

activity one

Electric Radio Control Model Aircraft

BUILDING AND FLYING THE PIPER CUB

OBJECTIVE

To introduce senior members to radio control model aircraft for the least investment of money. A secondary objective is to introduce the member to the Piper Cub and help him/her understand its place in the rich history of Civil Air Patrol.



BACKGROUND

Gil Taylor, and his brother, established the Taylor Brothers Aviation Corporation in 1929. One of their famous designs was known as the Taylor Cub and it first flew in 1930. The company had a difficult time in the Great Depression; however in 1937 an oilman by the name of William T. Piper took over ownership and his financial strength kept the business alive. Taylor Brothers Aviation became the Piper Aircraft Corporation. Out of this new venture was born the Piper Cub, a 40 horsepower high wing monoplane powered by a Continental A40-4. A later version, the J-3C-65, became famous in World War II and this model was powered by a 65 h.p. engine and was commonly known as the J-3 Cub.

Just before entry into WWII, the United States government implemented what was known as the *Civilian Pilot Training Program* and the aircraft that was most used for the operation was the Piper Cub. In 1940, 3,016 Cubs were built and at the peak of wartime, a new Cub left the factory every 20 minutes! It was recorded that over 50,000 pilots began their flight training in Piper Cubs during World War II.

In 1941, the U.S. Army selected the Cub for artillery spotting. They soon learned that this versatile airplane had capabilities far beyond the Army's initial expectations. Modified for many tasks, the Army version was now designated as the L-4 Grasshopper. The Navy had a number of these airplanes and their designation was NE-1.

Specifications for the 65 h.p. version gave it a maximum speed of 85 miles per hour and a service ceiling of 12,000 feet. The range was just under 200 miles and the gross weight was 1,220 pounds. The aircraft had a wingspan of 35 feet, 2 inches and a length of 22 feet, 3 inches.

The Piper Cub also has a part in the history of Civil Air Patrol. During World War II, many civilian pilots contributed to the war effort by flying coastal patrol duty in their private aircraft. Many of these sorties were flown in the bright yellow J3 Cubs. When the Civil Air Patrol organization was formed, hundreds of pilots conducted exhaustive searches for German submarines, known as U-Boats. When a U-Boat was sighted, and several were, the submarine crews would try to shoot them down. As a result of the inability of the Army/Navy to react fast enough, the Army Air Corps began arming the CAP airplanes with bombs. During the war two U-Boats were sunk

by CAP air crews. If, however, a CAP aircraft was shot down, and several were, there was little chance for survival in the cold Atlantic Ocean.

Because of the nature of the mission, early CAP air crews became known as the *Flying Minutemen*. They would leave their homes in the morning, go fight in the war, and return home for dinner in the evening. This is similar to how the "minutemen" fought during the Revolutionary War (named for the fact that it only took these citizens a "minute" to arm themselves and go fight).

According to Robert E. Neprud's book, *Flying Minutemen*, it was written that "...after the German surrender in 1945, one of Hitler's high-ranking naval officers was asked why the Nazi U-Boats had been withdrawn from the U.S. coastal waters in 1943 and the official said it was because of those damned little red and yellow airplanes!"

Entering The Wonderful World of Radio Control Model Airplane Flying

The Electra Cub by Estes



The Cox Electric Radio Control Electra J3 Cub

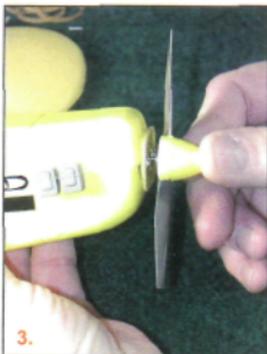


PROCEDURE

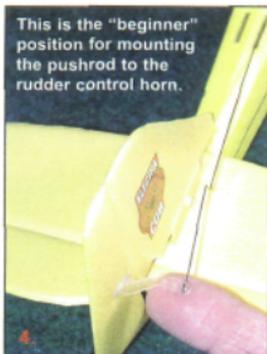
1. It's always a good idea to first lay out the parts of the kit. If something is missing, the hobby dealer, or factory, should be notified immediately.
2. Once the builder is sure that the Cub's parts are all included, it's time to get the flight battery charged. The charger comes with the kit and must be plugged into a wall outlet.



The instructions have a "Caution" that says, "Do not charge flight battery longer than 3.5 hours." There is also a warning about the wall charger that states, "Always unplug wall charger when not in use."



3. The Cox Cub comes with two propellers. Installation is easy; simply press fit it to the electric motor shaft. They recommend the builder leave 1/16th of an inch gap between the nose and the back of the hub.



4. The landing gear has a very simple mount. It is simply pressed into a mounting hole. The rudder control horn is a bit more tricky. It is attached to the control pushrod in one of three positions. For the "Beginner," it is mounted into the outer most hole.

NATIONAL SCIENCE STANDARDS

Content Standard E: Science and Technology

- Understandings about science and technology

Content Standard F: Science in Personal and Social Perspectives

- Science and technology in local, national, and global challenges

Content Standard G: History and Nature of Science

- Historical perspectives

Unifying Concepts and Processes

- Evidence, models, and explanation

NATIONAL SOCIAL STUDIES STANDARDS

2. Time, Continuity, and Change
6. Power, Authority, and Governance
8. Science, Technology, and Society



5. A small Phillip's screwdriver is used to secure the rudder to fuselage. A bracket mounted on the horizontal stabilizer has a hole in it and the screw that comes with the kit is attached at this point.



Capt. Russ Grell, AEO of the Denver-based Mustang Squadron, an avid electric model airplane builder, prepares the J3 for a field test.



The battery is connected and placed in the best position for weight and balance of the Cub. The battery is placed just aft of the windshield.



Russ decided that the aircraft needed a rudder adjustment based on the power of the motor and estimated flying characteristics.



The control system (rudder and throttle) is now checked with the radio on.



Capt. Grell said that the placement of the rubber bands is very important. They should not only go parallel to the chord, they should cross opposite from leading to trailing edges.



The symmetry and dihedral is given a final check.



...and again about 50 feet away.



The moment of truth! The author and Capt. Grell both agreed that the little Cub needed more power and more wing area for flights above 5000' ground level.