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ALL ADS WILL BE REMOVED AFTER 3 MONTHS UNLESS RENEWED.

## SMALL ADS

### Clubman CFX 180 Mk 2

Dark blue mylar 1/e, gold & yellow sail, speedbar, two spare uprights, large practice wheels. Stirrup harness, good condition. Low airtime, ideal P1 package. £650 ono.

Dick: 01-892-1684. 6-8 pm.

Magic 4 166 4.4 oz, VB Mylar 1/e, Blue & white. £900. Bug 6 months old £180, size medium. Parachute Australia 6 months old, £200. Venti, altimeter, offers.. Will take £1150 the lot.

Kelvin Jones: Ashford 0233 629200.

### Clubman 140.

9 months old, speed bar wheels, almost no airtime. As new condition. £900. Pod Plus, yellow, 5'4" to 5'8", as new, £200.. Small Ozee unused, Ring me and haggle... selling due to house purchase. Eric 0932 220819

### Magic 4 FR 177.

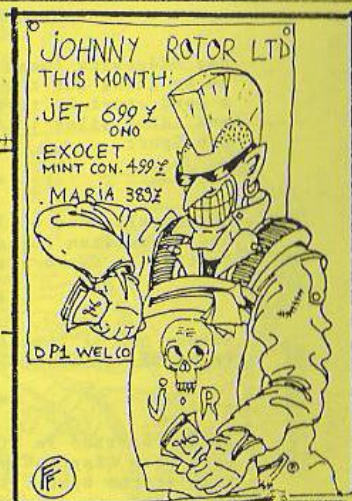
As new, including Pitchy and XC bag. £950. Adrian 01-660-0824.

### PLANTERS PEANUTS

MAGIC 4 WITH USUAL EXTRAS 30 Hrs AIRTIME, GARAGED, IMMACULATE £600 BAR, MITTS AND XC BAG INCLUDED. ALSO BENNET PARACHUTE & HIWAY HARNESS. LINDSAY RUDDUCK VARIO, THOMMEN ALTIMETER £150 WILL SPLIT PHONE DAVE 023376217

Magic 4 166 v.g.c. Blue mylar 1/e, 4.4 cloth, light blue u/s May 87. £995 Rob: 0263 75649.

Must have quick sale-- Pilot leaving country!!



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condition. £980  
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044484 217

# Windsock

FEB 89

SOUTHERN  
HANG GLIDING  
Club

From CHRYSLIS  
612 Baraga  
Marquette, Michigan 49855

### SPECIFICATIONS

Span ..... 22 ft.  
Area ..... 142 sq. ft.  
Aspect Ratio ..... 5.5  
Empty weight ..... 50 lb  
Structural materials: dacron sail stretched over an aluminum tube frame with stainless steel cable and fittings

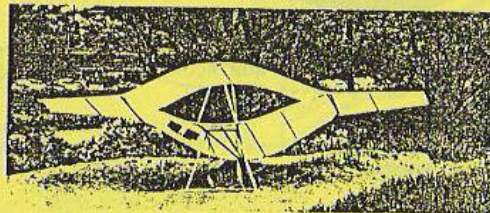
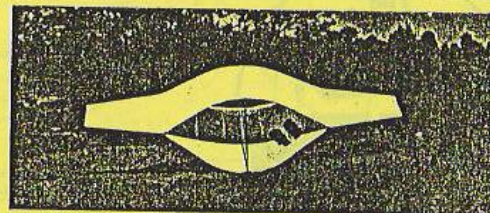
### PERFORMANCE

Stall speed ..... 15 mph

### OTHER

Designer ..... David Tiemeper  
No. built ..... 1

This unorthodox approach to ultralight glider design is defined as a modified ring wing with swept leading edge and a reflexed airfoil. Twist grips and spoilers provide roll, yaw & glide angle control while body shift gives pitch control. Dave has already made a few encouraging ground skimmings and is currently soliciting for professional flight testing of prototype. Should the flight tests prove satisfactory, plans will be available after the first of the year.



SPORT KITES, INC.  
1208 "H" East Walnut Street  
Santa Ana, California 92705  
(714) 547-1344

### RED BARON

#### SPECIFICATIONS

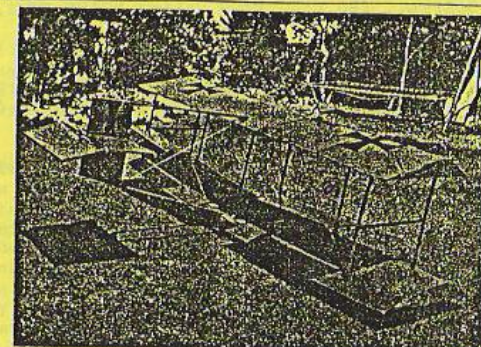
Span ..... around 20 ft.  
Area ..... around 120 sq. ft.  
Empty weight ..... 80 lb  
Manhours required ..... 100  
Airfoil ..... "Warped wood"  
Structural materials: brown wrapping paper doped, broomsticks, iron wire and one go-cart wheel

#### PERFORMANCE

Stall speed ..... 20 mph  
Controllability at min. speed: none

#### OTHER

Designers ..... the gang  
No. built ..... 1



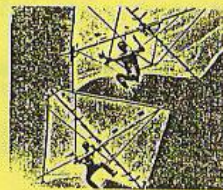
Built in 1967, the Red Baron was towed behind a pick-up truck at speeds up to 40 mph. Chris Wills towed it up to 20 feet above the pavement. Bob Wills was satisfied with 2 feet, while Chris Price was content with just scraping along behind the

truck. The two Chises decided that rather than fly it, they would just burn it to the ground with a flame thrower, so they did just that. It had 2-axis controls that worked somewhat.

### BAMBOO BOMBER

#### SPECIFICATIONS

Span ..... 17 ft.  
Area ..... 110 sq. ft.  
Aspect ratio ..... 2  
Leading edge ..... 12 ft.  
Ail. .... 16 ft.  
Empty weight ..... 40 lb.  
Pilot weight ..... 100-200 lb.  
Wing loading ..... 1.4-1.85 psf  
Manhours required ..... 15  
Nose angle ..... 90°  
Sail below ..... 2"  
Structural materials: bamboo, plastic, duct tape, nylon rope & swivel



#### PERFORMANCE

E-D Max ..... 2.5  
Min. sink ..... 11.6 fps

Sail characteristics: it fell at 18 mph  
Controllability at min. speed: enough to manage formation flights

#### OTHER

Designed by ..... the gang  
No. built ..... 1

Constructed of bamboo and plastic held together by duct tape and nylon rope, the Bamboo Bomber was eyeballed out of National Geographic by Chris Wills & Chris Price. This 1972 vintage glider had over 100 flights and got up to 100 feet in elevation. One nice thing about its construction was that it could be repaired as easily as it was crashed. (It took one Saturday to build.) A Boy Scout troop built one as a troop project, and this one was used in a MacGillivray Freeman film on flight with Chris and Bob Wills flying.

50 THE ABOVE ARE JUST A FEW ARTICLES FROM THE OLD "GROUND SKIMMER" U.S.A. MAGAZINE. CHECK OUT THE BAMBOO BOMBER, "THOSE MAGNIFICENT MEN !!!"

DECEMBER 1972



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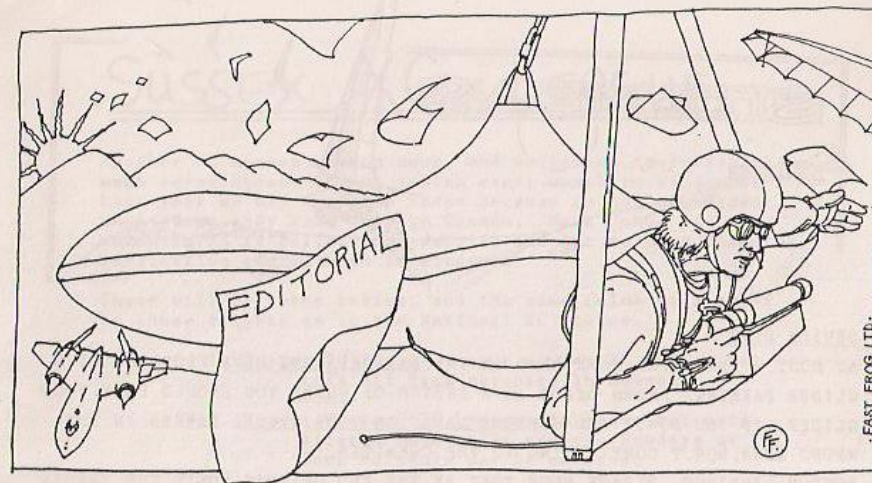
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FAST FROG LTD.

Another Windssock rolls off the photocopier, we've managed to scrape together enough stuff to make another issue, despite the lack of contributions!! If you think the content could be improved, just send in your article, letter, etc., before whingeing!!!

Dyke problems are still refusing to go away... with almost no proper discussion at club level (opinions in Windssock, suggestions to the committee, etc.) this is not surprising. Everyone has an opinion on this, but there is no proper feedback. But now, suddenly its national news... front cover lead in and photo and half a page given over to the thoughts of Dave Clayton, the Old Timer!! Well, it seems we are all wrong-- the best way to help inexperienced pilots is to encourage them to land in a dangerously restricted area between a road and a barbed wire fence with trees at the back, and in which a number of experienced pilots have had serious accidents.

I certainly hope no-one will take his advice, but if they do, they will not be welcome on our sites, and will be risking a severe ear bashing from the club, as well as courting disaster for themselves.

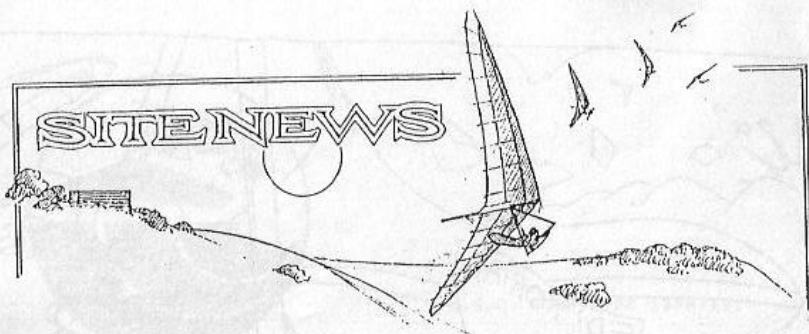
Let's have your views on this and any other local problems... not just in Wings, but here in Windssock, your local newsletter!!

With that plea, I'll leave you, for another month, and wish you a good flying season... fly high and far, and safely..

Mark

Mark Fisher.

PS Anyone remember how to rig a glider????!???

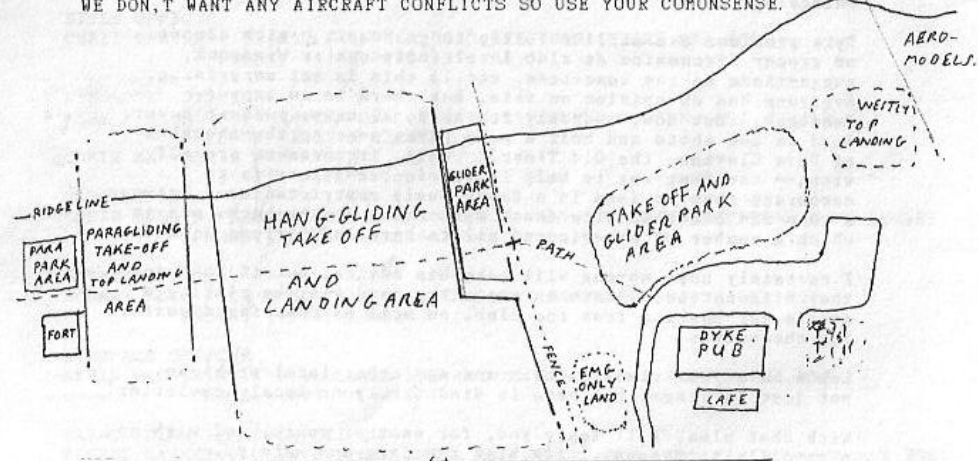


DEVILS DYKE

AS MOST OF YOU WILL HAVE READ IN THE EDITORIAL WE HAVE PROBLEMS WITH GLIDER PARKING. DRAWN BELOW IS A SKETCH OF WHERE YOU SHOULD PARK YOUR GLIDER. IF YOU DON'T AND SOMEONE LANDS ON YOUR GLIDER PARKED IN THE WRONG AREA, DON'T COME CRYING TO THE COMMITTEE.

BOTTOM LANDINGS, PLEASE NOTE THAT BY THE END OF THIS MONTH THE FARMER WILL BE PUTTING IN A CORN CROP. WHEN THIS IS IN YOU WILL NOT BE ALLOWED TO LAND IN THE BIG FIELDS IMMEDIATELY BELOW THE TAKE OFF AREAS.

NOTE ALSO PARAGLIDER PILOTS, THE AREA RESERVED FOR TAKE OFF AND TOP LANDING IS IMMEDIATELY IN FRONT OF THE OLD FORT. PLEASE USE THIS AREA AND DON'T STRAY IN FRONT OF THE HANG GLIDING TAKE OFF AND LANDING AREAS. WE DON'T WANT ANY AIRCRAFT CONFLICTS SO USE YOUR COMMON SENSE.



B.H.G.A. AGM URGENT...

PLEASE SEND IN TO JOHNNY CARR ALL YOUR B.H.G.A VOTING SLIPS, IF YOU CAN NOT ATTEND THE A.G.M. NOTE THAT ALL THE SLIPS WILL BE PUT INTO A DRAW/RAFFLE AND THE WINNER WILL WIN A YEARS CLUB MEMBERSHIP. NOTE JOHNNY'S ADDRESS ON PAGE 1, IF YOU CAN NOT POST IT JUST HAND IT TO ANY COMMITTEE MEMBER ON THE HILL.

SUSSEX XC LEAGUE

Another XC season starts soon, and we intend to revive the much loved Sussex league tables every month in Windsock. Last year we did not have these because no one organised them after Andy Wood went to Canada. Mark Johns has volunteered to collate the details and let me have them for publication every month in Windsock.

These will be three tables, and the same rules will apply to these flights as in the National XC league.

1. Sussex XC league: open to any P2 SHGC pilot take off from anywhere in Sussex,
2. Sussex Weekend XC League: As above, but only flights made on Saturdays, Sundays or Bank Holidays may be entered.
3. SHGC XC League: SHGC pilots, p2 or above, take off anywhere in UK.

You may enter Weekend flights in for both Sussex leagues.

Pilots will score on best four flights, plus one defined XC. (out and return or Triangle)

To enter, please use the form below, which will be printed in Windsock each month. Phoned in flights will not be accepted!!

Post to MARK JOHNS  
17, Blackthornes,  
Hurstpierpoint,  
Sussex.

Please tick one or more boxes:

Sussex League

Sussex W/E League

SHGC League

NAME .....

SHGC NUMBER..... PILOT RATING .....

DATE OF FLIGHT .....

GLIDER .....

<u>TAKE OFF</u>	<u>LANDING</u>
Place:	Place:
Grid reference:	Grid Reference:
Witness:	Witness:

NOTE: BE AT DEVILS DYKE, 8.00pm SAT, 18<sup>TH</sup> MARCH FOR THE X.C. TALK.

If you have an accident, however minor, please take the time to fill in the form below and send it to Rod Lees, the Safety Officer.

ACCIDENT REPORT

NAME: .....

ADDRESS: .....

.....

.....

.....

SHGC NUMBER: ..... PILOT RATING: .....

DATE OF INCIDENT: .....

LOCATION/SITE: .....

TIME: .....

BRIEF DETAILS: (Include flight details, equipment, names of any witnesses, damage to third party, etc.)

DIAGRAM:

SEND FORM TO: Rodney Lees,  
22 Hempstead Road,  
Saltdean,  
BRIGHTON.  
BN2 8QD.

## DARING YOUNG AVIATOR PAYS US A VISIT



At top: The Trike tied to a fence post at the Rosa Brook farm.

Inset: Neil Hardiman working on his machine.

When round Australia ultra light pilot Neil Hardiman was forced to land at Margaret River he did so right in the middle of an old controversy.

"You have got such a poxy strip that I decided it was safer to land in a paddock," said the intrepid young English pilot who is setting a round Australia inaugural ultra light record.

By chance he put down his little aircraft, that is a glorified hang glider, beside Rose Brook road, not far from that proposed airport site.

Mr Hardiman dropped into Margaret River last week when the two cylinder motor on his ultra light aircraft started to misfire at high revs, a recurrent problems he thought he had recently fixed in Perth.

Not impressed with the local airstrip and the strong cross wind that was blowing he sought a paddock and made a perfect touchdown on one of Leeuwin Estate's properties.

It was then only a matter of undoing a solitary bolt (known by pilots as the Jesus Bolt) that holds the wing on, and he was ready for a trip to the Shell service station for a tune-up.

Fortunately country courtesy prevailed and the manager of the property, who had arrived to inquire about the unusual propeller-pushed vehicle powering around the paddock in search of an unlocked gate, organised a lift on a ute into town.

Mr Hardiman left Sydney in early August with the intention of flying around the coast of Australia, a 16,000km journey expected to take six months.

Unlike other round Australia flights, he has covered almost every kilometre of the coastline, and he is doing the trip solo.

So far he has covered the entire north including the isolated Cape York area where a crash landing almost ended the circumnavigation attempt.

When he flew out of Rosa Brook on Monday afternoon he was headed for Albany, more than a little anxious about the tall forest below that offers little hospitality for a light aircraft in the event of trouble arising.

Mr Hardiman arrived in Australia earlier this year as a co-ordinator for Brian Milton's epic Britain to Australia Bicentennial solo flight.

He had never before taken to the air in an ultra light aircraft, though he has been flying hang gliders for five years and is an instructor.

"We got talking about an inaugural round Australia ultra light record one night and it sounded like a great

thing to do," he said.

"I found it difficult as an Englishman to get sponsorship for the trip, though I have some support from Australian Geographic and the makers of the aircraft, Airborne Windsports.

"I am doing it on a shoe-string budget. If anything serious goes wrong then I will have to stop and try to earn some money before getting underway again."

He worked for several days to pay his passage after he crashed in a thunderstorm on a remote Cape York beach when he struck soft sand and flipped the aircraft.

After sitting on the beach, about 200km from nowhere, he managed to contact a passing Coast Watch aircraft with his small radio and several days later a barge rammed up onto the sand and rescued him.

Believing that the damage to the ultra light was enough to end the mission, he was encouraged by the crew of the barge to repair it and carry on. They even

offered him money to help him on his way.

For the inquisitive here are the details of the little aircraft, that at an illegal squeeze, can carry two people.

It's an Airborne Buzard Trike with an Arrow II wing. It has a minimum speed of 50kmh, a maximum of 130kmh, cruises at 80kmh, has an overall length of 3m, a wingspan of 10m, weighs 148kg unladen and is powered by a Rotax 532, 62hp 2-stroke motor.

STOP PRESS  
BRITISH TEAM WIN  
BRAZIL WORLD CUP  
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2nd BRAZIL 3rd U.S.A  
JOHN PENDRY 1st INDIVID  
ROBBY WHITALL 2nd "  
AIRWAVE, MAGIC KISS, S  
TAKE ALL 1st to 5th  
PLACES.

# Bill Bell Airsports

7th Jan

Dear Mark,

Hello! as you can see from the enclosed note we ( Bill Bell Airsports in the U.K. and Western Hang Gliders in California ) are organising a trip to the Owens Valley this summer.

I think it possible that a few of your members could be interested in this trip, it seems to be a trip everyone promises themselves someday - well here's the chance! I would be grateful if you could perhaps display the note on your 'club noticeboard'.

Just to whet your appetite I've enclosed a copy (not a terribly good one I'm afraid ) of a photo I took last June looking north up the valley over Horseshoe Meadows at about 14,000 feet, you can see about 80 miles worth in the picture. If you or any of your members are tempted, give me a ring and I'll send some more details- for a reasonably experienced X-C pilot it really is a lot of fun!

Thanks for your time, lets hope for a good spring this year!

Safe flying,  
Yours sincerely



Bill Bell

34 Ashdale Avenue, Pershore, Worcestershire. Tel (0386) 553984

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## MAIN DISTRIBUTORS OF PARAGLIDERS

The design of paragliders has gone a long way on the continent in the last 5 years, following the path of hang gliding. Unfortunately in this country, paragliding has suffered from a significant parasending heritage. This is why most British made canopies were not very competitive. The sport of parasending requiring solely to land with accuracy, as opposed to soaring and thermalling, was mainly responsible for this. Sky Systems decided then to import some suitable canopies from the following leading manufacturers: ITV and CUSTOM-SAL from France, AIRMAN from Korea and FALHAWK from Japan. We also supply harnesses from ITV and AIRMAN as well as manufacturing our own range.

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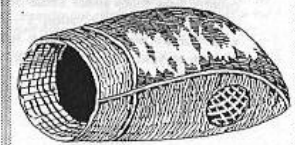
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You can see a wide range of equipment for both hang gliding and paragliding at the Brighton based Sky Systems showroom. Books, clothing, instruments, helmets, harnesses, canopies, stickers, sunglasses etc... The shop is open all week from 9 to 6 and Saturdays from 10 to 4 and is within 10 minutes from Devil's Dyke, one of Britain's best hang gliding and paragliding site.

## FOR MORE INFORMATIONS PLEASE CALL NOW:

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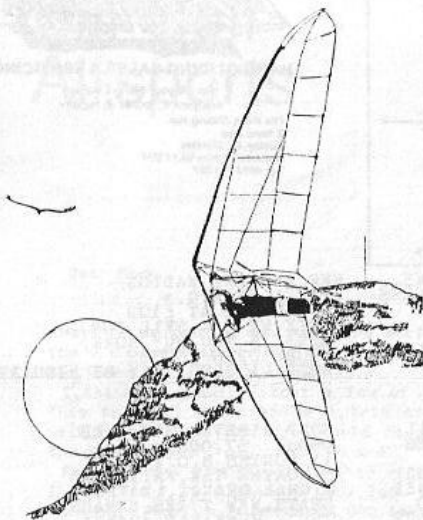
## NEW PRODUCT!



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# Remote Thermal Detection

by Deane G. Williams



As the art of hang glider design becomes more and more refined a point will be reached when further performance gains will not be possible without redefining the operating mode of the craft. Increased weight and/or complexity much above present limits will greatly reduce portability, foot-launch capability and probably will increase cost. Although sleek new gliders will continue to be of great interest to pilots and designers alike there is an area of this sport which holds the possibility of greatly increasing our flying performance. This area is that of remote thermal detection. I suspect that there are more hang glider pilots trained in the areas of electronics and optics than those trained in aerodynamics. This might speed the development of such devices.

Let's look at the possible advantages of thermal detection. Imagine being able to be sure of launching into a good thermal. Think how cross country flying could be extended. In some areas of the country your hang glider could almost become reliable transportation! Fly in to your friend's picnic, your high school reunion or your backyard all without a

motor. It would be like magic.

Some people might argue that this would take the challenge out of flying but there would be plenty of challenge left. Would you like to go flying without your vario?

By now you are probably wondering if this is all possible or just more science fiction. The facts are that several devices exist that do remotely detect convection cells (thermals) although most are currently too big for use even by a sailplane.

Let us examine the known technologies involved. For our purposes a thermal may be defined as a bubble or column of air rising upwards from the ground. Its buoyancy is caused by the relative warmth and/or humidity compared with the surrounding air. Remote thermal detection may be divided into two classes: active and passive. Active detection makes use of some power source in the detection apparatus to bounce energy off the thermal. Passive detection makes use of some naturally occurring characteristic of the thermal to detect it.

One of the first people to examine the problems of finding thermals was the famous Dr. Paul McCready. In (ref. 1)

he notes some of the characteristics of thermals which might be useful in detecting them. In his sequel to that article (ref. 2) he re-examines the problem ten years later (in 1971) and concludes that of all passive and active schemes only one, space charge detection, is "really practical" although no one had tried it at that time. Space charge detection is about the only passive method on which any work has been done to my knowledge. It works like this:

In a mixed free atmosphere above the earth's surface an equal number of particles are electrically charged positively and negatively. But close to the ground there is an excess of positive charges due to natural radioactivity in the soil and other causes. When air near the ground is drawn up in a thermal it brings these positive charges with it. When this positive parcel of air is more than several hundred feet above the surface it becomes detectable from its neutral surroundings by means of sensitive, horizontally looking electrostatic field detectors. See figure 1.

In 1972 Dr. Ralph Markson published a detailed study of this method including results of experiments he had performed

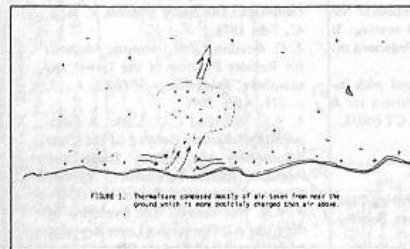


FIGURE 1: Thermals composed mostly of air taken from near the ground which is more positively charged than air above.

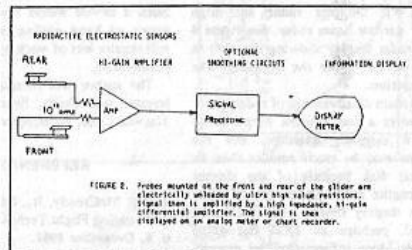


FIGURE 2: Probes mounted on the front and rear of the glider are electrically unshielded by ultra high value resistors. Signal from it amplified by a high impedance, 11-pole differential amplifier. The signal is then displayed on an analog meter or chart recorder.

using an instrumented sailplane (ref. 3). His results were encouraging. During several flights he made in the area around Mount Greylock, Massachusetts he seemed to be able to predict the location of a thermal up to about 6,000 feet away. The primary problems with the system include the fact that the natural vertical electric field of the atmosphere is much stronger than the horizontal fields generated by thermals so the craft must be kept level when measurements are made. Also plastic materials such as Dacron tend to build up a static charge in the air which might overload the highly sensitive detectors. The advantages of this system are that it makes use of available electronic components, is small and is lightweight. See the block diagram in figure 2 for an overview of the basic system.

In the summer of 1982 Jim Westbrook, a pilot with a keen interest in this subject and an excellent knowledge of electronics, worked with me on creating a space charge detection system for a hang glider. Initial ground experiments showed promising fluctuations of the meter when gusts occurred. On August 6th, 1982 I flew a cross country flight from Brace Mountain with radioactive electrostatic detectors attached to the front and rear of my keel. The sensors were connected to high gain amplifiers and then to a differential meter on the control bar. The results were inconclusive. It was difficult to make much sense of the rapid meter fluctuations that occurred although a characteristic pattern seemed to take place before entering a thermal. Perhaps the raw data needs to be processed before being displayed. I did not fly with the system again due to time constraints. Jim has continued to work on the system

intermittently. More information about this promising method can be found in references 3, 4 and 5.

## ACTIVE TECHNIQUES

A meteorological instrument called an acoustic sounder is capable of locating thermals at distances of up to 6,000 feet or more. However, such units are far too large to fly with at present. The acoustic sounder usually consists of a large (6 foot) diameter parabolic reflector having both a speaker and a microphone mounted at its focus. A powerful amplifier sends short pulses of audio frequency tone to the speaker and then the microphone picks up the weak echoes as the sound reflects off thermals, inversions, wind shears and other atmos-

pheric layers. For ground use it is pointed straight up so that reflections are not received from nearby hard objects. Perhaps different sorts of directional microphones could be constructed for in-flight use. A good information display system could be worked out to show type and direction of echoes. Wind noise on the microphone would be a large problem in our application and would have to be filtered out somehow. More information on acoustic echo sounding for thermals may be obtained in references 6, 7 and 8.

Everyone now knows that radar is used for finding precipitation areas by weathermen but they don't know that there are many other kinds of meteorological radar used for other purposes. Certain types are capable of sensing

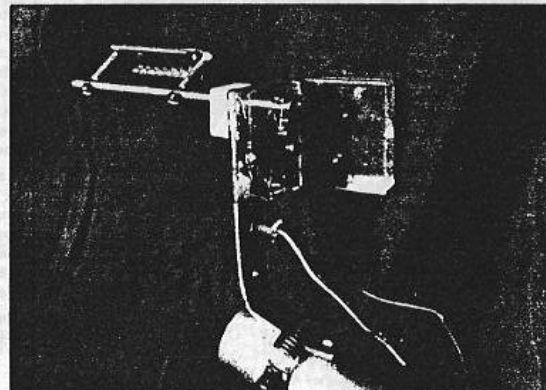


FIGURE 3: A photo showing the radioactive electrostatic sensor probes as mounted on the glider. The high value resistor and a Field Effect Transistor pre-amp circuit are mounted in the clear plastic box. The assembly is clamped to the keel tube.



