The effort of this subcommittee will henceforth be toward establishing criteria for approval of non-STC hitches and to getting standardization for the application of this criteria by the FAA and its agents in the field on a national scope. This will be the subcommittee's goal with a secondary goal of acting as a clearing house and library for information on towplanes, their hitches, performance and problems. For this purpose I will gratefully receive any data readers may wish to submit.

I will also appreciate written accounts of the trials and troubles encountered by individuals during the approval cycle. This data will be used to demonstrate to the FAA that a wide variance in standards does exist on a national scale, and that therefore there are grounds for issuing standardization instructions to the field agents. Thus armed there may be a reasonable chance of obtaining improvement in this troublesome area.

Bibliography on Soaring

Recent articles or items on soaring which have appeared in non-soaring publications.

Air Progress, Winter, 1962-1963, pp. 14-33, "America's Soaring Championships," a comprehensive, profusely illustrated (53 photos) story on the 1962 Nationals, including *Soaring's* table of scores.

Aviation News Illustrated, June, 1962, p. 49, "Soar Heads," three photos and news note about the Nationals.

Aviation News Illustrated, Dec., 1962, p. 12, news item on Nationals results.

Flying, June, 1962, p. 23, "Low Speed Research at Princeton," includes photos and description of glider sailwing; p. 48, "Hanover Holiday," describes glider ride activity at the Hanover, N.J., Airport.

Flying, Jan., 1963, p. 32, pilot report on Schweizer 2-32, including four photos.

National Aeronautics, Dec., 1962, p. 19. Story on George B. Moffat, Jr., and the two world soaring speed records he set at El Mirage in August. Also, photo of SSA plaque in National Air Museum.

Sports Illustrated, Dec. 24, 1962, pp. 26-27, photo of 2 sailplanes soaring as an example of how some "non-conformists give dramatic expression to a zest for living."

CERTIFICATION OF TOW HITCHES ON CESSNA PLANES

by H. Marshall Claybourn

One of the more frustrating problems that often face a new soaring group is that of obtaining FAA approval of the installation of a tow-hook on their towplane. This difficulty can arise because of unsympathetic and uninformed FAA personnel and/or because those seeking the approval are unfamiliar with FAA procedures and because they often do not have the required engineering data. The Soaring Society has attempted to alleviate this situation, but generally has not been able, with volunteer help, to maintain an up-to-date file on which airplanes have been approved and copies of the forms used. Something has been done to partially solve this problem, and more glider guiders should know about it.

As a direct result of Cessna Aircraft's generous support of the 28th Nationals, it was decided, by Cessna, to certify their aircraft for glider tow. This decision was made by V. G. "Doc" Weddle, General Manager of Cessna's Commercial Division, whose introduction to flying, incidentally, was in a glider back in the 1930's. Now, in fact, all of Cessna's current production single-engine aircraft are certified for glider tow.

In the Engineering Department's Structures Group report, the following is stated in the introduction:

"There are no FAA requirements available for aircraft used for glider tow; however, NACA Technical Note 844 states that tests have shown that twice the glider gross weight can be assumed as a reasonable design *limit load factor. Ultimate design load factor* is 1.5 (2.0) = 3.0." (1.5 is the safety factor.)

NOTE: LIMIT LOAD is that load the structure shall be capable of supporting without suffering detrimental permanent deformation.

ULTIMATE LOAD is a limit load multiplied by the appropriate safety factor.

The FACTOR OF SAFETY is 1.5 unless otherwise specified in the Civil Air Regulations.

"It will be assumed that this force acts separately in the following cases:

(a) Aft from the tow fitting.
(b) Up and aft at an angle of 30° with the longitudinal.
(c) Down and aft at an angle of 30° with the longitudinal.
(d) Sideward and aft at an angle of 30° with the longitudinal."

In the report's summary is the following:

"Each of the Cessna single-engine models are substantiated in this report for glider towing. The ultimate allowable tow loads are considered acting anywhere within a 30° cone about the airplane centerline. Attachment is made at the tail tie-down fitting on tricycle gear models, and at the tail gear spring on the conventional gear models.

"The loads shown below for the various models are the *ultimate* allowables and become the limit of the appropriate combination of glider weight—load factor—safety factor, or breaking strength of towrope.

Ultimate load of 1835 Lbs:
Models 120, 140, 140A, 140B, 150, 150A, 150B, and 150C

Ultimate load of 3400 Lbs:
Models 182E, 182F, 205, 210B, and 210C

Ultimate load of 3600 Lbs:
Models 170, 170A, 170B, 172, 172A, 172B, 172C, 172D, 175, 175A, 175B, 175C, P172D, 180, 180A, 180B, 180C, 180D, 180E, 180F, 185, 185A, 185B, 182, 182A, 182B, 182C, 182D, 210, 210A, 305, 305A, 305B, 305C, and 321."

(NOTE: The 305 is the Cessna design designation for the L-19 and the 321 is the OE-2.)

It can be seen that the loads used for the tests are quite severe and, in my opinion, much greater than are likely to be encountered in normal glider operation. The sailplane used in the airplane tests reported in NACA TN 844 was a strut-braced glider with a gross weight of 450 pounds. The maximum tow load recorded was 385 pounds, or 85% of gross weight, and this was obtained during intentionally executed violent yawing maneuvers. The average of the maximum tow loads was only 41% of the glider's gross