, to allow participants ample time to submit comments.

Notice 80-11 also responded to the petition of Raven Industries, Inc., of Sioux Falls, South Dakota, which requested that the FAA reduce the 20-inch height requirement for nationality and registration marks on airships, spherical balloons, and nonspherical balloons.

Interested persons were given an opportunity to participate in the making of this rule, and due consideration was given to all information submitted. Except as discussed in this preamble, the revisions adopted by this amendment and the reasons for them are the same as those in Notice 80-11.

Need for Amendments

Civic organizations in California, Florida, New York, New Jersey, and Hawaii have submitted resolutions asking, and private citizens have requested, that the FAA impose

regulations that require larger N-numbers to be displayed on all civil aircraft for better visual identification. The organizations have expressed concern about low-flying aircraft over citizen's homes that cause hazardous conditions and considerable noise. Further, citizens complain that aircraft cannot be identified positively because the identification marks are too small to see. Without accurate identification, appropriate action cannot be taken against violators of regulations.

The FAA has received reports and complaints that law enforcement activities have been hampered by 3-inch marks. Agencies on the Federal, State, and local levels have complained of an increase in cases involving aircraft in various illegal acts and operations. Some law enforcement agencies have asserted that it is virtually impossible to identify aircraft displaying small marks and that identification through registration marks is the important element in investigation and in prosecutions.

The Department of Defense (DOD) has recommended that 12-inch registration marks again be required on all civil aircraft. The recommendation was based on statistical data acquired from hazardous traffic reports. DOD indicated that large N-numbers would eliminate the need for military aircraft to closely approach civil aircraft displaying small marks to identify them. Accordingly, DOD has reconsidered and revised its 1976 decision regarding 3-inch marks.

Air traffic controller reports have indicated that even with mandatory radio communication between pilots and controllers and the aid of optics (binoculars, etc.), a high rate of aircraft traffic flow cannot be maintained safely without positive visual identification of aircraft, especially at airports with high general aviation activity. This air traffic problem is increased at complex airports with multiple runways and intersections, where it is difficult for transient pilots to know, or properly describe, their location on the airport. The frequent use of radio transmissions to ascertain an aircraft's exact location is time-consuming and detrimental to airport operation because control frequency congestion is also increased. This congestion of the control frequency leads to blocked or partially blocked radio transmissions that often result in misinterpreted clearances and unauthorized aircraft movements. Complicating the problem of safe and efficient aircraft control is the low level of experience of some pilots, which frequently makes it essential to identify

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quickly, and communicate with, an aircraft making an unauthorized movement.

For these reasons it is in the public interest to change the minimum height of aircraft registration marks from 2 inches and 3 inches to 12 inches on aircraft that have been involved in these problems.

Discussion of Comments

Comments from individuals on Notice 80-11 largely oppose the proposal. However, many commenters give no reasons for their opposition or specific suggestions that would resolve the problems posed by the old regulation. Many commenters indicate a misunderstanding of the notice or conclude that no one problem is important enough to require a rule change. For example, early comments indicate owners of excepted aircraft are not aware of the exceptions. Others are not aware of the minimal cost involved or of the provision for delayed compliance. Many are of the opinion that large numbers should not be required since the same size numbers are not used on other transportation vehicles, and cannot be seen at night, in bad weather, or when aircraft are out of visible range. Some objections minimize or dismiss out of hand the need for improving aircraft identification in favor of aesthetics. These issues are discussed in subsequent paragraphs with specific comments on the proposed rule.

Comments from those favoring the rule indicate general agreement with the notice as published. The requests and comments concerned with improving aircraft identification span a wide range of specific problems. For example, citizens and civic organizations from all across the United States cite as unacceptable hazardous low flying, the disregard of normal air traffic patterns, and the disregard of noise abatement procedures by unidentifiable aircraft. The problems also involve violations by aircraft that engage in sightseeing while flying low over congested areas, such as beaches, parks, or stadium events; agricultural aircraft improperly spraying toxic materials; as well as prohibited hunting, smuggling, and other illegal activities.

Because of smugglers using small aircraft, government agencies have requested the FAA to revert back to 12-inch-high marks. For example, the Western Caribbean/Central American Flight Safety Group, with U.S. participation that includes the Drug Enforcement Administration, the FAA, the Customs Service, and the National Transportation Safety Board, requested that the size of N-numbers on small aircraft be increased.

Further, FAA General Aviation District Offices have reported that investigations and enforcement actions have been hampered by the lack of positive aircraft identification. Since 3-inch marks were allowed, the number of reported low-flying violations has increased nearly 20 percent, yet the number of investigations completed dropped nearly 30 percent. Identification of aircraft by description instead of N-number is insufficient to locate alleged violators.

The analysis of over 2,000 comments submitted in response to the notice indicated that approximately 10 percent are in favor of the amendment, while 90 percent are opposed. The majority of the comments, those that oppose large numbers, include the views of organizations representing aircraft interests.

Nearly 60 percent state that N-numbers are not needed to identify aircraft or that 3-inch marks are adequate for visual identification. Over 40 percent contend that large numbers are costly, and nearly 40 percent state that large "ugly" numbers disfigure aircraft. Nearly 25 percent comment that the proposed amendments would discriminate against some small aircraft owners. Close to 25 percent indicate that the 1977 FAA decision to allow certain fixed-wing aircraft to display 3-inch marks was justified and that the decision should be maintained.

Need for Identification by N-Number

Over 1,100 comments contend that N-numbers are not needed to identify aircraft or that 3-inch numbers are adequate for visual identification. To support these views, the following comments were offered:

(1) When aircraft identification is needed, it is mostly done by color, type, and location only.

This comment is contradicted by the experience of FAA air traffic control and enforcement personnel. Abstract descriptions of aircraft using color, type, or location have been ineffective in enforcing regulations. Further, they do not meet the needs for safe and effective control of aircraft movements.

(2) Registration numbers are rarely used in controlling air carrier aircraft at large air carrier airports or military aircraft at military airports.

With regard to airline aircraft, while it is true that at large air carrier airports controllers handle airline aircraft without relying on N-numbers, the conditions at busy general aviation airports are different from those encountered at air carrier airports. Fewer air carrier aircraft are handled at any one time, and these are easily

distinguished by unique airline color scheme and type of aircraft. In the case of general aviation aircraft, however, it is not uncommon to have many similar-looking aircraft with no distinguishing characteristics lined up on a taxiway.

Another important consideration is that of air terminals. Air carrier aircraft arrive at and depart quickly from gates near the tower where they are more easily seen. In contrast, the busiest general aviation parking and servicing areas are not usually near the tower, making visual confirmation of aircraft movements difficult. Small registration markings intensify the identification problem.

With regard to military base operations, the larger military aircraft are handled in the same manner as air carrier aircraft. Many smaller aircraft flights are formation flights, and control communications only involve the lead aircraft. At basic training bases, many flights are performed under a form of control where aircraft follow each other in a preset pattern, and no attempt is made to clear each aircraft to land or take off, as required for civil aircraft.

(3) To identify aircraft, conditions have to be favorable with respect to daylight, weather, obstructions, and aircraft position and range.

It is true that some conditions preclude aircraft identification by registration marks either for enforcement or air traffic control purposes. This is of course the case during IFR weather and at night; however, general aviation night or IFR operations are not an air traffic problem since activity is lower during the night and in IFR weather. In contrast, during VFR daylight hours, traffic counts of 275 to 300 operations per hour are not uncommon at the busiest airports.

It is true that aircraft are not always visible from the tower because hangars or other aircraft obstruct the view; however, once aircraft approach a controlled taxiway or runway, positive identification by the tower is mandatory. The method of identification will vary from one airport to another. When traffic is heavy, this is usually done by quick visual confirmation of the N-numbers and by radio contact as the aircraft enters a controlled portion of the airport. Aircraft that display small marks preclude fast traffic flow since quick visual confirmation is not possible.

(4) Identification numbers are rarely used in controlling private aircraft at large aviation events, such as the EAA Convention at Oshkosh, Wisconsin. Approximately 450 commenters cite the aircraft traffic control methods used at

various aviation conventions as proof that N-numbers are not needed on aircraft.

The handling of air traffic at large aviation events is accomplished in accordance with restrictive and highly specialized procedures. The specialized procedures are published in advance, and restrictions include closing designated runways and curtailing instrument approaches for the duration of the event. Regular airport operations do not lend themselves to these kinds of restrictions.

Cost of Application

Approximately 800 comments, including those the Aircraft Owners and Pilots Association, the Experimental Aircraft Association, the National Business Aircraft Association, and the General Aviation Manufacturers Association, contend that the cost of increasing the size of N-numbers would impose an undue burden on owners who would have to re-mark recently painted aircraft displaying 3-inch numbers.

It was apparent that many failed to note that the rule allows affected aircraft displaying small N-numbers before the effective date of this amendment to continue to display the numbers until the aircraft is repainted, or the numbers are repainted, restored, or changed.

The General Aviation Manufacturers Association (GAMA) comments that a member study of the cost associated with adopting the 12-inch numbers indicates that to process and apply these larger N-numbers on aircraft would cost approximately \$50 more than the smaller numbers; that this significant cost would be passed on to owners; and that the burden of compliance and the associated financial strain would be extreme.

FAA information based on estimates obtained from aircraft painting companies indicates that there is no significant price difference for initial painting or repainting of an aircraft that required 3-inch or 12-inch N-numbers, since the cost of applying numbers is negligible when compared to the total cost of painting.

GAMA based its cost estimates on the difference between the cost of applying 3-inch decal numbers as opposed to painting 12-inch numbers on most aircraft. The FAA recognizes that decals have been applied on many new smooth-fuselage aircraft surfaces and by aircraft owners who apply their own numbers. These costs would reflect a lower cost compared with painting N-numbers. Professional aircraft painters on the other hand indicated that painting N-numbers was preferred to

applying decals which have to be ordered or stocked for each application and are not cost-effective.

In either case the cost would be minimal. Even the maximum increase in cost of applying N-numbers, estimated at approximately \$50 by GAMA, when compared with the estimated sales price of \$25,000 to \$100,000 for affected new aircraft, is not a significant enough burden to outweigh the need for larger numbers. When an aircraft is only re-marked, this incremental cost would not be significant compared to the operating costs of the aircraft during the period preceding re-marking.

Moreover, to avoid any undue cost burden on aircraft owners and manufacturers, the rule, as adopted, will allow an aircraft which displayed marks smaller than 12 inches high before the effective date of these amendments and a new aircraft manufactured after the effective date of the amendments, but before January 1, 1983, to display those marks until the aircraft is repainted or the marks are restored, repainted, or changed.

Aircraft Aesthetics

Approximately 700 commenters assert that the 12-inch N-numbers affect the aesthetics of aircraft and ruin their appearance. The FAA recognizes that this may be true; however, the safety benefits of providing for positive aircraft identification have been determined to outweigh aircraft aesthetics.

Discrimination

Approximately 400 commenters contend that the rule is discriminatory. Most comments regarding discrimination note that vehicles in other transportation systems such as automobiles, trucks, boats, and ships display small marks or marks that are proportionately smaller than the 12-inch marks required for aircraft.

The FAA recognizes the differences in the size of registration marks for vehicles in the different modes of transportation. However, there are vast differences in visual identification requirements imposed by the different operational environments. Since aircraft speeds are much greater than those of automobiles, trucks, boats, and ships and aircraft operations are not simply confined to roadways or waterways at ground and sea level, a comparison of requirements for visual identification is not appropriate.

Other commenters believe that it is unjust discrimination to allow aircraft certificated in the experimental category to display 3-inch marks while requiring those in the standard category to display 12-inch marks; however, the

discrimination between categories which concerns these commenters has a reasonable basis. The exceptions to the 12-inch requirement for experimental exhibition, experimental amateur-built, and antique aircraft are supported by consideration of the operational limitations imposed on these aircraft and their limited number.

FAA recognized that the large marks would preclude antique aircraft owners from preserving authenticity and diminish the historical value of these aircraft.

Regarding the operation of experimental-exhibition and experimental amateur-built aircraft (certificated under § 21.191(d) and (g)), FAA has found that these aircraft have not created identification problems. They are required by § 91.42 to operate in limited, tightly controlled and monitored environments, which separate them from busy air traffic control operations. The limitations prescribe that unless authorized by the Administrator experimental aircraft cannot be operated over densely populated areas or congested airways and must operate in daylight hours. The operators also must notify the control tower of the experimental nature of the aircraft when operating into or out of airports with operating control towers. Finally, they must adhere to any other limitations prescribed by the Administrator.

Antique Aircraft

In Notice 80-11, the FAA pointed out that the original designs of many aircraft currently in service are approaching or exceed 30 years of age. This is causing a rapid increase in the number of aircraft eligible to display 2-inch-high marks. In addition, many newer aircraft that have the same external configuration as an aircraft built at least 30 years ago would also be able to display the 2-inch marks. The intent of § 45.22 was to permit the small number of owners exhibiting antique and amateur-built copies of antique aircraft to display 2-inch marks rather than the 12-inch identifications marks then required by § 45.29. The FAA recognized that the more visible large marks would detract from the authenticity and diminish the historical value of these small aircraft. The FAA did not anticipate that the rule would eventually permit large commercial aircraft, as well as an increasing number of commercially manufactured copies of older aircraft not in the experimental exhibition or experimental amateur-built category, to display the less-visible 2-inch marks. While the number of antique small aircraft is limited, there is

an increasing number of commercially manufactured aircraft that look like them, and this is contributing to the identification and air traffic problems already discussed.

To remedy this problem, this rule will require aircraft not certificated as experimental exhibition or experimental amateur-built to display 12-inch marks, unless they are small aircraft built 30 years ago. These aircraft will no longer be able to display marks as small as 2 inches high, and a proliferation of new aircraft displaying these small marks is expected to cease.

Gliders, Airships, and Balloons

In response to the petition of Raven Industries, Inc., Notice 80-11 also proposed to allow airships, spherical balloons, and nonspherical balloons to display marks at least 3 inches high. Raven Industries asked that the height requirement for nationality and registration marks be reduced from the current requirement of 20 inches to 3 inches for airships, spherical balloons, and nonspherical balloons.

No adverse comments were submitted concerning the decrease in size of marks on gliders, airships, and balloons.

When compared to powered aircraft, there are a relatively small number of gliders (less than 4,000) in operation. Many gliders are not equipped with two-way radios and, thus, operate at uncontrolled airports and at airports with low levels of general aviation activity. These factors minimize radio communication and air traffic control problems associated with gliders displaying 3-inch marks. The lack of easily identifiable numbers has not created enforcement problems with these aircraft. For these reasons, the rule has maintained the 3-inch numbers for registration marks on gliders.

Because of the smaller number and individual characteristics of airships and balloons, they are more easily identified than other aircraft. In addition, balloons are not likely to be used in the conduct of illegal activities, as they would be readily identifiable by their individual characteristics. Their size and maneuvering capabilities facilitate identification and apprehension. Accordingly, marks on airships, spherical balloons, and nonspherical balloons are being reduced from 20 inches to 3 inches.

Alternatives

Two alternatives were available to resolve the aircraft identification problems.

One solution would be to maintain the status quo but restrict the use of busy general aviation airports to aircraft

displaying marks at least 12 inches high. This option would solve the identification problems at these airports but would be difficult to implement and enforce. Further, the current law enforcement problems would continue unresolved and would be compounded by new aircraft displaying small marks. The identification problems noted by DOD, drug enforcement agencies, and civic organizations would in effect be ignored by this option. Accordingly, this option was not considered realistic.

The second and only viable solution is to raise the marks on aircraft involved in the identification problems to a size that in the past has facilitated safe and efficient air traffic control as well as enforcement.

Marks 12 inches high can be identified from four times as far as 3-inch-high marks. The effectiveness of 12-inch marks has been confirmed by air traffic controllers and field inspectors under actual operating conditions. Moreover, with these 12-inch marks, the hazardous close maneuvering now required by DOD and the Drug Enforcement Administration to identify aircraft displaying 3-inch marks will be eliminated.

Regulatory Evaluation

The FAA conducted an economic study to determine the benefits and costs of the new registration marks requirements. This study is included in the rules docket for the final rule.

The costs are the incremental costs (costs that would not result unless the regulation is in effect) incurred in the application of 12-inch registration marks instead of 3-inch registration marks to all airplanes affected by the new amendments. By the FAA's not establishing a mandatory compliance date for owners of airplanes presently displaying 3-inch marks, owners will not have to display 12-inch marks until their aircraft are re-marked or repainted, which is done on approximately a 7-year cycle. The individual cost burden will be largely eliminated because the incremental cost attributable to painting 12-inch as opposed to 3-inch marks is a small percentage of the total cost of repainting an airplane.

The FAA found the estimated incremental cost to be highly judgmental. The FAA contacted several aircraft painting enterprises, and the price quoted to repaint an airplane was the same regardless of the size of the registration marks to be displayed. The incremental cost of applying N-numbers is only a small portion of the price to repaint an old airplane or the price of a new aircraft. For example, a price of \$2,000 was quoted to repaint a medium-

size general aviation airplane. The \$46.50 incremental cost estimated by GAMA is 2.3 percent of the total repainting price. Further, assuming the price of a similar new general aviation airplane is approximately \$50,000, the incremental cost of applying 12-inch instead of 3-inch marks would be only 0.1 percent of the total price of the airplane.

With respect to re-marking without repainting, the cost remains minimal. While the continued use of 3-inch marks may present a minimal saving as opposed to re-marking with 12-inch marks, the minor cost involved does not outweigh the considerations involved in the current identification problems. The FAA estimated the maximum costs for remarking N-numbers by assuming a 7-year cycle for repainting and even the maximum incremental cost of re-marking would not be significant compared to the cost of operating the airplane during that 7-year period.

The total cost of this final rule depends on the volume of future aircraft production. The FAA made 10-year cost estimates with the \$46.50 incremental cost supplied by GAMA for low-demand, constant-demand, and high-demand scenarios for the approximately 240,000 present active airplane and those to be produced in the next 10 years. The scenario cost estimates are \$13.8 million, \$15.0 million, and \$15.8 million, respectively. It must be emphasized that these are estimates of the maximum cost under each scenario condition. The FAA expects that the actual incremental outlay for compliance for each airplane involved will not be as much as \$46.50 and, therefore, that the true total cost of compliance with the final rule under each scenario will be considerably less.

Adoption of the amendment

Accordingly, Part 45 of the Federal Aviation Regulations (14 CFR Part 45) is amended as follows, effective November 2, 1981:

PART 45—IDENTIFICATION AND REGISTRATION MARKING

1. By revising the introductory text of § 45.22(b) to read as follows:

§ 45.22 **Exhibition, antique, and other aircraft: Special rules.**

(b) A small U.S.-registered aircraft built at least 30 years ago or a U.S.-registered aircraft for which an experimental certificate has been issued under § 21.191(d) or 21.191(g) for operation as an exhibition aircraft or as an amateur-built aircraft and which has

the same external configuration as an aircraft built at least 30 years ago may be operated without displaying marks in accordance with §§ 45.21 and 45.23 through 45.33 if:

* * * * *

2. By revising § 45.29(b) (1) and (2) to read as follows:

§ 45.29 Size of marks.

* * * * *

(b) *Height.* The character marks must be of equal height and on—

(1) Fixed-wing aircraft, must be at least 12 inches high, except that:

(i) An aircraft displaying marks at least 2 inches high before November 1, 1961 and an aircraft manufactured after November 2, 1961, but before January 1, 1963, may display those marks until the aircraft is repainted or the marks are repainted, restored, or changed;

(ii) Marks at least 3 inches high may be displayed on a glider;

(iii) Marks at least 3 inches high may be displayed on an aircraft for which an experimental certificate has been issued under § 21.191(d) or 21.191(g) for operating as an exhibition aircraft or as an amateur-built aircraft when the maximum cruising speed of the aircraft does not exceed 180 knots CAS; and

(iv) Marks may be displayed on an exhibition, antique, or other aircraft in accordance with § 45.22.

(2) Airships, spherical balloons, and nonspherical balloons, must be at least 3 inches high; and

* * * * *

(Secs. 307(c), 313(a), 501, and 601(a), Federal Aviation Act of 1958, as amended (49 U.S.C. 1348(c), 1354(a), 1401, and 1421(a); and sec. 6(c) of the Department of Transportation Act (49 U.S.C. 1655(c)).)

Note.—Since this amendment will impose only a minimal increase in the costs

associated with marking aircraft in the future and would not impose any other cost or other economic burden on aircraft owners and manufacturers, it has been determined that this is not a major regulation under Executive Order 12291 and that, under the criteria of the Regulatory Flexibility Act, it will not have a significant impact on a substantial number of small entities. In addition, the FAA has determined that this regulation is not considered to be significant under the Department of Transportation Regulatory Policies and Procedures (44 FR 11034; February 28, 1979). A copy of the evaluation prepared for this action is contained in the regulatory docket. A copy of it may be obtained by contacting the person identified under the caption "FOR FURTHER INFORMATION CONTACT."

Issued in Washington, D.C., on September 3, 1981.

J. Lynn Helms,
Administrator.

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