October 19

Uni Gliding
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Official Journal Of The Adelaide University Gliding Club.

NEXT MEETING: Wednesday, 2nd November , 7:30 p.m., in the Jerry Portus Room.

Agenda: 1: Business - Find out about the meaty bits of the club's operations.
2: Educational Lecture - Listen to an instructor talk about a secret topic !!!
3: Coffee - or tea - maybe even .... BISCUITS!!! (we had some last time.)
4: Video - Come and see the expertly made tape that we failed to show last time. (or the time before).

and/or hear Dennis → talk about his cross country course experience.

must begin with a decision to land (a survival rule in flying and especially in X-country). Thermalling on the downwind leg is not acceptable practice and must cease.

- Only one cable should be attached to any glider at one time. After a launch ground crew should wait until the used cable is retrieved before handling or hooking on the other.
- If the wing is down the cable must be released from the glider.

Sat 24-9

Instructor: R. Quinn
1st flight 10:17 ; KYW: G. Reddeck,R. Quinn.
last flight 17:54 ; KYW: J. Boroky, R. Quinn.
longest flights;
KYW; 1 hr. 28 mins.; D. Medlow, R. Quinn.
GNB; 1 hr. 3 mins.; B. Giles.
No. of flights; 36
Total flying time; 8 hrs. 6 mins.

Sun 25-9

Cancelled.

Whyalla visit.

Sat 1-10

Instructor: R. Quinn
1st flight 10:59 ; KYW: T. Parish, R. Quinn.
last flight 18:22 ; GNB: K. Frost.
longest flights;
KYW; 38 mins.; T. Parish, R. Quinn.
GNB; 44 mins.; D. Medlow.
GNN; 1 hr. 55 mins.; B. Giles.
Visitors; 1 hr. 41 mins.; D. White.
No. of flights; 31
Total flying time; 11 hrs. 59 mins.

Sun 2-10

Instructor: D. Hein
1st flight 09:52 ; IS28: B. White, G. Ziesler.
last flight 15:51 ; KYW: R. Heath, M. Forster.
longest flights;
KYW; 8 mins.; achieved on 4 flights.
GNB; 8 mins.; D. Hein.
GNN; 6 mins.; A. Sawyer.
Visitors; 8 mins.; achieved on 3 flights.
No. of flights; 37
Total flying time; 3 hrs. 45 mins.

The AUGC field was invaded at the beginning of October with approximately 20 - 30 Whyalla Gliding Club people and three aircraft, an IS28B2 metal twin seater (very...grunt... hard to rig!), a single astir (VH-WUK) and (on Sunday) a homebuilt 'Duster' VH-UIS belonging to Whyalla's CFI., Ron Dunn.
The weather was a mixed bag over the weekend; it looked good on Saturday with a good SW wind and some thermal activity, thus giving our visitors a taste of our ridge and local soaring. The ridge let us down midway through the afternoon and it was back to circuits after 1600.
On Sunday, a typical 'grey day' with wind from the SSE turning back to SE in the afternoon; needless to say, it was circuits all day, and with up to 7 aircraft on the line, the winch was having a hard time, but we had no winch problems all day.
Although we could not host our visitors with our usual great flying conditions I believe they left us quite content with their visit. For those members who attended it was the chance to inspect (and fly) 'strange' aircraft and swap the usual stories on Saturday night at the Shearer's Quarters.
Hopefully Whyalla will come back next year, and who knows, AUGC may soon be riding Highway 1 to try our hand at what Whyalla can offer.

D. Medlow.

Long Weekend.

Sat 8-10

Instructor: D. Hein
1st flight 10:26 ; KYW: J. Boroky, D. Hein.
last flight 16:45 ; GNB: J. Boroky.
longest flights;
KYW; 48 mins.; G. Ewing, D. Hein.
GNB; 1 hr. 3 mins.; D. Medlow.
GNN; 2 hrs. 12 mins.; A. Sawyer.
No. of flights; 30
Total flying time; 9 hrs. 27 mins.

Conditions in the morning were good, allowing thermalling to 7,100'! However, at about lunchtime, a front came through, and the attendent cloud caused thermal activity to die down after a while. The wind turned Westerly for about 15 minutes at about 1:30 p.m., encouraging some eleven hang gliders to take to the air, though the wind was too weak and too short lived for any real ridge soaring by our aircraft. The day turned to circuits after that, and flying stopped before 5:00 due to rain.

Sun 9-10

NO REPORT AVAILABLE.

Mon 10-10

Instructor: M. Barnden.
1st flight 10:22 ; GNB: D. Medlow.
last flight 16:30 ; GNB: N. Abbott.
longest flights;
KYW; 59 mins.; B. Giles, passenger.
GNB; 1 hr. 17 mins.; N. Abbott.
GNN; 6 mins.; B. Giles.
No. of flights; 17
Total flying time; 6 hrs. 2 mins.

The initial prospects for the day seemed good with a forecast maximum of 25 C with 5-10 kt S-SE winds.

The aircraft were inspected between sneezes and by the time they arriveed at the launch point the cirrus which had threatened to dampen the day's activities had moved off leaving a clear sky.

The first lift was contacted at about 11:30 although initially it was only sufficient to keep the Ka6 aloft. By 1:30 the day was booming with the Bocian flying passengers and trainees to 6,500'.

At 3:15 the barograph was loaded and stowed in the rear of the Ka6 for a silver C height attempt - a seemingly easy task. At 3:30 the sea breeze moved in and quickly turned a sky full of lift to nothing. The aircraft flew several circuits before being hangared.

The longest flight of the day was, surprisingly enough, not flown by Dennis (you're slipping) although he recorded the maximum height in the vicinity of 6,500' on his 72 min. flight.

Sat 15-10

Instructor: R. Quinn
1st flight 11:01 ; GNB: T. Parish.
last flight 17:05 ; GNB: R. Quinn.
longest flights;
GNB; 1 hr. 1 min.; T. Parish.
GNN; 26 mins.; B. Giles.
No. of flights; 22
Total flying time; 5 hrs. 22 mins.

A technical history of soaring—

From Paleoaeronautics to Altostratus

by M.K. CHEN and J.H. McMASTERS

Acknowledgement

The authors wish to thank Doug Lamont, former editor of *Soaring*, and Bob Storck, archivist of the Vintage Sailplane Association, for providing data and drawings for this article. Thanks also go to Dan Knutzen who transformed the authors' sketches into art.

PART I

An unconventionally long time-line has been selected in the following history of soaring. It includes an overview of the evolutionary process in the belief that this often poorly appreciated and significant part of aeronautical development led to the technical and aesthetic triumph of the modern sailplane. Thus, the story progresses from the true dawn of flight with the emergence of biological flying devices (animophilous seeds, pterosaurs) through a discussion of future trends in sailplane development. It will outline the history of the technical developments which have allowed progress from the tentative hang glider experiments of Pilcher, Montgomery, and Lilienthal in the last two decades of the 19th Century through the present range of sport and competition sailplanes. Modern sailplanes are at the forefront of important technologies such as laminar flow aerodynamics and routine production use of advanced composite materials. Yet, in no category of modern aircraft is the influence of *natural* models of flying machines more clear and direct than in the sailplane. To put this in clear perspective, the historical time-line of this presentation extends back to the very origin of flight some 300 million years ago.

Any winged flying device can, inadvertently or by intent, become a glider. As shown in Figure 1, a steady glide is characterized by the balance of the weight by lift and drag forces with gravity acting as the propulsion device. Since

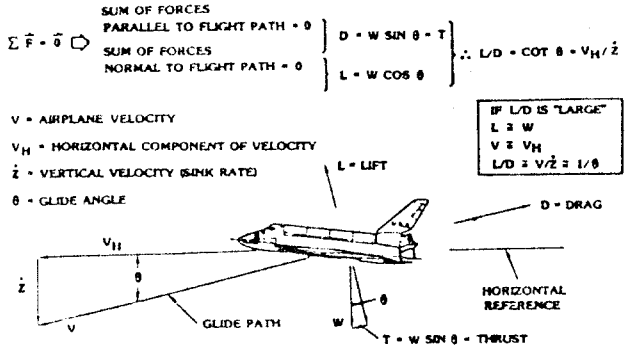


Figure 1. Forces on an Aircraft in an Equilibrium Rectilinear Glide in Still Air

the aerodynamic forces are generated in proportion to motion of the machine relative to the air, the descent locity (sink rate in gliding parlance) is proportional to aerodynamic efficiency (lift-to-drag ratio) achieved given velocity along the flight path. But gliding flig merely expedient or unavoidable, and, while occasion exciting, otherwise uninteresting.

The fact that the atmosphere is seldom completely q cent leads to a splendid additional possibility, howeve the glider is capable of flying sufficiently slowly (i.e., a low wing loading) and possesses some minimum v of aerodynamic efficiency, the resulting sink rate wi "low." As pointed out by Lord Rayleigh in 1883 (Refer 13), if the proper combination of atmospheric condit and topographical features produces air currents which ("lift") as fast or faster than the glider sinks (in still then the machine will remain aloft or climb. This is the principle of *soaring* flight, the classic conditions for w are shown in Figure 2.

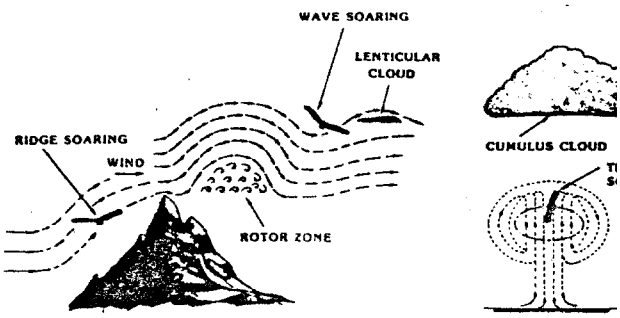


Figure 2. Classical Forms of Soaring Flight

Thus, flying in ridge lift, a crude Rogallo wing hang g (M/S≈6 kg/m², L/D≈5 at 35 km/h), and a U-2 type airp transformed into a glider (M/S = 200 kg/m², L/D = 150 km/hr) would have roughly the same still-air sink s of about 1.9 m/s, making them both capable, in princ of marginal soaring under sufficiently strong wind c tions. But the soaring performance of either aircraft in comparison with that of a modern fiberglass racing plane, as shown in Figure 3.

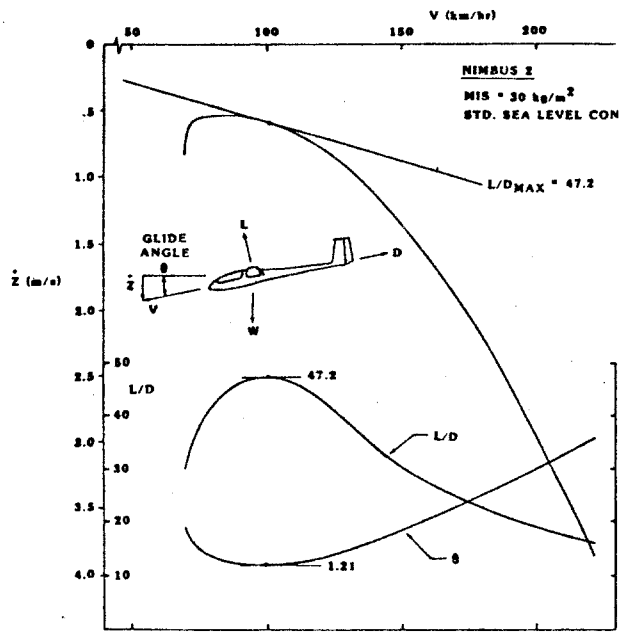


Figure 3. Typical Open Class Sailplane Performance

THE BASICS OF MODERN SOARING

Before discussing the evolution of soaring technology, it is first necessary to review a few of the finer points of how an efficient glider can sustain itself, and, in fact, fly substantial distances, borne aloft only by the motions of the atmosphere derived ultimately from energy from the sun. In the process of this review, several of the dominant principles in sailplane design will be illuminated. Further details may also be found in Reference 1.

The advances made in the evolution from gliding to soaring make an interesting story involving experimentation leading to sporting competition and then to the discovery of unsuspected aspects of dynamic meteorology. Had "motorless" flight in the historic era been limited to the range of possibilities offered by simply gliding over hills and ridges, it would have suffered the fate of the Zeppelin by the early 1920's. However, as sailplane performance capabilities (advanced by the application of wing theory and structural developments) outstripped the limits of flying techniques and competition goals, the discovery of thermal lift made possible the shift in performance objectives from endurance flights in a local area of favorable topography to more ambitious cross-country distance flying. This discovery and the rise of competition soaring resulted in even higher performance machines capable of exploiting atmospheric motions in ever more subtle and complex ways. Modern sailplanes are capable, under the right conditions, of flying literally from dawn to dusk over distances in excess of 1600 kilometers. Thus the present competitive challenge lies in racing over a specified course. Competition soaring has evolved into a sport which is a direct three-dimensional analog of competitive sailing, demanding a superb level of both physical and mental ability, a profound understanding of aerodynamics and meteorology — and good luck.

Central in the evolution from ridge soaring to cross-country racing was the discovery and appreciation of how to exploit thermal lift. While thermal flying had become common prior to WW II, it was not until the early 1950's that Dr. Paul B. MacCready, Jr., published a practical theory of optimal cross-country thermal soaring strategy. The apocryphal story goes that MacCready went on to become world soaring champion in 1956, having published the simple graphical construction shown in Figure 4 to provide his competition with a first-rate red herring, while he himself paid proper attention to the weather — and won the contest.

Be that as it may, the classical MacCready construction shown in Figure 4 demonstrates, in an idealized way, the

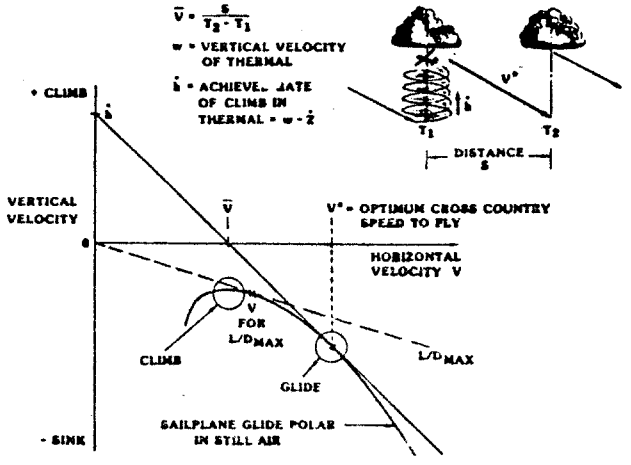


Figure 4.
Classical (MacCready) Optimal Cross-Country Soaring

tactics by which a properly designed sailplane should be flown in order to exploit a sequence of thermal updrafts to achieve an optimum overall cross-country speed. By flying slowly in a banked turn, the pilot seeks to achieve the greatest rate of spiraling climb in a thermal of given strength and profile. Having achieved (in the pilot's judgment) an acceptable height gain, the sailplane then is put into a high-speed rectilinear glide to the base of the next thermal updraft encountered, the sport in this game being, in part, the fact that the next thermal is usually invisible to the pilot. The optimum speed to fly (V^*) between thermals to maximize the average cross-country speed ($\bar{V}$), which accounts for the time spent thermaling, is determined simply from a knowledge of the total glide polar (plot of vertical versus horizontal speed) of the sailplane in still air, and the rate of climb achieved in the thermal involved, with adjustments made for any horizontal wind which may prevail.

According to the simple construction shown in Figure 4, the optimum sailplane needed to execute this sort of flight strategy is that which possesses both a low minimum sink rate at low forward speed (for optimum climb) and a flat glide polar (low sink rate) at high speed. The speed for maximum lift-to-drag ratio is seldom flown, although L/D maximum and the speed at which it occurs are a useful index in assessing a particular sailplane's overall performance.

Recognition of the importance of the basic features shown in Figure 4, and the fact that the L/D performance of the sailplane is independent of the weight of the machine (cf. Figure 1), leads to the construction shown in Figure 5. Un-

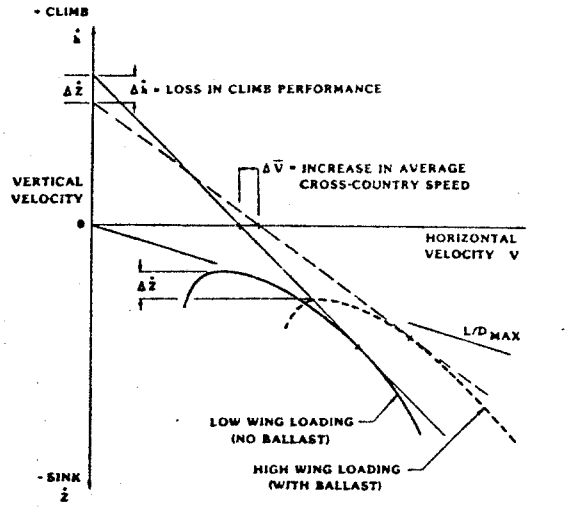


Figure 5.
The Influence of Wing Loading on Classical Cross- Country Soaring Performance

der certain conditions (the presence of strong thermal lift) adding weight to the sailplane in the form of ballast can actually increase racing performance. The usual practice is to load the sailplane with water carried in bags running spanwise along the wing spar. The additional weight is then distributed across the span, providing a relieving bending load, and the wing loading can be increased by as much as 40 percent of the minimum flying weight. The effect of this is to shift the still-air gliding polar of the machine downward and to the right — the loss in climb performance hopefully to be compensated for by the increase in interthermal speed at a given sink rate for a net gain in average achieved cross-country speed.

Having reached the level of performance necessary to

fully exploit these effects, the sailplane now becomes (with some minor resizing) capable of thermal soaring *without* circling. This alternative *dolphin mode* in soaring is shown in Figure 6 in contrast to the more traditional approach. With the lift-to-drag ratios of modern Open Class racers exceeding 50, this approach to competition racing has become routinely viable. The next step in this progression is to provide the sailplane with the variable geometry capabilities of span and/or area change which birds possess. Despite the spectacular levels of performance (and cost) achieved by modern racing sailplanes, major advances remain possible.

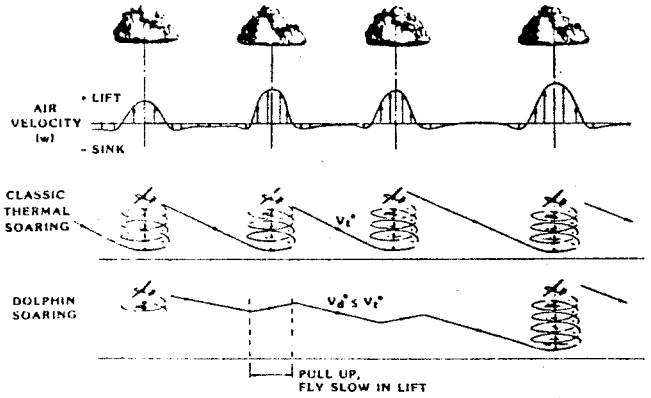


Figure 6. Variations on a Theme in Soaring

THE NATURAL HISTORY OF SOARING AND GLIDING

Lip service is paid frequently in aviation historical writing to the inspiration natural flying devices provide to the designers of airplanes. Despite the addition of high technology gadgetry such as winglets to business jets, it often remains difficult to see much direct connection between these sorts of machines and a pigeon or a bat. In the case of gliding and soaring, the parallels are far more direct and valid, although sometimes obscure or not fully appreciated. In order to put the present discussion of soaring technical development in a properly broad context, the developments which preceded human flight are briefly outlined here.

The relevant natural flying "devices" are: flying seeds, birds, bats, and pterosaurs. As shown in Figure 7, these organisms and creatures have evolved over huge time scales, and those which survive today can be assumed to have been nearly perfectly optimized (compromised) to fill their various ecological niches.

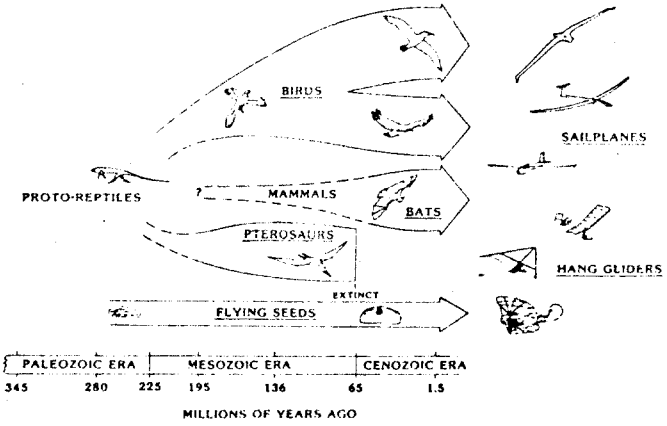


Figure 7. The Natural History of Gliding and Soaring

Earliest of the natural fliers were the animophilous s evolved to provide their parent species more eff means of competing for sunlight and fertile soil even b the advent of pollenating insects and other means o persal. Common examples are the milkweed seed, v may be considered a direct natural antecedent of the chute, and the maple seed, a natural prototype o autogiro. Of considerable historical interest, because it onstrated to aviation pioneers the feasibility of constru a true self-stable tailless airplane, is the seed of the palm tree, *Zinonia macrocarpa*.

Few insects glide or soar, and the next range of na flying devices having a direct influence on man-made f machines were the birds and pterosaurs which appe share a common (although uncertain) reptilian ance While often overlooked and largely unknown to th oneers of human flight, the grand line of warm-bloc fur-coated pterosaurs were to dominate animal flight period of some 120 million years until their eventual ec by birds and their extinction some 65 million years a the close of the Age of the Dinosaurs. An interesting a of pterosaur flight which is emerging from recent st is the remarkable parallel in wing structure, and appar in flight performance, of the larger species with mc high aspect ratio Rogallo wing hang gliders.

Bats are a relatively poorly studied class of flying chines, and, although several species (e.g., Central A ican fishing bats) do glide on a regular basis, they are erally more akin to fast-flapping smaller bird specie interest in this discussion is the alternative wing arcl ture employed by the bats (cf. Figure 8) which allows

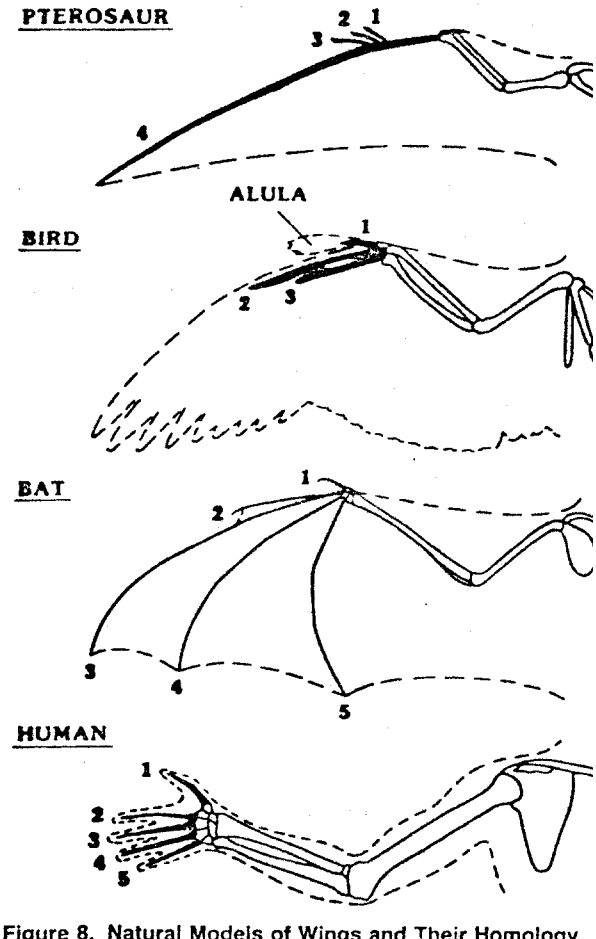
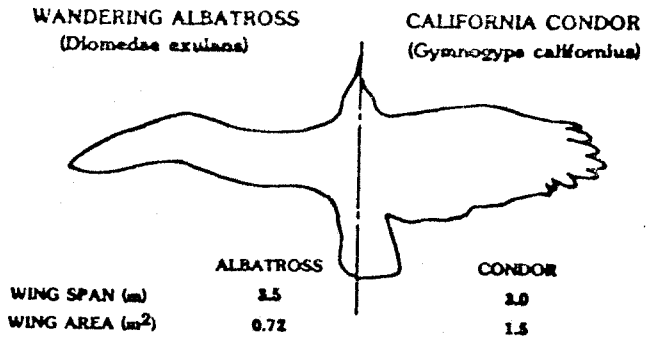


Figure 8. Natural Models of Wings and Their Homology to the Human Arm and Hand (Digits Indicated)



	ALBATROSS	CONDOR
WING SPAN (m)	3.5	3.0
WING AREA (m^2)	0.72	1.5
ASPECT RATIO	17	6
MASS (kg)	9.8	10
WING LOADING (kg/m^2)	13.6	6.6

Figure 9.
Planform Comparison of Large Land and Sea Soaring Birds

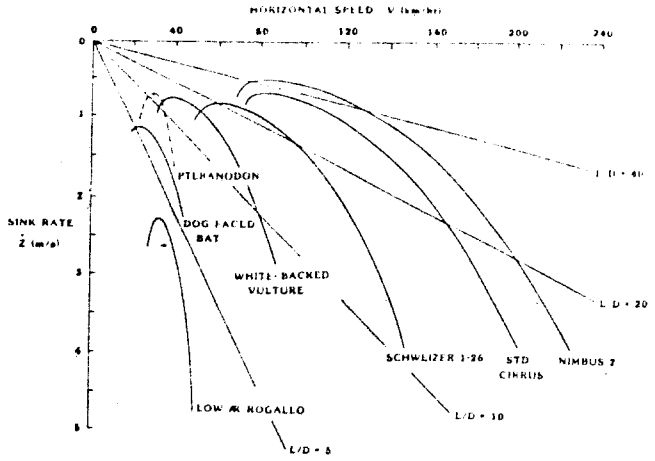


Figure 10. Relative Performance of Various Gliders

to maintain a very high degree of control over the camber and twist distribution of their wing beyond that possible for birds or pterosaurs. However, this capability is gained at the expense of the birds' ability to radically alter their wing span and area.

An interesting commentary on the general lack of appreciation of the importance of this characteristic — the ability of natural fliers to control and alter their wings' twist, camber, span, and area — was recently recounted by a paper documenting aeronautical research in the United States. In a mid-1930's attempt to determine by experiment the lift and drag characteristics of a seagull, a dead specimen was frozen in what was thought to be its optimum flight configuration (wings outstretched). The frozen bird was then placed in a wind tunnel and forces were measured. The conclusion of this experiment was that dead birds can't fly!

It is the range of soaring birds which has had the main influence on human soaring. Birds (which some modern paleontologists argue are the direct modern descendants of the dinosaurs) are a remarkably successful class and cover a very wide range of sizes and functions. Of interest here are the two divergent types of soaring flight practiced by land-soaring types (e.g., vultures, hawks) and sea-soaring types (e.g., gulls, albatross), and the differences in wing geometry and loading which the two categories exhibit (cf. Figure 9).

A book could easily be written on the topics outlined in this section, and the interested reader is referred to References 2 through 16 for further background. For comparison purposes here, the relative gliding performance of various natural and man-made gliding and soaring devices is shown in Figure 10.

This brings the discussion to the main topic of this paper — the technical development of the high-performance sailplane. As a map to the history to be discussed, Figure 11

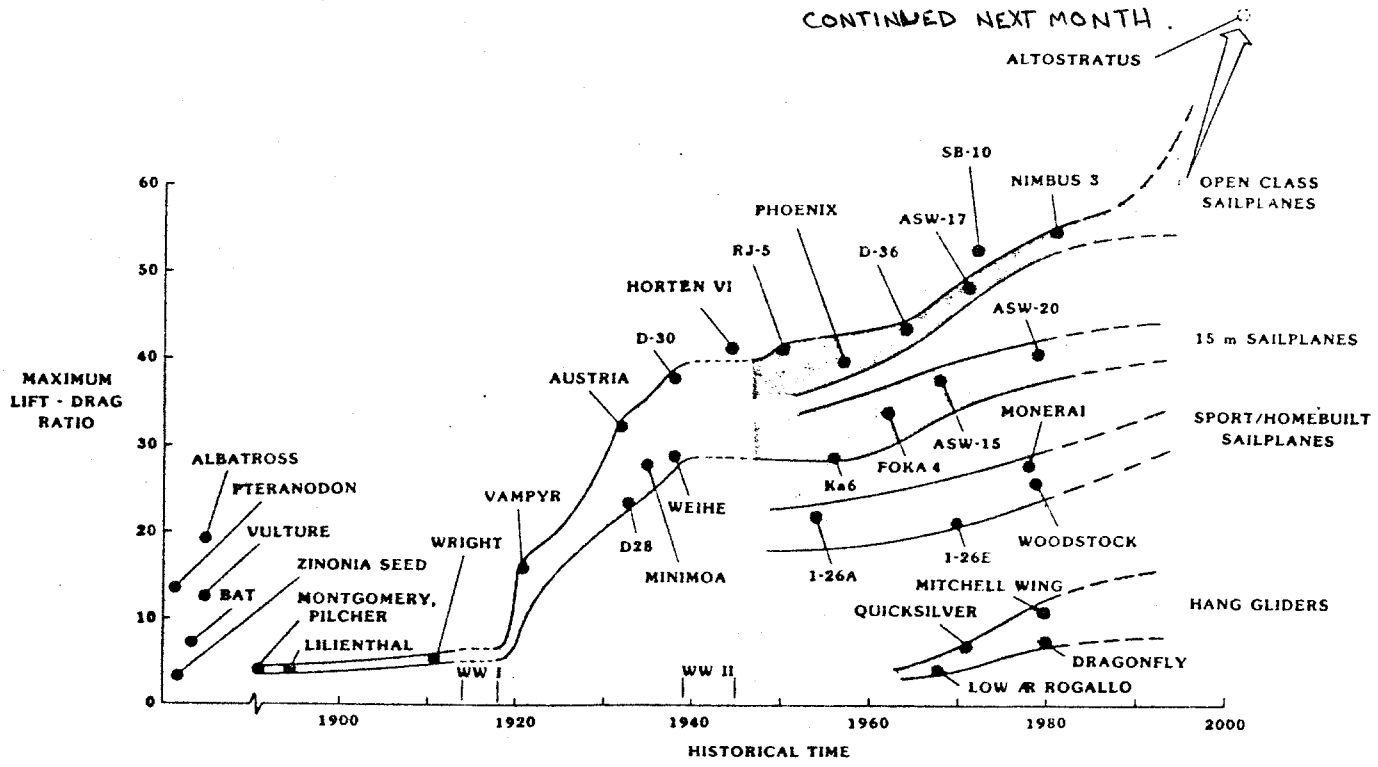


Figure 11. Historical Trends in Gliding and Soaring Performance

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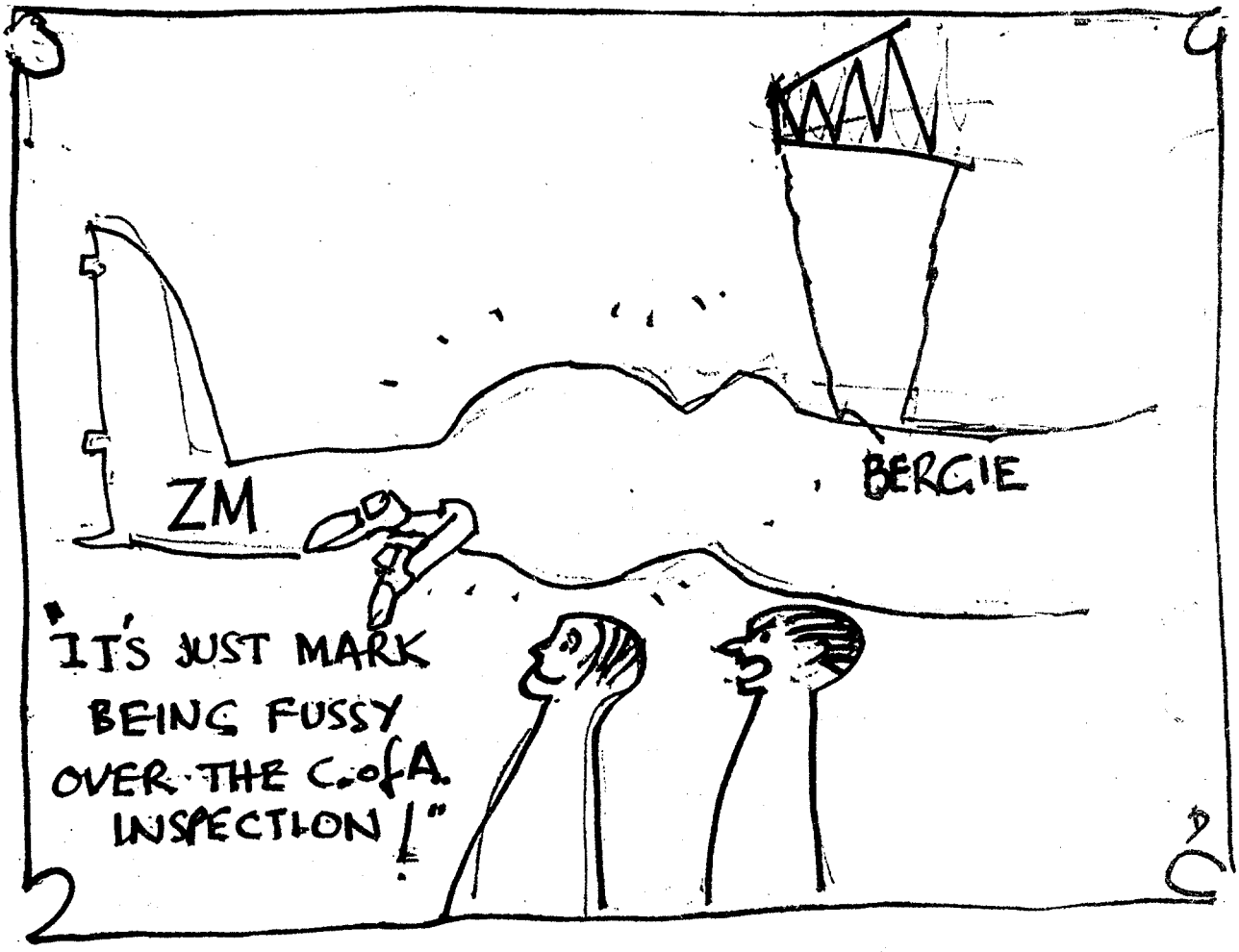
PREPARED BY : D.Medlow DATE : 18 October 1993
FILE ID : MEMBERS.TXT

Me#	Name	Address	Phone	Cnt
001	ABBENANTE, J	35 North St HECTORVILLE 5073	08 336 3175	SO
002	ABBOTT, N	PO Box 44 CLARENDON 5157	08 383 6236	NH
003	ADAM, John	12 Wooton Rd EDWARDSTOWN 5039	08 297 4119	RA
073	ADAMS, Robert	6 Yorrel Av SURREY DOWNS 5126		
004	BAKER, Timothy	5 Shalford Tce CAMPBELLTOWN 5074	08 337 0077	SP
005	BARNDEN, Mike	11 Adelaide Rd MALALLA 5502	085 272 237	OC
080	BATT, Richard	18 Petherick St GLENALTA 5052	08 278 7357	
006	BENZ, John	St. Anns 187 Brougham Pl NTH ADEL 5006	08 267 1478	UM
007	BLANDFORD, A	41 Myrtle St SEACLIFF 5049	08 296 6768	LL
008	BOROKY, Jane	PO Box 169 JAMESTOWN 5491	086 652 043	OC
009	BOROKY, Neil	6 Wilson Av FELIXSTOW 5070	08 337 7543	NE
078	BRADLEY, M	3 Coppin St GLENGOURIE 5044	08 295 1699	OC
010	BROOKS, P	5 Toolaby Av BEAUMONT 5066	08 799 081	NN
011	COLEMAN, M	2 Mawson St PARA HILLS 5096	08 264 7136	QU
012	COLLAS, P	2 Fridmore Rd GLEN OSMOND 5064	08 791 494	
079	CONWAY, David	386 Cross Rd CLARENCE PARK 5034	08 297 8438	NE
013	CRADDOCK, A	C/O Area School SNOWTOWN 5520	088 652 146	SC
075	CROUCH, Rob	11 Londy Avenue SALISBURY EAST 5109	08 250 2276	OC
014	DAMIN, Danny	7 Creaser St SALISBURY 5108	08 258 3940	LL
015	DELLER, M	9 Heathpool Rd TUSMORE 5065		LL
016	DELROY, Mike	61 Stanley St ERYNDALE 5066	08 332 2850	NM
017	DENYER, A	31 Davenport Tce HAZELWOOD PK 5066	08 311 908	NM
018	DUCKMANTON, R	5 John St EASTWOOD 5063		OC
019	DUNLOP, E	Jenkins Ave MYRTLE BANK 5064	08 336 2235	SC
020	EWING, G	64 Newton Rd CAMPBELLTOWN 5074	08 336 2235	GN
021	FAROOQI, K M	10/25 Thirza Av MITCHELL PK 5043		SC
022	FORSTER, Mark	37 Cronulla Dr REDWOOD PARK 5097	08 251 2810	OC
023	FROST, Kevin	11 Tucker Pde NEWTOWN KADINA 5554	088 212 239	OC
024	FINN, Brian	26 Wilton Av SOMERTON 5044	08 296 3350	DD
025	FRASER, C	12/308 Anzac Hwy PLYMPTON 5038		
026	GEORGE, David	3 Peglar St BEVERLEY 5009		
027	GIARDINI, M	24 Alfred St PARKSIDE 5063	08 272 1252	MO
028	GILES, Rob	27 Collingbourne Dv ELIZABETH VALE 5112	08 255 3233	OC
029	GREENSLADE, V	2 Ravenswood Av NORWOOD 5067	08 425 141	
030	HARLEY, Guy	35 Watson Av ROSE PARK 5067	08 317 340	OC
031	HEATH, Robert	21 George St KADINA 5554	088 211 401	OC
032	HEIN, Donald	1 Yandra St VALE PARK 5081	08 261 4245	OC
033	HOUGH-DAVIES,M	97 Le Fevre Tce NORTH ADELAIDE 5006	08 267 1582	SY
034	HUNTER, B	7 Taminga Av GLENUNGA 5064	08 799 080	NM
035	JOHNSON, Tim	12 Blackwood Ct RIDGEHAVEN 5097	08 264 3972	
036	JOYCE, J	11 Keen Av SEAVIEW DOWNS 5049		SC
037	KROMAROV, R	6 Harrow Av MAGILL 5072	08 336 6918	SC
038	KULASINGHAN, M	45 Brougham Pl NORTH ADELAIDE 5006		
039	LARWOOD, Brett	58 Harris Rd KLEMZIG 5087	08 261 5732	OC
040	LARWOOD, Dene	58 Harris Rd KLEMZIG 5087	08 261 5732	OC
041	LIM, Eddy	73 Third Av ST PETERS 5069	08 421 541	SC
042	MCGRATH, A	185 Military Rd TENNYSON 5022	08 356 2466	NO
043	MCLACHLAN, C	28 Hardy Ct CAMPBELLTOWN 5074	08 337 9543	
044	MARTIN, H	Kincardone Av ST GEORGES 5064	08 295 016	LL
045	MEAKIN, S	10 Ridgecrest Av DARLINGTON 5047	08 298 8339	SC
046	MEDLOW, Dennis	34 Tenth Av ST PETERS 5069	08 425 093	OC
047	MELVILLE, Tom	213 Jeffcott St NORTH ADELAIDE 5006	08 267 1977	NM
077	NEWCOMBE, G	ENGLAND		OC
048	NEMETH, Tom	11 Terrigal Rd REDWOOD PARK 5097	08 251 3137	Con
049	NORMAN, R	PO BOX 76 CHERRYVILLE 5134	08 390 1528	GA
050	NOTTLE, B	45 Brougham Pl NORTH ADELAIDE 5006		AP
071	PARISH, T	10 Rodda Rd MYRTLE BANK 5064	08 338 1415	
051	PATERSON, A	21 Leane Av GLENELG NORTH 5045	08 294 6369	
052	PETRICK, D	15 Yallum Tce KILKENNY 5009	08 268 1057	EE
053	PHILLIPS, I	12 Crispian St FULHAM 5024	08 356 4917	LL

056	QUADROS, Nikei	Lincoln Coll 45 Brougham Pl NTH AD	
057	QUINN, Redmond	13 Redmond St COLLINSWOOD 5081	08 445 331
058	RAFT, A	3 Hughes St FULHAM 5024	08 353 2025
059	RAFTERY, Mark	16 Stradbroke Av PLYMPTON PK 5038	08 293 6276
060	RAUD, Tarmo	2 Hollywood Way GLENALTA 5052	08 278 1387
074	REDDEK, Gordon	Delhi Petroleum 10/45 King William Adel	08 218 7611
061	RODDA, Dean	51 Port Rd KADINA 5554	088 212 285
062	RUSSO, Remo	20 Donaldson Drv PARADISE 5075	08 337 6095
063	SAWYER, Andrew	19 Salerno Ct ELIZABETH EAST 5112	08 255 3646
064	SCADDEN, John	112 Swaine Av TOORAK GARDENS 5065	08 332 0491
065	SCHULTZ, A	Aquinas Coll Palmer Pl NORTH ADEL 5006	
072	SLEIGH, J	78 Ferguson Av MYRTLE BANK 5064	
066	TAYLOR, Deb	30 Stonehenge Rd PARA VISTA 5093	
067	TEMPLE, Dick	Rangeview Dr CAREY GULLY 5144	08 390 1827
068	TEMPLE, Peter	Rangeview Dr CAREY GULLY 5144	08 390 1827
069	WACHTEL, S	46 Pennington Tce NORTH ADELAIDE 5006	08 267 1279
076	WILLIAMS, L	6A Emerson Drv TRANMERE 5073	08 310 467
070	WILLMORE, J	34 Columbia Ct MODBURY NORTH 5092	08 265 3182



WANTED

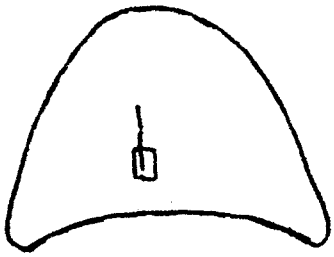
A prominent computer scientist & AUGC member is interested in hearing from AUGC pilots about experiences with the famous "Lochiel Hole" that usually forms around the AUGC field on thermal days. He is preparing to write a treatise on the subject entitled:

"The Lochiel Hole Phenomenon and Related Socio-economic Pilot Encountered Supernatural Downward Air Trends."

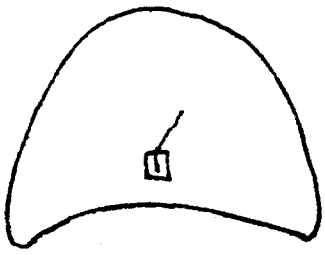
All information given will be treated confidentially.

KNOW YOUR YAW STRING

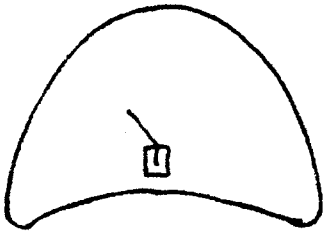
WHAT DOES YOUR YAW STRING TELL YOU?



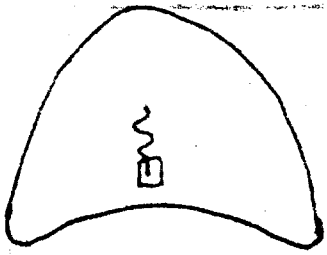
YOU ARE ON A CHECK-FLIGHT WITH THE INSTRUCTOR BREATHING HEAVILY BEHIND YOU.



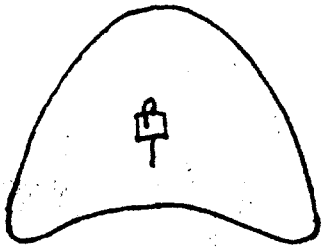
YOU ARE NOW FLYING SOLO



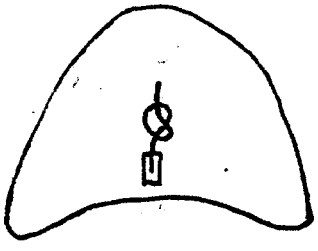
STILL SOLO



YOU HAVE ATTEMPTED A CHANDEL AND DIDNT QUIET MAKE IT. YOU ARE BEGINING TO SLIDE BACKWARDS.



YOU ARE NOW SLIDING BACKWARDS.



THE SUPREME ACHIEVEMENT OF THE POST SOLO PILOT. "TIED IN FLIGHT".

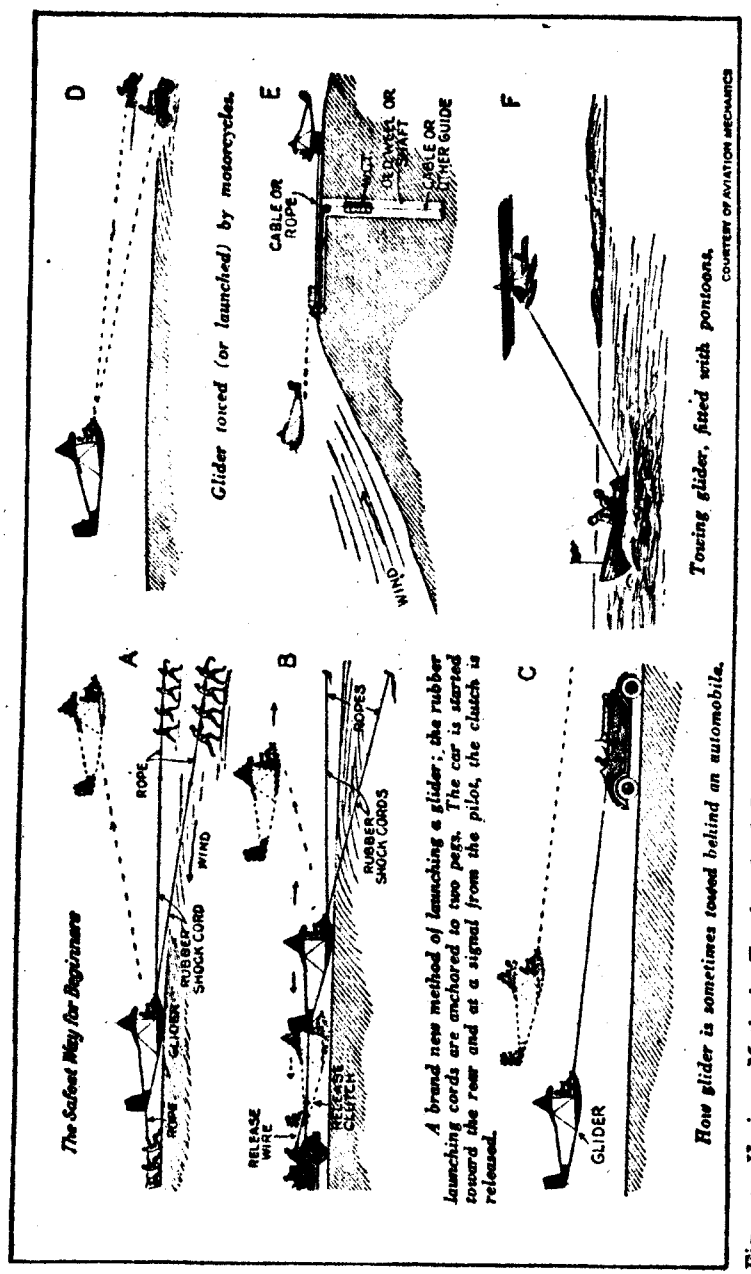


Fig. 45.—Various Methods Employed of Launching Gliders. A—The Safest Way for Beginners Is Shock Cord Catapult Launchings. B—Method Employing an Automobile and Release Mechanism. C—Towing Glider Behind an Automobile. D—Towing Glider by Motorcycles. E—An Elaborate Catapult Device Suited for a Guiding Center or School by Which a Falling Weight Pulls a Launching Car. This Is a Modification of the Early Wright Airplane Launching System. F—Towing Seaplane Glider Behind a Speed Boat.

As soon as a student gains enough knowledge to fly and can maintain a straight line flight across a field at an altitude of 10 to 15 feet, he is ready to go up to 30 feet for a fast flight and quick release. It is at this point that he really begins to learn something about glider flying. By quick release is meant that when the glider is at an adequate elevation, the pilot releases the rope quickly. The student must maintain his speed and climb a little before coming in to land. The quick release method was devised to prepare students for the shock cord launchings they will experience when ready to shoot from hilltops over valleys a long distance below. If a student does not have the "feel of the plane," does not know by instinct and feeling when the release comes, he is liable to stall the plane and crash to earth. Such an experience from the low altitude at which a towed glider flies holds no serious consequences.

After the instructor has inspected the tow rope to see that it is properly fastened and that the release device is functioning as it should, his instructions to the novice will be something like this:

"Take your seat in the 'cockpit.' This is the rather frail seat stuck out in front of the wing. Place your feet on the rudder bar. Take the 'stick' in your right hand and put it in its 'neutral' position or place it so that the elevators and ailerons are in the inactive position. Be sure the safety belt is properly secured. 'Ready? Remember, do not move the stick. This is the first lesson, and your only responsibility demands that you guide the glider straight down the field as the automobile to the rear of which you are attached by a 200-foot rope, gathers speed until the glider is sliding along 12 miles an hour.' 'Keep the stick in

Digitized 1931