



MODELING FOR VICTORY

by Jim Alaback

The WW II National Model Building Program was a unique but brief episode in the history of American aeromodeling. Although it has been over 50 years since the program ended, its history and artifacts are still of interest—perhaps because it was the only time in history that model airplane building was regarded as a serious, patriotic public service—and not as playing with toy airplanes.

Program Origin: The genesis of the program came from a trip that U. S. Navy Commander Louis DeFlorez had made to England prior to America's entry into the war. DeFlorez, who was head of the Navy Bureau of Aeronautics Special Devices Division, learned about the English aircraft identification program that used models for training military personnel and civilian aircraft spotters. He also learned how England helped with its increasing wartime labor shortage by involving young people in auxiliary military units for the production of training equipment.

DeFlorez returned to America with samples of the English identification models and prepared a plan for a similar program that could be put into motion in the event that the U.S. should be drawn into the war.

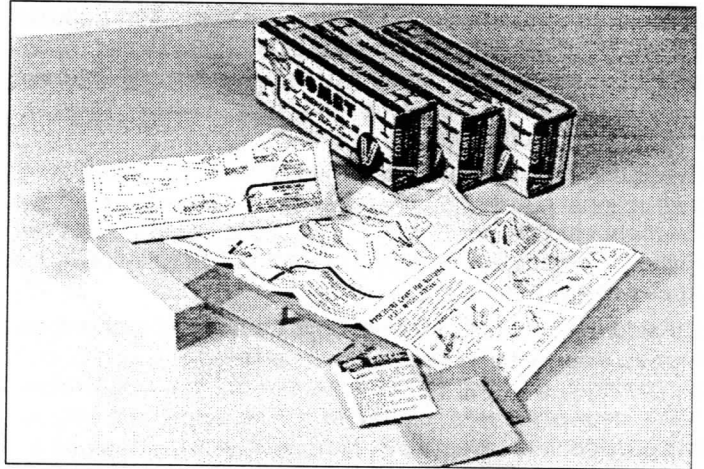
On December 8, 1941, Congress declared war on Japan. The following day the Navy called the head of the Comet model airplane company, William Bishop, to Washington. Bishop's account of the event, in a 1991 letter to Bill Hannan, is as follows:

"On December 9, 1941, the Navy called me to Washington; instructions were needed for aircraft recognition models to be built by school students. The Navy paid us, but the U.S. Office of Education sponsored the program. There was concern, at that time, about mothers objecting to their kids being utilized in the war effort.

There was very little information on Japanese aircraft. The Navy mounted camera guns on our fighter planes, and we got the pictures to work from. We became expert on interpreting those photos. For example: If we got a picture of a Zero showing the outline of the pilot's head, it was valuable. I sent a draftsman to the Crerar library (a research library) where our guy received help from the librarian. We studied anthropology to determine the average height of a Japanese man. We used proportional dividers on the head, knowing that it is approximately one-sixth of a person's height. Then we made assumptions; the Japanese would not train unusually small or large men.

That is how we determined the size of the aircraft; not perfect, but close! We also studied ground shadows, if there were any, to compare with a fence, barn, etc. Again, the Crerar library was of great help."

Implementing the Program: Within the Comet organization, Chief Designer Robert Reder took the lead in preparing the drawings and instructions for building the identification models. He and other well known Comet designers, including Carl Goldberg, went to work. The deadline for the instructions and the first 20 models ("Series A") was to have them ready for distribution in 60 days: February, 1942. They were to be followed by 20 more in April (Series B) and another 10 in May (Series C).



Three Comet ID kits for the Spitfire, F4F, and Buffalo, with the Buffalo kit contents displayed. Note two grades of sandpaper and a packet of Casco glue, a powder that had to be mixed with water to form a paste. The kits shown were priced at 15¢ each, as were other single-place fighter models. Larger models cost more, from 20¢ up to 75¢ (for the Consolidated PB2Y-3). (Jim Alaback photo.)

Under the circumstances of severe time constraint and lack of knowledge of the Japanese aircraft in particular, the results were amazing. The instructions are still as good as any to be found on building solid wood models, and the plans are drawn to a high standard for the intended purpose.

Perhaps inevitably, a few major bloopers did occur in the drawings of Japanese aircraft models. For example, in Series A, the "Baku Geki" was, in fact, an Aichi D3A1 Val, and the "Sento Ki 001" was the Mitsubishi A6M2 Zero.

The Model Aircraft Program was announced by Navy Secretary Frank Knox on January 31, 1942. It called for 500,000 models to be built, 10,000 each of 50 selected planes then being used by the Allies and the Axis powers.

The Navy sponsored the program and paid for it. It selected the plane types to be modeled and obtained the drawings. The U.S. Office of Education distributed the plans and instructions through the states' Superintendents of Schools to the local schools where the models were to be built and inspected. The Navy then provided collection centers and distributed the models to the armed forces.

To further motivate the boys in the program, recognition was offered for their achievements. The first model completed qualified the student for a certificate awarding him the honorary rank of Cadet Aircraftsman. The certificate was 8" x 10", very impressive, signed by an Admiral and the state School Superintendent. Definitely suitable for framing!

Since single-seat fighters were most popular with the boys, and the easiest to build, the incentives built into the program went on to require the less popular and more difficult planes be included when earning higher honors. The second rank was the Honorary Ensign Aircraftsman. It required three models of any type, including a scout bomber or observation plane. So it progressed, from rank to rank, up to the highest honor offered: Honorary Captain Aircraftsman. This rank required that 10 models be completed from 5 nations, including fighter, scout bomber, observation, twin-engine bomber, seaplane, biplane, twin-fuselage fighter, torpedo bomber, 4-engine army bomber, and 4-engine patrol bomber. The boys would have to WORK for those 4 stripes!

Publicity: The government also arranged a tremendous publicity program through local newspapers and popular national magazines of the day such as *Readers Digest*, *Time*, and *Life*, along with many appropriate special interest magazines such as *Model Airplane News*, *Popular Science*, and *National Scholastic*.

Eventually there were also two books of plans and instructions published: "Building Model War Planes" by Emmanuele Stieri and "How to Build Solid Scale Model War Planes" by Jesse Davidson (the model aviation editor of *Flying Aces* magazine).

Outside the school programs, boys could build recognition models from kits offered by Comet and Megow. Comet, not surprisingly, was the first to advertise the kits, in the May, 1942, issue of *Model Airplane News*. The Comet and Megow kits provided the same plans, templates, and instructions as those from the Government, except for showing their own company name in the title block in place of "U.S. Navy Bureau of Aeronautics." Later, other model companies also offered "spotter" kits, not necessarily using the official Navy plans, however.

Results of the School Program: By August, 1942, deliveries of school-built recognition models amounted to 284,712. Some 398,048 students from 6,836 junior and senior high schools had taken part in the program up to that time.

With the start of the 1942-43 school year it was decided to continue the program, although deliveries of factory-built plastic recognition models were about to begin. The school program was asked to provide 300,000 additional models: 10,000 each of 30 additional types (Series D, E, and F), as well as to complete their remaining quota from the prior school year. Still later, an additional 30 types were designated for projected series G, H, and I. Series G drawings were prepared but not released, and the H and I series were dropped when the school program officially ended December 31, 1943. By this time the factory-produced plastic models had become available in quantity and the schools' capacity to carry out the program was reduced by the loss of manual arts teachers to the defense industry and to military service.

In retrospect, the National Model Building Program was important in filling a void in the supply of recognition models before factory-produced models could be made available. It

also involved many students in a patriotic program that gave them a chance to feel that they were participating in the war effort before they were old enough to join the military services themselves.

Plastic ID Models: A program to produce factory-built spotter models was launched concurrently with the school program. However, experimentation to find suitable materials and processes took months, and then the production of tooling required additional time. The first delivery of plastic ID models did not occur until late 1942, nearly mid-way into the 1942-43 school year. However, the plastics, once well underway, overwhelmed the student-built solid wood models in quantity, quality, and diversity. Plastic ID models went on to be a military training tool for some 20 years, until the end of 1961. No complete list of the types of planes available in the U.S. program is known to exist, but collectors have identified 434 different plastic models, some being variations of the same type of airplane.

ID Model Influence Today: The plastic ID models provided the impetus for plastic hobby models that started in America right after the war and have dominated non-flying scale modeling since the 1950s.

The ID models also popularized the idea of constant scale models. Before WW II, some higher-priced lines of kits were to a constant scale, most commonly 1/4" = 1" (1:48 size) for solid models and 3/4" = 1' (1:16 size) for flying scale models. However, the majority of kits were designed to fit one size of box for a given price. Thus, a Megow 10¢ solid model of the huge China Clipper had the same 8" wingspan as their model of the diminutive Sopwith Camel. Similarly, in flying models, a 25¢ Megow kit gave you a nominal 24" wingspan whether the subject was a Taylor Cub or a Vultee Transport. (Not to pick on Megow; it was typical of Comet, Whitman, Guillow, and all the others who offered low-priced kits.) It should also be noted that in the days of full-size model plans published in segments over several pages of a model magazine, that designers selected model sizes to fit the size of the page, much as kits were designed to fit the size of the box.

ID models not only popularized constant-scale models, but also the specific scale of 1/6" = 1' (1:72 size). This was an unknown scale in America until it was introduced in the National Model Building Program. The customary solid model scales were 1/4" = 1' (1:48 size) and 3/16" = 1' (1:64 size). There wasn't even such a thing as a ruler with one-sixth divisions, so where did this particular scale come from?

The simple answer is that the model scale of 1/6" = 1' came from the English ID model program and was adopted without change for our U. S. program. However, digging farther back to the origin of this scale in England is interesting.

The scale of 1/6" = 1' got its start during WW I when an English modeler, Peter Capon, began building model airplanes for sale. Most of his customers initially were fellow employees at the Greaves & Thomas furniture company, which was building wings under subcontract for the AVRO 504 trainer. Capon carried the parts for his models around the factory in the pockets of his shop apron, which were just big enough to hold a six-inch wing. Since his best-selling model was of the AVRO 504, and its wingspan was 36 feet, he settled on a scale of 1/6" = 1', which gave him a 6-inch model wing to fit his pocket. After the war, Capon started advertising his finished models for sale in aviation magazines and at

aircraft shows. These models continued to use and to publicize the 1/6" = 1' scale.

When the English SkyBirds solid wood kits were introduced in 1932, they were also to a scale of 1/6" = 1'. The company founder, James Hay Stevens, had previously built his own models to a scale of 1/3" = 1', the same as standard toy lead soldiers. However, he found this size of airplane model would be too costly for hobby kits, so he cut the scale in half to the same 1/6" = 1' that Capon had settled on earlier. Then in 1936, FROG used the same scale for the world's first plastic model kits. Thus, by 1939, this scale had established a precedent for small solid or plastic models in England and was adopted for their ID model program.

In view of the impact the 1/6" = 1' scale (1:72 size) has had on world-wide plastic scale modeling, one might wonder what if Peter Capon's apron pockets or James Hay Stevens' toy lead soldiers had been of some different size?



Detroit Cloudbusters built these ID models in 1995 for display at the Naval Aviation Museum at Pensacola. L to R: Dave Brock, Don Campbell admiring a 1/72-scale Martin TBM-1 by Pres Bruning standing behind him, Paul Boyanowski, and Bill Hadley. Have fun identifying the models! (Stephen Kanyusik photo.)

AWARDING OF CERTIFICATES

As stated in the preceding chapter Certificates of Award issued by the U. S. Navy will be awarded to model builders who make models that pass inspection. The certificate will be signed by the local superintendent of the public school system upon certification by the Local Director, Model Aircraft Project, appointed in your locality. The certificate will indicate the appropriate rank of "Aircraftsman" based upon the number of approved models of different types completed by the model builder as follows:

- Cadet Aircraftsman 1 of any type of models completed.
- Ensign Aircraftsman 3 of any type of models completed, including a scout bomber or an observation plane.
- Lieutenant Aircraftsman 5 models completed, including one twin-engine bomber and planes (junior grade) from 2 nations.
- Lieutenant Aircraftsman 7 models completed, including a seaplane or twin-fuselage fighter.
- Lt. Commander Aircraftsman 8 models completed, including a torpedo bomber or biplane and including planes from 3 nations
- Commander Aircraftsman 9 models completed, including one four-engine bomber and including planes from 4 nations.
- Captain Aircraftsman 10 models completed, including planes from 5 nations and consist of the following types: fighter, scout bomber, observation plane, twin-engine bomber, seaplane, biplane, twin-fuselage fighter, torpedo bomber, four-engine army bomber, and four-engine patrol bomber.
- Rear Admiral Aircraftsman 25 models completed, each of a different type.
- Vice Admiral Aircraftsman 40 models completed, each of a different type.
- Admiral Aircraftsman 50 models completed, each of a different type.

These requirements are cumulative and the awards should be progressive. For example, to qualify as an Ensign Aircraftsman, the model builder must first have qualified as a Cadet Aircraftsman, etc. A model builder who has earned a rank by making A, B, and C series of planes may raise his rank by making planes of the D and other series which will be announced from time to time.

Certificates are to be awarded on the basis of models which pass inspection, whether such models are retained for local use or shipped as part of the local quota.

From the Editor: I try not to take valuable KAPA space for my comments, as I enjoy putting a full package together for you each issue. But two things have come up that I want to share with you. First, Cleveland Model & Supply Co. has been sold to an ardent Cleveland kit collector and admirer, John Jacox. Continue sending your orders in to Cleveland at the new address of P.O., Box 55962, Indianapolis, IN 46205-0962. Lastly, I read of some modelers lamenting the lack of young blood in model building and that it's hard for some parents to come up with \$500 for kit, engine, and radio gear. I think too many dealers are putting themselves out of work with that attitude. Teenagers need almost instant gratification. I think

the next time you take a teenager under wing, get him that beginner's Sterling control-line kit he can put together in one evening and fly the next day—well, almost. The thing is, it's a whole lot cheaper, quicker, and more manageable for a beginner, and they have a vested interest in the building—it's not a "disposable" ARF. Hopefully that will whet their appetites for something more in the future. I've tried everything else. I'll try that this coming year with my high school kids. Don't forget, besides the money, that parent may not know how to help the kid with R/C while they can follow instructions for a simple U-Control. Enough. Now sit back and enjoy what Jim Alaback, Morrie Leventhal, and John Pothier have helped me put together for you!

FEDERAL SECURITY AGENCY
U. S. OFFICE OF EDUCATION
 WASHINGTON, D. C.

REVISED OCT. 15, 1942

FORM FOR INSPECTION OF SCALE MODEL AIRCRAFT FOR IDENTIFICATION AND OTHER PURPOSES

SERIAL NO.	OFFICIAL NAME	SYMBOL	WINGS ENGINE FUSELAGE TAIL UCAR PEGUL													CHECKER'S INITIALS																			
			NATIONALITY*	SPIN	LOCATION ON FUSELAGE	ALIGNMENT	DIRECTION OF LEAD EDGE	TURRETS & OTHER PROJ.	UNUSUAL FEATURES	FINISH	LOCATION	SHAPE	ALIGNMENT	SHAPES	STABILIZERS-ELEVATORS		FINN-RUDDERS	LOCATIONS FOR WINGS ETC	SHAPES AT STATIONS	OUTLINE-HORIZONTAL	OUTLINE-SHAPE	NACELLE SHAPE	DISTANCE FROM LEAD EDGE	ALEROIS & FLAPS	LOCATION	LOCATION ON FUSELAGE	DIRECTIONAL								
A-1	BREWSTER	F2A-3	US	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	68 H.D.

* UNITED STATES, U.S.; BRITISH, B.; DUTCH, D.; JAPAN, J.; GERMAN, G.; ITALIAN, I.; RUSSIAN, R.; ETC

THIS FORM FILLED OUT AND SIGNED MUST BE INSERTED IN EACH PACKAGE OF 10 MODELS SHIPPED. MODELS MUST INCLUDE ALL DETAILS ON PLANS AND NO MORE. BE SURE TO CHECK EACH ITEM.

INSPECTED & APPROVED _____ CHAIRMAN
 FOR LOCAL INSPECTION COMMITTEE



THE UNITED STATES NAVY
 BUREAU OF AERONAUTICS
 Washington, D. C.

HEREBY CONFERS UPON

Michael Patti

the honorary rank of Lieutenant (Junior Grade) Aircraftsman in recognition of war-time service in making in accordance with specifications approved by the Bureau of Aeronautics of the United States Navy

SCALE MODEL AIRCRAFT

For use by the Government of the United States.

Given this second day of July in the year of Our Lord one thousand nine hundred and forty-two and of the Independence of the United States one hundred and sixty-six.

Harold G. Campbell
 Superintendent

J. H. Farrow
 Admiral J. H. Farrow, U. S. N.
 Chief of Bureau of Aeronautics



The Mini Page



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By BETTY DEBNAM

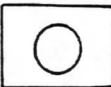
Spotter Cards in World War II



Do you collect cards such as baseball cards? Many kids during World War II collected cards showing silhouettes of airplanes.



But this collecting wasn't for fun. It was very serious. The government made the cards for people to use in spotting, or identifying, planes.



The attack on Pearl Harbor was such a surprise that people didn't know what to expect. They feared U.S. cities might be the next targets.

Friend or foe?

Although two oceans separated them from their enemies, people at home took no chances. Citizens on the West Coast were worried about an attack by the Japanese. Those on the



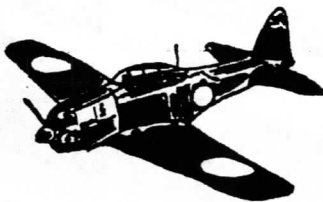
East Coast were more worried about being attacked by Germans.

Civilians worked to spot planes and to identify if they were friend or foe. Students as young as 10, older people and mothers served as spotters. They worked in spotter observer stations along our coast and borders.



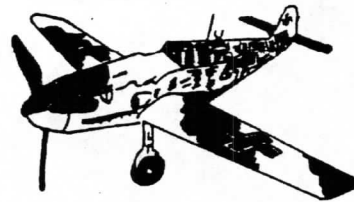
The Mini Page thanks Dan Hagedorn and Melissa Keiser of the Archives Division, the National Air and Space Museum, Smithsonian Institution; and Dr. Judy Bellairs and Ted Ballard of the Center of Military History.

Foe



A drawing of a Mitsubishi A6M Zeke.

Foe



A drawing of the Messerschmitt Bf-109G.



The Japanese Mitsubishi A6M Zeke was nicknamed "The Zero."



The German Messerschmitt Bf-109G was one of the most famous Luftwaffe fighters.



The Japanese Mitsubishi Betty was a bomber that could carry two torpedoes.



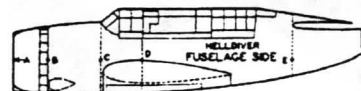
The German Focke-Wulf FW-190 fighter plane could fly almost 400 miles per hour.



Friend



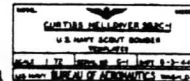
A drawing of a side view of a Boeing B-17.



Model planes

Pilots often carried spotter cards with them when they went on combat missions.

Pilots also needed exact models of the planes to get a better idea of how they looked. High school students built models for the armed forces. Schools competed with each other to build the most models.



The American P-51B Mustang, a famous fighter plane, had a Rolls-Royce engine.

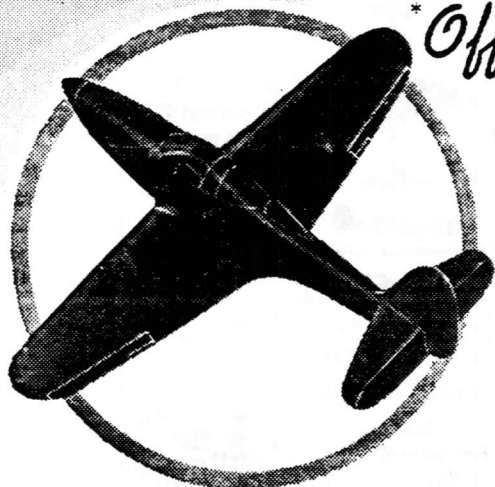


The Boeing B-17G, the Flying Fortress, was one of the most famous American bombers.

COMET is FIRST...again!



First to bring you
Official IDENTIFICATION MODEL KITS
 — at your DEALER'S Now!



15c MODELS: 1A-1—Brewster F2A-3; 1A-2—Grumman F4F-4; 1A-6—Bell P-39D; 1A-9—Curtis P-40E; 1A-10—Northrop A-17A; 1A-14—Messerschmitt ME-103; 1A-16—Santo Ki-001; 1A-19—Spitfire; **20c MODELS:** 1A-3—Douglas SBD-3; 1A-4—Vought Sikorsky OS2U-1; 1A-5—Douglas TBD-1; 1A-17—Baku Geki Ki-99; **35c MODELS:** 1A-11—Douglas A-20A; 1A-13—Douglas DC-3; 1A-15—Heinkel 111; 1A-18—Mitsubishi-96; 1A-20—Wallington; **50c MODELS:** 1A-6—Consolidated PBV-5; 1A-12—Boeing B-17E; **75c MODELS:** 1A-7—Consolidated PB2Y-3.

DEPEND on Comet—and your Comet dealer—to bring you the important things FIRST! Right NOW—at your dealer's—you'll find all the "Official Identification Models that have been released to date—in handy kit form, complete with wood, cement, two grades of sandpaper, template sheet and assembly chart—in five price groups according to size! The U. S. Office of Education-Navy has asked for a half-million Identification Models. Comet was proud to devote its designing facilities to the task of furnishing the official plans. And we are proud to turn our production facilities to the bigger job of assembling these "Official Identification Model Kits! Whether you work through your school, local model-building club or other organization—get the Comet Identification Model Kits you want from your Comet dealer—and help give Uncle Sam the models he wants!

All Identification Models are 1/72 scale. Models released to date include planes of the United States, English, German and Japanese Air Forces. Identical with those used in the High School Building Program of the U. S. Office of Education, sponsored by the U. S. Navy, Bureau of Aeronautics.



This Comet ad appeared in the May 1942 issue of *Model Airplane News*.

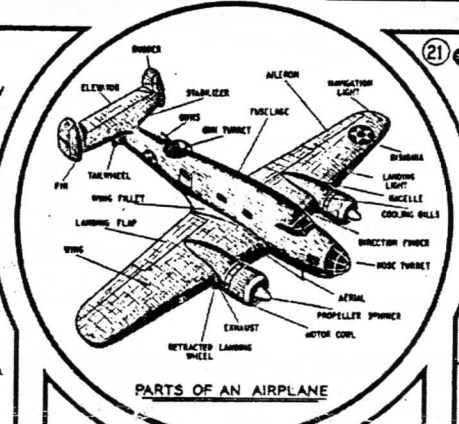
PROCEDURE CHART FOR BUILDING SCALE MODEL AIRCRAFT

FUSELAGE

<p>1</p> <p>STEP: PENCIL SANDPAPER</p> <p>TRACE SIDE AND TOP OUTLINES WITH TEMPLATE. SEE THAT BOTH ARE LINED UP AT FRONT OF BLOCK.</p>	<p>2</p> <p>SAW TO TOP OUTLINE USING JIG, BAND OR COPING SAW. REPLACE SIDE PIECES WITH PINS OR SMALL BRADS.</p>	<p>3</p> <p>CUT OUT ELONGATED SLOT</p> <p>SAW TO SIDE OUTLINE. IT IS EXTREMELY IMPORTANT THAT THIS BE CUT VERY ACCURATELY.</p>	<p>4</p> <p>ON MOWING MODELS, CUT OUT PORTION UNDER WING AS SHOWN AND GLUE LIGHTLY BACK IN PLACE BEFORE CUTTING OUT SIDE OUTLINE.</p>	<p>5</p> <p>REMOVE SIDE PIECES FROM FUSELAGE. THESE CAN BE PULLED OFF BY HAND.</p>
<p>6</p> <p>PLACE TEMPLATE OVER TOP OF FUSELAGE AND PUSH PINS THRU CIRCLES INDICATED. DRAW LINE DOWN CENTER OVER PINHOLES. USE SAME PROCEDURE ON BOTTOM.</p>	<p>7</p> <p>BEGIN CARVING TO GENERAL SHAPE AS SHOWN BY CROSS SECTION TEMPLATES AND FINAL ASSEMBLY DRAWING. IF FUSELAGE HAS RADIAL COWL, MAKE IN SAME MANNER AS MACELLE FRONTS. SEE FIG. 22-24.</p>	<p>8</p> <p>CARVE FUSELAGE CLOSE TO TEMPLATE SHAPES BUT A LITTLE OVERSIZE TO ALLOW FOR SAND-PAPERING. DO NOT CARVE AWAY CENTER LINE. DRAW ON TOP AND BOTTOM OF FUSELAGE.</p>	<p>9</p> <p>AROUND COCKPITS, ON BOTTOM OF FLOATS, AND WHEREVER CONCAVE CUTS HAVE TO BE MADE, USE KNIFE WITH EDGE PARALLEL TO WOOD GRAIN. CHECK WITH CROSS SECTION TEMPLATES FREQUENTLY.</p>	<p>10</p> <p>USE RASP OR ROUGH SANDPAPER WRAPPED AROUND A SMALL BLOCK TO REMOVE BUMPS. THEN SAND SMOOTH WITH FINE SANDPAPER.</p>

WING

<p>11</p> <p>IF WING IS TAPERED, MARK THICKNESS TAPER ON WING BLOCK USING STRAIGHT EDGE AND SHARP PENCIL.</p>	<p>12</p> <p>CLAMP BLOCK IN VISE AND TAPER TO LINE WITH SPOKE SHAVE, PLANE OR KNIFE. SAND SURFACES SMOOTH.</p>
<p>13</p> <p>PIN WING TEMPLATE TO TAPERED BLOCK, PUSHING PINS THRU MARKED PINHOLES. TRACE AROUND TEMPLATE AND SAW OUT.</p>	<p>14</p> <p>USING PINHOLES AS GUIDES, DRAW LINES ON TOP OF BLOCK. THEN DRAW DOWN CENTER OF FRONT EDGE.</p>
<p>15</p> <p>CUT BLOCK DOWN TO GUIDE LINES WITH KNIFE OR PLANE. LEAVE TRAILING EDGE AT LEAST 1/32" THICK.</p>	<p>16</p> <p>TRIM DOWN AND SAND TO FIT WING AIRFOIL TEMPLATE. ROUND OFF LEADING EDGE.</p>
<p>17</p> <p>CUT WING APART AT DIHEDRAL BREAKS AND BEVEL EDGES AS SHOWN ABOVE.</p>	<p>18</p> <p>GLUE PIECES TOGETHER AND BLOCK UP WING TIPS USING DIHEDRAL GAUGE. USE WAX PAPER BENEATH GLUE JOINTS TO PREVENT STICKING TO TABLE.</p>



NACELLES

<p>21</p> <p>'CARROT' TYPE</p> <p>MARK NACELLE POSITIONS WITH TEMPLATE AND CUT OUT WITH SAW.</p>	<p>22</p> <p>CUT NACELLES FROM BLOCKS USING SAME PROCEDURE AS FOR FUSELAGE. FIT INTO WING AS SHOWN AND DRAW WING SHAPE ON NACELLE WITH PENCIL.</p>
<p>23</p> <p>CARVE NACELLE, LEAVING PORTION THAT FITS INTO WING UNTOUCHED.</p>	<p>24</p> <p>SAND SMOOTH, THEN ROUND OFF FRONT EDGE WITH SANDPAPER.</p>
<p>25</p> <p>CLOTHESPIN TYPE</p> <p>ON THIS TYPE, NACELLE IS CUT OUT TO FIT WING.</p>	<p>26</p> <p>AFTER SAWING, SAND TO FIT WING AS SHOWN. THEN FINISH SAME AS 'CARROT' TYPE NACELLE.</p>
<p>31</p> <p>CUT OUT STABILIZER AND SLIP IN FUSELAGE SLOT. DRAW LINES ON TOP AND BOTTOM OF STABILIZER AS SHOWN.</p>	<p>32</p> <p>DRAW CENTER LINE AROUND ENTIRE EDGE OF STABILIZER.</p>
<p>33</p> <p>SHAPE STABILIZER APPROXIMATELY AS SHOWN ABOVE. ON SMALL MODELS, PORTION THAT FITS INTO FUSELAGE IS LEFT SQUARE.</p>	<p>34</p> <p>SAND STABILIZER SMOOTH WITH SAND-PAPER BLOCK. BUILD FIN IN THE SAME MANNER AS THE STABILIZER.</p>

SCORING

<p>19</p> <p>PUSH PIN THRU TEMPLATE TO MARK CONTROL SURFACES.</p>
<p>20</p> <p>SCORE INTO SURFACE WITH KNIFE USING PINHOLES AND STRAIGHT EDGE AS A GUIDE.</p>

SPINNERS

<p>27</p> <p>CARVE DOWEL TO APPROXIMATE SHAPE.</p>
<p>28</p> <p>SANDPAPER DOWEL. USE TWISTING MOTION.</p>
<p>29</p> <p>CHECK SHAPE WITH TEMPLATE.</p>
<p>30</p> <p>CUT OFF SPINNER WITH SAW.</p>

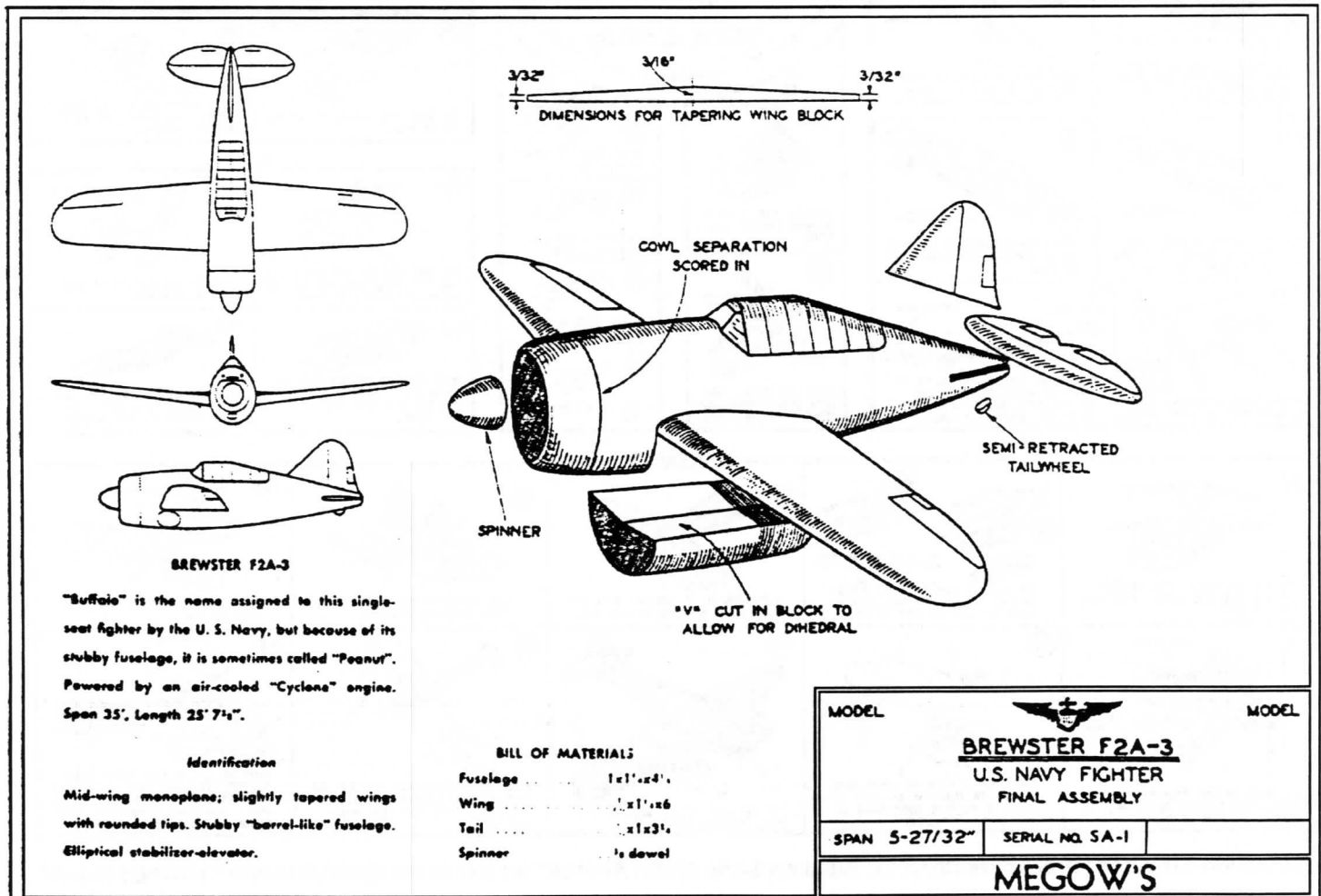
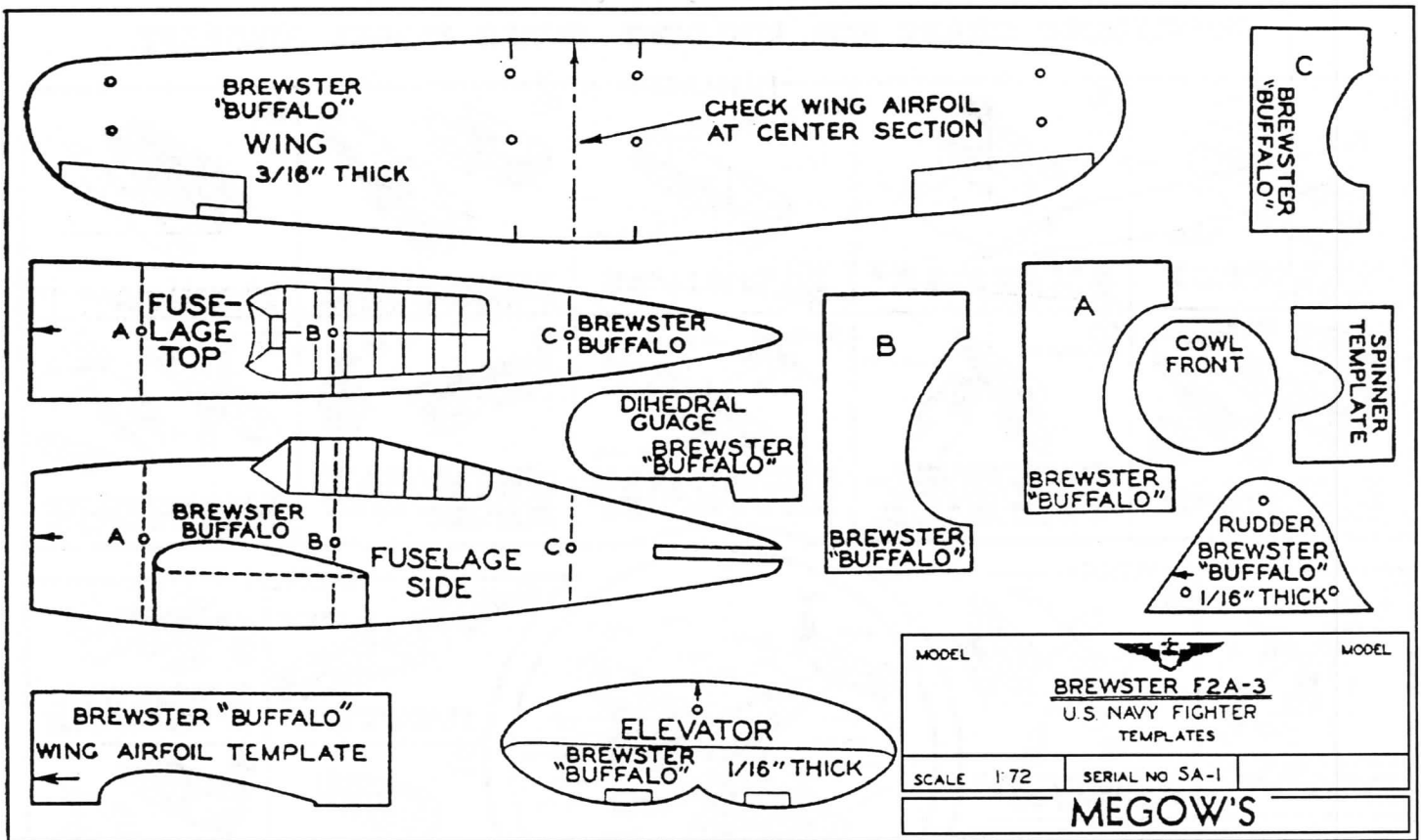
TAIL

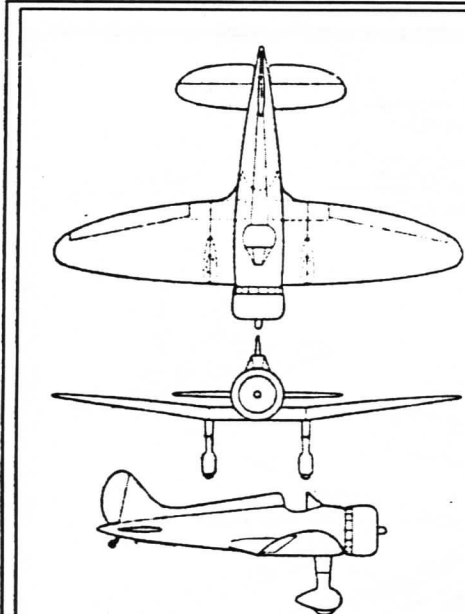
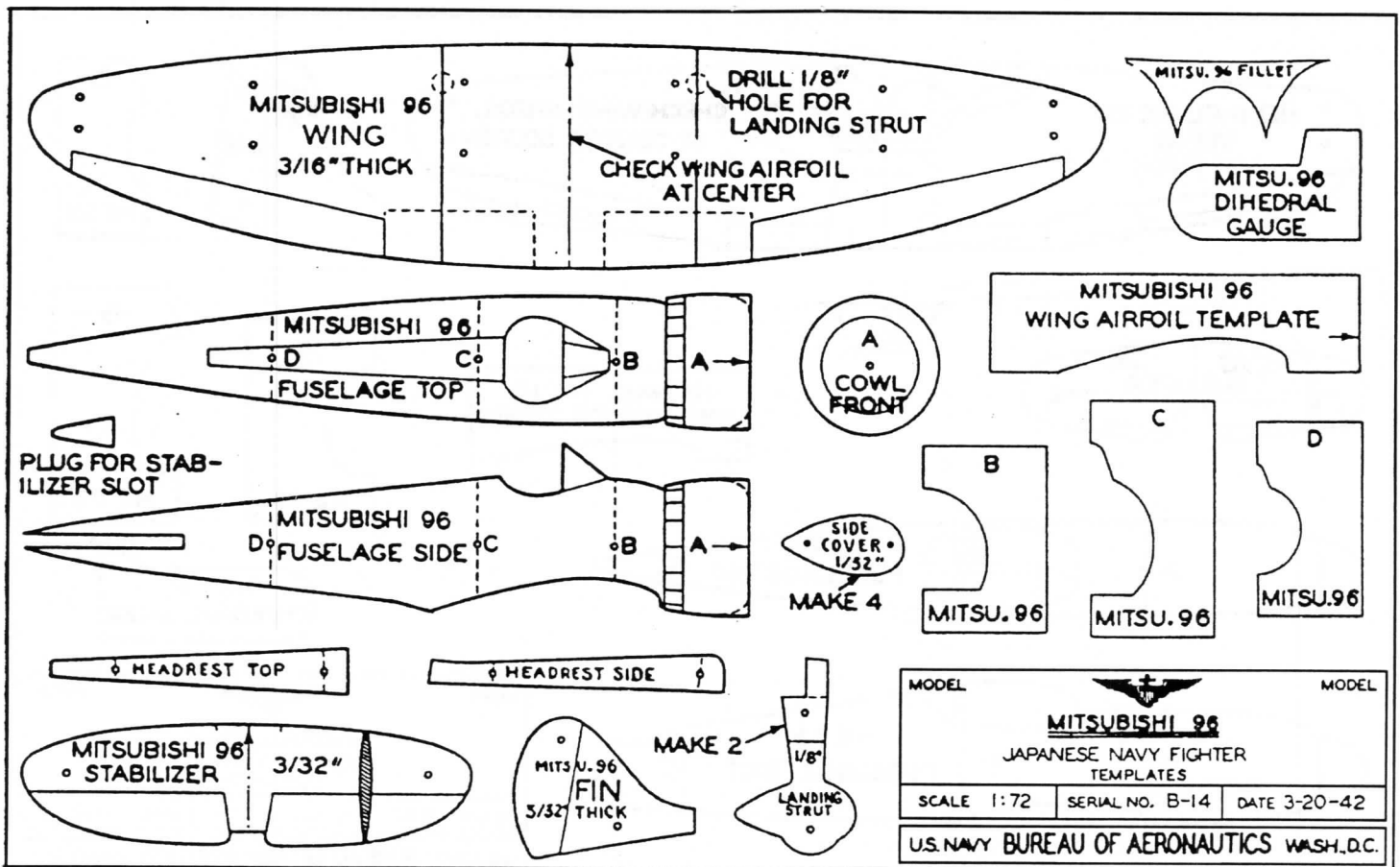
<p>31</p> <p>CUT OUT STABILIZER AND SLIP IN FUSELAGE SLOT. DRAW LINES ON TOP AND BOTTOM OF STABILIZER AS SHOWN.</p>	<p>32</p> <p>DRAW CENTER LINE AROUND ENTIRE EDGE OF STABILIZER.</p>
<p>33</p> <p>SHAPE STABILIZER APPROXIMATELY AS SHOWN ABOVE. ON SMALL MODELS, PORTION THAT FITS INTO FUSELAGE IS LEFT SQUARE.</p>	<p>34</p> <p>SAND STABILIZER SMOOTH WITH SAND-PAPER BLOCK. BUILD FIN IN THE SAME MANNER AS THE STABILIZER.</p>

ASSEMBLY

<p>35</p> <p>ON LOW-WING MODELS, TRIM FUSELAGE UNTIL IT FITS WING AIRFOIL. THEN GLUE WING IN PLACE.</p>	<p>36</p> <p>ON MID-WING MODELS, REMOVE BOTTOM SECTION. FIT AND GLUE WING IN PLACE. THEN TRIM BOTTOM PIECE TO FIT.</p>	<p>37</p> <p>GLUE ELEVATOR TO FUSELAGE. MAKE CERTAIN THAT IT IS LINED UP WITH WING.</p>	<p>38</p> <p>GLUE RUDDER OR RUDDERS IN PLACE. CHECK ALIGNMENT CAREFULLY.</p>	<p>39</p> <p>GLUE ENGINE NACELLES, IF MODEL HAS THEM, TO WING.</p>
<p>40</p> <p>CUT FILLET PATTERN FROM CARDBOARD OF APPROXIMATELY POSTCARD THICKNESS. GLUE TO FUSELAGE AND WING AS SHOWN.</p>	<p>41</p> <p>SHAPE PLASTIC WOOD OR OTHER FILLET MATERIAL TO FORM TOP OF FILLET AS SHOWN. IF FILLET IS LARGE, BUILD UP WITH SEVERAL APPLICATIONS.</p>	<p>42</p> <p>ADD ALL SMALL DETAILS SUCH AS SPINNERS, EXHAUSTS, ETC.</p>	<p>43</p> <p>COVER ENTIRE MODEL WITH AT LEAST TWO COATS OF CLEAR LACQUER AND SAND BETWEEN EACH. THEN PAINT WITH BLACK LACQUER.</p>	<p>44</p> <p>USING PIN, LOCATE POINT WHERE MODEL BALANCES LEVEL AND DRILL A 1/16" HOLE THRU FUSELAGE AT THIS POINT. COUNTER-BORE A 3/32" HOLE UP ABOUT 1/4" FROM BOTTOM SO THREAD CAN BE INSTALLED.</p>

Government-provided "Procedure Chart for Building Scale Model Aircraft" for use in recognition model building program.



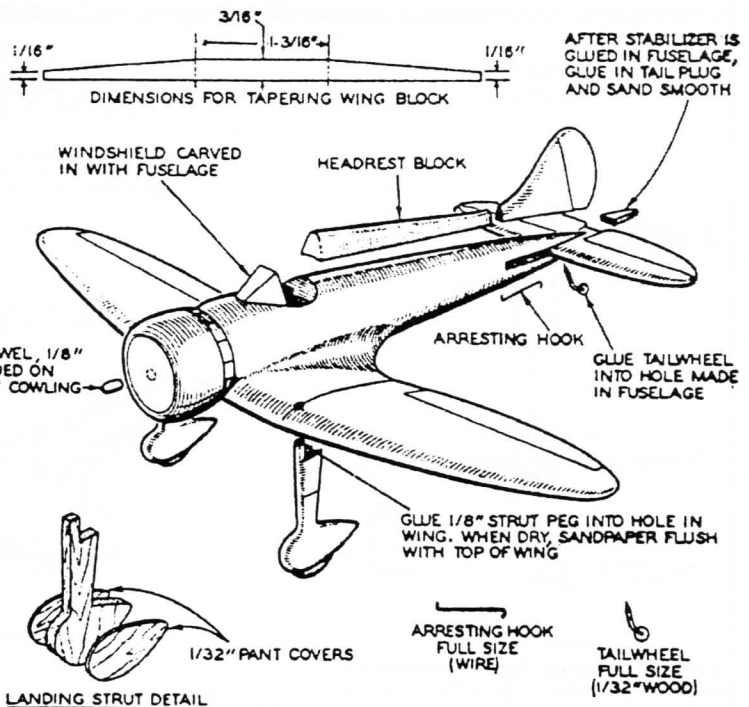


MITSUBISHI 96 FIGHTER

Single-place Japanese Navy fighter powered by a radial engine. Same airplane reported to be built by Nakajima. Fixed landing gear with streamlined pants over wheels. Has hook for carrier landings. Span 35' 6", Length 25'.

Identification

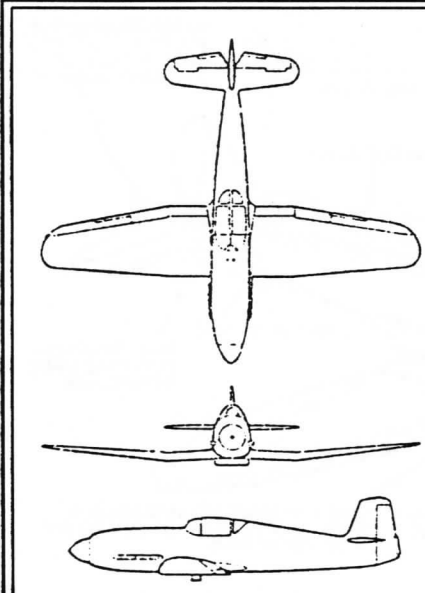
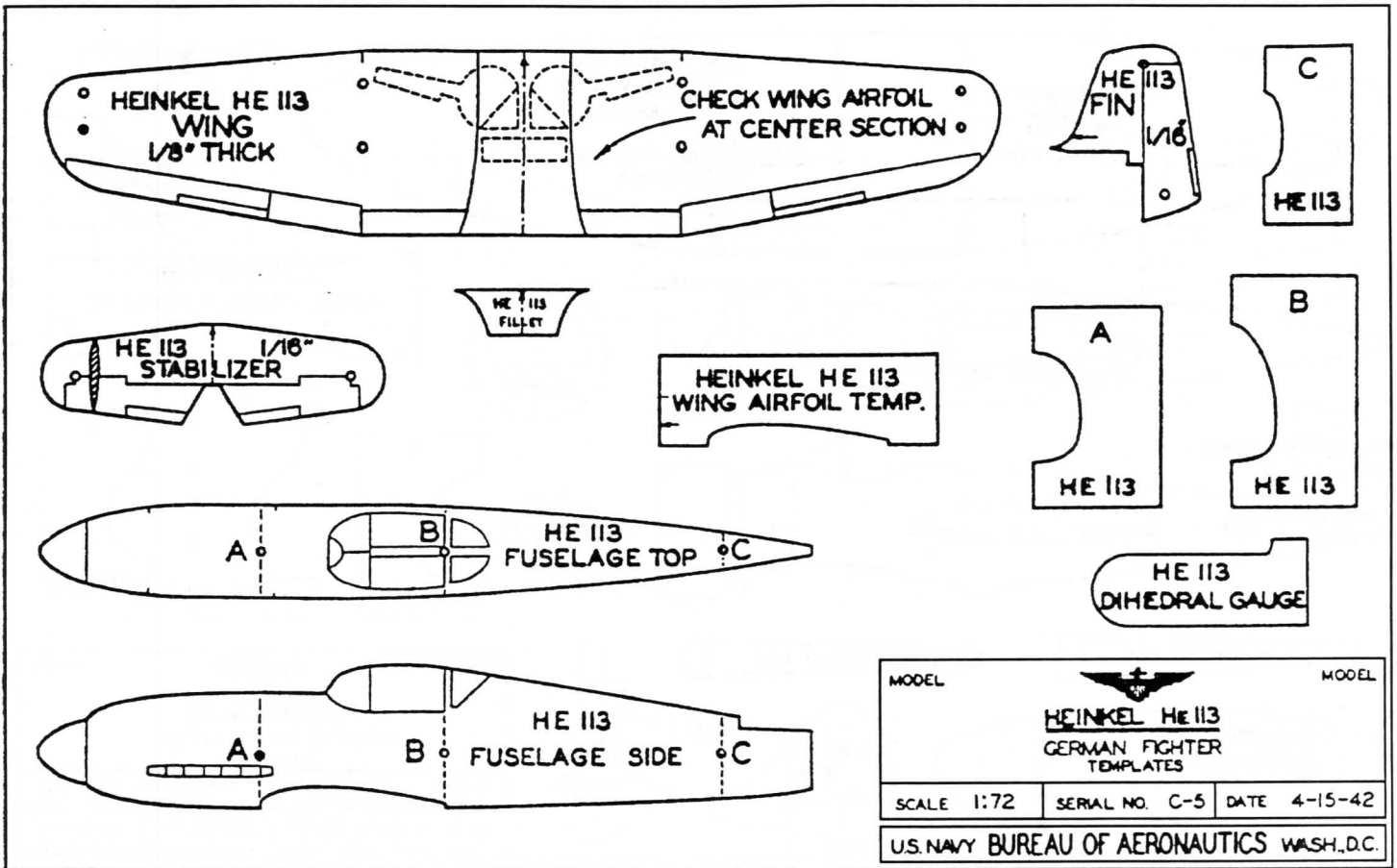
Low wing monoplane with elliptical wing. Fuselage has short nose. Pilot sits far forward in open cabin with long headrest fairing into fin. Rudder hinge line slants forward. Elliptical stabilizer-elevator.



LANDING STRUT DETAIL

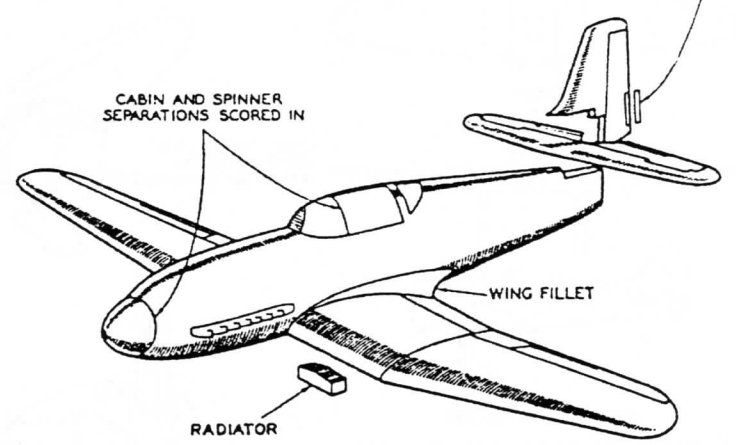
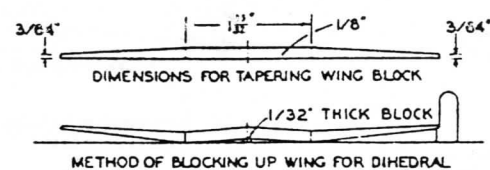
- BILL OF MATERIALS**
- Fuselage 1/2x1 1/2x4 1/2
 - Wing 1/2x1 1/2x6
 - Tail 1/2x1x3 1/2
 - Landing Struts 1/2x1x2 1/2
 - Headrest 1/2x1x1 1/2
 - Pant Covers 1/2x1x1 1/2

MODEL			MODEL
MITSUBISHI 96			
JAPANESE NAVY FIGHTER			
FINAL ASSEMBLY			
SPAN 5-29/32"	SERIAL NO. B-14	DATE 3-20-42	
U.S. NAVY BUREAU OF AERONAUTICS WASH., D.C.			



HEINKEL He 113
 A single-place German fighter powered with a 1500 H.P. Daimler-Benz engine. Has two large-bore machine guns in wing roots and cannon firing through propeller hub. Landing gear retracts inwards under center-section of wing. Span 30' 10", Length 26' 10"

Identification
 Low-wing monoplane having slightly inverted gull wings. Wing center-section is parallel and outer panels are tapered to rounded tips. Long bullet-like nose. Short, wide radiator under wing below cockpit. Stabilizer-elevator tapered to rounded tips.



- Fuselage 1/4x1x4 1/4
- Wing 1/2x1 1/2x5 1/4
- Tail 1/4x1x3

MODEL	HEINKEL He 113		MODEL
GERMAN FIGHTER FINAL ASSEMBLY			
SPAN 5-1/8"	SERIAL NO. C-5	DATE 4-15-42	
U.S. NAVY BUREAU OF AERONAUTICS WASH., D.C.			

CURTISS SOC-3 UPPER WING
1/8" THICK
CABANE STRUT LOCATIONS
N° STRUT LOCATIONS

CURTISS SOC-3 LOWER WING
3/32" THICK
N° STRUT LOCATIONS
FLOAT STRUT LOCATIONS

FUSELAGE FRONT
CABANE STRUT LOCATIONS
A B C D
CURTISS SOC-3 FUSELAGE SIDE

AIRFOIL TEMPLATE FOR CENTER OF LOWER WING

CURTISS SOC-3 FUSELAGE TOP
A B C D

CURTISS SOC-3 PONTON TOP
E F G
PONTON STRUT LOCATIONS

CURTISS SOC-3 PONTON SIDE
E F G

CURTISS SOC-3 STABILIZER
1/16" THICK

CURTISS SOC-3 FIN
1/16" THICK

SOC-3 COWL FRONT

CURTISS SOC-3 LOWER WING AIRFOIL TEMPLATE

CURTISS SOC-3 COWL TEMPLATE

SOC-3 TIP FLOAT
TOP SIDE
H SIDE

SOC-3 UPPER WING AIRFOIL TEMPLATE

SOC-3 FUSE FRONT

SOC-3 A **SOC-3 B** **SOC-3 C**

SOC-3 D **SOC-3 E** **SOC-3 F** **SOC-3 G**

SOC-3 H **SOC-3 PROP. HUB.** **CURTISS SOC-3 DIMEDRAL GAUGE**

For Assembly Plans and Description of This Plane, See "Building Model Warplanes" Page 78

MODEL			MODEL
CURTISS SOC-3			
U.S. NAVY SCOUT OBSERVATION SEAPLANE			
TEMPLATES			
SPAN 6"	SERIAL NO. D-2	DATE 10-5-42	
U.S. NAVY BUREAU OF AERONAUTICS WASH., D.C.			

EXHAUST 1/16" DOWEL MAKE 2

FILLET

WING FILLET TEMPLATE

NOTE: USE WIRE FOR STRUTS EXCEPT WHERE OTHERWISE SPECIFIED. ALL STRUTS SHOWN FULL SIZE.

USE SANDPAPER WRAPPED AROUND DOWEL TO SAND "INVERTED GULL" IN LOWER WING

CABANE STRUTS

N° STRUT

AILERON PUSHROD

STABILIZER STRUT MAKE 2

FRONT FLOAT STRUTS

REAR FLOAT STRUTS

PONTON STRUTS

FILLET

TIP FLOAT

FUSELAGE REPLACEMENT BLOCK

AILERON PUSHROD MAKE 2

PONTON

EXHAUST

FRONT PONTON STRUTS 1/32" WOOD-MAKE 2

REAR PONTON STRUTS 1/32" WOOD-MAKE 2

CABANE STRUTS MAKE 2

CUT FROM STIFF PAPER

N° STRUT MAKE 2 1/32" WOOD

CURTISS SOC-3

A two-place, scout observation plane of the U. S. Navy convertible for wheels or floats. Stressed for catapult landings from battleships and cruisers. The Coast Guard has also used this type. The land-based version has a fixed, two-wheel landing gear with open-faced "pants" over the wheels. Wings fold back for stowage. Span 35' 11". Length 31' 8 1/2".

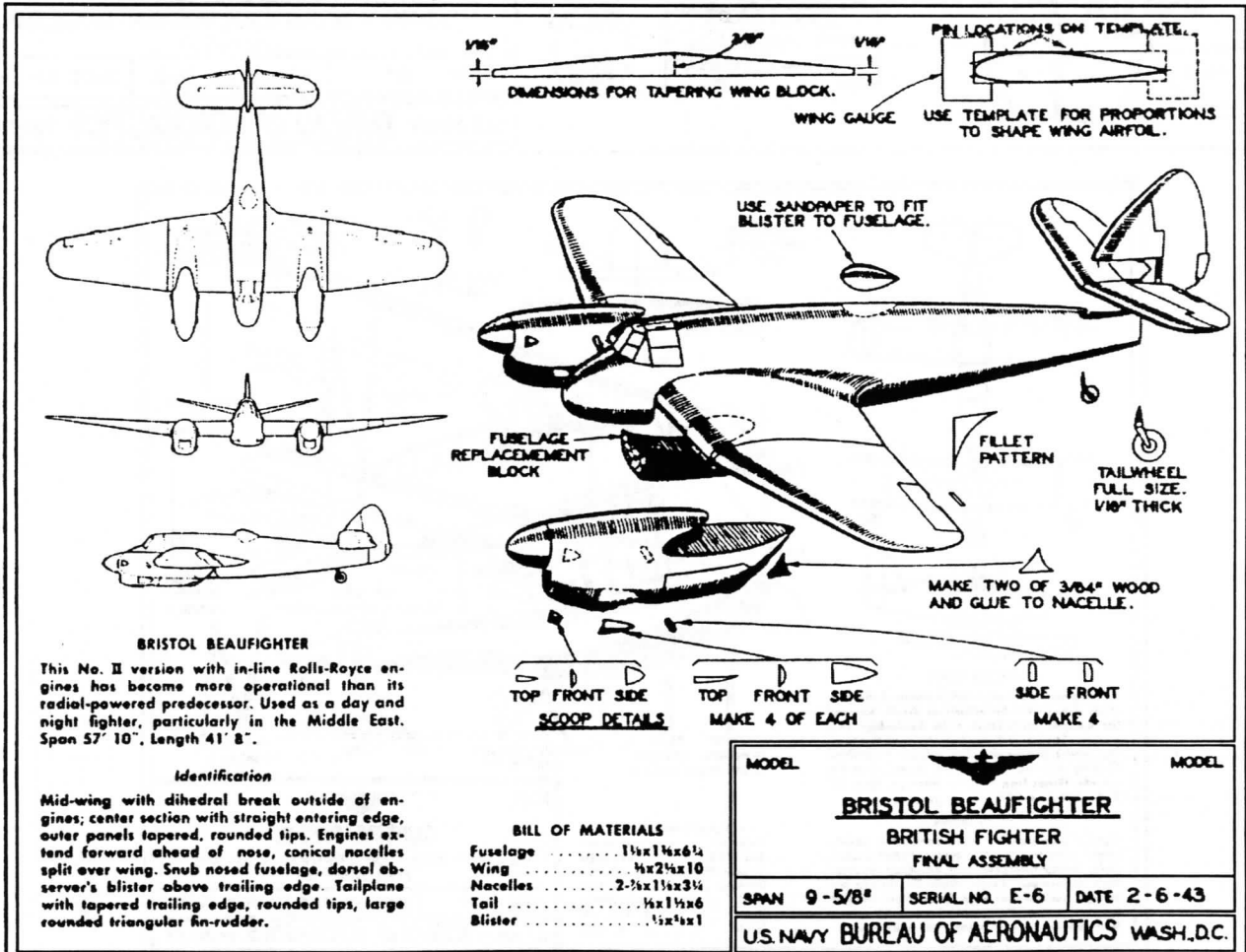
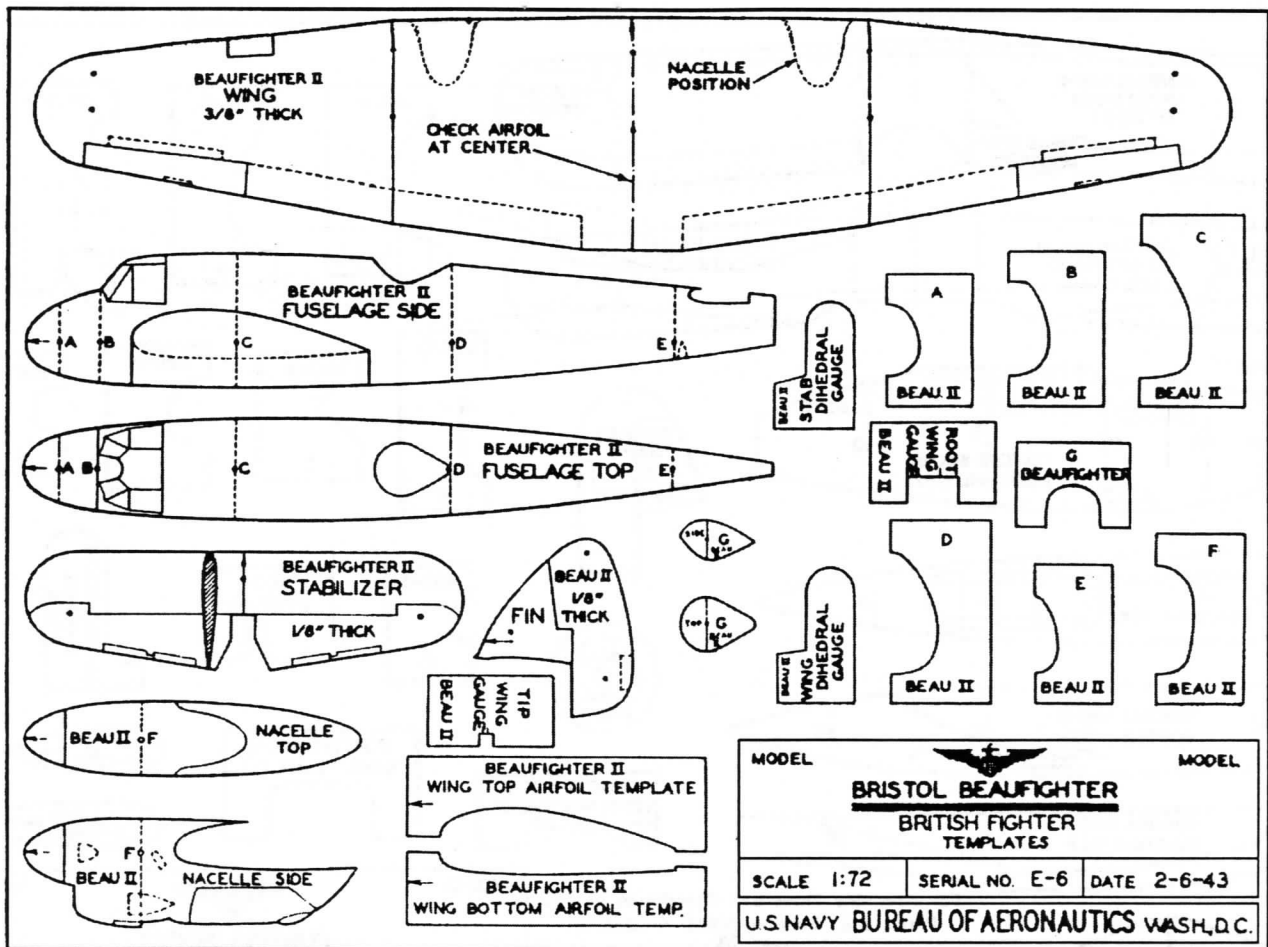
Identification

Biplane with parallel, swept-back wing panels. Upper wing has "bite" in center. Radial engine. Deep, faired fuselage. Large, single fin. Rudder has straight vertical rear edge. Single float beneath fuselage and small floats at wing tips. Wings and floats are braced with many struts and wires.

BILL OF MATERIALS

Fuselage	1x18x4 1/2
Top Wing	2x14x6 1/4
Bottom Wing	2x14x6 1/4
Pontoon	2x18x5
Tail	2x18x4 1/2
Floats	2x18x1 1/2
Struts	2x1/16" thick

MODEL			MODEL
CURTISS SOC-3			
U.S. NAVY SCOUT OBSERVATION SEAPLANE			
FINAL ASSEMBLY			
SPAN 6"	SERIAL NO. D-2	DATE 10-5-42	
U.S. NAVY BUREAU OF AERONAUTICS WASH., D.C.			



BRISTOL BEAUFIGHTER

This No. II version with in-line Rolls-Royce engines has become more operational than its radial-powered predecessor. Used as a day and night fighter, particularly in the Middle East. Span 57' 10". Length 41' 8".

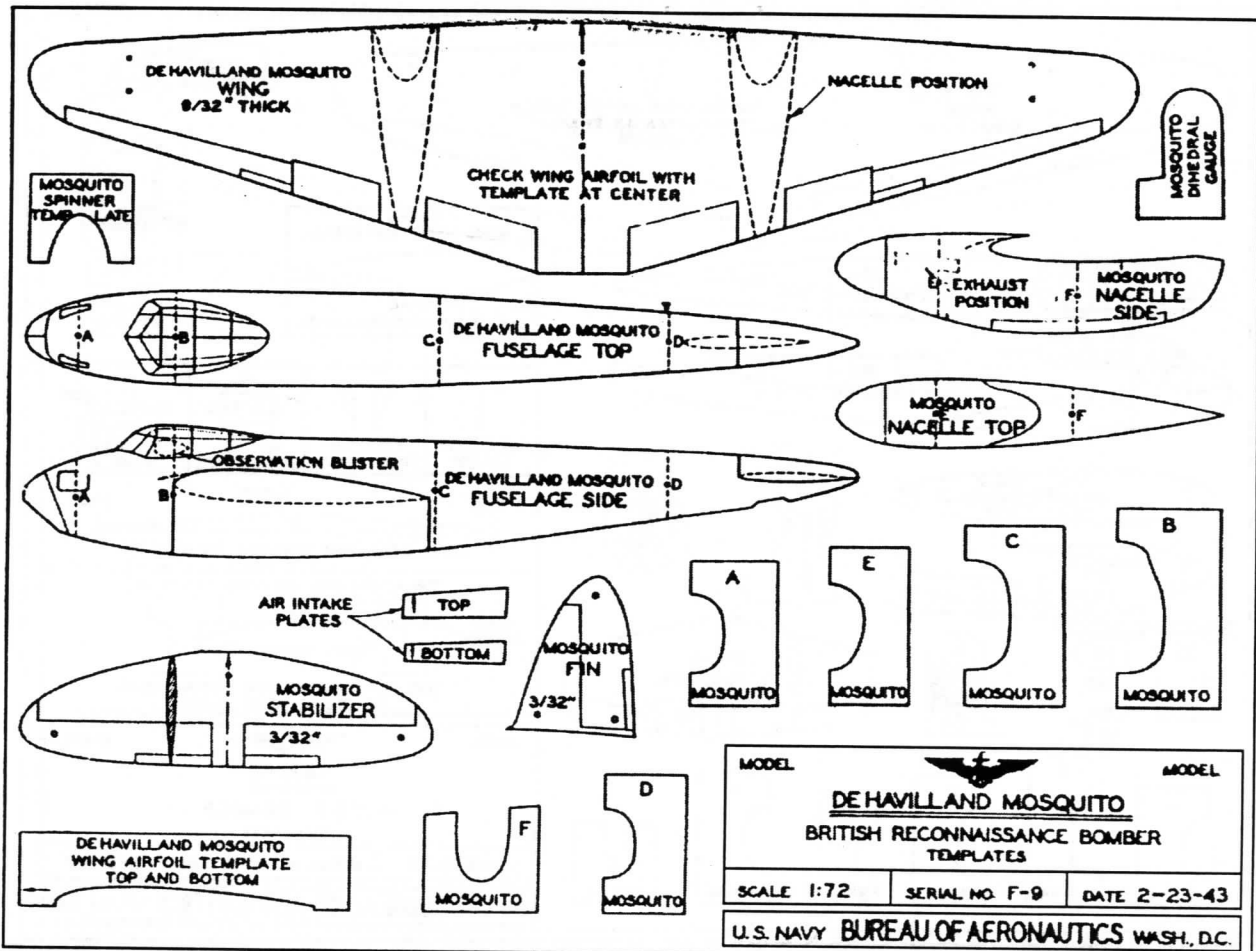
Identification


Mid-wing with dihedral break outside of engines; center section with straight entering edge, outer panels tapered, rounded tips. Engines extend forward ahead of nose, conical nacelles split over wing. Snub nosed fuselage, dorsal observer's blister above trailing edge. Tailplane with tapered trailing edge, rounded tips, large rounded triangular fin-rudder.

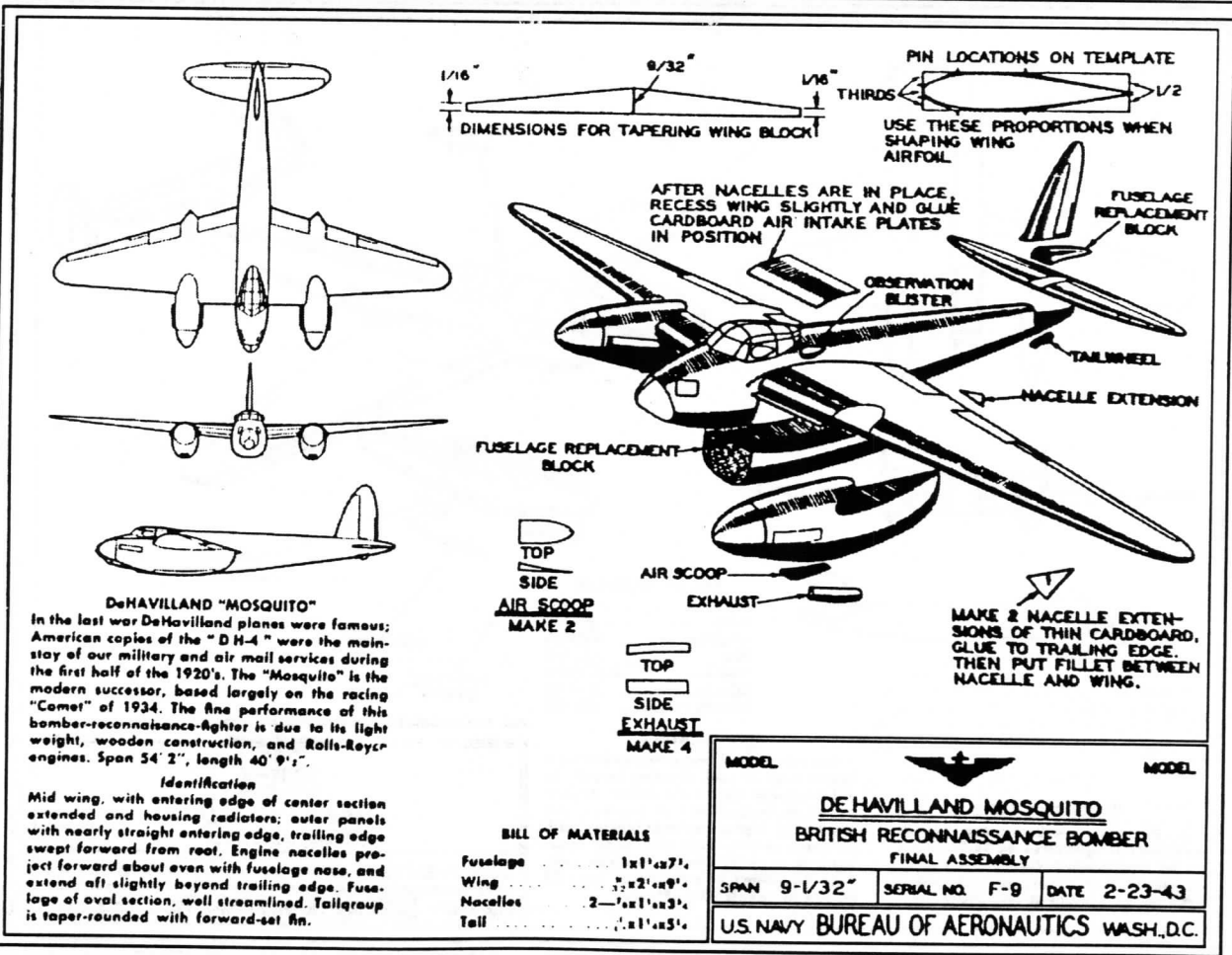
BILL OF MATERIALS

Fuselage	.....	1 1/2 x 1 1/2 x 6 1/4
Wing	.....	4 x 2 1/2 x 10
Nacelles	.....	2 - 2 1/2 x 1 1/2 x 3 1/4
Tail	.....	1 1/2 x 1 1/2 x 6
Blister	.....	1 1/2 x 1

MODEL	BRISTOL BEAUFIGHTER		MODEL
	BRITISH FIGHTER		
	FINAL ASSEMBLY		
SPAN 9 - 5/8"	SERIAL NO. E-6	DATE 2-6-43	
U.S. NAVY BUREAU OF AERONAUTICS WASH., D.C.			




MODEL			MODEL
DE HAVILLAND MOSQUITO			
BRITISH RECONNAISSANCE BOMBER			
TEMPLATES			
SCALE 1:72	SERIAL NO. F-9	DATE 2-23-43	
U.S. NAVY BUREAU OF AERONAUTICS WASH., D.C.			



DeHAVILLAND "MOSQUITO"
 In the last war DeHavilland planes were famous; American copies of the "DH-4" were the mainstay of our military and air mail services during the first half of the 1920's. The "Mosquito" is the modern successor, based largely on the racing "Comet" of 1934. The fine performance of this bomber-reconnaissance-fighter is due to its light weight, wooden construction, and Rolls-Royce engines. Span 54' 2", length 40' 9".

Identification
 Mid wing, with entering edge of center section extended and housing radiators; outer panels with nearly straight entering edge, trailing edge swept forward from root. Engine nacelles project forward about even with fuselage nose, and extend aft slightly beyond trailing edge. Fuselage of oval section, well streamlined. Tailgroup is taper-rounded with forward-set fin.

- BILL OF MATERIALS**
- Fuselage 1x1'x27"
 - Wing 2x2'x2'x9"
 - Nacelles 2-1x1'x3"
 - Tail 1x1'x5"

MODEL			MODEL
DE HAVILLAND MOSQUITO			
BRITISH RECONNAISSANCE BOMBER			
FINAL ASSEMBLY			
SPAN 9-1/32"	SERIAL NO. F-9	DATE 2-23-43	
U.S. NAVY BUREAU OF AERONAUTICS WASH., D.C.			

YAK-4 WING 9/32" THICK

CHECK WING AIRFOIL WITH TEMPLATES AT THESE POINTS

YAK-4 WING TIP TOP & BOTTOM AIRFOIL

YAK-4 WING ROOT TOP AIRFOIL

YAK-4 WING ROOT BOTTOM AIRFOIL

YAK-4 ROOT WING GAUGE

YAK-4 TIP WING GAUGE

YAK-4 FUSELAGE TOP

YAK-4 FUSELAGE SIDE

ANTENNA MAST

FILLET PATTERNS

3/32" THICK WHEEL SEGMENTS

EXHAUST (1/16" THICK) MAKE 4

1/16" 9/32" 1/16"

DIMENSIONS FOR TAPERING WING BLOCK

PIN LOCATIONS ON WING TEMPLATE

WING GAUGE

USE WING GAUGE FOR PROPORTIONS TO SHAPE WING AIRFOIL

YAK-4 LEFT NACELLE TOP

YAK-4 LEFT NACELLE SIDE

WING DIHEDRAL GAUGE

YAK-4 FIN 3/32"

NACELLE SCOOP

YAK-4 STABILIZER DIHEDRAL GAUGE

YAK-4 STABILIZER 1/8" THICK

YAK-4 A

YAK-4 B

YAK-4 C

YAK-4 D

YAK-4 E

YAK-4 F

MODEL	YAK-4		MODEL
U.S.S.R. BOMBER TEMPLATES			
SCALE 1:72	SERIAL NO. G-9	DATE 8-3-44	
U.S. NAVY BUREAU OF AERONAUTICS WASH., D.C.			

ANTENNA MAST

WHEEL SEGMENTS

EXHAUST

NACELLE SCOOP

BILL OF MATERIALS

Fuselage	.....	1/2 x 1/4 x 6
Wing	.....	1/2 x 2 x 8
Stabilizer	.....	1/2 x 1/4 x 3
Fins	.....	1/2 x 1 x 2
Nacelles	.....	2-1/4 x 1/4 x 3/4
Wheels	.....	1/2 x 1/4 x 1/4
Nacelle scoops	.....	1/2 x 1/4 x 1/4

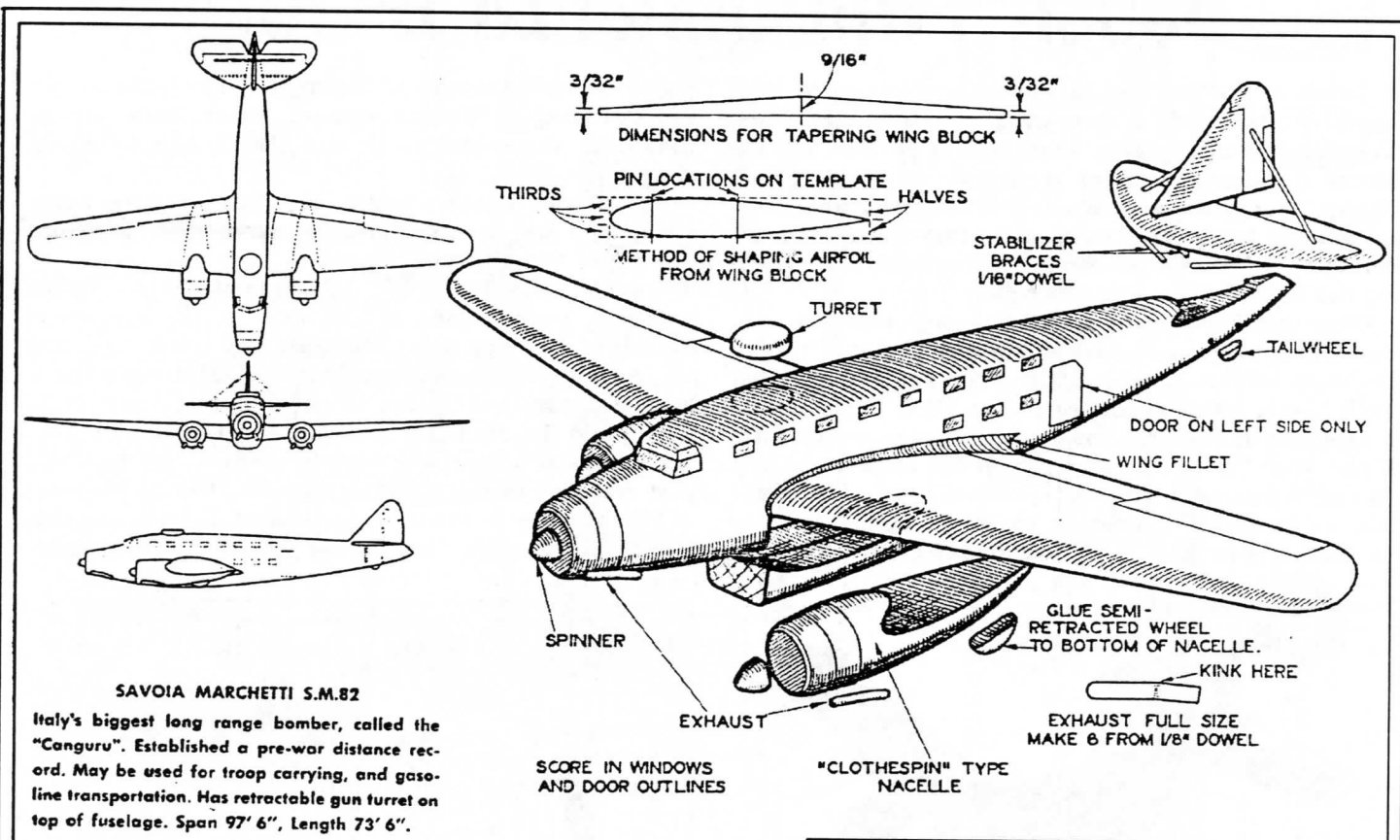
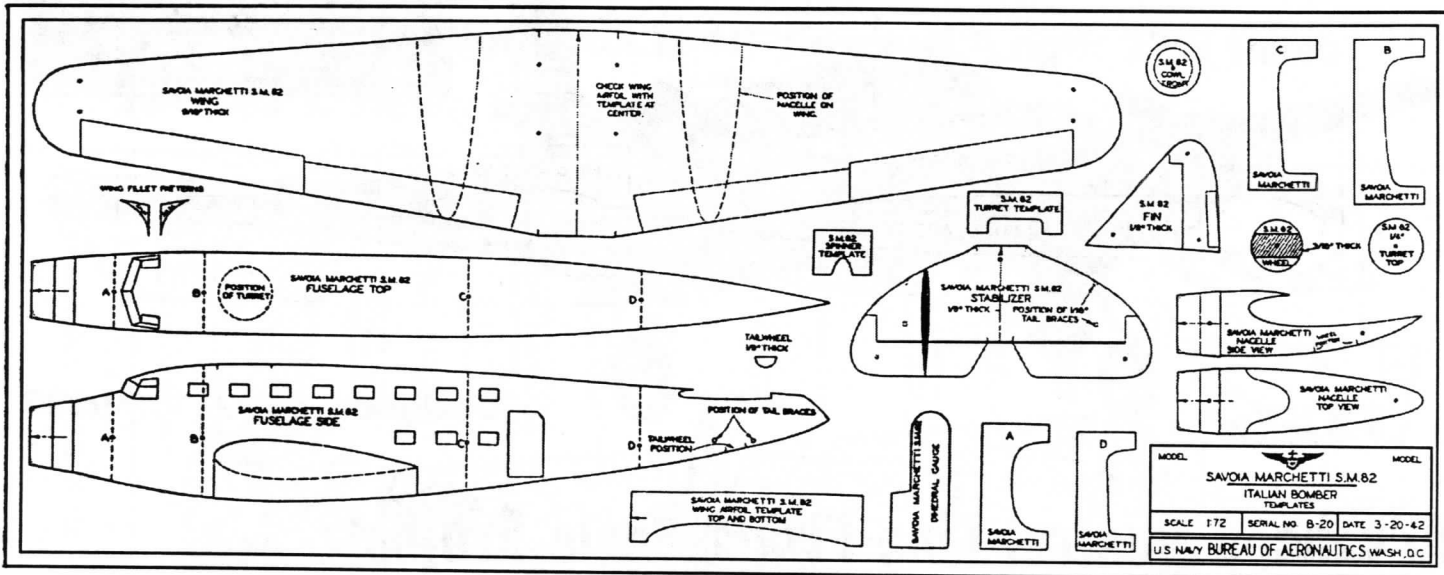
IDENTIFICATION

Low wing monoplane with dihedral from center; wide at root, tapering forward to point-rounded tips. Twin in-line engines extending beyond nose of fuselage, and aft of wing. High greenhouse wall forward. Tailplane of wide span and chord, tapering with slight dihedral to squared ends. Twin fin-rudders of pear shape. Span 45 ft. 10 1/4 in. Length 32 ft. 9 1/4 in.

INTERESTING FACTS

A two-place reconnaissance bomber, sometimes designated as the BB-22. Powered by liquid-cooled Hispano-Suiza in-line engines of 1150 horsepower each, providing a speed reported at over 300 m.p.h.

MODEL	YAK-4		MODEL
U.S.S.R. BOMBER FINAL ASSEMBLY			
SPAN 7-21/32"	SERIAL NO. G-9	DATE 8-3-44	
U.S. NAVY BUREAU OF AERONAUTICS WASH., D.C.			



SAVOIA MARCHETTI S.M.82

Italy's biggest long range bomber, called the "Canguru". Established a pre-war distance record. May be used for troop carrying, and gasoline transportation. Has retractable gun turret on top of fuselage. Span 97' 6", Length 73' 6".

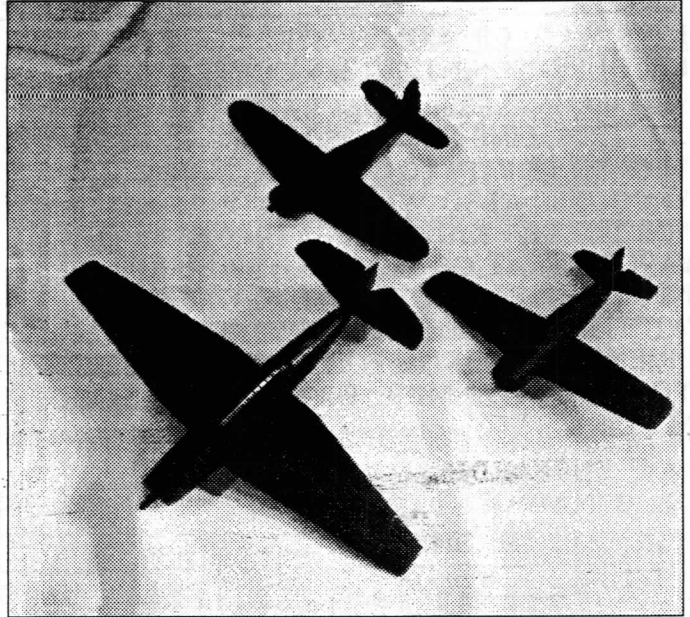
Identification

Low-mid-wing monoplane with wings tapered to rounded tips. Three radial engines, one in nose of deep, flat sided fuselage. Many windows in fuselage sides. Underslung engine nacelles. Leading edge of stabilizer is rounded back and elevator trailing edge is straight. Braced tail surfaces.

BILL OF MATERIALS

- Fuselage 1 1/2 x 2 1/4 x 12 1/4
- Wing 1 x 3 1/4 x 16 1/2
- Tail 1 1/2 x 2 1/4 x 6 1/4
- Nacelles 2 - 1 1/4 x 1 1/2 x 3 1/4
- Turret 1 x 1 x 1
- Wheel 1 x 1 x 1
- Exhausts 6 dowel
- Spinners 2 dowel

MODEL			MODEL
SAVOIA MARCHETTI S.M.82 ITALIAN BOMBER FINAL ASSEMBLY			
SPAN	16 - 1/4"	SERIAL NO. B-20	DATE 3-20-42
U.S. NAVY BUREAU OF AERONAUTICS WASH., D.C.			



Do you remember these? These photos, courtesy of Don Campbell of the Detroit Cloudbusters, show some of the WW-II type ID models built by his group for the Naval Aviation Museum at Pensacola. They now hang suspended from the overhead in the carrier "ready room" at the museum. Beautifully done. Can you identify them as "Friend" or "Foe"? Answer below.

(It depends on whose side you were on.)



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