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T. O. NO. 07-1-1

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# AIRCRAFT CAMOUFLAGE MARKINGS AND INSIGNIA

*This Technical Order replaces T. O. Nos. 07-1-1, dated June 1, 1943, 07-1-1A, dated January 9, 1943, and 07-1-1B, dated August 15, 1942.*

*NOTE: The work directed herein will be accomplished whenever necessary by service activities with the aid of sub-depots, if necessary.*

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## SECTION I

### CAMOUFLAGING OF AIRCRAFT

#### 1. AIRCRAFT TO BE CAMOUFLAGED.

All United States Army Air Forces aircraft will be camouflaged in accordance with Army Air Forces Specification No. 24114, with the following exceptions:

*a.* Aircraft operating in the Alaskan Department or in any country having similar climatic and terrain conditions will not be basic camouflaged. However, either camouflage or marked contrast finishes may be used as specified in paragraph 2.a.(4)(d).

*b.* Training type of aircraft.

*c.* Aircraft of other types regularly used for training purposes by the Flying Training Command.

*d.* All types of aircraft not regularly assigned to, or normally located in, theaters of operation.

#### 2. TYPES OF CAMOUFLAGE FINISHES.

##### *a.* PERMANENT CAMOUFLAGE.

(1) TYPES AND APPLICATIONS.—Paragraph E-1b of Army Air Forces Specification No. 24114, permits the use of lacquer and enamel materials on metal surfaces, dope on fabric, subject to the provisions herein. It will be noted that the use of both types of materials for metal require use of primer, zinc chromate. Camouflage materials in kind can be satisfactorily applied over existing protective coatings, that is, specification camouflage lacquer over existing lacquer finishes, specification camouflage enamel over existing enamel finishes, and specification camouflage dope over existing dope finishes. It is anticipated that there will be minor chipping of the camouflage materials at the leading edges of airfoils, which may be somewhat unsightly, but as long as the material affords a reasonable coverage of the surface, the finish will not be touched up. However, touching-up of permanently camouflaged surfaces is authorized, if the permanent camouflage has been partially destroyed by brushing action in removing temporary camouflage. No attempt will be made to secure a high gloss as this will tend to defeat the purpose of camouflage.

(2) PAINTS TO BE USED ON CAMOUFLAGED AIRPLANES.—The only permanent exterior paints that will be applied to camouflaged airplanes will be the following Air Forces camouflage materials in colors covered by Air Forces Bulletin No. 41:

(*a*) Lacquer, Specification No. 14105.

(*b*) Dope, Specification No. 14106.

(*c*) Enamel, Specification No. 14109.

These specifications are being revised to include infra-red reflectance qualities which decrease photographic qualities of a plane. This new paint will be used on all planes consigned to overseas theaters. Primer, zinc chromate, Specification No. AN-TT-P-656, will be used wherever a primer coat is required. Special de-icer paint is available only in oyster white for use on white camouflage.

#### NOTE

It will be borne in mind that essentially, all paints, dopes, and lacquers are of a toxic nature and inflammable. Therefore, precautionary measures will be exercised in handling and application. (See T. O. No. 07-1-4 and Army Air Forces Regulation No. 85-6.)

(3) BASIC CAMOUFLAGE.—The basic camouflage scheme in permanent camouflage materials for Army Air Forces aircraft is dark olive drab, shade No. 41, for surfaces viewed from above and extending down on sides of fuselage; medium green, shade No. 42, in irregular splotches along all edges on the upper side of the wing and the horizontal outline of the tail assembly; also, along all edges of both sides of the vertical outline of the tail assembly, extending inward from the edges for various distances up to 20 percent of the total width of the wing or the tail assembly. Rubber parts will not be painted except utilizing white de-icer paint in white camouflage. (See figure 1.) Neutral gray, shade No. 43, will be used for surface viewed from below. Masking will not be employed to separate ANY COLORS. Junction lines will be blended by overspraying. (See figure 9.)

(4) SPECIAL.—Use of one coat of the following special permanent finishes over material of like type is authorized (also temporary Specification No. 14057), as required to conform to existing local terrain.

(a) Medium green, shade No. 42, on upper wing and fuselage surfaces for aircraft operating over terrain predominately green.

(b) Sand, shade No. 49, for upper surfaces for aircraft operating over desert terrain.

(c) Black, shade No. 44, for under surfaces for aircraft to be used for night flying.

(d) To provide marked contrast for spotting forced landings, or to provide camouflage, as required by the Commanding Officers, the use of any camouflage materials in color covered by Bulletin No. 41 may be used for aircraft in Alaskan or other theaters having similar terrain conditions.

(e) Insignia white, shade No. 46, on all under surfaces and leading edges and olive drab, shade No. 41, on all upper surfaces for aircraft assigned to seasearch duty. Special de-icer paint in oyster white is available only for this and similar camouflage outlined in preceding paragraph.

(5) CAMOUFLAGE OF PROPELLER. — The camouflage of propellers, as required by Army Air Forces Specification No. 24114, will be accomplished by

spraying each propeller blade in a horizontal position and retaining the propeller in this position until the camouflaging materials have set, after which it will be necessary that the propeller be checked for balance. Over one light coat of zinc chromate primer, one coat of black lacquer, shade No. 44, will extend to within 4 inches of the tip of the blade; this 4-inch tip will be yellow lacquer, shade No. 48, one light coat. When necessary, three and four blade metal props may be lightly "touched-up" between overhaul periods while installed on the plane. Care should be taken to apply proportionate amounts of paint to each blade to maintain the proper balance.

After overhaul the propellers will be repainted as outlined above, and balanced. No attempt will be made to camouflage wood propellers.

b. TEMPORARY CAMOUFLAGE. — Paint, water dry, Army Air Forces Specification No. 14057, in the following shades may be applied over existing permanent camouflage finishes when required and directed by commanders in the theaters of operation.

(1) Sea green, shade No. 28, for upper surfaces when operating over terrain predominately green.

(2) Black, shade No. 33, for the lower surfaces of night flying aircraft.

(3) Sand, shade No. 26, for upper surfaces when operating over desert terrain.

## SECTION II

### MARKINGS AND INSIGNIA

#### 3. MARKINGS.

a. Each part and assembly will be permanently and legibly marked the same number as the drawing number in such location that it can be read after assembly in the unit. (See Specification No. 98-24105Q.)

b. Various detail and code markings for the cockpit, fuselage, oil lines, etc., as required in Specification No. 98-24105Q, will be maintained.

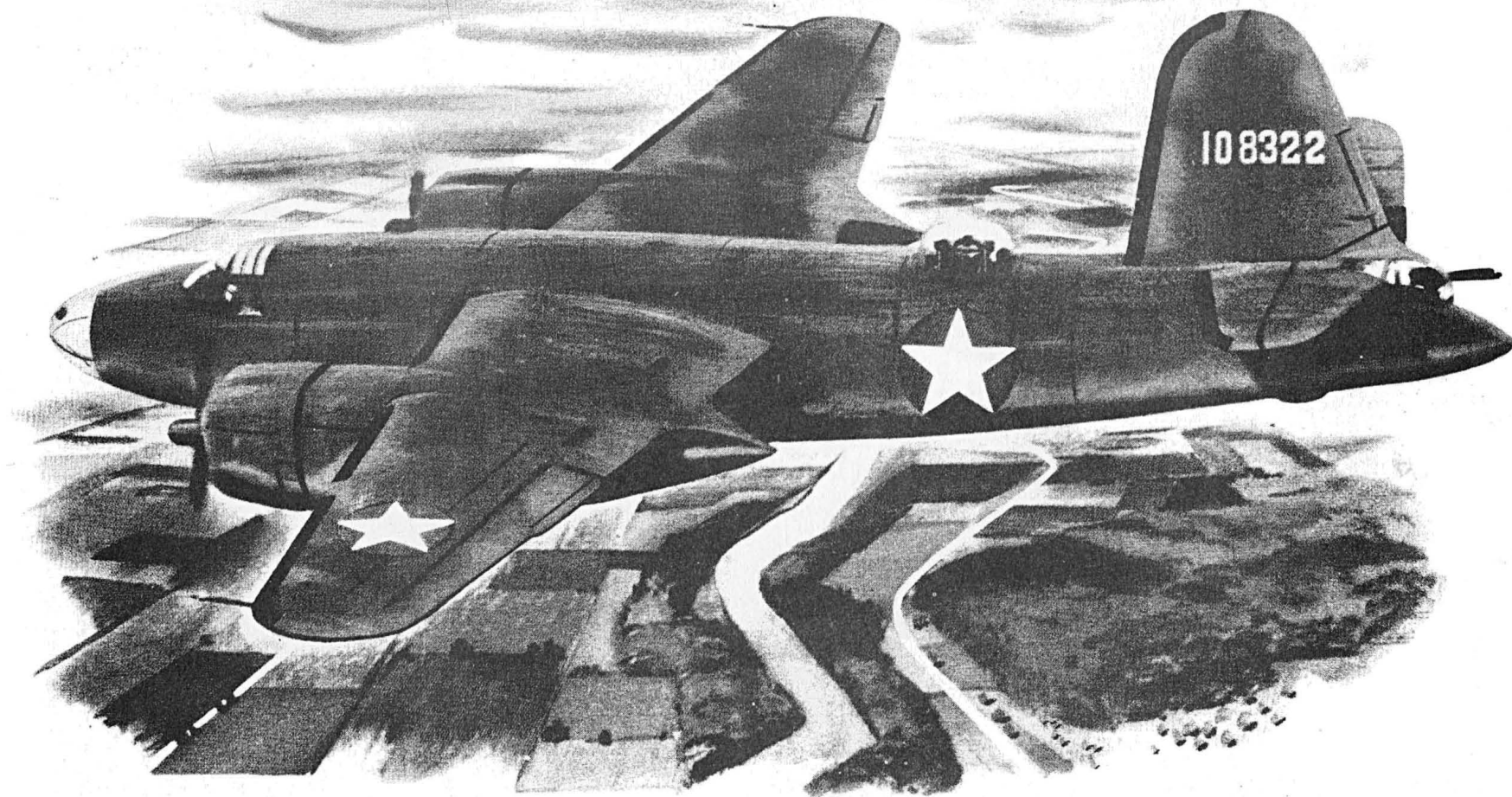
c. Radio call letters of not less than four numbers, utilizing both sides or each outboard side, as applicable, of vertical stabilizer and rudder assembly, will be maintained on all Army Air Forces aircraft. (See figures 8 and 10.) Call letters, or designators, will be derived by deletion of the first numeral of serial number (4) and

the hyphen, and the combination of the remaining four or more numerals. In case of serial numbers of type 41-7, use zero as necessary to make four numerals, as 1007. Decalcomanias may be used in all cases where available. Standard sizes 8 x 12 inches and 6 x 9 inches may be used when present stocks are depleted. Colors will be yellow, shade No. 48, for dark camouflage, and black, shade No. 44, for light surfaces.

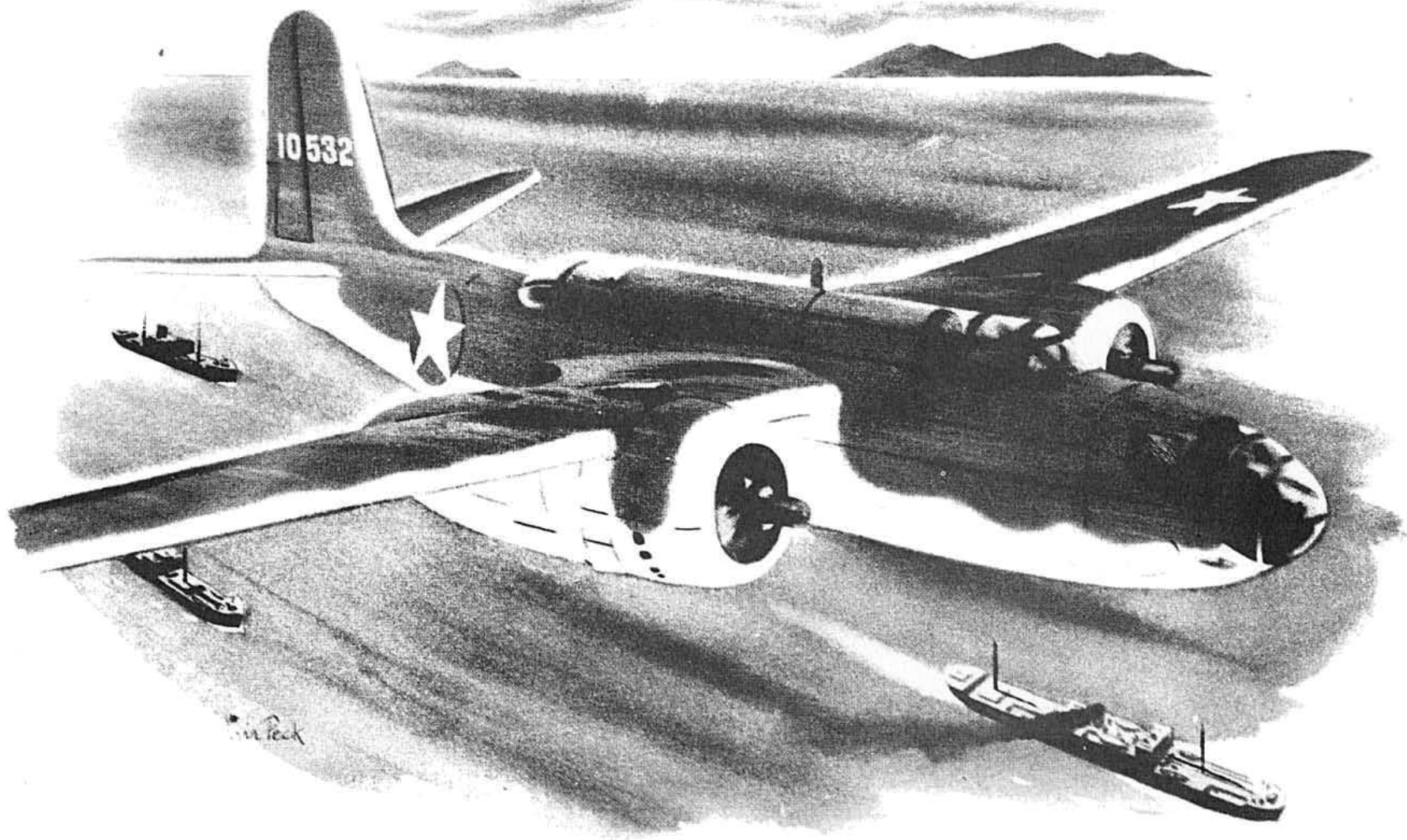
d. Under no condition will the letters "U. S. Army" be applied to any airplane lower wing surface.

#### 4. STANDARD INSIGNIA.

Cocardes, the five-point white star within a blue circle, will be placed and maintained on each Army Air



BASIC CAMOUFLAGE



SEASEARCH

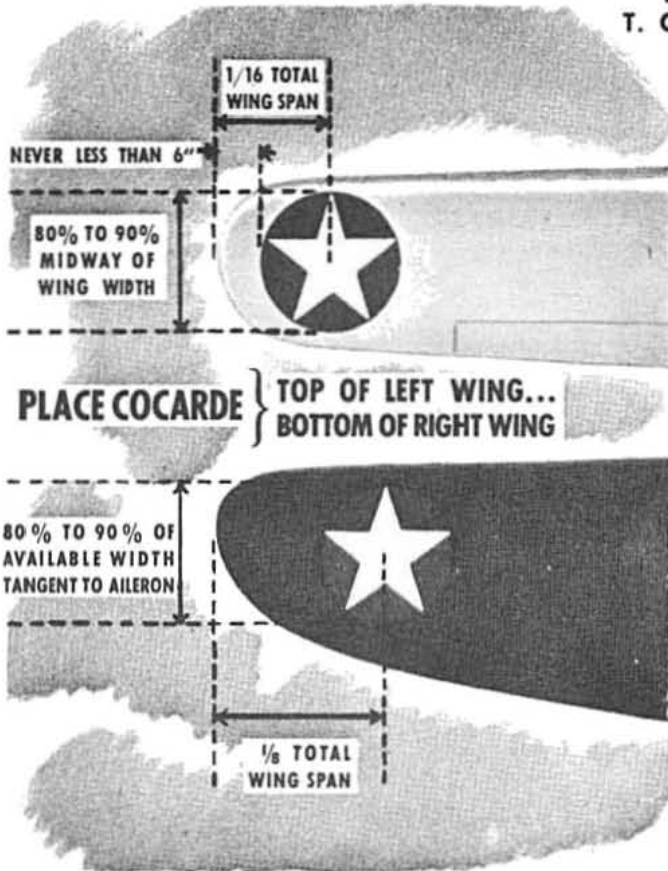


FIGURE 7

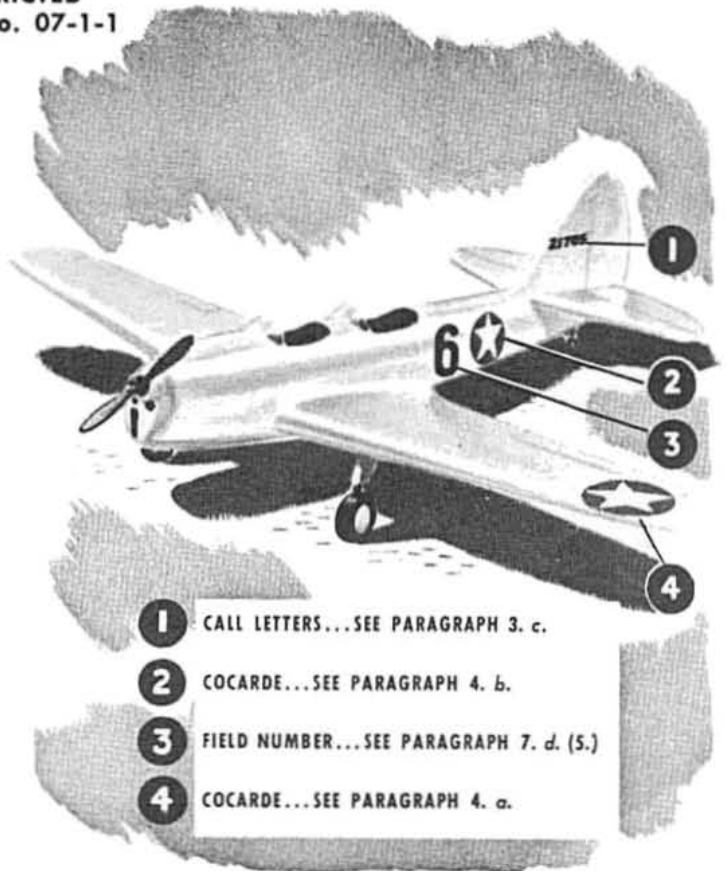
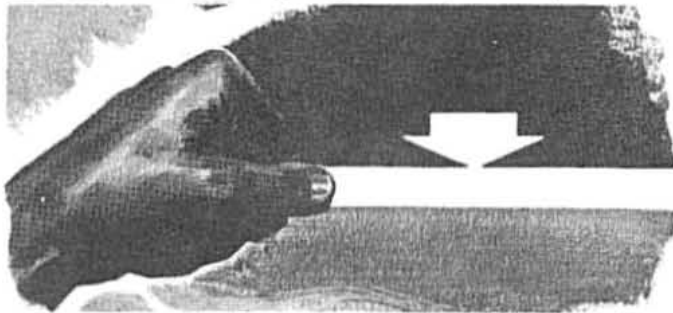


FIGURE 8

**DON'T** use masking tape to separate colors...



blend junction lines by **OVER-SPRAYING**

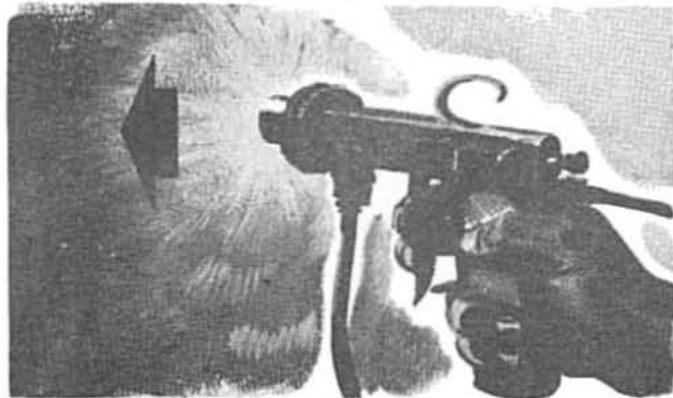


FIGURE 9

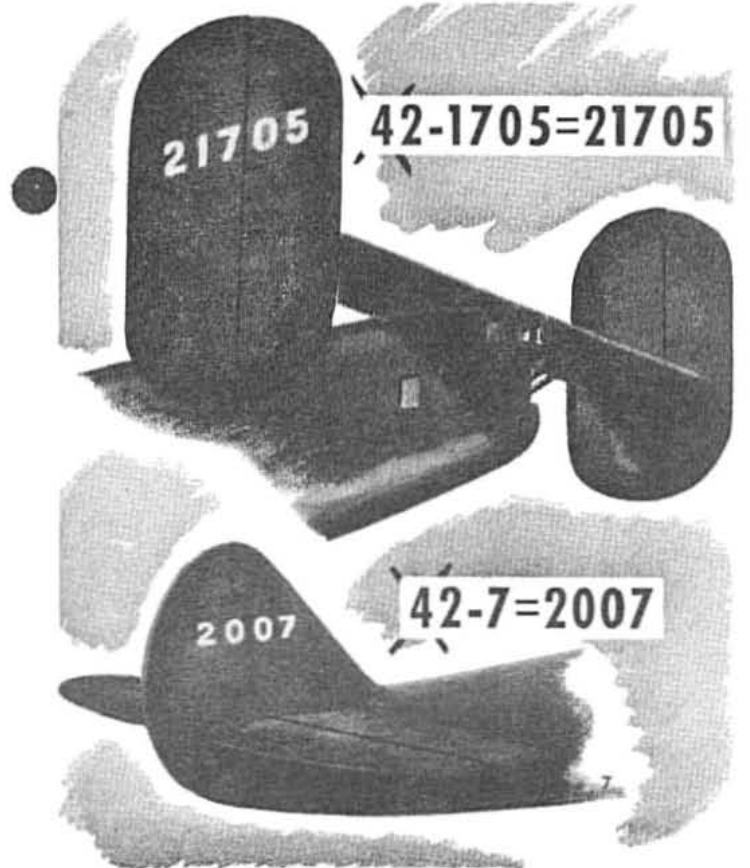


FIGURE 10

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(4) All exterior fabric parts will have four coats of clean nitrate dope, Specification No. AN-TT-D-514. (Aluminized dope vehicle AN-TT-D-551 is not a suitable substitute as it does not have the tautening qualities of AN-TT-D-514.) This will be followed by two or more coats of aluminized dope prepared by adding 6 to 8 ounces per gallon of bronze, aluminum pigment paste, type B, Specification No. TT-A-468 or AN-TT-A-461, to dope, cellulose nitrate, clear, Specification No. AN-TT-D-551.

(5) Patching will be accomplished with clear dope, Specification No. AN-TT-D-514 applied in same manner as semipigmented dope previously used.

(6) EMERGENCY REJUVENATOR FOR OLD FABRIC.—To one gallon of 2 to 1 mix of clear dope, Specification No. AN-TT-D-514, and blush retarding thinner, Specification No. AN-TT-T-258, add one fluid ounce each of tricresyl phosphate and castor oil. Apply one coat by brush to clean surface, followed by one spray coat. After several hours' drying, spray one coat aluminized dope prepared as specified in paragraph 7.c.(4).

(7) For removal of all types of paint material from metal surfaces, use paint and varnish remover, Specification No. 14119. For removal of dope from fabric surfaces, use nitrate dope and lacquer thinner, Specification No. AN-TT-T-256.

*d.* MARKINGS.

(1) Each part and assembly will be permanently and legibly marked the same number as the drawing number in such location that it can be read after assembly in the unit. (See Specification No. 98-24105Q.)

(2) Various detail and code markings for the cockpit, fuselage, oil lines, etc., as required in Specification No. 98-24105Q will be maintained. Use of one coat of varnish, Specification No. TT-V-121 or AN-TT-V-116, for protection of fuselage legend is authorized.

(3) Radio call letters will be used as prescribed in paragraph 3.c.

(4) Painting of ring cowls is authorized in colors as directed by the Commanding General of the Flying Training Command.

(5) Field numbers are authorized as designated by the Commanding General of the Flying Training Command for use in Army Air Forces Training Centers and Civil Flying Schools. They will be of contrasting color, preferably block type, and will be applied to opposite sides of the fuselage between the trailing edge of the wing and the leading edge of the horizontal stabilizer directly in front of the star insignia. The height will be approximately 75 percent of the height of fuselage at that point. (See figure 8.)

*e.* Standard insignia will be used as prescribed in paragraph 4.

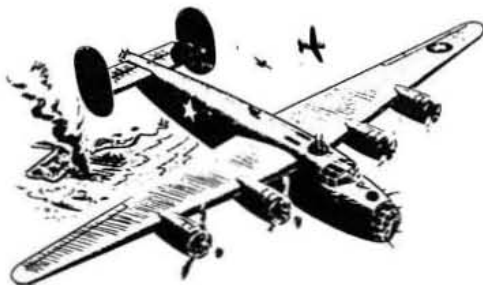
*f.* All markings and insignia will be made with enamel, Specification No. AN-E-3, insignia colors in oil, Specification No. 3-120, or lacquer, Specification No. AN-TT-L-51.

**8. LIGHTER-THAN-AIR.**

*a.* Organization insignia will be placed on each side of each lighter-than-air aircraft. The location for observation balloons will be on each side, halfway between the greatest diameter and the leading edges of the horizontal lobes. The locations for spherical balloons will be at points in line with and three feet from each end of the wording "U. S. ARMY."

*b.* In no instance will the size of lighter-than-air insignia exceed 9 square feet. The insignia placed on each craft assigned to an organization will be uniform in size. However, this does not require that insignia of different organizations be of the same size.

*c.* The insignia for all lighter-than-air aircraft will be painted on two-ply envelope fabric, code No. 101, and securely attached to the envelope with rubber cement. Each sheet of fabric will be neatly trimmed to the minimum size required, and, to insure adhesion, corresponding areas of the aluminum finish will be carefully removed from the envelopes with suitable wire brushes.



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