

Radio Controlled Soaring Digest

December 2015

Vol. 32, No. 12



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Front cover: Flying in the Mala Fatra mountains, Slovakia (GPS: 49.190188, 19.019120). Frantisek Ruisl pilots an F3F Rotmilan Midi under outstanding conditions to close out the 2015 flying season. A 15-20 m/s south wind was blowing during the whole day with a relatively comfortable 11C at a bit more than 1550m elevation.

Photo by Pavol Rebros

iPhone 6 Plus, ISO 32, 1/9900 sec., f2.2, 4.2mm (29mm)

4 Laser Cut Ribs

Charlie Bair outlines the benefits of Laser cut ribs and provides a list of resources for those contemplating building Chuck Anderson's LilAn RES design.

7 Futaba T18SZ

a transmitter for gliders with 4 wing servos

Use this check-list for programming your Futaba T18SZ to control F3X machines. Provided by Marcus Hedlund, Team Sweden - F3J.

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This 4-passenger fuel cell aircraft from Deutsches Zentrum für Luft- und Raumfahrt seems like a good candidate for e-power scale buffs.

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Rene Wallage has ritualized his pre-flight checks. This of course has benefits, and Rene relates a personal experience to prove the point.

Tom's Tips

A very simple spray paint rack 20

Tom finally, after three decades, got around to building a rack for all of his spray cans. It's easily modifiable for individual needs, and no plans are necessary.

Slope Soaring News, October 1988, V1N2 23

The second issue of Charlie Morey's classic magazine.

Back cover: A Freestyler 3 awaits the first launch of the day at Capel, South Australia. Photo taken at 6:00AM by Ed Meester. Samsung SM-N9005, ISO 50, 1/3000 sec., f2.2, 4.1mm (31mm)

R/C Soaring Digest

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In the Air

Putting together the last issue of the year always brings about a desire to review the previous eleven editions. This retrospection is of great value as it allows us to see the continuing evolution of *RCSD* over a specific period of time. We of course automatically see the magazine from the perspectives of editors and publishers. We also try to see the magazine from the perspective of the reader - subjects of interest and readability. The latter is difficult to evaluate because of the wide range of PDF-capable appliances now in use; desktop, laptop, tablet, 'phone... so any feedback on that score is welcome.

Two things were brought to the forefront by our review this year. First was the increasing international flavor of *RCSD*. We received materials directly from readers in (alphabetical order) Australia, Brazil, Britain, France, Iceland, Italy, New Zealand, Nova Scotia, Portugal, Slovenia, South Africa, Sweden, Wales, and the United States. The second highlighted item was the wide range of topics which have appeared over the last year. These included event coverage and individual experiences, aircraft design and construction projects, tools and construction techniques, RC soaring philosophies and flying techniques, a full size sailplane walk-around, kit and equipment reviews, presentations of a number of new electrical and aerodynamic technologies, photographs, and a travelogue. Our sincere thanks go to everyone involved!

RCSD is a relatively straight forward presentation medium and stands in direct contrast to the labyrinths of the majority of on-line forums. (Al Clark's 1:3 scale Cherokee RM construction series is a case in point.) As has been the norm for *RCSD* since its inception, we are always on the lookout for materials for future issues. We appreciate all submissions: full-blown individual articles with text, photos and/or illustrations; a series of articles which outline and describe in detail some project, concept, or other appropriate topic; single photographs which can be used for front and back covers or within the magazine itself. We also appreciate "leads," information which can lead us to obtaining substantive material for publication. These can be referrals to a specific person, URL, or news item. Additionally, we are always eager to hear readers' ideas for topics of interest.

We are definitely looking forward to the possibilities for 2016!

Time to build another sailplane!

LASER CUT RIBS

Charlie Bair



Chuck Anderson, <chucka12@outlook.com>, and I have been building and flying Chuck's LilAn design for several years now.

Chuck did a great job of coming up with an RES soaring model that handles and performs well.

He's always telling me that the first goal was to have good handling qualities. This is important to both of us since we're

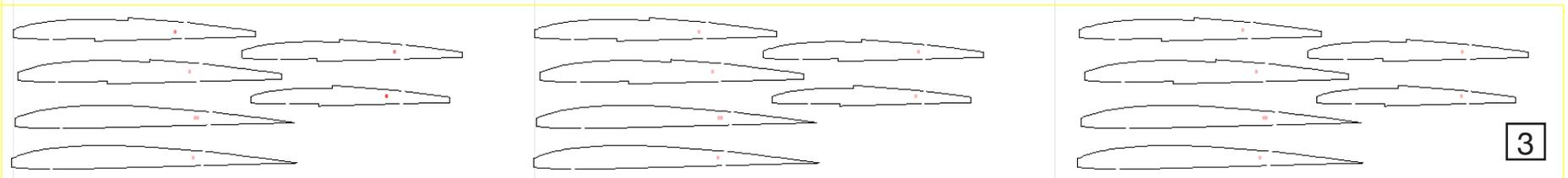
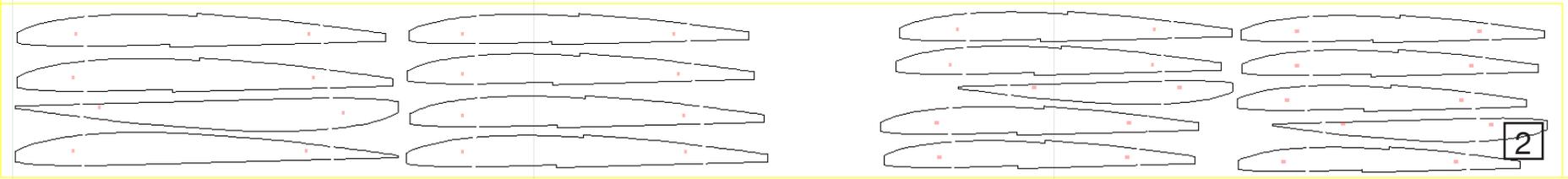
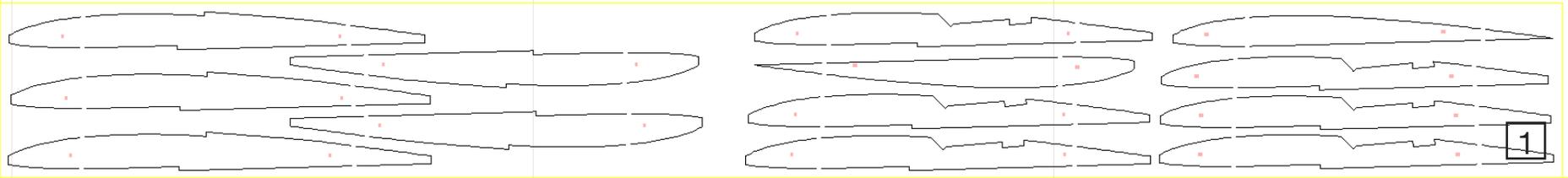
"Senior flyers." We need a model that will cruise and soar with lots of stability and good agility to stay with tight thermals and to get close to landing spots.

Ribs for the first four LilAns were stack cut (October 2015 *RC Soaring Digest*).

Since I spent a number of years teaching computer aided design (CAD), I saw an opportunity to save time and improve accuracy of airfoil shapes.

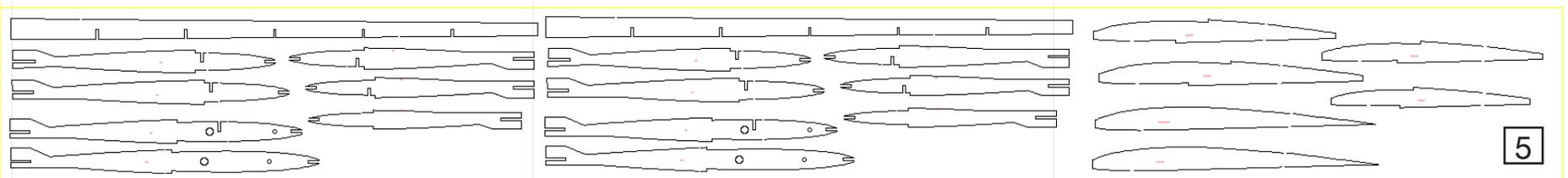
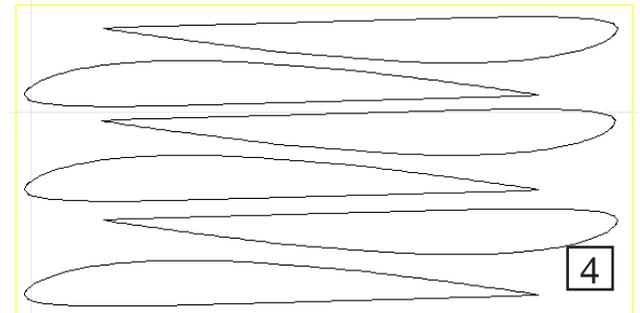
Modern CAD programs coupled with laser cutters can produce balsa and plywood parts with far more accuracy than any modeler can produce by hand cutting and sanding.

The CAD system allowed me to create shapes in three dimensional space and check alignment and straightness to a degree of accuracy better than we can work to with balsa wood and hand tools.



Lo-res screen grabs of the laser cut files:

1. LILAN PANEL 1 RIBS.dxf
2. LILAN PANEL 2 RIBS.dxf
3. LILAN TIP PANEL RIBS.dxf
4. LilAn Root rib.dxf
5. D tube stab cut file.dxf



Airfoil shapes were plotted from data Chuck generates from an airfoil program he wrote years ago (September 2014 *RC Soaring Digest*). Initially the airfoil shapes were plotted, and cut by hand and sanded to final shape.

The CAD files can be used by laser cutters to cut parts to a high degree of accuracy at a reasonable cost. This is well worth the time savings and it produces a smooth cut that is ready for assembly.

An interesting problem is that the balsa we typically buy for model construction is not finished to very accurate thickness — 1/16 inch balsa may vary by several 100ths of an inch. This means that notches in ribs for example will not be an exact fit for sheeting that varies in thickness. Usually balsa sheet thickness is oversized by small amounts. Finish sanding solves this problem.

LilAn 4, held by Chuck on the right in the photo, was the last one built with stack cut ribs while LilAn 6, on the left of the photo, was Charlie's first LilAn built with laser cut ribs. They have well over a thousand flights between them and we have been unable to detect any differences in performance.

These CAD cut files are available from the *RC Soaring Digest* web site:

1. LILAN PANEL 1 RIBS.dxf
<http://www.rcsoaringdigest.com/Supplements/Anderson_LilAn/01_LILAN_PANEL_1_RIBS.dxf>
2. LILAN PANEL 2 RIBS.dxf
<http://www.rcsoaringdigest.com/Supplements/Anderson_LilAn/02_LILAN_PANEL_2_RIBS.dxf>
3. LILAN TIP PANEL RIBS.dxf
<http://www.rcsoaringdigest.com/Supplements/Anderson_LilAn/03_LILAN_TIP_PANEL_RIBS.dxf>
4. LilAn Root Rib.dxf
<http://www.rcsoaringdigest.com/Supplements/Anderson_LilAn/04_LilAn_Root_Rib.dxf>
5. D tube stab cut file.dxf (Makes one stab set plus one wing tip.)
<http://www.rcsoaringdigest.com/Supplements/Anderson_LilAn/05_D-tube_stab_cut_file.dxf>

For convenience, a single ZIPped file containing all of the above DXF files can be downloaded from the *RC Soaring Digest* web site by using this URL:

<http://www.rcsoaringdigest.com/Supplements/Anderson_LilAn/LilAn_DXF.zip>

Two sets of Panels 1 and 2 ribs are cut from 3/32 inch balsa. These are required to complete one model.

One set of Tip Panel ribs cut from 1/16 inch balsa is required.

One set of root ribs cut from 1/16 inch plywood is required.

D-tube stab parts are cut from 1/16 inch balsa and are an alternate stab using a D-tube leading edge.

These files can be cut with a laser cutter. I use Bob Holman Plans. His web site is <<http://www.bhplans.com>> and his e-mail address is bhplans@aol.com.

If you decide to order these files from Bob, he will already have a current copy. He has always done a nice job for us at a reasonable cost and he supplies good quality balsa.



Futaba® T18SZ

a transmitter for gliders with 4 wing servos

Magnus Hedlund, magnus@maghed.se

The new Futaba 18SZ has arrived and with eight flight conditions it's a radio suitable for F3X gliders.

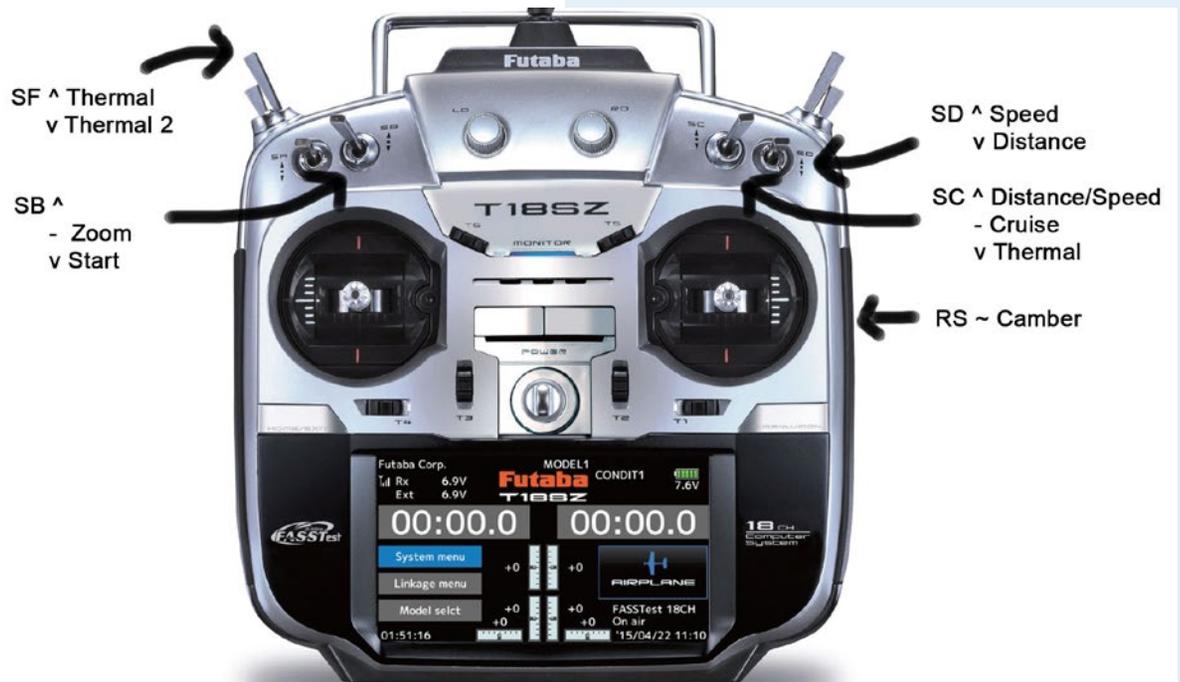
Programming the radio and how to set up a model glider doesn't differ for this radio compared to the earlier Futaba transmitters at the higher price range.

It's rather straight forward and this text describes one way to set up a glider with four wing servos.

With Futaba there are almost always several ways of doing things. The T18SZ handles both Futaba transfer systems including the latest T-FHSS, although I recommend the FASSTest telemetry system for a glider.

What makes the 18SZ shine compared to other Futaba transmitters are:

- It handles all Futaba systems including T-FHSS. The 18MZ doesn't support that for the moment.
- Eight flight conditions.
- A colour display with good contrast in daylight.



- Same sticks as the 18MZ.
- A 2S LiFe battery with a balancing connector made for external charging.
- The 930 gram transmitter balance very nice and flat with the neck-strap, and has a 180 degree adjustable antenna.

The 18SZ has three basic menus, System-, Linkage- and Model-menu.

The system menu defines all the basic characteristics for transmitter. It's ideal to do the adjustments the first time the transmitter is used.

The linkage menu defines all the values for the new glider model. When proper done there is no reason to go back. The adjustments being made in this menu (except T1-T6) affect all flight conditions at the same time. It's important to select the right model type (glider, wing, tail) because changing this at a

later time resets all the adjustments done to default, i.e. it's like starting all over again.

The model (glider) menu is where the pre-defined mixes are used. The mixes can be individually activated for all the flight conditions at the same time (Group = group) or only the selected condition (Group = single). There is also the possibility to define new mixes.

A good thing is to look at the servo monitor in the display to see what happens with the individual servo when setting-up the mixes.

In this text there will be eight flight conditions defined. They can be reduced depending on usage.

CRUISE	Normal cruising.	(Neutral camber position)
THERMAL	Right side slider, RS, adjusts the value	(Variable camber position down)
THERMAL2	Fixed position	(Camber position down)
DISTANCE	Fixed position	(Camber position up)
SPEED	Max speed	(Camber position more up)
LANDING	Used for landing phase	(Butterfly brake)
ZOOM	Used for tow- or winch-start during the zoom phase and the following climbing up to maximum height.	
START	Start camber	(Camber position more down) or for a glider with motor, allows the motor to run.)

Start with defining a new model, for example Glider-X, as a template for a glider with x-tail.

MODEL NAME = Glider-X

LINKAGE – FUNCTION	(channel, stick, trim)					
1: ELEVATOR	J2 T2	Elevator (or V-tail)	9: AUX2	-	-	
2: RUDDER	J4 T4	Rudder (or V-tail)	10: AUX3	-	-	
3: AILERON	J1 T1	Left aileron	11: AUX4	-	-	
4: AILERON2	- -	Right aileron	12: AUX5	-	-	
5: FLAP	- -	Left flap	13: AUX6	-	-	
6: FLAP2	- -	Right flap	14: AUX7	-	-	
7: MOTOR	LS -	(Motor control)	15: BUTTERFLY	J3	-	Brake
8: AUX1	- -		16: CAMBER	RS	-	Camber

LINKAGE – SUB TRIM All 0%	(Servo neutral position)
LINKAGE – SERVO REVERSE All NORM	(Servo reverse) (MOTOR = REV)
LINKAGE – END POINT ELE, RUD, AIL, AIL2: FLAP, FLP2:	(Max servo position) 135%, 100%, 100%, 135% 155%, 140%, 140%, 155% (for max brake)
GLIDER – COND. SELECT CONDIT1, ADD CONDIT2, ADD CONDIT3, ADD CONDIT4, ADD CONDIT5, ADD CONDIT6, ADD CONDIT7, ADD CONDIT8, START ZOOM LANDING SPEED DISTANCE THERMAL2 THERMAL	(Flight condition) Rename to CRUISE (Lowest priority) Rename to THERMAL Rename to THERMAL2 Rename to DISTANCE Rename to SPEED Rename to LANDING Rename to ZOOM Rename to START (Highest priority) Switch = "SB", ON down position Switch = "SB", ON middle position Switch = "J3", Linear, ON = -90% Switch = Logic: "SC" ON = up position AND "SD" ON = up position Switch = "SC" ON = up position Switch = Logic: "SC", ON = down position AND "SF" ON = down position Switch = "SC", ON = down position
LINKAGE – T1 T6 SETTING T2 = SEP Other = COMB	(Trim) (Separate elevator trim for every flight condition. "SEP" needs to be set in all flight conditions) (Other trim levels common for all flight conditions)
GLIDER – AIL DIFF	(Aileron differential, Less angle down) GROUP = group (Single, if different mix wanted in conditions)
	LEFT RIGHT
AIL	100% 99%
AIL2	99% 100%

GLIDER – FLAP SETTING	(Flap neutral position with break stick J3 up, i.e. no break)					
	GROUP = group					
	FLAP	FLAP2				
UP	100%	100%	(Don't move)			
DOWN	100%	100%	(Don't move)			
OFFSET	-40%	-40%	(Neutral position)			
GLIDER – AIL -> CAMB FLAP	(Aileron to flap)					
Menu 2:	GROUP = group	(Single, if no mix wanted in some conditions)				
	STATUS = ON or INH	(on or off)				
		LEFT	RIGHT			
	FLAP	30%	30%			
	FLAP2	30%	30%			
GLIDER – AIL -> RUD	(Aileron to rudder)					
Menu 2:	GROUP = group					
	STATUS = ON or INH	(On or off)				
Menu 1:	RATE A = 40%	(One side)				
	RATE B = 40%	(Other side)				
GLIDER – BUTTERFLY	(Brake)					
Menu 1:	GROUP = single	(If condition LANDING is defined				
	STATUS = ON	...then only in condition LANDING				
	STATUS = INH	...then in other conditions)				
	OFFSET = 8%	(Defines when braking stick J3 activate butterfly mix)				
Menu 2:	AIL= 0%	AIL2 = 0%	(Aileron brake up)			
	FLAP = +140%	FLAP2= +140%	(Flap brake down, with stick J3 at max break)			
	ELEVATOR SETTING:	(down compensation)				
	CURVE = Point	(These values need to be adjusted after first flights)				
POINTRATE						
	1	-152%	5	-110%	9	0%
	2	-140%	6	-90%	10	0%
	3	-135%	7	-65%	11	0%
	4	-125%	8	-35%		

Menu 2: RATE 1 = 0%
 RATE 2= 20% (Proper maximum down compensation)

GLIDER – TRIM MIX 1 (Fixed camber position for every flight condition)

GROUP = single

STATUS = INH (Off in CRUISE and LANDING)

STATUS = ON (On in the other flight conditions)

 AIL AIL2
OFFSET 0% 0% (Set aileron position for every used condition)

 FLAP FLAP2
OFFSET 0% 0% (Set flap position for every used condition)



Type of wing, four servos

SETTING-UP A NEW GLIDER MODEL

Copy "Glider-X" to a new memory position, select the model and change the name.

1. Adjust elevator, rudder and ailerons to neutral position, LINKAGE – SUB TRIM

Sticks and trims at zero position

2. Adjust flaps to neutral position, GLIDER – FLAP SETTING

Offset-value (Stick J3 at no brake, forward position)

3. Adjust maximum elevator up- and down travel, LINKAGE – END POINT
Travel value ...%
4. Adjust maximum rudder left- and right travel, LINKAGE - END POINT
Travel value ...%
5. Adjust maximum aileron up- and down travel, LINKAGE - END POINT (Set the same travel up and down)
Travel ...% (The differential between up and down is set in the AIL DIFF mix)
6. Adjust aileron down, GLIDER – AIL DIFF

	LEFT	RIGHT
AIL	100%	...% (Left aileron)
AIL2	...%	100% (Right aileron)
7. Adjust flap up and down, GLIDER – AIL -> CAMB FLAP

	LEFT	RIGHT
FLAP	...%	...% (Left flap)
FLAP2	...%	...% (Right flap)
8. Adjust butterfly with breaking stick J3 at max break, GLIDER – BUTTERFLY

AIL= ...%	AIL2 = ...%	(Aileron up)
FLAP = ...%	FLAP2= ...%	(Flap down)
9. Adjust elevator compensation with breaking stick J3 at maximum brake, GLIDER – BUTTERFLY ELE SETTING

RATE 1 = 0%	
RATE 2= ...%	(Set proper max down compensation)
10. Adjust aileron to rudder mix, GLIDER - AIL -> RUD

RATE A = ...%	(One side)
RATE B = ...%	(Other side)
11. Adjust actual camber position for the following flight conditions
THERMAL, THERMAL2, DISTANCE, SPEED, ZOOM and START, GLIDER – TRIM MIX 1

	AIL	AIL2	
OFFSET	...%	...%	(Aileron position)
	FLAP	FLAP2	
OFFSET	...%	...%	(Flap position)

12. Adjust variable camber position for flight condition THERMAL:

1. Right slider RS sets position. Check that RS is activated:
Linkage - Function: CH 16 "CAMBER RS"
2. To activate the function:
Glider - Camber mix
GROUP = single, STATUS = ON for Flight condition THERMAL.
3. Glider - Camber mix, Travel
Ail = Ail2 = +100
Flap = Flap2 = +100
4. With RS at forward position there is no camber change.
Glider - Camber mix, Aileron (and Flap)
Rate A and Rate B = wanted max camber travel (example +5%)
Offset = - Rate B (example -5%)

OTHER FUNCTIONS

Timer 2:

Switch SG – up position = zero
SG – middle position = stop
SG – down position = start

LINKAGE – TIMER (Timer2)

00:00.0

MODE = Up

Reset switch, SG = On, Off, Off

Start switch, SG = Off, Off, On

Stop switch, SG = Off, On, Off

Beyond sub-trim:

To be able to set the servo neutral position outside the allowed sub trim window.

Use a ProgMix

(Example, to set the elevator neutral position)

GLIDER – PROGRAM MIXES

Mode = Offset

Offset mix menu 5:

INH = ON

Mixing menu 1:

Slave = Elevator

Offset ON = "To set elevator servo position"

Trim T5 as a global elevator trim:

Trim T2 is used for elevator trim, i.e. it changes the trim separate for all flight conditions.

Trim T5 is used at the same time, but it changes the elevator trim in all (wanted) flight conditions simultaneously.

This trim T5 is useful, in CRUISE flight condition, to set the flight level quickly for a neutral flight, depending on wind or geographical position.

LINKAGE – FUNCTION

Channel 14, Auxiliary7, Control = "- -", Trim = "T5"

GLIDER – PROGRAM MIXES

Mode = Mixing

Mixing menu 2:

INH = ON, Trim= ON

Master = Auxiliary7

Slave = Elevator

Mixing menu 1:

Rate A = +100

Rate B = +100

Compared to 14SG, both 18SZ and 18MZ lacks the Trim memory function. It's very useful for setting the trim levels to zero without changing the trim positions. The firmware revision for the 18SZ is 1.3, and maybe a future update will have this.

The cons for the moment (with ver. 1.3) according to my experience, and what I'm missing, are:

- Mixing of group/single in flight conditions.
- Trim Memory function.
- Dial monitor menu (to be able to set trim steps in "%")
- To be able to sort the model list.
- Batch copying selected models at once to SD card (Backup).



As a summary the 18SZ lives up to my expectations for a new radio and the look-and-feel regarding programming is the same as it always has been with a Futaba transmitter: it's very powerful. The way I have described setting-up a glider has been working for the Swedish F3J-team since 2010, and now we are looking forward to the WC 2016 in Slovenia.

Magnus Hedlund
Team Sweden – F3J





HY4 four-passenger fuel cell aircraft

http://www.dlr.de/dlr/en/desktopdefault.aspx/tabid-10081/151_read-15429/year-all/



With the project for the HY4 four-seater aircraft, the German Aerospace Center (Deutsches Zentrum für Luft- und Raumfahrt; DLR) is taking another major step towards making zero-emission flying a reality – the HY4 will be the world’s first

four-passenger aircraft powered solely by a hydrogen fuel cell battery system.

“With the HY4, we want to bring electromobility to the air, demonstrating the feasibility of this technology and identifying specific fields of application

in passenger transport,” explained DLR Coordinator of Electrical Aviation Josef Kallo, during the official presentation of the project at the International Trade Fair World of Energy Solutions on 12 October 2015 in Stuttgart.

High-tech power train with a hybrid system

For clean, quiet, energy-efficient and safe flights, the researchers at the Stuttgart-based DLR Institute of Engineering Thermodynamics rely on a special hybrid system: the main power source is a low-temperature Proton Exchange Membrane (PEM) fuel cell. This converts the hydrogen and oxygen in the tank into water and electrical energy. During cruise flight, the fuel cell continuously supplies the electric motor with durable and reliable power. A high-performance lithium battery covers peak power loads during take-off and when climbing altitude.

The HY4's electric motor has an output of 80 kW and allows for a maximum speed of approximately 200 kilometres per hour and a cruising speed of 145 kilometres per hour. Depending on velocity, altitude and load, a range of between 750 and 1500 kilometres is possible. The most striking feature of the HY4 is the two fuselages, which are firmly connected to each other by the wing. This twin fuselage design allows an optimal distribution of the drive components and a higher total loading capacity. Each one can seat two occupants. The maximum weight of the HY4 is 1500 kilograms.



Flying emission-free, faster, higher and further

“The major scientific challenge of the project is to maximise the performance, efficiency and reliability of the drive system step by step and test it for use as a passenger transportation vehicle,” summarises Kallo. Firstly, DLR researchers will design the drive train and install it in the aircraft. The first flight of the HY4 is planned for the summer of 2016 at Stuttgart Airport. The development of the drive system is based on DLR's extensive aviation and energy research activities in the areas

of batteries, fuel cells and hydrogen technology.

Electric Air Taxis – regional transport as an entry scenario

In particular, the DLR researchers see application possibilities in European regional traffic. “Our goal is to use aircraft such as the HY4 as an Electric Air Taxi to connect destinations more flexibly and offer faster alternatives to existing routes and means of transport,” said Kallo, explaining a possible scenario. Electric drives are well suited



for shorter distances due to their low noise and emission levels, as well as their capability to take off and land on short runways thanks to their high torque. With more than 60 regional and international airports, Germany has a well-developed, extensively distributed network and already possesses the appropriate infrastructure for the implementation of this approach. André Thess, Director of the DLR Institute of Engineering Thermodynamics stressed: “The HY4 four-seat electric aircraft perfectly matches our strategy to develop synergies between electromobility on the road and in the air.”

The HY4 project partners

Under the auspices of the DLR Institute of Engineering Thermodynamics, which is responsible for the overall integration of the power train, the following partners have joined forces to achieve the world's first fuel cell passenger aircraft: the fuel cell manufacturer Hydrogenics, the aircraft manufacturer Pipistrel, the University of Ulm as a scientific partner, as well as Stuttgart Airport as the home airport for the HY4. The DLR spin-off H2FLY will operate the HY4 and will be responsible for the certification process.

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pre-flight

ritual

Rene Wallage
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I averted a tragedy last Friday...

Most club members who know me will agree that I am fairly pedantic (to put it mildly) when it comes to pre-flight checks. It was drilled into me by my late father, who was a pilot instructor in the airforce and taught me to fly at a very early age.

“The flight starts the moment you walk towards your plane. Count the wings. The wind may have blown one off. Count the engines. A mechanic may have removed one. Count the prop blades etc, etc...It doesn't matter if it is your first flight of the day, or the second or third. You **MUST** do your pre-flight before every flight.” So some of that stayed with me when I started RC flying.

Last Friday I was getting my e-Bird of Time ready for the second flight.

Pre-flight, no launch, no landing.



The first flight was uneventful, but there wasn't much thermal activity at that time of the morning (08:00). So the second flight, about 45 minutes later, should see more thermals.

I go through my ritual, pulling on the elevator and rudder to see they are still attached, wings are still there, wing bolts haven't loosened up, switch transmitter on, check transmitter voltage, switch on receiver, check voltage (seperate receiver battery), connect motor pack, listen for the correct music from the ESC.

Wiggle sticks, all surfaces move.

Now move stick slowly left, then slowly right. Rudder should move smoothly left and right (and it did). If it doesn't, a tooth in the servo gear may be broken.

Move elevator slowly up, it did. Move elevator slowly down, it started then stopped, and then jumped further down.

Tried again, same result. I opened the rear hatch (elevator servo in the tail), and oh dear... the servo that was epoxy glued into place had come loose.

Would I have just "wiggled the sticks" like so many pilots do, surely I would have launched without control over the elevator, with disastrous results.

Thanks Dad!

No pre-flight, launch, no landing.



TOM'S TIPS

A very simple spray paint rack

Tom Broeski, T&G Innovations LLC, tom@adesigner.com

I have a hundred spray cans on various shelves here and there and I've been needing a spray paint rack for years.

I finally built one.

I had some 3/8" dowels, an 8 ft. piece of 1" x 6" and a piece of scrap paneling.

It took about 35 minutes to make, but 30+ years to get around to it.

The illustrations on the right are concept drawings which show the finished product and a blow-up depicting how the various parts go together.

The first step was to cut the 1" x 6" in half and clamp the two pieces together.



Concept drawings which show the finished product and a blow-up depicting how the various parts go together.



Photo 1



Photo 2

I measured down a couple inches and drew a line across the board at 45 degrees. See Photo 1.

Then I measured down 4 1/2" and drew a second line. I did this a total of 10 times for the boards I had. See Photos 2 and 3.

I then came in 2 1/2" from the back and 3/4" from the front of the board and marked the drill spot.

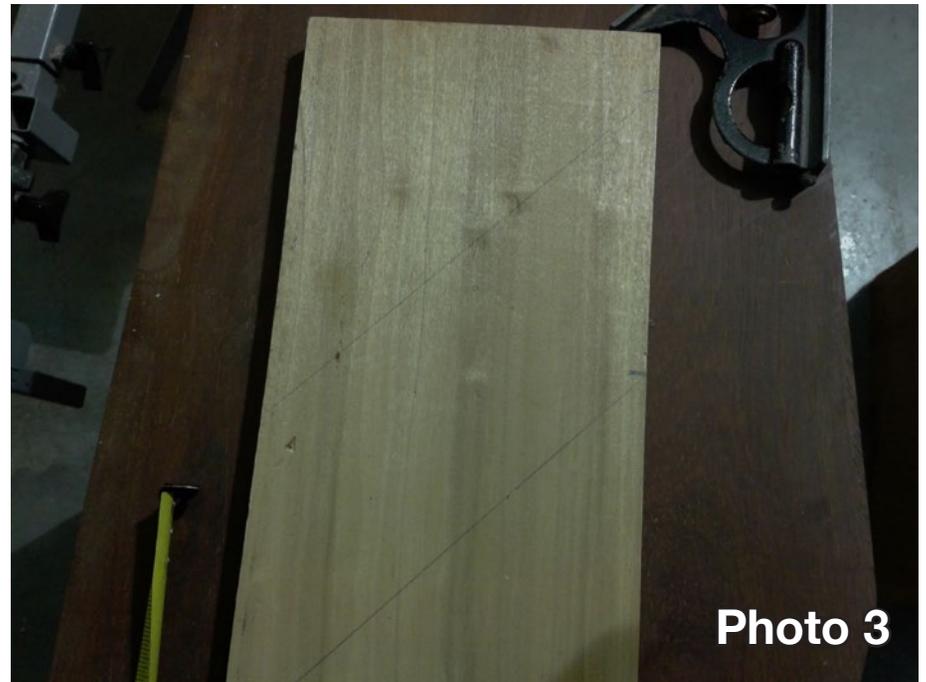


Photo 3



Photo 4



Photo 5

Drilled (20) 3/8" holes, stuck in the dowels, put both sides together, found a scrap piece of paneling and screwed it to the back. See Photo 4.

Stuck in some paint cans. See Photo 5.

You could put a couple of wheels on the back corners so you can roll it when tilted back.

Thanks to the graciousness of Charlie Morey, we've been given the opportunity to create a PDF archive of *Slope Soaring News* <<http://www.rcsoaringdigest.com/SlopeSoaringNews/>>.

For those not familiar with *Slope Soaring News*, SSN was Charlie's brainchild which enjoyed a run of twenty issues in the late 1980s. The first issue was published in September of 1988, and the last issue was dated June/July 1990. During nearly two years of publication, SSN enjoyed quite a following. Manufacturers, flying sites, aerobatic skills, personalities, and everything else related to slope soaring was covered. Particular issues of SSN are sometimes mentioned within the RCGroups web site, the RC Soaring Exchange e-mail list, and other venues, but very few people are aware of SSN's existence, and tracking down specific articles is nearly impossible.

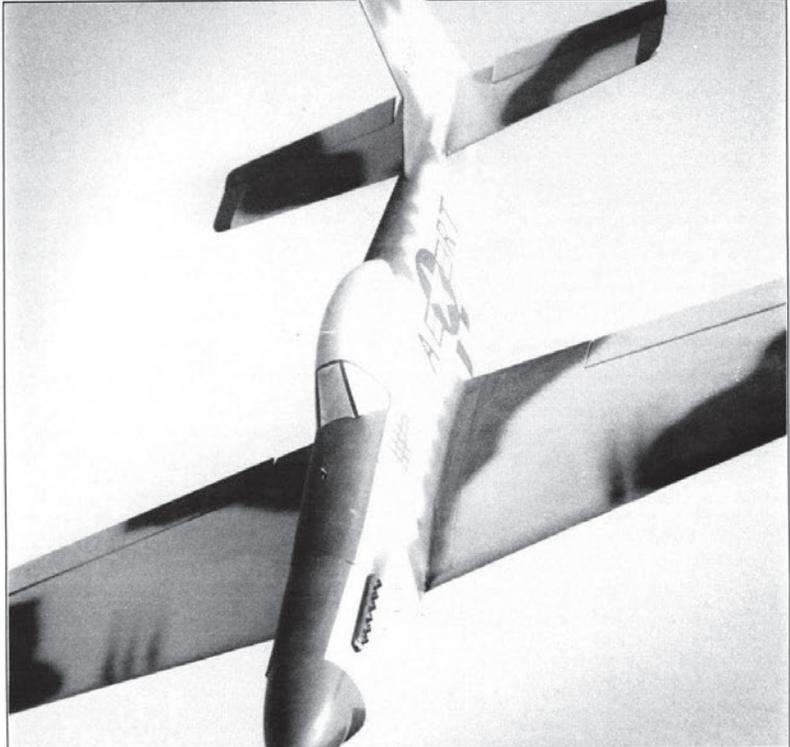
Because of this lack of availability, we contacted Charlie and have received permission to create a PDF archive of all twenty issues of *Slope Soaring News* here on the *RC Soaring Digest* web site.

The second issue of *Slope Soaring News*, October 1988, is reprinted on the following pages.

The two major articles in this issue are Kite Hill (the site of the month), and Power Scale Soaring with a number of kit suppliers mentioned. Smaller articles on elliptical dihedral, Gary Everett's Pressure, Ray-Jay's 7-channel, 10-plane memory, 16-subchannel, and 14-mixes transmitter, the ATRCS modification for Airtronics transmitters, Harry Finch's anhedral sloper, Rich Spicer's Synergy III, and a bunch of letters to the editor complete the 16 pages of this issue.

Power Scale Special!
P-51 Mustangs, F-16s, P-40 Warhawks, F4U Corsairs,
F-5s, F-4 Phantoms, Me-109s, Spitfires, F-20s and more!

Slope Soaring News
Vol. 1, No. 2 October 1988 \$1.50



PLUS: Futuristic, 16-Channel Competition Radios • Curved Foam Wing •
International Slope Race Info • Site of the Month: Kite Hill •
Composite Marvels: F3B Sailplanes at the U.S. Finals.
A Peek at the Kuntz/VealeTitan III Slope Racer •

Wingin' It

LOOSE ENDS

First things first. Thanks to all you guys (and one gal) who subscribed. We appreciate your support, and we'll do our level best to make *Slope Soaring News* your favorite publication.

Talk to us

Don't be shy about letting us know how we can do that, either. Write! Let us know what's on your mind. Let us see pictures of the gliders you've built. We might even have a design contest. Any

"We want to be involved in anything that helps the pastime of slope soaring."

ideas about how to judge one?

Let us know about your flying sites. We'd like very much to come visit them and learn more about the people who fly there and what they've built.

Sponsored by SSN

Any clubs or promoters in the crowd? We're interested in helping sponsor slope events. Races, fun fliese—your name it. We want to be involved in anything that helps the pastime of slope soaring.

Talent search

Are you a writer? A photographer? We can use news from everywhere. We'd appreciate any help you may offer. I had a great phone conversation with John Veale today. (He and Ray Kuntz are mentioned a couple of times in our "Scraps" section this month.) John offered to write a radio column. I think that's a great idea, but I wonder

exactly what sort of questions you'd like to ask him. He can tell you how to modify your radio, how to set up mixes and gains, battery care—whatever you want. Send in your questions, and I'll pass them on to John.

Advertising update

Check it out! We have an ad this month. Larry Sribnick of SR Batteries got on the phone as soon as he received his first issue, and we chatted for a half hour about slope soaring. He loves it! Larry decided to place his ad with us even though we're a brand new publication just because he wants to support slope soaring and he likes our effort. He's a neat guy to talk with, and I already know where I'm going to buy my next battery pack. By the way, if you purchase any products you see here, either in an ad or in one of our stories, please take an extra moment to tell them that you heard about it through *SSN*. It'll help us develop a good reputation with the hobby industry companies. With their advertising support, we'll be able to expand *SSN* to more pages.

Thanks, Wilshire!

Bob Ratzlaff gave us a half-page in his Wilshire Model Center catalog so we could tell his customers about *SSN*. The extra exposure will help us get more readers, and with growth comes bigger and better issues.

Dealers

Wilshire Model Center is also our first dealer. We mailed copies of the first issue to about 50 California hobby dealers, then followed up with a second mailing asking them to sell *SSN*. Only Bob at Wilshire has responded so far. If you'd like to see *SSN* on sale at your favorite dealer, please remind him to send in the order form. Thanks!

Charlie Morey

SR Batteries Hot Line

Save this new Hot Line phone number to order or ask technical questions about the finest R/C battery packs made!

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Call Monday to Friday between 9 a.m. and 2 p.m. Eastern time. We now accept Visa, Mastercard, and U.P.S. C.O.D. orders. Send a self-addressed, stamped business size envelope for full details.

SR Batteries, Inc. Box 287 Bellport, New York 11713

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Marcie Beriz

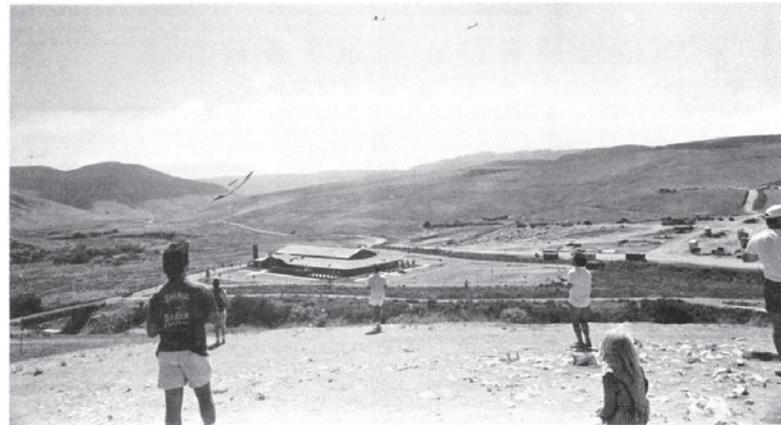
EDITORIAL CONTRIBUTIONS are welcomed. Unfortunately, we can't pay for them. Editorial material is selected based on its perceived value to the slope soaring community, and the publisher assumes no responsibility for accuracy of content.

CLUB CONTRIBUTIONS are welcomed. Please keep us notified of your club's events and/or fun flying activities. Material printed will be selected at the discretion of the editors.

ALL CONTRIBUTIONS should be addressed to SSN, c/o Charlie Morey, 2001 E. 19th St., #29, Signal Hill, CA 90804. All contributions requested for return must be accompanied by return postage. The editorial deadline is the 15th of the month preceding the cover date. All material is subject to editing and revision as necessary to meet SSN requirements. We can accept A4x11 text files over the phone or work with your IBM-compatible 3-1/2" or 5-1/4" disk. Please call first for details at 213/494-3712. Don't get depressed if you get our answering machine. Just leave your name, phone number and the purpose of your call, and we'll get back to you.

ADVERTISING INQUIRIES should be addressed to SSN, c/o Charlie Morey, 2001 E. 19th St., #29, Signal Hill, CA 90804, 213/494-3712.
SUBSCRIPTIONS are \$15.95 per year in the U.S.; \$22 U.S. currency per year in Canada/Mexico; \$26 U.S. per year in Europe/England; \$30 U.S. per year in Asia/Pacific/Middle East.

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When the thermals roll in at Kite Hill, soaring is superb!

Unlike the frantic action at Point Fermin, Kite Hill offers afternoons of relaxed flying with a combination of slope and thermal conditions. You're likely to see everything from Son of Savage slopers to huge scale Minimoas.

Site of the Month

KITE HILL

By Chuck Korolden

Last month we went to the vertical cliffs and booming lift of Point Fermin Park. This time, we go to Kite Hill, a different type of slope. Well, it's more *hill* than *slope*. And it offers a different style of flying than most other slopes where I've been.

The first thing you'll notice about the site is how well organized it is. At the bottom of the hill, just off Alicia Parkway, a gate marks the beginning of a narrow, well-paved road to the top. At the top is a paved parking lot and a real restroom—not one of those fiberglass sweat boxes that makes you wonder, once you're inside, if maybe holding it would've been a better idea. On the flying side of the hill are some picnic tables. It's the classiest site I've found to date.

The people who fly at Kite Hill are very laid back and friendly. At some places I've been to, the reception to strangers has been pretty cold, to say

the least. But not at Kite Hill. Granted, I've only been there twice, but both times, the flyers made me feel right at home.

Now, about the lift. It's not like any place I've been before. The lay of the land is interesting. Kite Hill is sloped gradually on the south side and gets steeper on the west side. The hill sits at the end of a west-running valley and is about 75-100 feet high. It's about 10 miles inland, so the on-shore breeze isn't very steady. Hence, neither is the lift, or at least it wasn't on these two occasions. What seems to be happening is a combination of thermal and slope conditions.

If you're into fast, heavy planes, it might not be worth the trip if all you want to do is fly. On the other hand, if you want to pack your planes and go explore a new site, you'll find yourself at a place where the view is nice and the natives friendly. Also, if you have an F3B ship and don't want to screw around with the winch, this could be just the ticket. A plane like that could take advantage of the varied conditions and would find the landing area a nice place to shoot spot landings.

You land on the south face of the

hill on the gently-sloping side. You start low and come up the hill. As you bleed off air speed, the ground rises to meet you. It makes for gentle landings as long as you set up right.

Remember, whenever you go to a new site, you're going to somebody else's back yard. They may not own the land, but they fly there on a regular basis, and so they stand to lose the most if someone acts in an unsafe manner. Translation: Don't act like a jerk at any flying site.

In an upcoming issue, we'll talk about site closure. Some are lost because of new building construction. Not much we can do about that. But some are in danger of being shut down because the neighbors don't feel safe. Think about it. If you don't want to get hemmed in like the power pilots, then it's up to all of us to take care of what we have and educate those who don't understand.

How to get there:

Exit I-405 at La Paz Rd. near Mission Viejo and Laguna Hills. Go southwest on La Paz. Turn right on Aliso Creek Rd., then left on Alicia Parkway. As you round the corner, look to the left. You'll pass directly under the slope. Turn left just after the slope.

P • O • W • E • R S • C • A • L • E

Paul Masura has a huge grin on his face. The plane he's flying—a friend's P-51 Mustang—is locked in a tight, three-plane formation high over the beach at Bluff Cove. An Me-109, a Spitfire and the Mustang reach the peak of their climb simultaneously, yaw through weightless wing-overs 100 feet over our heads and point their noses directly at us. The two-pound gliders accelerate silently in near-vertical descent, wing tip to wing tip, and whistle past our noses in a blur of speed.

At the apex of their next ascent, two of the planes click wing tips. An exclamation rises from the onlookers as the planes topple, temporarily out of control, until their pilots get the noses aimed down and regain enough speed to fly again.

Their rhythm broken, the three fighters take off in separate directions. The Messerschmitt clicks off a four-point roll; the Spitfire lays a strafing run on the beach; Masura brings the Mustang straight down past our toes, just skimming the grass-tops along the cliff and dives 150 feet below before pulling out, then rolls inverted into an enormous outside loop that once again brings the plane within flinching distance of where we're standing.

The pilots' skill, Bluff Cove's incredible lift and the appearance of these miniature World War II fighter planes has provided us with an experience that's ALMOST as much fun as piloting our own gliders.



4

By Charlie Morey

Power scale—what a dry name for such an exciting facet of slope flying! Power scale combines the speed and maneuverability of a high-performance slope ship with the appearance of real aircraft. And what aircraft they are!

In addition to the WWII planes mentioned, you can also pilot F-5s, F-16s, F-20s, F-4 Phantoms, and several non-military models.

My personal favorite is the Sailplanes Only P-40 Warhawk. Oh yeah, and biplanes. I've got a modified Ace All-Star power model that's now a glider. True, it's not really a scale airplane, and its performance could best be described as so-so. But I've learned enough from it to draw up plans for a semiscale WWI SE-5A. Now all I need is more building time.

Power scale is a natural extension of slope flying. Good slope lift allows heavy wing loadings that just won't stay airborne in normal thermal flying conditions. High performance is the name of the game; scale appearance is frosting on the cake.

As appealing as power scale may be for beginners and fliers with no aileron-ship experience, it's not a good choice for anyone but an accomplished slope pilot. Work your way through that aileron trainer first. Most power-scale planes are fast and quick handling, designed for experts. The heavy planes can quickly become a handful for the inexperienced flier, and the inevitable crash can injure people, plane and pride. For safety's sake and in the interest of keeping your new model (and ego) in one piece, don't try power scale until you're sure you're ready!

THE PLAYERS

We don't claim to have a complete list of all power-scale manufacturers, but there are some very interesting kits and plans listed here. If you happen to

manufacture power-scale kits, or if you know of one we missed, please tell us about it. We'll mention it in an upcoming issue.

Sailplanes Only

Marty Silberstein and Tom Moxley have produced two excellent choices, the F-5 jet and the P-40 Warhawk WWII warbird. Steve Peacock has joined Marty recently and the two have just come out with an exciting new kit, a Corsair, a bent-winged beauty that's bound to challenge the popularity of the Mustang. Next on their agenda is a Japanese warbird, the Ki-100, a fighter introduced late in WWII that outperformed the infamous Zero.

The \$60 kits are offered Bluff Cove style: two-piece fuselage, foam cores and basic instructions. Not for the beginning builder!

The two-piece fuselage presents a new challenge for many builders, and Marty offered the following tips for assembly. Joining the top and bottom fuselage halves smoothly is the tricky part.

First, tape the halves together using short pieces of tape around the outside to hold the sides in alignment. Using thin cyanoacrylate glue, fasten the two halves together. This is not a tacking

process; put a solid glue joint all the way around. If the seam is not completely sealed, resin will leak out when you complete the seam from the inside and make a long, difficult clean-up job for you.

Cut out the wing opening. Then lay one-inch-wide fiberglass cloth in convenient length pieces on each side all the way around the seam. It's easier to do the tail first, one piece on each side. Next, lay two short pieces toward the nose. Finally, after cutting the cowl hatch, complete the nose reinforcement. Marty also recommends filling the nose cone with a solid mix of resin and microballoons for strength.

You supply all wood and hardware. Full-size drawings are furnished for the tail surfaces. Estimated wood cost is \$20-\$30, although experienced builders will probably have what they need "filed" away somewhere in the shop already.

Typical Bluff Cove finishing includes a permanently attached wing and tail, filled and smoothed with resin and microballoon fillets, and realistic paint schemes with flat colors. Seems to me vacuum bagging the wings on these little speedsters would be a good way to go if you have the know-how. (By the way, I met Joe Wurts at the F3B meet and hope to feature his wing bagging

Warbirds and jets roost at Bluff Cove.

Most of the models available from Slope Scale and Sailplanes Only are visible in this photo. See anything you like?



5



Hey, mister! Wanna buy an airplane? If you're lucky enough to be a Bluff Cove local, you can pick up your Sailplanes Only F-5 or P-40 Warhawk "factory-direct" from Marty Silberstein.

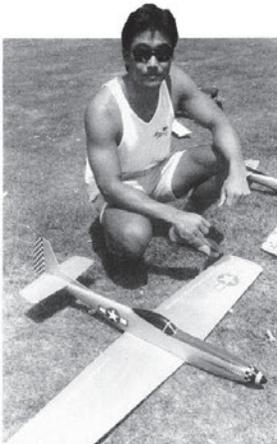
(technique in an upcoming issue of SSN.)

Locals can catch Marty at Bluff Cove. He always has a few P-40s and F-5s in his van (and hopefully a good supply of Corsairs soon). He's always happy to close a cash-and-carry deal. Otherwise, contact him by mail at 221 N. Swall Dr., #2, Beverly Hills, CA 90211, and he'll ship your kit to you. The \$60 price tag includes shipping.

Slope Scale

Paul Masura and Brian Laird produce several WWII fighter planes including a P-63, a Messerschmitt 109, a Spitfire Mk. 15 and a P-51 Mustang. Part of the Bluff Cove gang, Paul and Brian produce expert-only aircraft. As we explained earlier, that applies to both building and flying skill. The kits include a two-piece fiberglass fuselage, foam cores and plans; the rest is up to you.

Typical of Bluff Cove power-scale planes, they take standard radio gear (yep, the bargain-basement Futaba Conquest with S-28 servos and 500mah battery pack). The basic Bluff Cove



Vortech Models' P-51 Mustang. Jeff Fukushima tested his prototype Mustang at Long Beach, so we know it'll fly in only moderate lift.

plane generally weighs out at 32-34 ounces, ready to fly. Wing spans are around four feet, and they fly on a thinned Epler 374 airfoil. The E-374 is a standard for slope racers, so it's not surprising that the little power scalers are fast.

Judging from Paul's reaction to flying the Mustang, it's the best performer of the lot, although Brian flies a P-63 that's especially clean. When he brings it by at Mach speed, it doesn't even whistle; it just passes in a blur and a quiet whoosh.

The Me-109 and the P-63 are available now. The Spitfire and the Mustang will be later this year. The last time I talked with Paul, he predicted the P-51 would be ready by October, but in the meantime, both he and Brian bought new houses and moved to Riverside. Conflicting rumors indicate that (1) everything's fine and the Mustang will be produced as soon as the moving pains subside, or (2) the Mustang proved to be too difficult to produce, so they won't do it. A subrumor claims that a limited edition of the Mustang was produced before the mold was destroyed. The scoop under the wing was very detailed on their prototype and is reportedly the cause of the difficulty. Which may not be a difficulty at all since this is just a

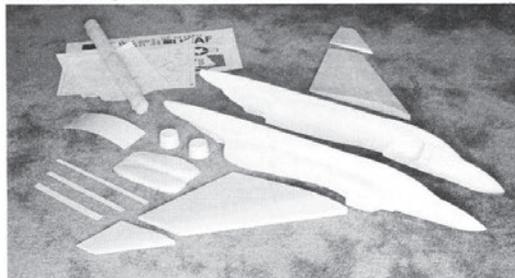
rumor. OK? So much for the rumors. If you're seriously interested in owning a Slope Scale model, contact Chuck Allen, as listed below, for the latest information.

Slope Scale kits are available exclusively through Chuck's Model Shop, 14005 Hawthorne, Hawthorne, CA 90250, 213/644-5000. Check with Chuck on availability (and bypass all the slope-side rumors!). There's probably a waiting list, especially considering the halt in production while the guys moved. The price is \$59.95 for the partial kits. Plan on an additional \$20-\$30 for other materials to complete them.

Vortech Models

You may remember Jeff Fukushima from the cover of our first issue. That was his Shadow running a knife edge down the Long Beach rail.

Jeff produces a complete P-51 Mustang kit: fiberglass fuselage, foam cores, plans and wood. The fuselage is one piece; in other words, he does the assembly of the two halves for you. This feature makes the kit as easy to build as any fiberglass-fuselage and foam-core slope plane. The airfoil is a semisymmetrical TLAR (That Looks About



Eric Clutton offers this unique F-4 Phantom kit. Good stuff! The fuselage is vacuum-formed plastic; the wings are blue foam. The builder must furnish wood and hardware.

Harry Finch and the Howard Metcalfe F-4 Phantom. Doesn't it look great? There's definitely a Phantom in SSN's future.



Right) configuration, and the wing is sheeted in 1/64" plywood. No, it doesn't come already sheeted; you have to do it. Jeff's P-51 flies at Long Beach, so the model should fly just about anywhere. We have a small slope, probably about 60 feet high, so lift varies between barely adequate and fairly good. It never reaches Point Fermin or Bluff Cove standards. The Vortech P-51 doesn't appear to match the speed of the Bluff Cove planes, but it's difficult to judge since I've never seen them side by side. Regardless, the Bluff Cove ships are designed specifically for high-lift sites, and Jeff's is designed to fly anywhere that will support a typical aileron plane.

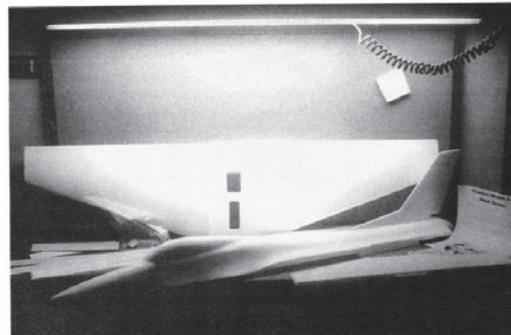
As we go to press with this issue, negotiations are underway between Vortech and Wilshire Model Center. The prospects look good. Jeff wants to be a manufacturer, not a salesman, and Bob Ratzlaff is looking for a good power-scale model to sell. Obviously, the P-51 is a very popular choice, so both should do very well if the deal goes through.

Contact Wilshire Model Center at 2836 Santa Monica Blvd., Santa Monica, CA 90404, 213/828-9362, for more information. (If their deal doesn't work out, contact me at SSN, and I'll find out what Jeff's planning to do instead. If Wilshire decides against it, perhaps we'll sell the Vortech kits through SSN.) Oh, did I say kits, as in more than one kit? Not yet, but soon. What would make a perfect running mate for the P-51 Mustang? Of course! Mr. Fukushima now has a Zero in the prototype stage.

Eric Clutton

Eric Clutton imports the British Howard Metcalfe kits, but it's one of the best-kept secrets in the slope-soaring world. Ever notice the P.A.W. Diesel ads in the magazines, the ones that also show a tiny F-4 Phantom with a propeller sticking out of its nose? That Phantom is a very nice slope-soaring kit that people apparently screw up by putting a motor in it.

I ordered the \$69.95 kit more to satisfy my own curiosity than anything else. The F-4 is one of those planes that just looks right to me, and I wanted one bad. I felt like it was a long shot, but I haven't been disappointed yet. (I say "yet" be-



Combat Models' F-16 is a slam-dunk quick build. Yeah, there's one of these on the SSN building bench, too. Clean lines and quick, easy assembly are obvious features.

cause I haven't completed and flown the kit, although it looks as if it'll work just fine.)

The fuselage is a curious part, actually two parts. It's made of vacuum-formed plastic. The initial trimming has been done, so all I had to do was touch it up with a large, flat sanding surface and Zap it together. It's sort of an involved building procedure. For example, you have to cut off the tail end of the fuselage to install the fin-stab-elevator unit then glue it back on again. But in the interest of maintaining the scale appearance, I think it's worth the effort.

Curiously enough, the blue foam wing is cut in a flat-bottomed airfoil. I'd have expected an E-374 or some other semisymmetrical foil for speed and inverted flight. But this plane is not designed strictly for slope flying. Instructions include information on launching it from a winch, and the instructions suggest finishing the wing in brown paper and white glue, a standard British technique that's certainly lighter than balsa, obechi or light ply.

I confess, I've never made a kit exactly by the instructions, and the F-4 will be no exception. I'll make it heavier, and I also intend to make a second wing with a semisymmetrical airfoil. So much for intelligent, well-planned kit design; there's always some hack out there who knows better! Sorry, Howard; sorry, Eric. I can't help it. I also intend to beef

up the fuselage to withstand my patented clumsy landing techniques.

If you're a scratch builder who feels comfortable with standard balsa and ply construction methods, Eric also offers five power-scale plans: SR-71 Blackbird, Hawk 200, Tornado F2, English Electric Lightning and Harrier GR-3. He sent me a copy of the Hawk 200 plan, and it's of excellent quality.

Eric told us that some of these planes are to be built with foam wings, but he didn't specify which. The price for the SR-71, Hawk or Tornado is \$16; the Harrier is \$14; the Lightning is \$12. Add \$1.50 for postage in each case.

Eric says that for a winter project, he may kit one or several of these plans. It would be no problem to offer them as all-wood kits, but he feels that converting them to fiberglass fuselage and foam wings is a better way to go. Interested? Stay in touch with him at 913 Cedar Lane, Tullahoma, TN 37388.

Combat Models F-16

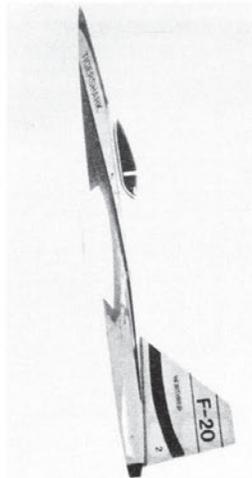
I just ran out of time on this one. I have a kit in the shop, and although I admit a personal aversion for foam models, this one looks better than most. The foam is stronger by far than the typical 7-11 styrofoam cooler foam kits, and it looks as if it should be a quick build. (So why can't I find the time?)

Again, my immediate impulse is to strengthen this model. That's partially due to my admittedly sloppy landing abilities and partially due to the fact that most slopes are chosen for their lift, not their landing surfaces. The F-16's long nose seems to be the first area to suffer. I'll probably add some strengthening, perhaps a light plywood "keel" embedded into the bottom edge to help it skid in more safely.

There are a few Combat Models F-16 flying in the Long Beach/Point Fermin area. They look nice, but they don't appear to match the performance of the fiberglass and foam core models. They require strong lift. Flying one at Long Beach is a nervous experience, and even at Point Fermin, they seem slower and not as responsive as the other fiberglass-and-foam-core power-scale planes.

The price is right, especially at the discount stores like Hobby Shack, and the quick-build characteristics appeal to me. That's why I bought one. List price is around \$70, but the discounted price is in the \$40-\$45 range.

If your dealer doesn't stock them, they're available through several mail



order outlets, or contact Combat Models, 2128 48th Court, San Bernardino, CA 92407.

As I mentioned, I ran out of time before I could get together with the people from Combat Models for this issue. I'll follow up with them, hopefully go flying with them, and put the results in an upcoming issue.

Advanced Glider Concepts

The AGC F-16 and F-20 are good-flying, high-performance slope kits that require an experienced hand at the stick as well as in the shop. Like the other Bluff Cove ships, the AGC F-16 and F-20 feature two-piece fiberglass fuselages and foam-core wings. Lynden Song, another Bluff Cove, designed his kits lighter than its Bluff Cove counterparts so that they (he claims) will fly at any slope. They do fly at Long Beach...

A buddy of mine who flies regularly at Bluff Cove has the F-16. He flies it well and thinks it's great. Other builders have reported that the kits are difficult to build, yet he felt it was no more difficult than the other two-piece fuselage-style kits.

Advance Glider Concepts' F-16

Headed for the sun! The AGC F-16 is a state-of-the-art power-scale slope ship. The two-piece fiberglass fuselage presents a building challenge, but the results are worth it.



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Complete kits are available at hobby stores, or contact Wilshire Model Center if you want to mail order one. If you'd like to try your hand at contacting the manufacturer, write to Lynden Song, Advanced Glider Concepts, P.O. Box 1019, Manhattan Beach, CA 90266. Wilshire Model Center's address is 2836 Santa Monica Blvd., Santa Monica, CA 90404, 213/828-9362.

J.M. Lupperger Plans

Scratch builders will appreciate the plans service offered by John Lupperger (say "lupper zyay"). John is also the silent flight columnist for *Model Airplane News*, and he has designed several very nice polyhedral sailplane kits, including the Gnome and the BODST (Bird of Daylight Savings Time) hand-launch glider.

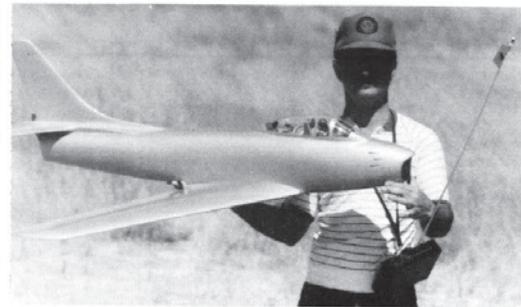
His catalogs list British plans for everything, so you'll have to weed through free flight, R/C power planes and much more to find the slope-soaring gems hidden within. Among them are the very interesting Grumman X-29A (experimental forward-swept wing jet), the A-10 "Warthog," the Chance Vought Cutlass and the British Vulcan. Another couple of plans that caught my eye were not power scale but intriguing nonetheless: a golden eagle and a bat. Right. Not air planes, but soaring models of the bird and beast.

The catalog includes good sections on sailplanes: scale, slope and thermal, and there are a lot of power planes (scale) that could be converted to slopers by talented builders.

Send \$3.00 for Argus Plans Handbook One to J.M. Lupperger Plans, 1304 Palm Avenue, Huntington Beach, CA 92648.

Jet Hangar

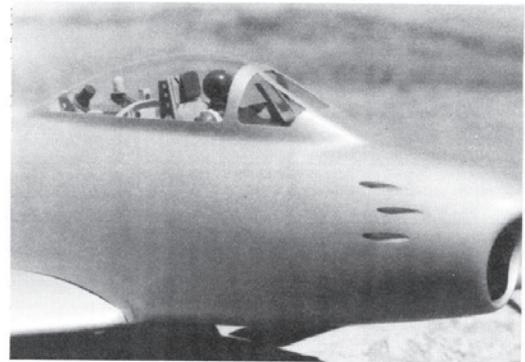
No, Jet Hangar doesn't offer slope kits. They do produce a superb line of scale ducted-fan models, though, and some of them lend themselves to slope use. Harry Finch bought the Jet Hangar F-86 Saber Jet and built it as a glider. It's beautiful, but it requires excellent lift to fly. I've looked longingly at the F-9F Cougar for the last year or so. The



Jet Hangar's F-86 is a handfull
Harry Finch accepted the challenge of converting a Jet Hangar Models' F-86 Saber Jet ducted-fan kit into a slope soarer. Beautiful, but it needs lots of lift to fly.

Check out the detail!

The Jet Hangar kit is designed for perfect scale appearance. If you want to detail it out, you can have the most accurate scale plane at the slope.



Cougar has a larger wing area than the F-86, and I could always enlarge it a little more to lighten the wing loading.

It's a demanding building project, though, and it's not a cheap date. The complete Jet Hangar kits are out of the question, but Larry Wolfe has said he'd sell a partial kit (the beautiful fiberglass fuselage, canopy, foam cores, etc.) for around \$130. If you fly in a spot with excellent lift and want a large model with perfect scale detail, Jet Hangar could

provide the answer.

Contact Jet Hangar Hobbies, 12130-G Carson St., Hawaiian Gardens, CA 90716, 213/429-1244, for more information.

That's all, folks!

Well, there you have it. Power scale slope soaring. It offers the best of everything a slope pilot might ask for—both performance and appearance. How about you? Ready to try it? 

9

Scraps

HEY, HOW DID HE DO THAT, ANYWAY?

Have you been wondering how they made those beautiful elliptical Hobie Hawk wings? With a very expensive set of molds, that's how! But when we saw Bill Bornemann test flying this curious-looking plane at Hughes Hill, it be-

came apparent that he'd found a way to produce an elliptical wing in his own workshop. Bill starts with a set of Eppler 205 airfoil templates and a couple blocks of foam. He cuts a standard foam core, then fiberglasses the bottom side. That allows him to bend the wing upward without breaking the foam on an elliptical jig he's built. The bending is the critical part, but foam will compress without breaking, so it works. Then he 'glasses the top. Simple! Well, sort of, anyway. Bill has agreed to write a more in-depth ex-

PRESSURE!

Whenever we're talking with people about their

planation of his process, complete with pictures, to be published in an upcoming issue of *SSN*. If you can't wait, he'd welcome your phone call at 213/821-7683.

replied. "Pressure. That's the perfect name for this plane."

You may think the little 36"-span Pressure looks a lot like a larger model that's readily available, but in fact, it's a whole new bird.

Gary offers the nearly completed plane, as shown here, with the fuselage rough-sanded, the wing sheeted and the tail pieces cut to shape. It's held together with tape for the photo. The wing shown here has been sheeted with 1/64" plywood, but all production models will be foam core with 1/32" balsa sheeting.

The Pressure features a TLAR airfoil. (Readers who get their 'foils from the Eppler book may not recognize the TLAR. It's an acronym for That Looks About Right. And believe it or not, it works!)

Pressure is also available in a flying-wing version. Basically, it's exactly what you see here with the tail cut off just behind the

wing's trailing edge. Mixing for the elevons is accomplished with a sliding servo setup. The price tag for either version of the Pressure kit is \$100, and you can get in touch with Gary at 213/755-6450.

That flying wing would look great in the *SSN* shop, Santa. (I sure hope Marcie proofreads this issue carefully...and recognizes a good hint when she sees one!)

KILLER RADIOS!

Competition breeds technology. At the F3B trials, we saw super-tech fiberglass and carbon fiber airplanes. At Hughes Hill, we saw Ray Kuntz and John Veale's Titan III slope racer. And in both places, we saw some incredible radios!

The big F3B and slope racers make our two-channel slope toys look stone-simple. Coordinated ailerons/rudder, flaps/elevator, flaps/ailerons, preset



Look, Ma! No polyhedral breaks.

Bill Bornemann has figured out how to reproduce an elliptical wing in his home workshop. The theory is simple, and Bill has agreed to detail the procedure in a future issue of *SSN*.

came apparent that he'd found a way to produce an elliptical wing in his own workshop.

Bill starts with a set of Eppler 205 airfoil templates and a couple blocks of foam. He cuts a standard foam core, then fiberglasses the bottom side. That allows him to bend the wing upward without breaking the foam on an elliptical jig he's built. The bending is the critical part, but foam will compress without breaking, so it works. Then he 'glasses the top.

Simple! Well, sort of, anyway. Bill has agreed to write a more in-depth ex-

original designs, we eventually ask them if they've come up with a name for the plane. About five times out of 10, they're ready for the question, but the other five times, we get a shrug, an embarrassed expression or an instant brainstorming session to think of one.

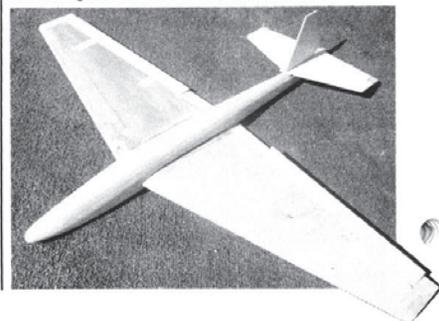
Gary Everett chose the last option. He was pacing and pondering, everyone was firing suggestions at him and the situation was getting tense. He had to come up with a name!

"Pressure!" he suddenly exclaimed. "There's a lot of pressure on me, here!"

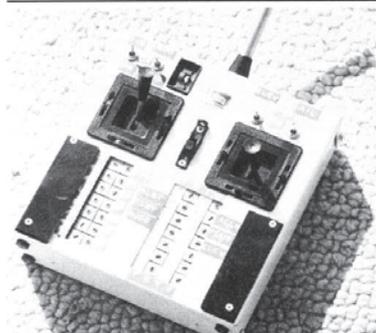
"That's it!" his buddy

Pressure!

Gary Everett's 36" model is available in both conventional and flying-wing configurations. The best part is that most of the work is already done. It comes in this rough-sanded ARF state. We want one!



...random bits and pieces from the world of slope soaring.



Ray-Jay's radio offers 16 subchannels.

John Veale modifies a seven-channel transmitter to accept 10 different plane configurations, generate 16 subchannels and mix channels in 14 combinations.

flap and aileron positions for launch and landing, and airfoil camber adjustment along with a full house of mixes, trims and gains, make the technoships ultimately adjustable.

Ray-Jay Aeronautical

Ray Kuntz and John Veale have formed Ray-Jay Aeronautical Engineering Company. They make both the Titan III slope racer and the radio that controls it. The Titan III is a personal project and not offered for sale, but the radio is, at a cost of around \$600 for the transmitter and receiver.

The Ray-Jay radio is an expanded version of the same technology that is based upon. From the original seven channels, it generates 16 subchannels, each with full throw, direction and trim adjustment.

A 10-position selector switch controls which combination of the 16 subchan-

nels are transmitted. The selection depends on your plane's configuration, and they've set up combinations for everything from "racing glider" to "flying wing" to "biplane with four ailerons." There are 14 function-control potentiometers that offer differential aileron adjustment, flap/elevator mixing, all the basics, plus more.

The "elevator input to ailerons" pots are used to lower the trailing edge of the wing with up elevator. In flight, that gives additional lift to assist your up-elevator command. The "landing switch to spoilers" and "landing switch to flaperons" pots raise the outer surfaces (ailerons) and lower the inner surfaces (flaps) to create drag, slowing the ship, generally used for landing.

A single switch returns the transmitter to the original seven-channel operation. Custom

programming is available in case Ray and John have forgotten anything you need.

Interested? Call John Veale at 213/370-6237 or Ray Kuntz at 213/645-4269 for more information.

ATRCS (say "A-Tracks")

We met Tom Mroz at the F3B finals where the U.S. team was chosen to compete at the world championship meet in France. Tom is a partner in a company called Control Systems Laboratories that produces the ATRCS module. He was with the South Bay Soaring Society team who used his modified Airtronics radios, and of the four fliers who qualified

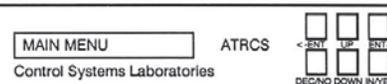
display. Like a computer, it operates on a menu system that displays on the LCD. It comes with an extensive manual, although the most difficult part to us would be knowing what settings to make, not how to make them.

ATRCS can store information on up to four airplanes: trim settings, complex mixes, you name it. It has seven "templates" which are preset for seven different plane configurations. The templates are all for sailplane use, not a throttle setting in the bunch.

Every moving surface is individually adjustable. You can adjust the amount of up-elevator and down-

ATRCS' control panel is computer-like.

CSL's radio modification installs a 16-megahertz, 16-bit microprocessor into your Airtronics Module transmitter.



for the team, three of them—Seth Dawson, Rich Spicer and Gene Engellgau—used the ATRCS radio.

The ATRCS is a \$295 modification to your Airtronics Module SP7 radio. Other radios will follow, but for now, it's Airtronics only. It works with most manufacturers' seven- or eight-channel FM/PPM receivers and with Airtronics' six- and eight-channel PCM receivers.

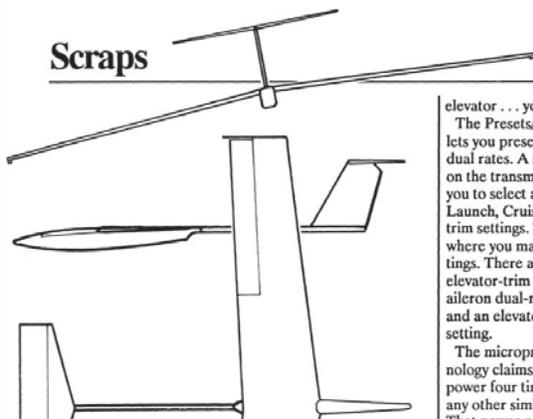
It's actually a 16-megahertz, 16-bit microprocessor (computer). The familiar pots are gone, replaced by six keyboard-style switches and a 16-character liquid crystal

elevator separately, for example.

The menu structure is divided into five parts. The Main Menu lets you specify which of the four planes you're flying. It also lets you set three protection levels (which will keep you from screwing up your presets at the field). Your protection options are (1) full, no changes allowed, (2) open, change anything you want, (3) limited, change only surface centering or mixing gains. Other Main Menu options include Mode selection (I or II, A or B), Calibration and Self-Diagnosis.

The Basic Configuration Menu lets you select aircraft type (one of the

Scraps



Only the wings are droopy on Harry Finch's anhedral ship. The performance is anything but! Low-speed maneuverability is excellent. Thin wings and smooth design keep it quick.

seven templates), V-tail, Side pot reversal, Spoiler selection, Receiver type, Servo reversing, Servo type and a couple of very interesting others. "Freeze flag enable" allows you to set a dead band of flap stick so that you don't accidentally move the flaps when using the rudder. "Set flap stick landing threshold" automatically moves the ailerons (spoilers) upward to assist the flaps at a point preset by you. "Select rudder/aileron mix for landing" can automatically reset the mix to maximum rudder as you reach the landing threshold. If you've been flying at a reduced (high-speed) mix, the option can remember to reset for you so you'll have maximum control while landing. Could save a plane!

The Surface Adjust Menu lets you set each individual control surface in each direction. All centering is done here, aileron differentials are dialed in, even the

rudder right and left settings are done individually. Mixer Gains Menu adjusts the amount of mixing in 17 different ways, including wing camber/aileron/flaps, spoiler/elevator, flap/

SSN's first SCRW-UP! Award.

When we saw Wayne Flower's F-20, we knew it was a natural winner for the Special Commendation for Rotten Workmanship - Ugly Plane! (SCRW-UP!) Award. In addition to the unpainted fuselage, wings and tail, Wayne's beauty (ugly) features three types of tape—duct, masking and unknown—and numerous nicks and scars. Congratulations, Wayne! What's next on your building board? (Seen any really ugly planes lately? Take a photo and send it in for the next installment of the SSN SCRW-UP Award.)



elevator . . . you name it!

The Presets/DR Menu lets you preset trims and dual rates. A single switch on the transmitter allows you to select among Launch, Cruise and Speed trim settings. This menu is where you make those settings. There are also two elevator-trim presets, an aileron dual-rate setting and an elevator dual-rate setting.

The microprocessor technology claims calculating power four times that of any other similar system. That power promises no jittering or jumpiness of control surfaces, and it operates on an advanced-memory technology called EEPROM that requires no battery to sustain itself.

Although this may sound very complicated, we found that by reading CSL's hand-out, it was relatively easy to learn. The hardest part, as

we mentioned before, is not making the adjustments, but knowing which adjustments to make.

For more information, contact Control Systems Laboratories, 1361 Fallen Leaf Dr., Milpitas, CA 95035, 408/946-4142. While writing this article, we called, and Tom answered the phone. While his radio and company name may appear too high tech for human consumption (computer intimidation is a very common modern malady), Tom is a friendly guy who loves R/C soaring (probably) as much as you do. Don't hesitate to get in touch with him about the ATRCS.

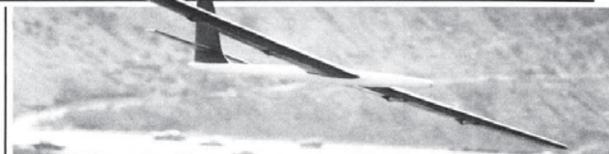
FINCH BIRD III

Harry Finch is one of SoCal's most prolific slope-soaring modelers. Elsewhere in this issue, you'll see a couple pictures of Harry and/or his power-scale slopers, but that's only part of his repertoire. His most recent creation, a 48"-wing-span, anhedral pod-and-boom glider, is truly a work of art.

The pod is vacuum formed like the Dick Vader pods featured in our last issue. In fact, Harry credits Vader with introducing him to the vacuum-forming process. Finch has written a very complete instructional article on the subject, and he's agreed to let us republish it. Originally, it ran in Jim Gray's newsletter, *R/C Soaring Digest*.

We went flying one Saturday afternoon with Harry at the Yorba Linda club's hill, and after just about twisting the focus ring off our trusty

...Random bits and pieces from the world of slope soaring.



Can the Kuntz/Veale Titan III win at the Los Banos ISR?

A pair of Hughes Hill regulars have put two years of development into this sleek slope racer. They'll go up against the best on October 22-23 in the South Bay Soaring Society's International Slope Race.

pler 374 airfoil. Modified? In what way? Thinned? "Just modified," Ray Kuntz replied with the small smile of a man with a secret.

The plane actually weighs nine pounds without ballast, a fact that impressed us, fliers of 10-ounce Vader planes, immensely. And it's built to be ballasted to 11 pounds, the legal maximum for slope racing. According to Veale, the lightest wing loading with the Titan III is a hefty 16 ounces per square foot. Again, we made mental comparisons to our six- to eight-ounce wing-loaded pod planes.

Whew!

Weight is not added without careful consideration, however. Why put lead in the plane when a 1200 mah battery could be used to help assure a problem-free day at the races? Why use lead when carbon fiber, or extra resin or 5/16-inch high-strength alloy wing rods could increase wing loading (and speed) while adding structural strength? The Titan III does have ballast holds, one in each wing, located at the center of lift, where lead can be added when conditions dictate.

One area where they con-

centrated on making the plane light is the tail. Instead of fully glassed stab surfaces, the Titan III's tail is made from a single layer of fiberglass sandwiched between two balsa sheets.

The Titan III is a very impressive sailplane. When it goes head-to-head with the best slope racers in California at the October 22-23 ISR, we're definitely going to be there. How about you?

F3B TECHNOLOGY: THE LEADING EDGE

International F3B sailplane competition is responsible

200mm Nikon lens, we can attest to the plane's maneuverability!

The anhedral wing looks odd, at least until we began comparing it with the soaring birds that joined us on the hill. Then it looked more at home than the dihedral- and polyhedral-winged models. The anhedral wing provides excellent low-speed handling characteristics, yet it didn't prevent Harry from performing a series of high-speed straining runs over our nervous photographer's head. The plane's speed may be due to the thinned Jack Chambers JC-20 airfoil. Chambers designed the 'foil at only seven percent thickness, but Harry went even thinner at five percent!

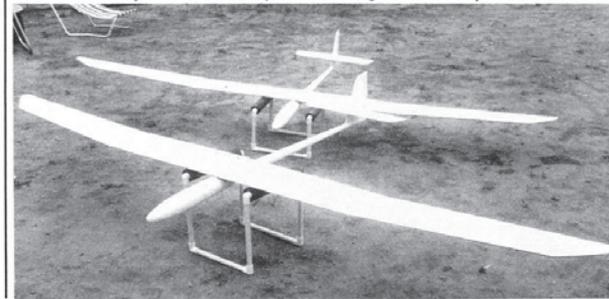
Is anyone else experimenting with anhedral designs out there? If so, we'd like to hear from you!

WE'RE TALKING FAST!

It's one of the fastest planes up there," John Veale explained as we watched his partner Ray Kuntz guide the sleek, massive Titan III slope racer back and forth along the Hughes Hill ridge line. We had just asked him about their chances at the upcoming International Slope Race. "The plane is certainly competitive," Veale stated. "Now we need the [flying] experience."

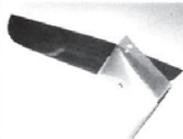
Nine pounds of sailplane swooshed past in front of us again and banked sharply into the turn. The wings bowed, then snapped back, launching the eight-foot sailplane back down the slope. It flies on vacuum-bagged (fiberglassed) foam wings with a modified Ep-

Fiberglass, carbon fiber and aerodynamic excellence. Got an extra \$800 and a yen to go fast? Perhaps these German Albatros models are for you—ultra-sleek, super-strong and with control-surface mixes you won't believe. The bottoms of these wings are black. It's not paint. It's pure carbon fiber. When "zoom launched" and fully ballasted for the speed run, strength is mandatory.



Scraps

for most of the advanced sailplane construction technology that's being discovered today. The multi-task events demand the maximum from both plane and pilot. Three tasks are flown: duration, distance and speed. All must be flown with one airplane, and that's what creates the very demanding set of requirements. Unlike slope racing where the planes just have to be fast and



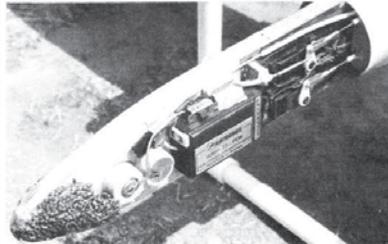
Look, Mal No horns!
The rudder is taped on the left side; its width is the length of the internal horn. (RIGHT) The radio gear fits into a "keel." Then, the nosecone slips over.

Rich Spicer's Synergy III's were awesome!

The latest version of the Synergy line is smaller than previous models due to new winch rules. It's an all-fiberglass ship; even the wings are formed in a mold, like the fuselage. Super strong, super aerodynamic. Note the Schuemann wing design. All trailing edges are razor sharp.



maneuverable, an F3B ship must also be able to thermal and to establish a very good (flat, fast) glide ratio for the distance segment. Since this is a slope soaring publication, we won't



subject you to all the details of the contest itself, but when the best in the U.S. gathered to compete, we knew there'd be some killer sailplanes just lying around waiting to be admired. We'll let the pictures and captions speak for themselves

CHARTER MEMBERS

Thank you! That's to all of you who have ordered your subscriptions to *SSN*. We appreciate your support. We extended our 13-issue special offer, by the way, to include all who subscribed before this second issue went to the printer. If you received this copy in the mail, you still have 12 more coming before your sub runs out. Again, thanks!

WILSHIRE'S MOVING

Bob Ratzlaff and Vince Parizek are moving in together. (Oops, that didn't come out right. Let's try again.) Wilshire Model

Center and Santa Monica Sailplanes, featured in issue number one of *SSN*, are combining forces, this time under the same roof. (There, that's better.) The new location hasn't been es-

tablished yet, but they're looking in the Culver City/Marina del Rey area. The move is scheduled for early next year. If you'd like to be notified when they move, send your name and address to Wilshire Model Center, 2836 Santa Monica Blvd., Santa Monica, CA 90404 and get on their list!

INTERNATIONAL SLOPE RACE SET AT LOS BANOS

The South Bay Soaring Society will host their annual International Slope Race on October 22-23 at the Los Banos flying site. The site is located near I-5 and route 152 at the San Luis Reservoir Recreational Area. The fun begins at around 9:00 a.m. each day, entry fee is \$6 for competitors and spectators get in for free. Contact Contest Director George Paige at 415/325-7543 or Competition Chairman Michael Forster at 415/831-3834.



Air Mail

R/C SOARING DIGEST

I enjoyed your first issue immensely and plan to recommend *Slope Soaring News* to my readers.

Congratulations and best of luck. Save extra copies of the first issue; they'll be valuable in the future.

Jim Gray
R/C Soaring Digest
210 East Chateau Circle
Payson, AZ 85541
602/474-5015

Thanks, Jim. We've printed your address in case some of our readers aren't aware of R/C Soaring Digest. (R/CSD is a monthly newsletter that deals with all aspects of R/C soaring.)—Charlie.

MODEL AVIATION

Congratulations on an outstanding issue of *Slope Soaring News*. It is the dreams, effort and accomplishments of people like yourselves that will help bring slope soaring to the forefront of R/C aviation.

California is undoubtedly the slope capital of the world, as those of us who live here continually preach. But with the work that you are doing with *SSN* and with my column in *MA*, we have the power to show the rest of the nation and the world what this sport is really about.

If there is anything I can do to help you with *Slope Soaring News*, just let me know. I'll let all the readers of *Model Aviation* know about it in my next column and, with your permission, I'd like to hand out copies of your back page (subscription form) at sites and clubs here in Northern California.

Mark Triebes
20794 Kreisler Court
Saratoga, CA 95070

*Most readers probably know that Mark writes the first and only slope soaring column in an American magazine, the Academy of Model Aviation's publication, Model Aviation. Along with the insurance package, it's another excellent reason for slope soaring enthusiasts to join. Mark also has produced a line of kits which, hopefully, we'll soon see in *SSN*. (Hint, hint, hint. That's a reminder, Mark. Did you remember to send out those pictures?)—Charlie.*

R/C MODELER

Congratulations on a workmanlike publication. I think the first issue is great! If you can hold out with no income for a year and work your tails off in the meantime, you can't miss.

I'd be glad to give you a boost in my *RCM* column, but I don't write it anymore. Nine years is enough. I don't know who they'll get to write it now, but I'm sure you'll find him cooperative. Best of luck.

Al Dolg
R/C Modeler Magazine
Sierra Madre, CA

Thanks, Al. We've figured that it'll take somewhere between 200-300 subscribers to pay the printing and mailing bills. We've also had some encouraging phone and letter conversations with the people from Cheetah, SR Batteries and Cox Hobbies concerning advertising. (Note the SR ad running this month.) But you're right, the first year is rough. This'll be my fourth publication "launch" so I know what you're talking about, and we're prepared to stick it out.

*You know, if you should get bored in your "retirement," there's always space in *SSN* for some words of wisdom. Howzat!—Charlie.*

BUDDY-BOX MODS

I have modified some two-channel transmitters for buddy-box use and also for some third function like spoilers, noisemaker or lights. Interested in a construction article?

Do you have an editor in Northern California, yet?

Rich Neveln
Oakland, CA

Absolutely! That buddy-box setup (where an instructor's transmitter can be plugged into a learner's with override ability) could save a lot of brand-new slope planes.

No, we don't have a NorCal editor. We'd like to, of course, but it's a no-income position (just like the SoCal editor's job), and nobody's volunteered. We welcome contributions from all sources.—Charlie.

DR. DENNIS

Thanks for *Slope Soaring News*. This is

just what the doctor ordered. Enclosed is a check for \$47.85. Put me down for three years.

Lloyd Dennis
Los Angeles, CA

*You're welcome, Lloyd. Your subscription just helped make *SSN* a lot healthier, too. Thanks for your support!—Charlie.*

SOUTH BAY'S SLOPE RACE

There are quite a few slopers in our club, the South Bay Soaring Society, both sport and race fliers. We fly at Coyote Hills, Sunset Beach and Davenport Beach.

In California, and maybe in Washington, we've organized an F3F slope race group to go to Denmark to compete in an international event. I'll send more info if you want it.

Our annual International Slope Race is another event you may be interested in. It's on October 22-23 this year.

John Dvorak
San Jose, CA

A couple weeks after receiving this letter, I met John at the F3B meet at the SULA field in Carson. We definitely will cover the SBSS's International Slope Race. How about it, readers? See you there?—Charlie.

Want Ads

THE FRENCH FLYER

Sensational easy-to-fly 36" wingeron. Complete with two standard servos. Only 16 oz. ready to fly. \$85. (2-4 channel receiver required.) Greg French 213/597-6346. (10-11/88)

CANNON MICRO SYSTEM

Four-channel Cannon micro Tx, two-channel micro Rx, two micro servos. No battery pack or wiring harness. Transmitter pot needs cleaning or repair(?). \$150, as is. Charlie Morey, 213/494-3712

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Name _____ Age _____ Male _____ Female _____

Address _____ No. of planes owned _____ No. of radios? _____

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I'm interested in _____ Building techniques _____ Flying techniques _____ Planes and the people who design them

_____ Scale sailplanes _____ Combat _____ Power scale _____ F3B-style planes

_____ Other? _____

Mail to Slope Soaring News, 2601 E. 19th St., #29, Signal Hill, CA 90804. Check or money order only, please.
PLEASE MAKE CHECKS PAYABLE TO "CHARLES MOREY," NOT "SLOPE SOARING NEWS." THANKS!



A Letter from an *RCSD* Reader

Gordy,

It is very satisfying to see and read something by someone who knows how to tell it like it is! Your article in the latest *RCSD* (October 2015) was right on point and really was well presented.

As you remember, we both were among those who weren't blessed with expensive magic flying machines in the old days. We all had to learn from our own experiences and failures and THAT was the real secret of our wonderful sport. I've lost the old fire in the belly, being over 84 now, but I still lie in my cave and look up at the twenty or so 1st place trophies that hold up my wall, as well as the four very special grand champion plaques, won when I somehow eaked out victories over some of the most wonderful and helpful friends that any competitor could ever wish to be associated with. They are my time machines. Anyone who has never been an LSFer will never know how much they have missed. And *RCSD* magazine has been there all along, educating all of us through all these adventures for more years than some of us easily admit to counting.

I've gone through the quarter scale aerotow thing, building my 1:2.9 ASK-18 and my Slingsby Dart from scratch. I've even got a Phantom FC-40 quad, (although I know that things without long wings really never can fly - it is just an illusion!).

I've been blessed with countless hours, flying with guys and girls from the likes of you Gordy, the Mrliks, Barb and Bob Robinson (Remember the all-women "WINGS" - Women In National Glider Soaring), Otto Heithecker and Dan Pruss, Cal Posthuma, Don Harris, Earle Latimer, Joe Wurtz, the Jeffries, Royes Salmon, Gordy Pearson, Bob Steele, Dick Proseus, Bob Champine, Ken Bates and Pat Flinn and well over half of the rest of the 136-plus LSF -5 Achievers, all who have really slipped the surly bonds together.

Thanks for everything, everybody. The pleasure has been mostly mine!

LIFT !

John Vennerholm, LSF #1291, (LSF-V # 51)



