



DIRIGO FLYER

Vol. IX, No. 11 November 2001

Newsletter of the Maine Aviation Historical Society
P.O. Box 2641, Bangor, Maine 04402 • 207-941-6757 • 1-877-280-MAHS (in state)
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The Waco Story

Member Ed Maliar of Bohemia, NY was inspired by member Lin Lawrence's reminiscence (in the August Dirigo Flyer) about training students in Wacos during World War II. Ed, being a former Waco owner and a long-time Waco lover, put together the following story of Waco biplanes. We think you will find it very interesting.

By Ed Maliar

I really enjoyed the August 2001 *Dirigo Flyer*, especially "Memories of a World War II Flight Instructor" by Lin Lawrence. His story about flying Wacos really caught my attention as my favorite antique aircraft is the Waco (pronounced War-co—not Way-co as they do in Texas). Lin Lawrence states in his story that "Waco must have produced 60 different models and we seemed to get one of each." He suspected that during the Depression they built whatever the customer wanted.

As noted above, Waco airplanes are of great interest to me, and I have many books, magazine articles and other data filling up my Waco files. The following compilation is a brief history of the Waco airplane from 1923 to 1945-6.

The company was started by Clayton Brukner and Edward (Sam) Junkin in Lorain, Ohio. Production started in Medina, Ohio under the name of Advance Aircraft Company. After the death of Edward Junkin in 1926, the company name was

changed from Advance to Waco and moved to Troy, Ohio. Between 1923 and 1926, a total of 70 aircraft were built and sold as listed below:

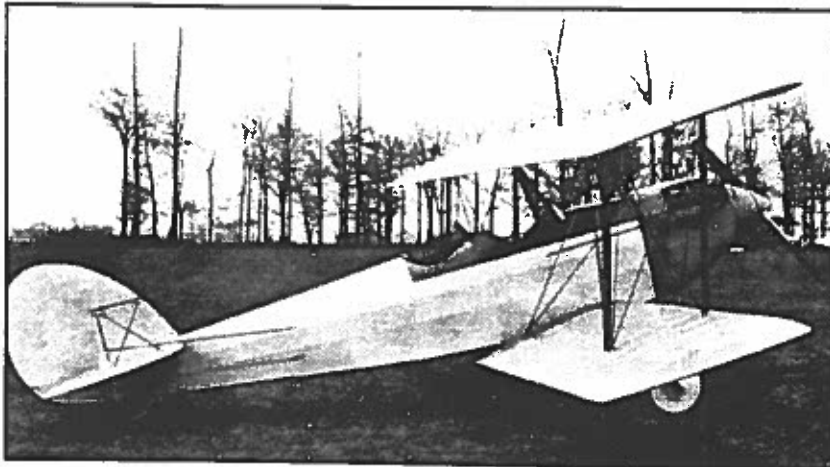
Model 7	20 aircraft
Model 8	3 aircraft
Model 9	47 aircraft

In 1926, there were 164 Waco Model 9s built and the design became eligible for one of the first Department of Commerce CAA Approved Type Certificates due to its welded steel tube fuselage construction. The Waco 9 became known far and wide for its rugged endurance and outstanding performance, especially being able to operate out of smaller and more restricted fields than its competitors.

In 1927, Waco designed an improved Model 10 with better structural and utility features, and introduced its hydraulic shock-absorbing landing gear to the personal aircraft field. Also in 1927, the Model 10 Waco won the Transcontinental Air Race and placed at the top of the field in the National Reliability Tour sponsored by Henry Ford

In 1928, Waco airplanes again were the winners in their class of the Coast to Coast Air Race, and won the Sweepstakes Trophy for the best time of all classes. After Charles Lindbergh's flight to Paris from New York in an airplane powered by a Wright Whirlwind engine, it became the most popular engine and the Waco design team fitted the Whirlwind to many Wacos.

In addition, they designed a new model around the Whirlwind engine called the "Taperwing", which became the most famous of all Wacos. This was mostly due to the aerobatic efforts of such well-known stunt fliers as Freddie Lund, Larry Hall, Art Davis, Tex Rankin, Joe Mackey and others. Joe Mackey and his Waco "Taperwing" were known from coast to coast and in many foreign countries, and they were responsible for giving the "Taperwing" a reputation and personality never to be equalled by any other aerobatic aircraft. During the year 1928, a total of 653 airplanes were sold by Waco.



Waco 9, the first production Waco. (All Waco photos via Ed Maliar)

"Waco," continued on page 4

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Monthly meetings
are held at 10 a.m.
on the second Saturday
of each month
at various locations.

See calendar for details.

Maine Aviation Historical Society Monthly Membership Meeting President's Report for October 2001

It has been a little over 30 days since our nation was suddenly and deliberately attacked. The tragic events of September 11th, and its aftermath, have caused many of us to pause and reflect on what these events mean to ourselves, our families, our friends, and our nation as a whole. While we try to rebuild our security, we will also try to rebuild the lives of those who were most affected by this tragedy.

Our organization and its goals may seem trivial at a time like this, but by doing our part to preserve Maine's aviation history, we are also preserving America's aviation heritage for our state and our nation's citizens. There has been a renewed interest in patriotism. And the honoring of our own heroes and their significant contributions helps to preserve and enhance this patriotism by honoring those who came before, and providing a permanent home for honoring those who are to come.

With these goals in mind, we are closing in on our immediate goal of having a new roof and heating system for the museum. This is no small accomplishment. Soon we will be ready to begin the process of building displays and getting ready to show them. Although we do not have a definite date set for the museum to open, I am confident that the day is fast approaching, a day that all of us have been working so hard to see for many years now. This has been the hope and dream of many people. It will take many people to see it through. It will not happen through the efforts of one or two persons alone. Many have come before us and have laid the groundwork for where we are today. Soon others will pick up where we have left off and will carry the task through until it is done. It has been my pleasure to be a part of the making of this museum, and I look forward to the day when its doors open to the public.

October Meeting

Because of a conflict in dates, it was necessary to change the venue of the October meeting from Bethel to Bangor. The placing of the memorial to the crew of the KC-97G crash in Newry was postponed to October 20th. A full report on this ceremony will follow.

President John Garbinski opened the meeting at 10 a.m. with his report printed above. This followed a Board of Directors meeting at 9 a.m. Following reports by the officers, we heard about the progress that Ed Armstrong, Al Cormier and others had made with the city of Bangor in providing us with a new roof. This should hopefully be resolved before the end of this month and a new roof on before the snow flies. They also reported on their work with Dead River on getting our furnace installed and up and running soon to keep us warm this winter.

Grant applications have been made to two foundations and, again, we should know something by the end of this month. Les Shaw is proceeding with a new data base for our computer to enable us to computerize the membership and mailing lists, thus making life simpler for all concerned. We have also been offered a Scorpion home-built helicopter for the museum display and it should be at the museum for viewing at next month's meeting.

The November meeting will be at the museum on Saturday, November 10th at 10 a.m. A chance to see our float for the Bangor Veteran's Day Parade on November 12th along with the Scorpion helicopter should make an interesting meeting. See you all there.



A Scorpion helicopter similar to the one which was donated to the Maine Air Museum and is now in residence there.

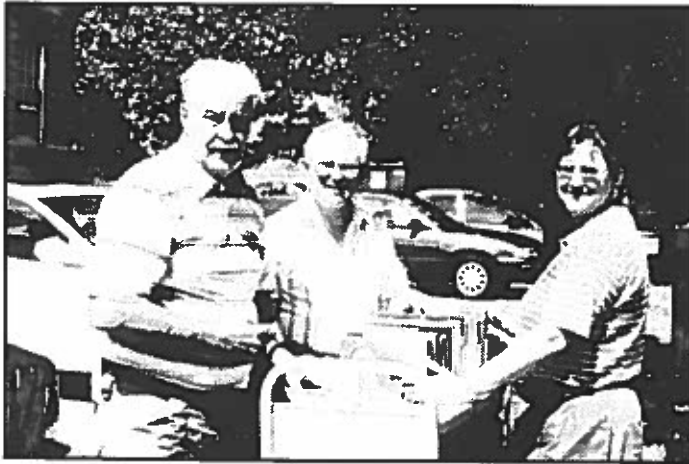
1927 News FLASH Update

Member Don Godfrey spoke to his Dad about the Arvo 504 pictured in last month's *Dirigo Flyer*. He remembers that it was sold to Percy Billings, who later crashed it in the Pittsfield area, with no injuries.

It was taking off on skis and it hit power lines. The fuselage snapped in two. Billings and his passenger used sticks to move the downed power lines.

The man from Central Maine Power later told them how lucky they were, as CMP did not know what had happened and kept turning the power back on.

New from the MAHS Photo Gallery



Norm Houle (left) delivering aviation books donated to the Bangor Public Library. Books came from the private collection of American Airlines Captain Ralph Mower, a Bangor native. Receiving the books for the library are MAHS member William Cook and Shawn Weisser, both library staffers. *(Norm Houle Photo)*



Army National Guard UH-1 Hueys show the American flag at Bangor, 9/25/01. *(Mike Cornett Photo)*

Election of Officers for MAHS

Last year, all officers were elected for two year terms. However, President John Garbinski has taken a new position which will require his moving out of state. He, therefore and with regret, has tendered his resignation as president effective December 31, 2001.

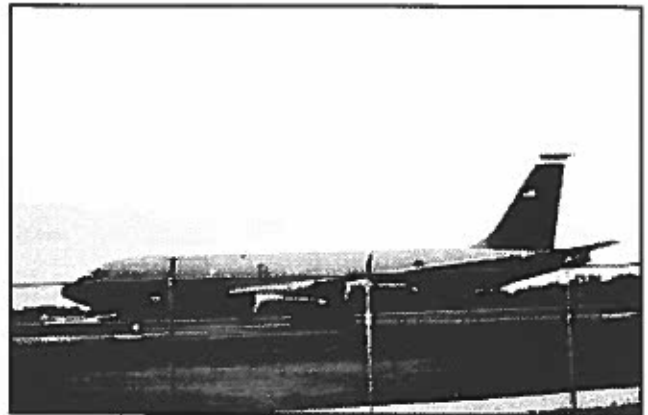
Nominations are now open for candidates for the one year unexpired term of the president's office.

Three director's terms also expire on December 31, 2001: Jim McCurdy, Ed Armstrong, and Carl Sederquist. Nominations are also open for these three directors positions.

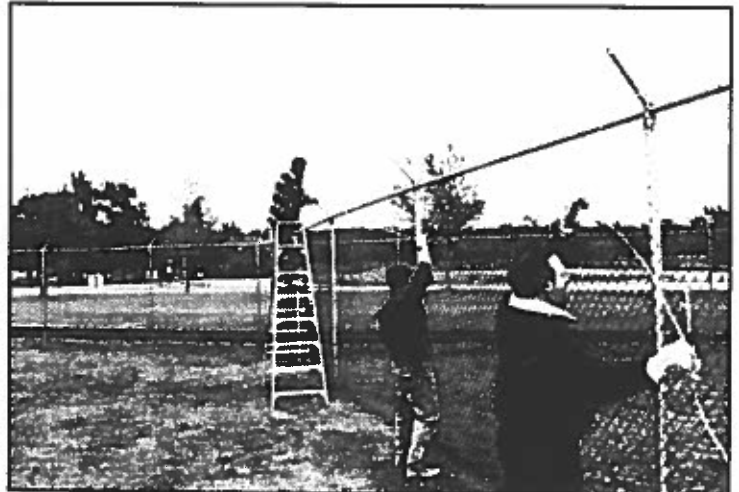
Please communicate your nominations to Director Mike Cornett at the museum as soon as possible in order that we may have the ballots printed and in the next *Dirigo Flyer* newsletter.

All of these positions are of vital importance to the Society and the museum in this coming year, so put your thinking caps on and make some good nominations — or volunteer if you can do a good job for us and yourself.

Join Us · Catch the Excitement



What a view! An Air National Guard KC-135 taxis past the Maine Air Museum on the way to a refueling mission on 9/15/01. *(Mike Cornett Photo)*



Les Shaw, Kent Knowles and John Garbinski stringing the barbed wire atop our fence to meet federal regulations on 9/25/01. *(Mike Cornett Photo)*

When the last Waco ceases to grace the sky . . .

Waco," continued from page 1

In 1929, Wacos were still winning national and regional air races and all Waco model 9s, 10s, ATO and CTO "Taperwings" as well as the DSO, BSO and ASO "Straightwings" continued to hold the spotlight as the most popular of all commercial airplanes. In 1930, the Waco Aircraft Company decided to standardize their method of model designations. They felt this was necessary due to the ability of Waco airframes to accommodate different power plants. Thus, with minimum design changes, the customer could actually tailor the fabrication/production of his airplane. The proliferation of models sold between 1930 and the beginning of World War II was earth-shaking, and both misunderstood and/or not understood at all. (As an old ground school instructor, I've noted that there is a tendency to only look at the book as a last resort!).

The designation system is extremely simple:

The first letter denotes the Engine make and horsepower.

The second letter denotes Wing Design.

The third letter determines the Model Type, such as S for Standard, C for Custom, or F for Open Cockpit.

Engine Designations are:

U for Continental engines of 210/220 HP

V for Continental engines of 240 HP

Q for Continental engines of 165HP

The letters P, Y, Z, and A stand for Jacobs engines of 170, 225, 285, and 330 HP respectively.

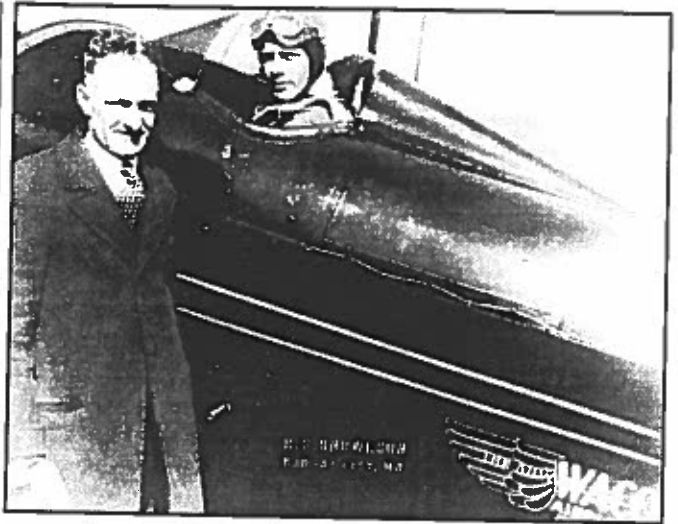
The letters D and E are for Wright engines of 285 and 330 HP respectively.

Other engines used in Waco aircraft are designated R for Warner, I for Kinner, M for Menasco, H for Lycoming and S for Pratt & Whitney.

In 1931, Waco continued production of the first F-2 Model, using the Warner 125 HP in the RNF, the Kinner 100 HP in the INF, and a 125 HP Menasco engine in the MNF. They continued to produce the ATO "Taperwing" and the ASO "Straightwing" of 1928 design. In addition, they produced their first standard cabin model, the Waco QDC, which carried a pilot and three passengers. The Waco PNF-2 was used by the US Navy as an auxiliary aircraft carried by their dirigibles.



Waco 10 with an OX-5 engine.



Freddie Lund's Waco "Taperwing," which flew in Maine in the 1930s.

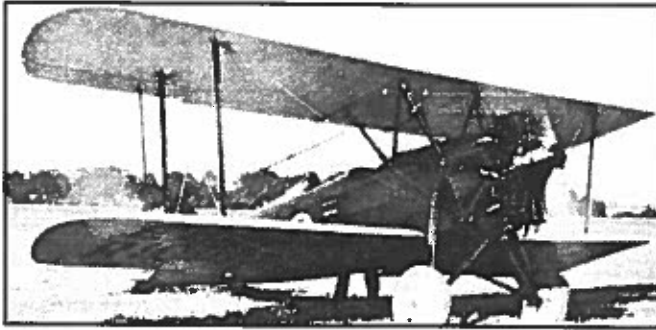
In 1932, in addition to other F Models of last year's design, Waco introduced a new Sport Model, the Waco A. It differed from the F Model in that it had one cockpit with side-by-side seating, with an optional plexiglass canopy to cover pilot and passenger. In 1933, Waco continued the extremely popular F-2 Models, the Waco A and other earlier designs, but in addition introduced an improved 4 place cabin model, the UIC powered by a 210 HP Continental. It became very popular both in this country and in many others.

In 1934, Waco continued production of the standard cabin models UKC and YKC, but their emphasis was on the D Model, powered by a 400HP Pratt & Whitney or a 420 HP Wright Whirlwind engine. These Ds had a 195 MPH cruising speed with a crew of two seated in tandem. They were equipped with a machine gun and fitted with bomb racks and sold in great numbers to Brazil, Nicaragua, Guatemala and Cuba for military use. Member Dick Jackson of Rochester, NH owns a Waco D.

Also in 1934, Waco improved the F Series with another Sport Model, the YMF-5 powered by a 225 HP Jacobs engine. This is probably one of the most beautiful Waco biplanes ever built. (Approximately eight years ago a company called Classic Waco was organized for the purpose of producing replicas of the famed YMF-5 airplane. It was powered by the 225 HP Jacobs engine with a ground adjustable propellor; later production models had Hamilton Standard two-position or constant speed propellers. The first production sale price was about \$150,000 and the author saw one in the spring of 2001 that sold for \$350,000.) Waco also continued the production of standard cabin models of the vastly improved UKC and YKC types.

In 1935, production of the WHD and SHD military aircraft continued along with the YMF-5. Also introduced for the first time were the Custom models: four and five place cabin airplanes with curved safety-glass windshields and a speed increase of 20 MPH over the Standard cabin models. These Custom cabin models were YOC, UOC and CUC, depending

... the sky will become merely air. (author unknown)



Waco ASO with Wright Whirlwind engine.

on power plant and wing design. For easy recognition of Custom vs. Standard models, the Custom's lower wings are smaller and shorter than the upper wings.

For 1936, Waco production soared to new heights due to the wide acceptance of the Custom cabin models, whose added speed did not sacrifice their reliability and simplicity of operation. No competitor could catch them! The F series continued in production and many were sold to Central American countries, as well as being available to American sportsman pilots.

Beginning in 1937 and continuing into 1939, the Waco company built a series of F model open cockpit biplanes which remained structurally the same during these years, while they incorporated many refinements and improvements. These were deluxe sportsman's airplanes designated as the F-7 model and available with several different engines:

YPF-7 225 HP Jacobs

ZPF-7 285 HP Jacobs

UPF-7 220 HP Continental

VPF-7 240 HP Continental

DPF-7 285 HP Wright. This model had a top speed of 159 MPH at sea level and a service ceiling of 20,000 feet. The Standard YKS-7, ZKS-7 and UKS-7 cabin biplanes continued in production, improved with wider landing gears and toe brakes.

The Custom cabin models were also improved with larger flaps, new windshields and richer interiors and were known as ZGC-8, AGC-8 and EGC-8. (The author owned a Waco ZGC-8 and flew it, as a Mainer-in-exile out of Bay Port, Long Island, NY.) 1938 saw Waco lead all of its competitors in total number of aircraft sold. It was also in 1938 that Waco introduced its new model, the AVN-8, a five-place cabin biplane with a tricycle landing gear. It cruised at 150 MPH, had a rate of climb of 900 feet/minute and a range of 460 miles.

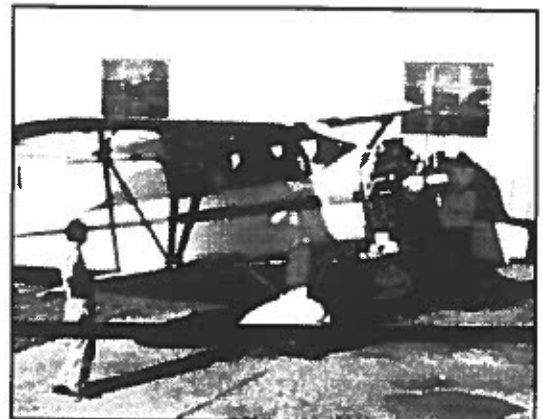
In 1940, Waco began the manufacture of 600 UPF-7 biplanes for the Civilian Pilot Training Program, plus 14 for the US Army Air Corps. Building of the Standard cabin series continued in parallel with the UPF-7 project, and in addition, they introduced the first Waco Model E, which was the finest Waco of the Custom cabin series. This five-place cabin model with fixed landing gear outperformed all others in its class,

some of which had retractable landing gear. The SRE with its 450 HP Pratt & Whitney engine cruised at 195 MPH, had a rate of climb of 1500 feet/minute, a range of 880 miles, and landed at 55 MPH. The E model sold for \$18,900 with the Pratt & Whitney engine, but could be ordered for less as an HRE (300 HP Lycoming) or as an ARE (330 HP Jacobs). There are several E models still flying in the 21st century, including a couple undergoing reconstruction.

All the 1940 models continued through 1941 into mid-1942, with the addition of a new Standard model in 1942 designated as VKS-7F. It was basically the same as the earlier Standard model except it was equipped with hydraulically operated flaps, a steerable tailwheel, Hamilton Standard two position propeller and a 240 HP Continental engine. Several of this model wound up as cross-country trainers in the Civilian Pilot Training Program.

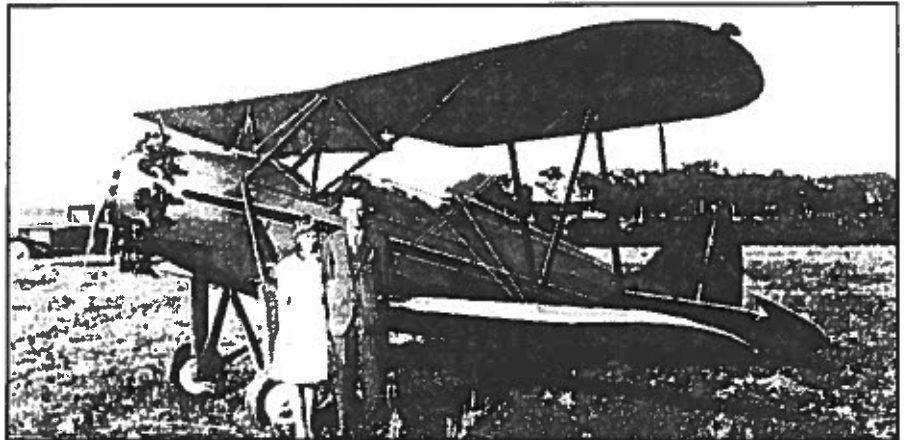
In late 1942, Waco was forced to stop production of all propeller driven airplanes after the 600 UPF 7s had rolled off the final assembly line. The United States government was in urgent need of large gliders that could be towed by C-47 transports and dropped behind enemy lines with troops, cargo or field equipment. Several hundred CG-3, CG-4, CG-13A and CG-15As were built by Waco. Even the Steinway Piano Company had to stop making pianos and start building Waco gliders in their Astoria, NY factory.

With the end of the war in 1945, Waco was faced with the enormous and costly task of retooling for a new era in aircraft production. Other aircraft manufacturers were also trying to come out with something entirely new and different. Waco designed a four-place cabin model with an all-metal high wing and a tricycle landing gear. It was powered by a 215 HP Franklin engine mounted in the nose, with a drive shaft running the length of the fuselage to the propeller in the tail. They received firm deposits from over 300 customers for this design. The airplane was to be called the Aristo-craft, but it never received an Approved Type Certificate from the CAA. The company closed its doors, disappointing thousands who had known the superior quality and beauty of the fine airplanes produced by the Waco Aircraft Company for over twenty years. Ask any pilot who has ever flown a Waco!



Ed Malia's
ZGC-8 Waco.

The Waco Story continues in pictures . . .



1932 Waco RNF



1932 Waco UEC



1935 Waco YMF-5

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Upcoming MAHS Meetings



November 10 10 a.m. MAHS Meeting, Maine Air Museum, Bangor, Maine.

December 8 10 a.m. MAHS Meeting.

Welcome to Shangri-la, Boys!



Young Phil Plummer, a John Bapst High School graduate from Bangor, Maine, found himself (*left, top row*) in the U.S. Army Air Corps Mechanic School in 1943. The school was operated by the Curtiss-Wright Technical Institute at the Grand Central Airport in Glendale, California. Mr. Plummer, a MAHS member, is retired. He is currently living in upper New York state and summers in Maine.

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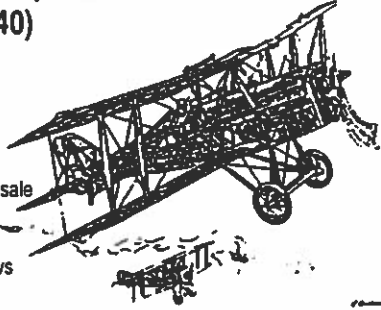
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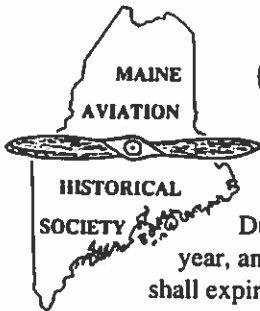
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Maine Aviation Historical Society
P.O. Box 2641
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November Meeting

Saturday, November 10, 2001
10 a.m.
Maine Air Museum
Bangor, Maine