ENGINEERING AND RESEARCH GLIDING CLUB
RIVERDALE, MD.

The Engineering & Research glider club was organized to facilitate operation of the primary glider which was obtained and reconditioned privately by some of the personnel of that company.

To date, the club has been limited to five members and training progress has been quite rapid, four of the members having been trained to make quite extended hops and 360° turns with ease in probably eight week-ends. None of the members had previously had extensive flight training, yet these four all soloed on the first afternoon's work.

The glider, built by Roche about 1930, is singularly well adapted to training work, having a full two-wheel landing gear, springing tail-skid, and foolproof release mechanism, so that it is really ideal for auto tow. During the training period it was customary to make 30 to 40 auto tow hops a day, and the wearing of the tow rope or fatigue of the students was usually the limiting factor on the number of hops.

The cost figures, in which the Soaring Society has expressed an interest, were quite low, since we were most fortunate in obtaining the glider at a very low figure. With only five participants, it has run about $30.00 each, including glider and incidentals, to obtain what we consider pretty good flight training.

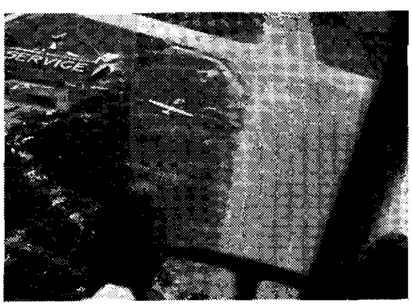
Operations were started at Queens Chapel Airport, but this field soon became too small and the ship was moved to Hybla Valley Field which has four wide, smooth runways, the longest being 6000 feet. This field was being used by the Naval Reserve club with their Mead secondary.

Progress at this field was more rapid, it being quite easy to auto tow to 800 to 1000 feet.

While operating here, the club had the pleasure of having Peter Reidel, who had previously been operating at College Park Airport by airplane tow, bring his Kranich to Hybla Valley for use.

After watching our auto tow methods, Reidel decided to try it with the Kranich, and subsequently changed to this method of launching entirely. He had no trouble at all towing the two place Kranich to 800 feet, and since has made many extended thermal flights from the field.

The flight picture shown was taken while flying the glider with the camera held normally at eye level, it being secured on a neck strap when not in use. This may be taken as evidence that this primary, at least, is quite stable in flight.



The Kranich as seen from the Roche Primary

The M.I.T. Sailplane

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per cent of the span; the choice of which arbitrarily establishes the plan view of the machine. In this way, many design values are automatically proportioned by the span selection.

Aspect ratio and wing area must be chosen next. These factors are related by the ratio $R = (\text{Span})^2 \div$ wing area, so for a plane of given span, increase in the aspect ratio means reduction in wing area. The aspect ratio should be made as high as practical without sacrificing adequate structural depth of the wing, with airfoil sections of 18 per cent chord or less in thickness. Aspect ratios of 14 to 20 are desirable for a modern sailplane.

The wing area and wing loading are dependent upon the flying speed range desired, as well as the minimum sinking speed. Excessive wing area will lead to a low flying speed as well as a low sinking speed. Reference to the performance of previous designs indicates that a wing loading of 3.0 to 4.0 pounds per square foot represents the maximum for good all-around performance.

The parasite drag of the plane should not only be kept as small as possible, but the final value should be definitely known by the designer in order that he may properly select an airfoil section to agree with the other design characteristics of the airplane. Suppose, for instance, the parasite drag is negligible. The ideal wing would use a low cambered airfoil in which the minimum L/D occurs at high speeds.

As the parasite drag increases from zero to a value comparable with present-day sailplanes, the lift-drag ratio of the airplane will decrease slightly. The maximum L/D can no longer be obtained at high speeds. It will occur at a considerably lower flying speed than is possible for the low parasite design. A high parasite machine should, therefore, be designed with a deeply cambered airfoil, to give best L/D at high lift coefficient. From this, it is evident that a minimum value of parasite drag is desirable for the high performance sailplane, in order to permit the use of a "high speed" or low cambered airfoil section.

A further advantage of this combination of low parasite drag with a high speed airfoil section lies in its beneficial effect upon the gliding angle and sinking speed at high speeds. Since low cambered airfoils have their maximum L/D at relatively higher speeds than deeply cambered sections, their characteristics at still greater speeds will likewise be superior. Recalling that a low wing loading is desirable to give low value of minimum sinking speed when necessary, it will be seen that the harmful effect of this may be partially offset by proper care with parasite drag and airfoil selection.

Wing tunnel tests have shown that the wing-fuselage combination for best all-around performance of a sailplane results from the union of a tear-drop fuselage of 3 to 1 fineness ratio, with a wing of desired planform, the wing being set down into the fuselage until the upper surfaces of both are tangent. A tapered tail boom of adequate strength and stiffness to carry the tail loads and prevent flutter then completes the fuselage. It is desirable to leave the upper surface of the wing unbroken by the boom. With such an arrangement, a small fillet between wing and fuselage is beneficial.

The foregoing description represents a summary of the design of the MIT sailplane. It is hoped that when the construction work is complete, members of the AES of MIT and other interested soaring folk will profit by the work which has been done.

EDITOR'S NOTE: Another article on the M. I. T. sailplane, covering structural details, will appear in SOARING when the ship is completed.

New Hampshire

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had as to the thrills and enjoyment that were to be found in our new avocation.

Late Sunday afternoon the Schweizer Brothers arrived with the just-hatched Pterodactyl in tow. The Pterodactyl, a Schweizer all metal utility built for the Altosaurus, was assembled in short order and was acknowledged by all to be a beautiful bird even before her first flight. That soon followed and the ensuing performances fulfilled our most optimistic expectations. We doff our hats to the Schweizers and their crew for the product of their concentrated labors.

Since that memorable week-end we have returned to Boston, located our ship in Nashua, New Hampshire, and are now pursuing the period of preliminary training with all our concentration and zeal. When sufficient progress has been made, we shall move to North Conway, New Hampshire, where conditions should prove more ideal for the truly intrepid bird-men.

Some week-end this fall we hope to be hosts to able pilots from other regions, and if Lewin Barringer finds us landing in front of him after a mere eight minutes' flight, I am very much afraid it will be neither out of sheer politeness nor a return of the compliment.

NEW YORK CITY, N. Y.
ALEXIS DAWYDOFF

We have five new members enlisted in the club: George Tabery, William Conner, Shephard Smith, who got his "C" in France and who wrote an article on gliding in France for SOARING, and Mr. and Mrs. Lewin Barringer.

All the flying is done now at the Hicksville Field and although soaring conditions on week-ends were not all that could be expected, the average flights with the Franklin were over 2 hrs. 30 min. Emil Lehecka flew his Rhoensperber several times and during one of the flights gained 400 feet inside the clouds, the cloud base being slightly below 600 feet. I was towing him with the winch and just before releasing the Sperber disappeared in the clouds. It was quite an unusual sight to see the rope stand up straight in the air with nothing on the end of it. Reminded me of the famous Indian rope trick—all that it needed to complete the illusion was a monkey to climb up it.