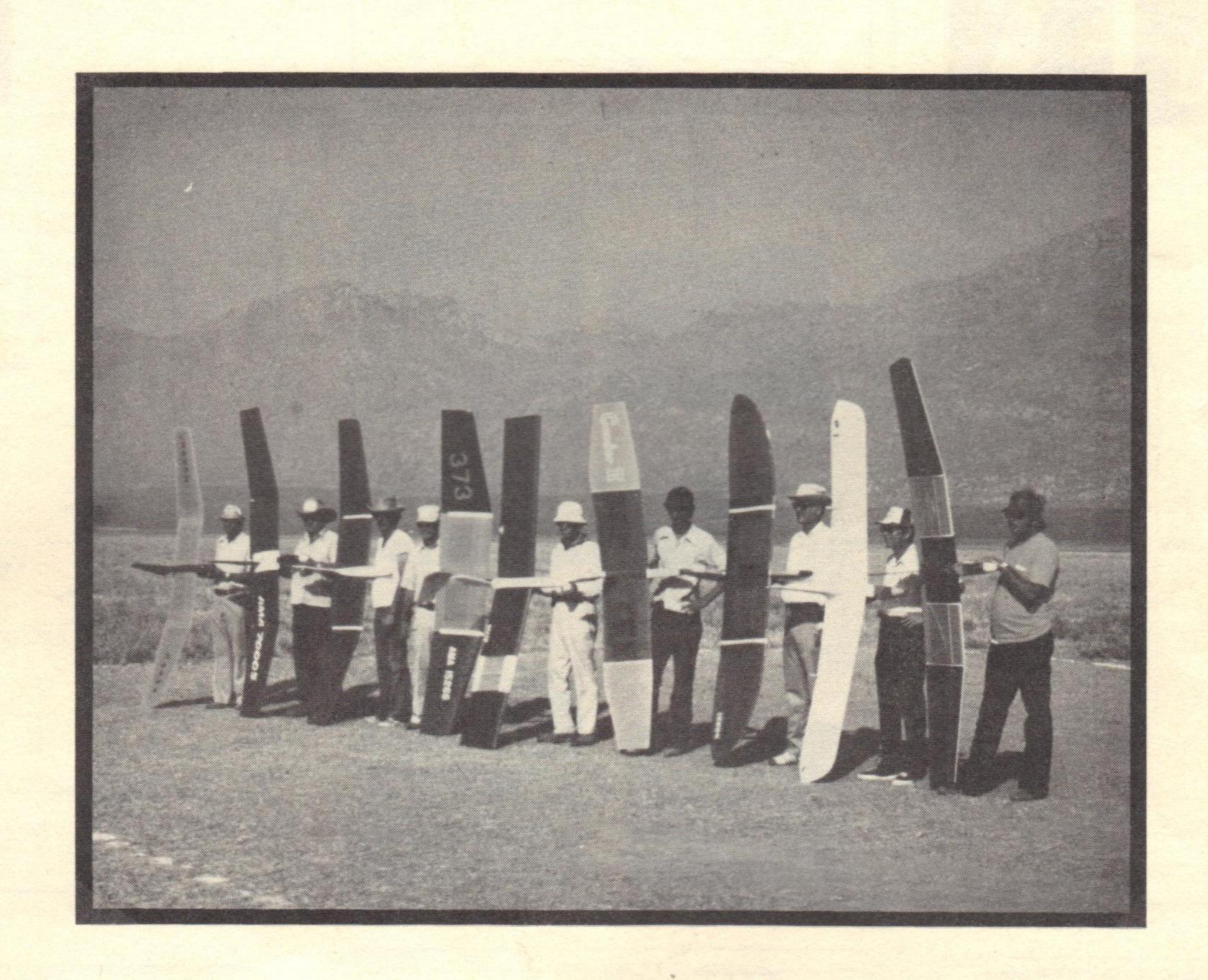


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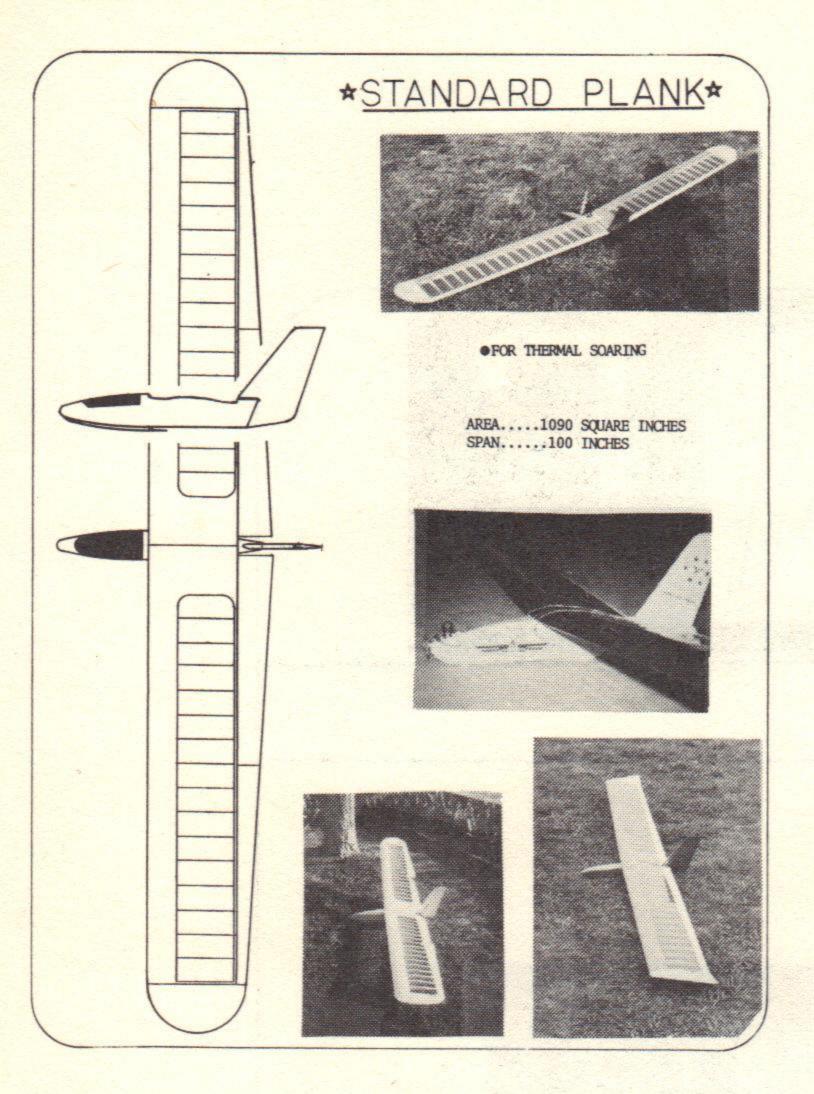
THE TIME WILL COME WHEN THOU SHALT LIFT THINE EYES

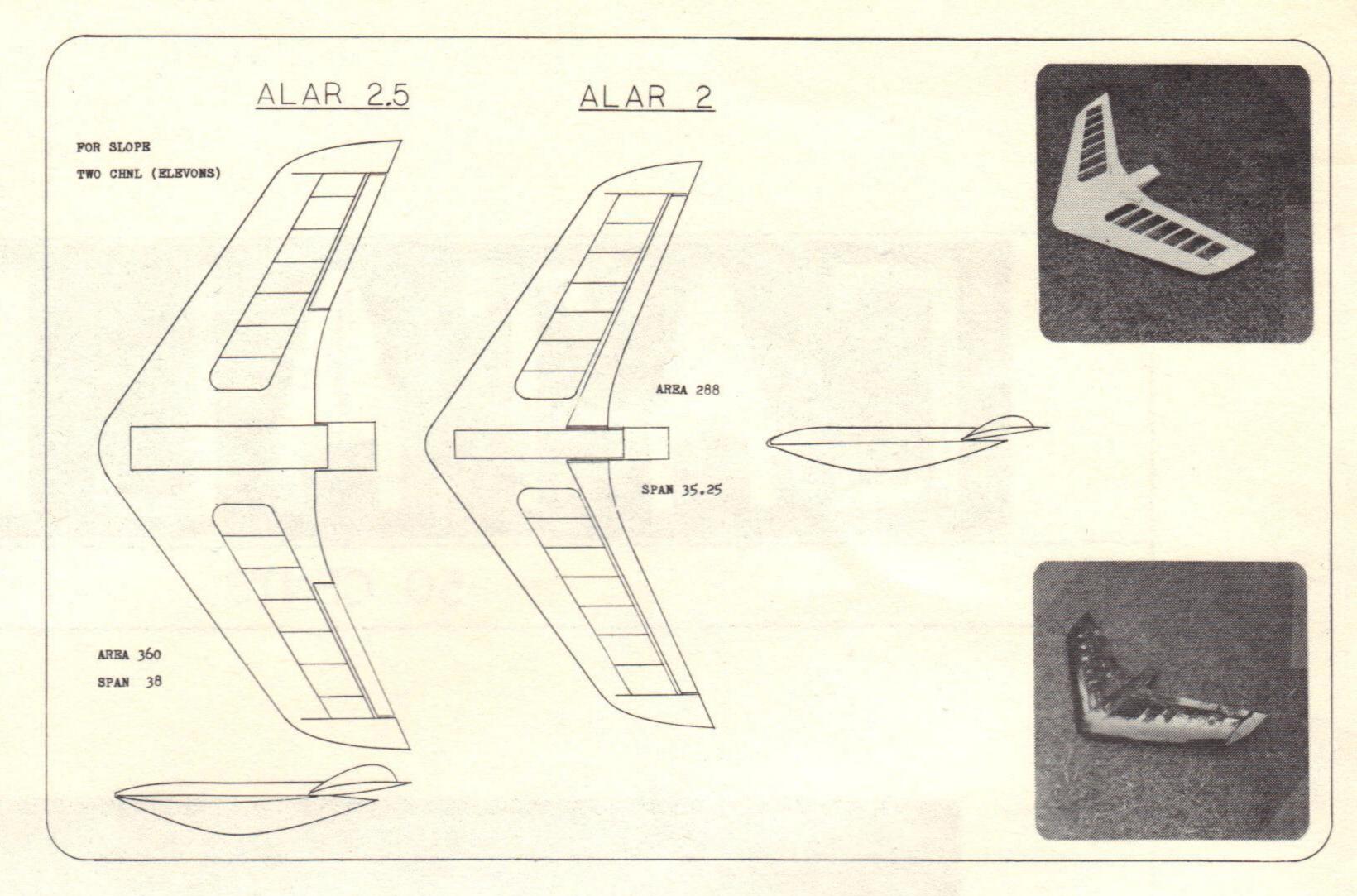
TO WATCH A LONG DRAWN BATTLE IN THE SKIES

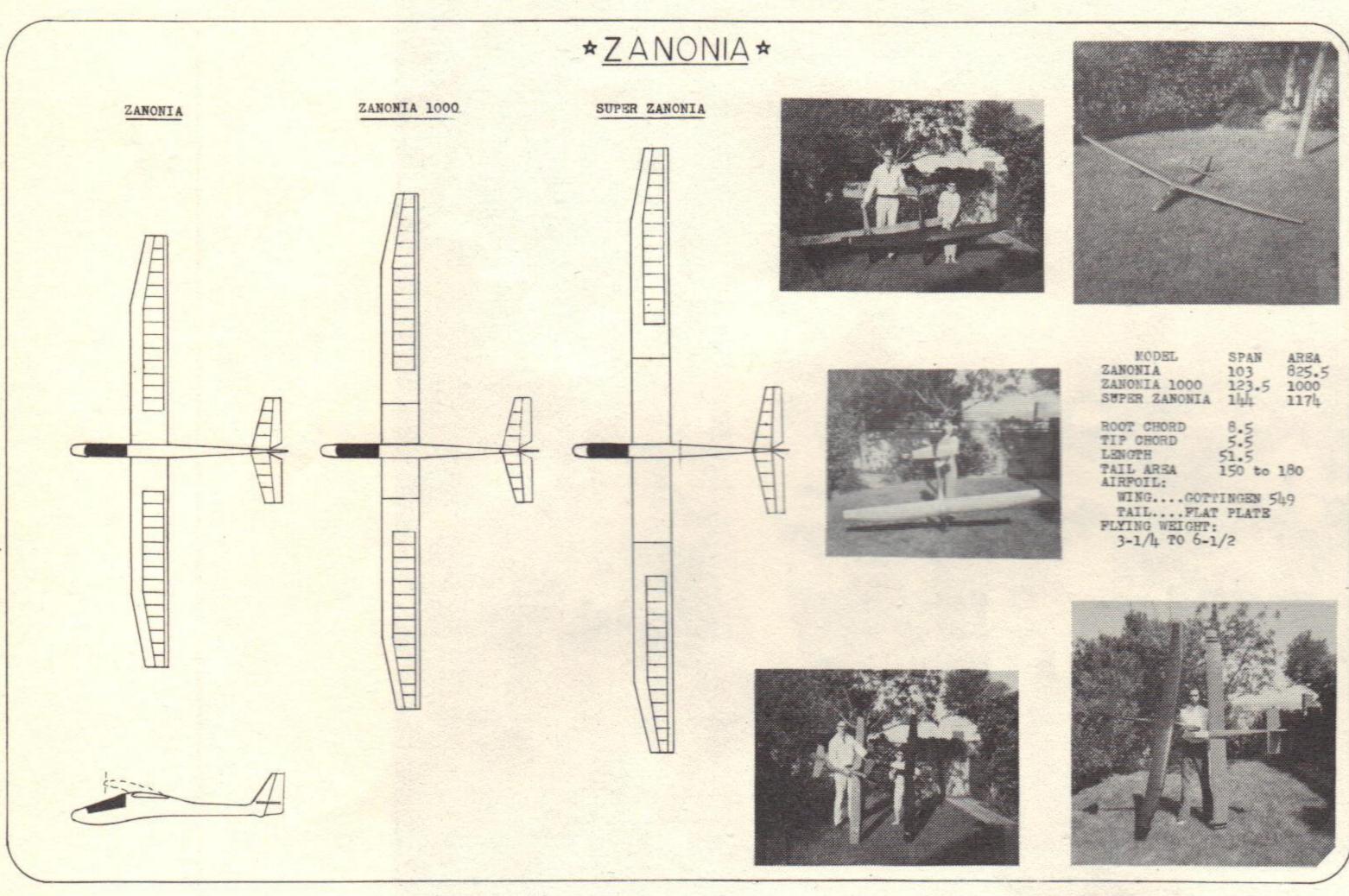
WHILE AGED PEASANTS TOO AMAZED FOR WORDS

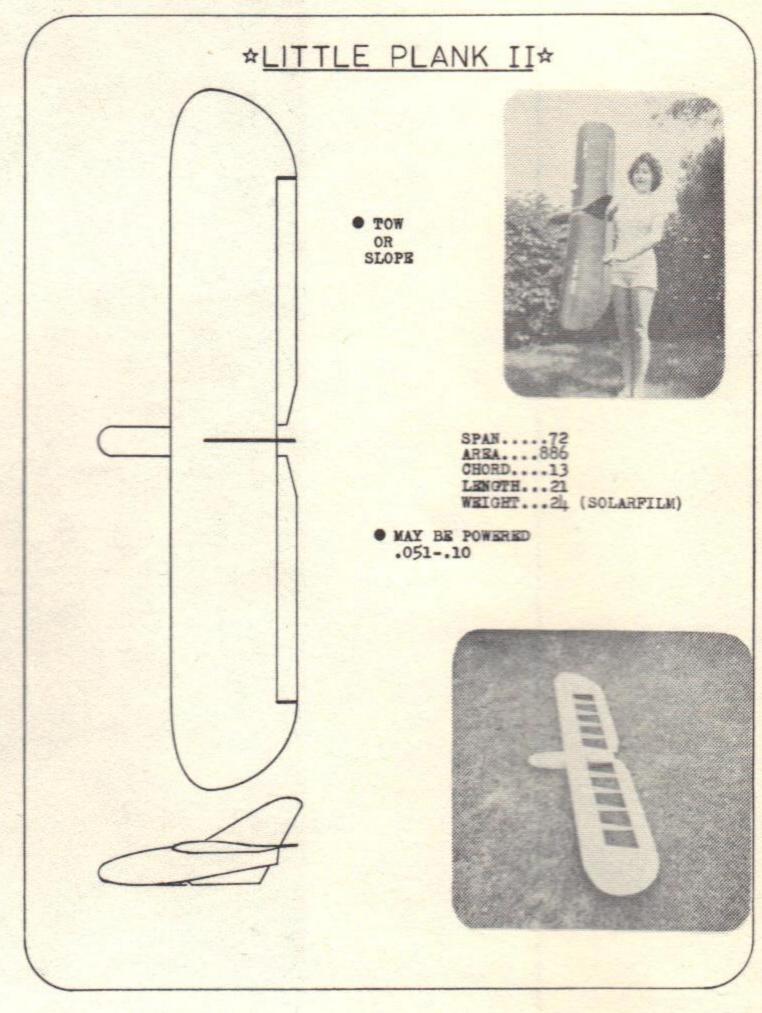
STARE AT THE FLYING FLEETS OF WONDROUS BIRDS.

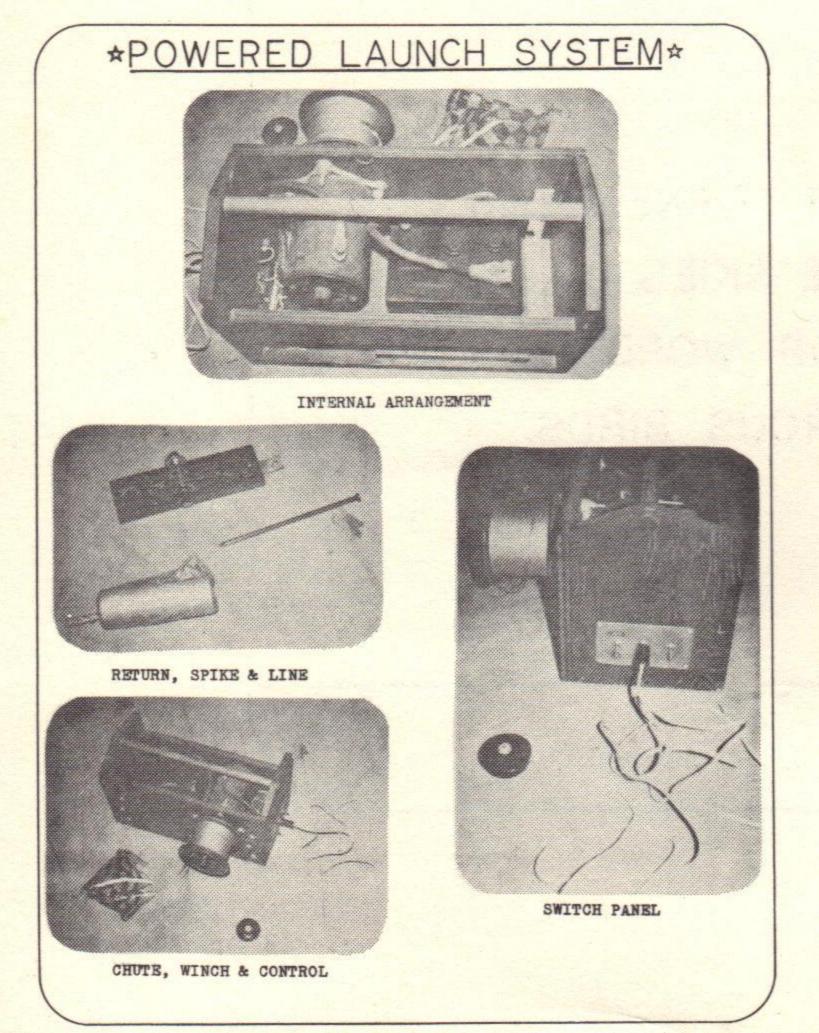
THOMAS GRAY

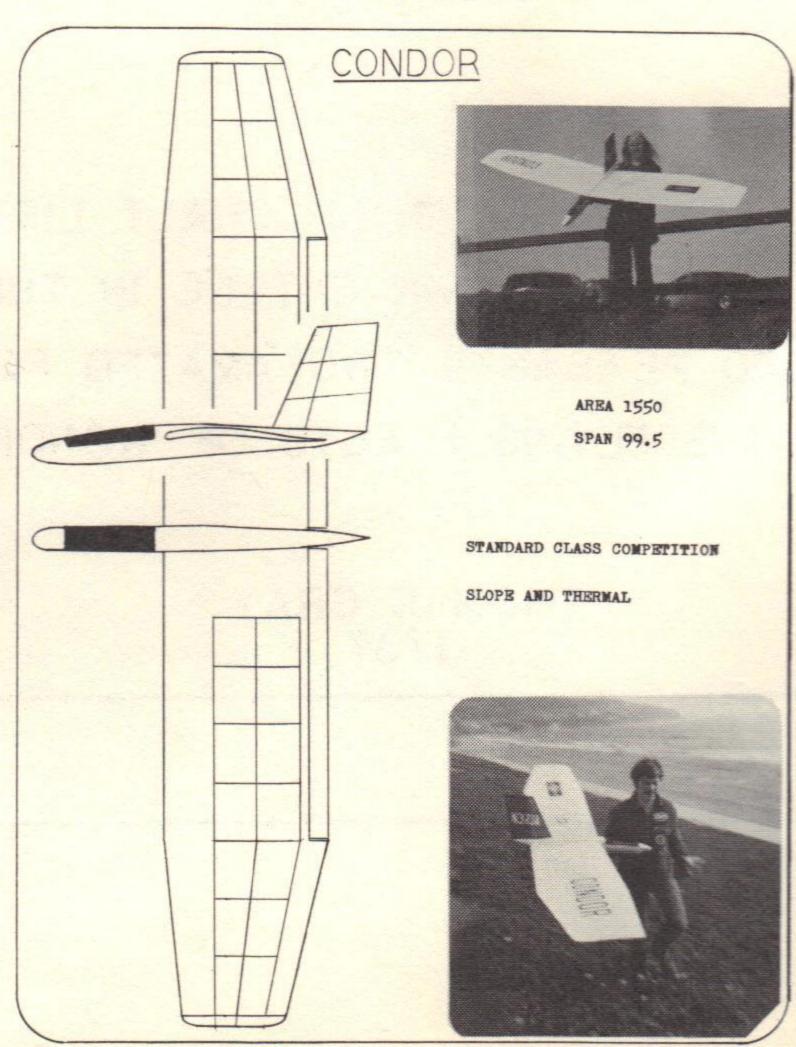


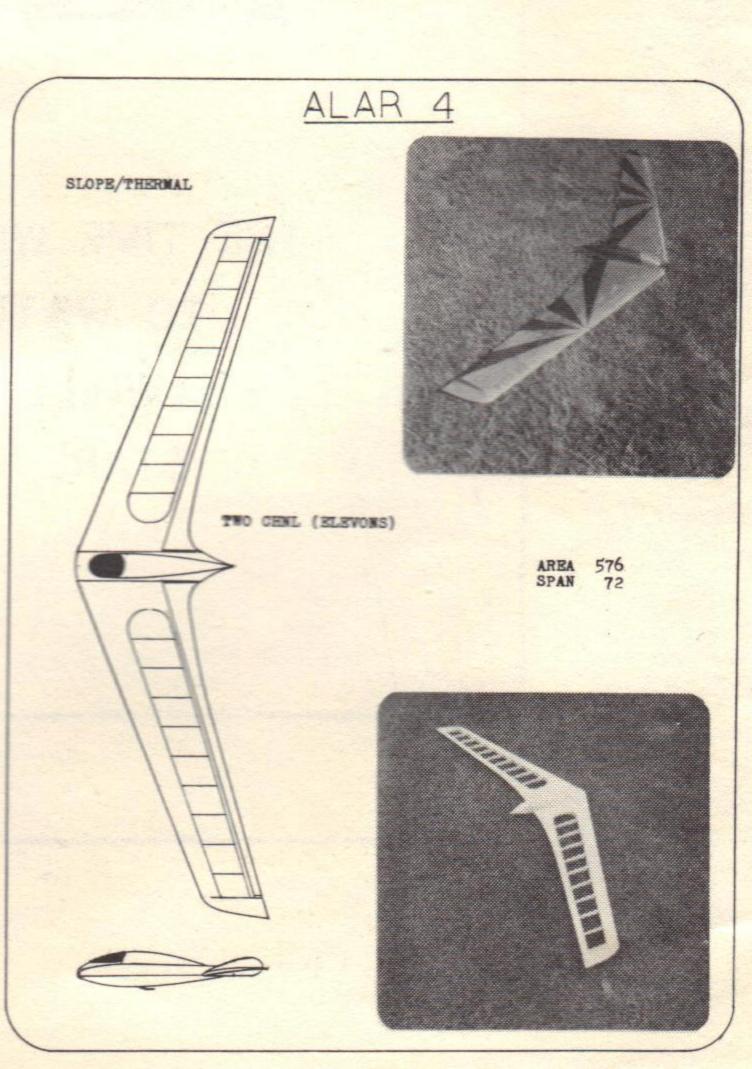


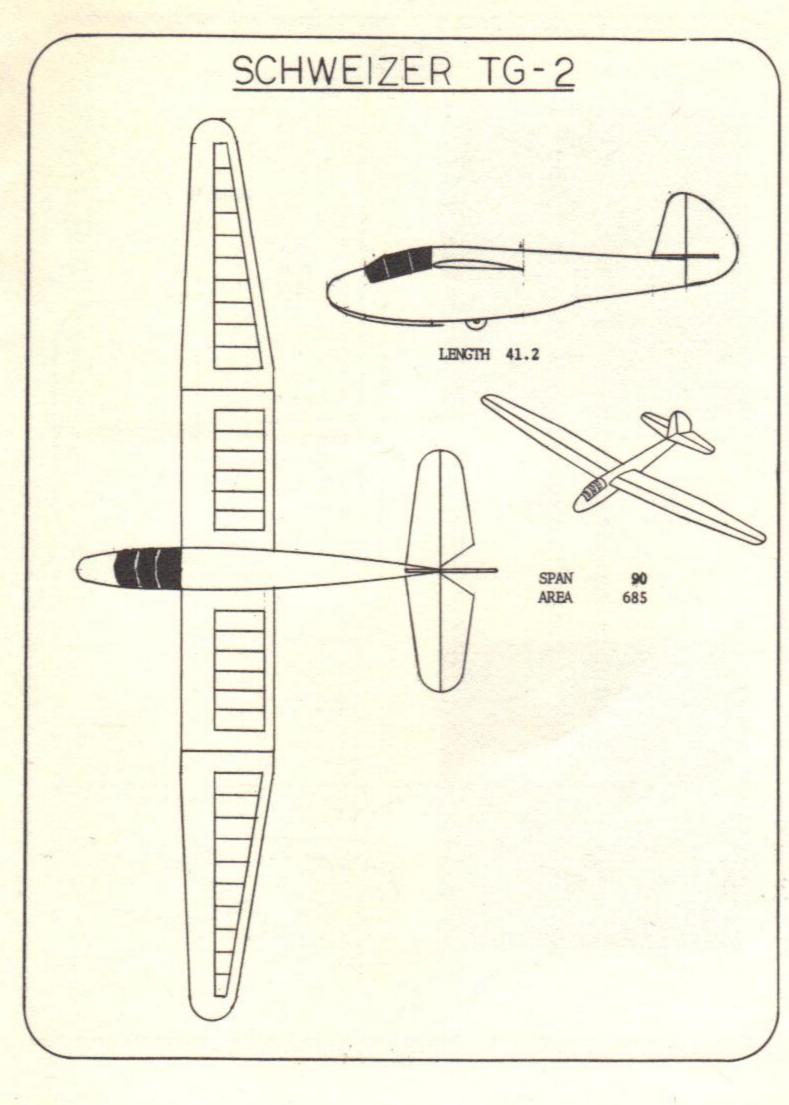


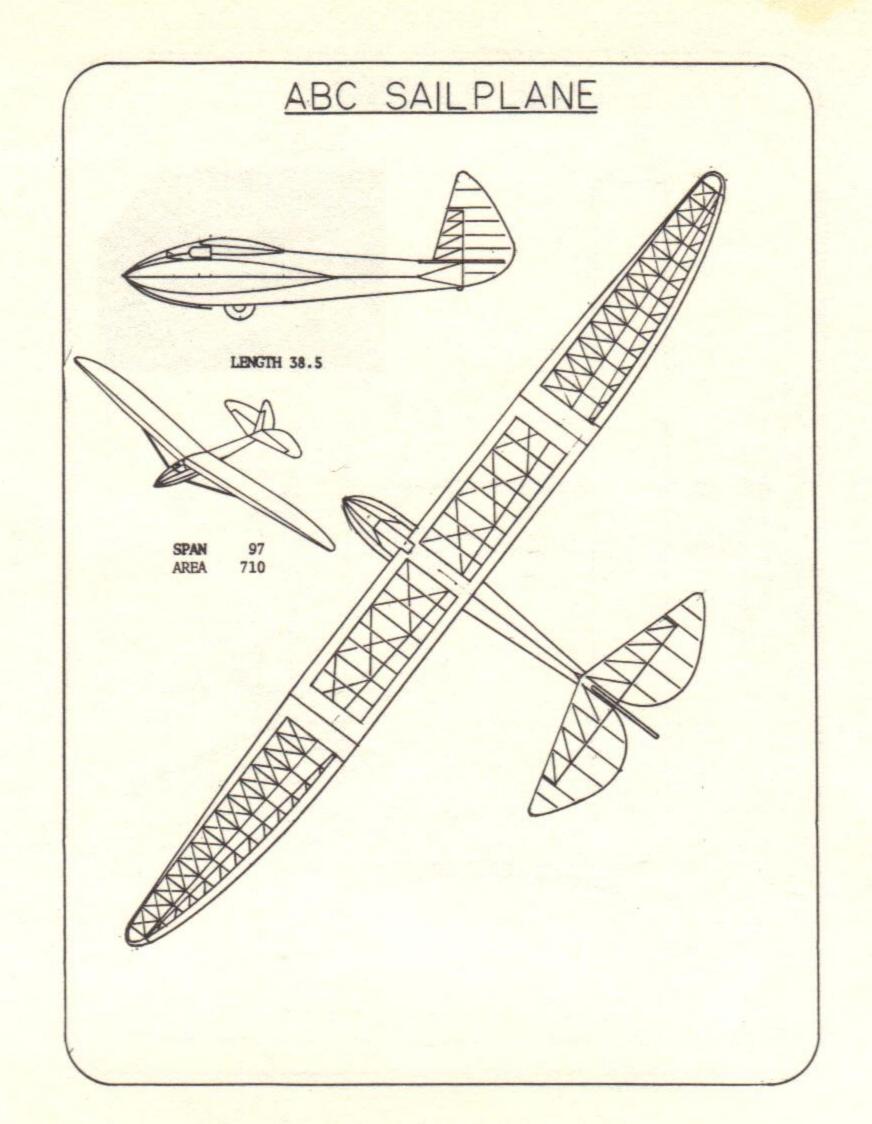


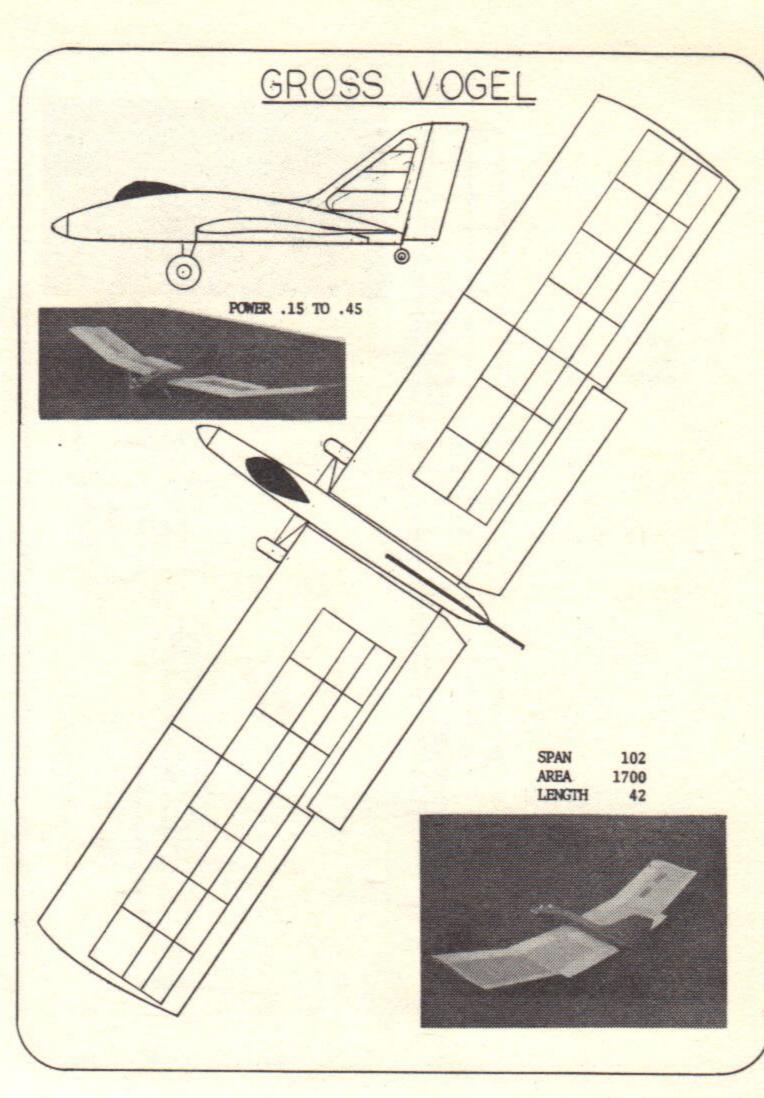


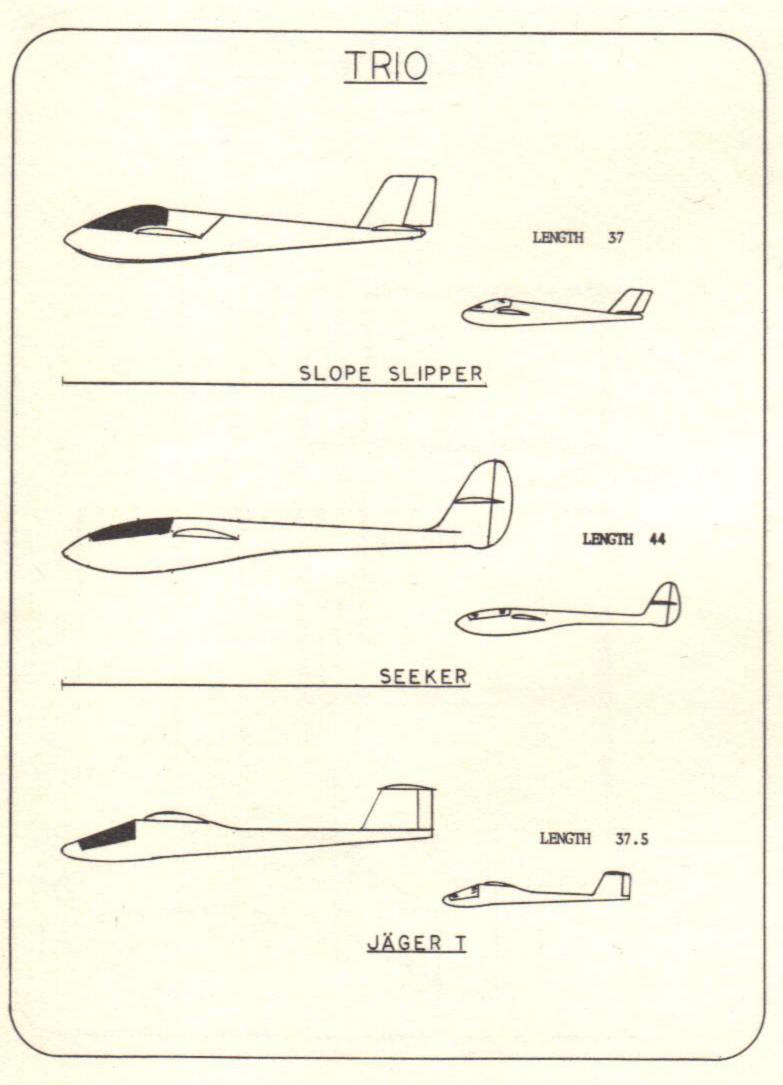


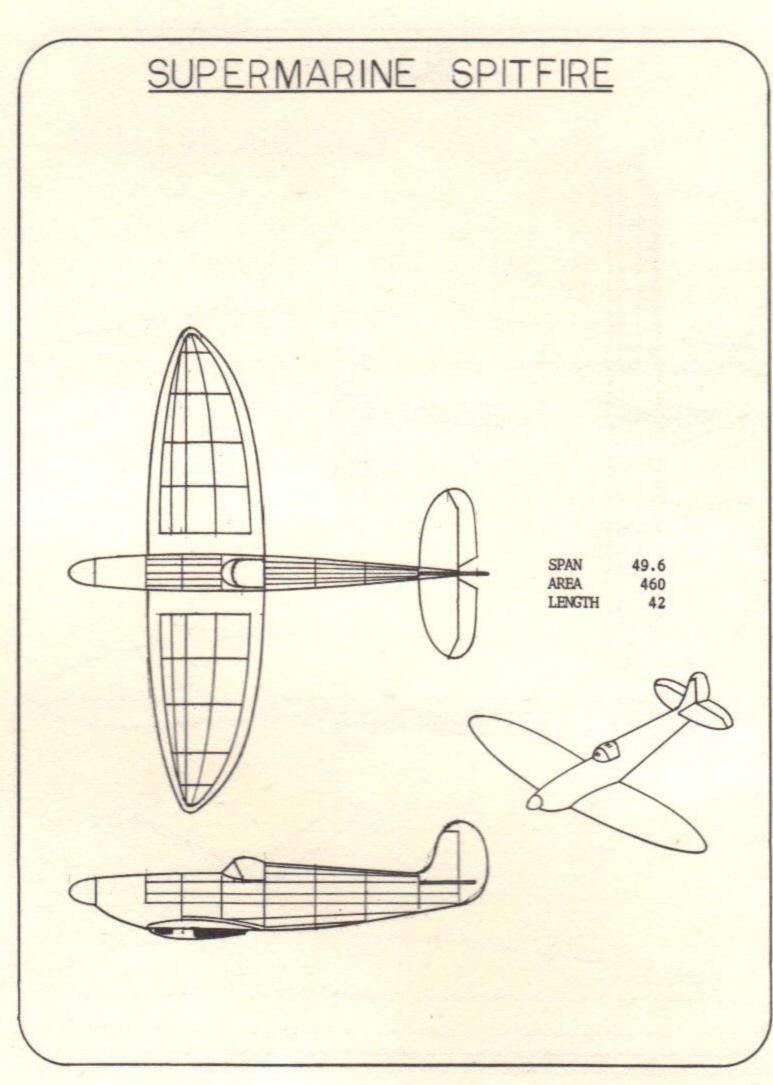


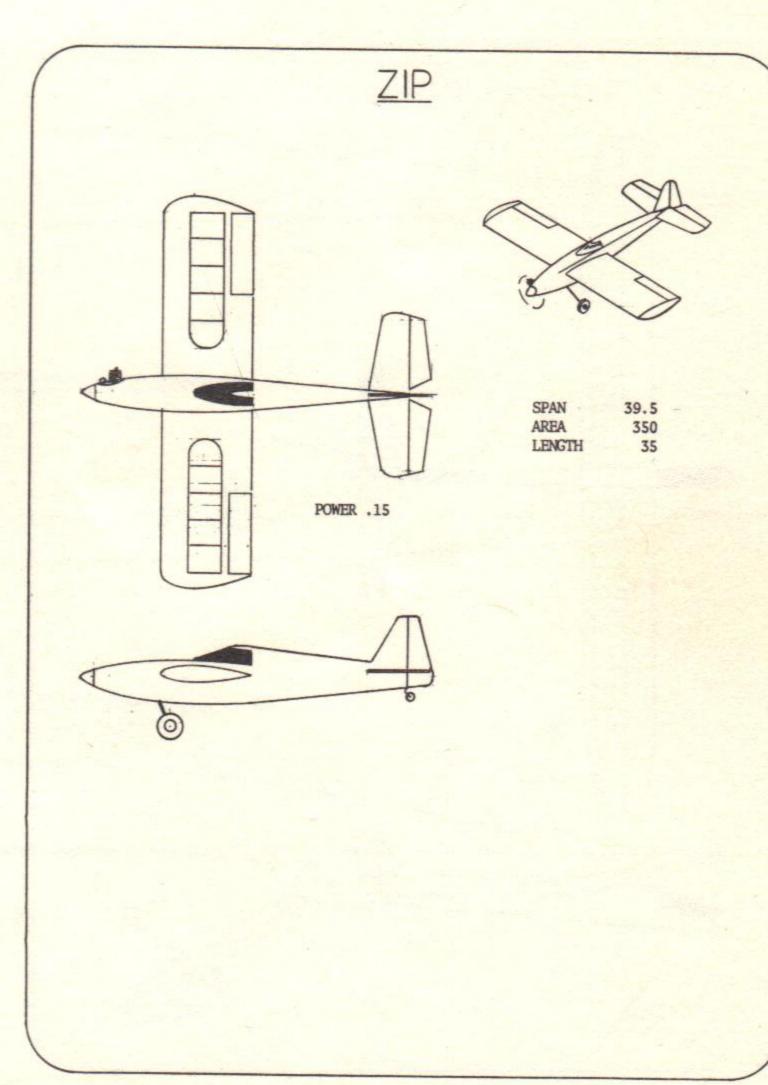


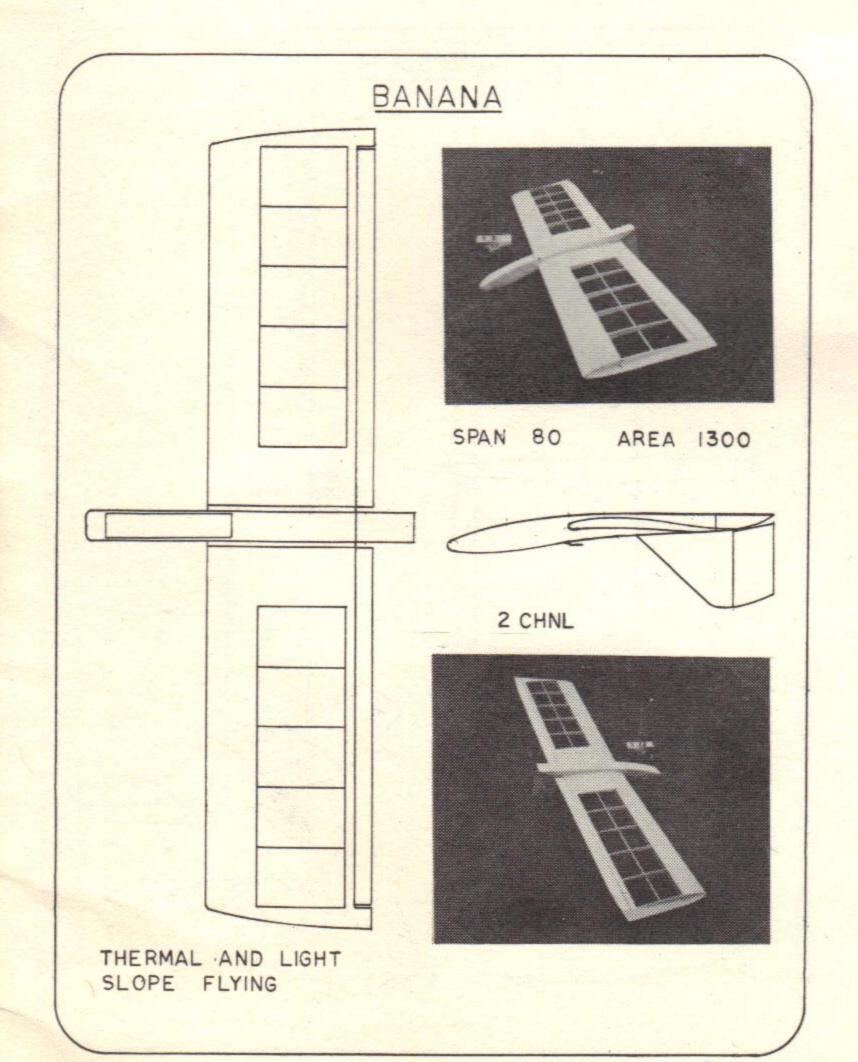


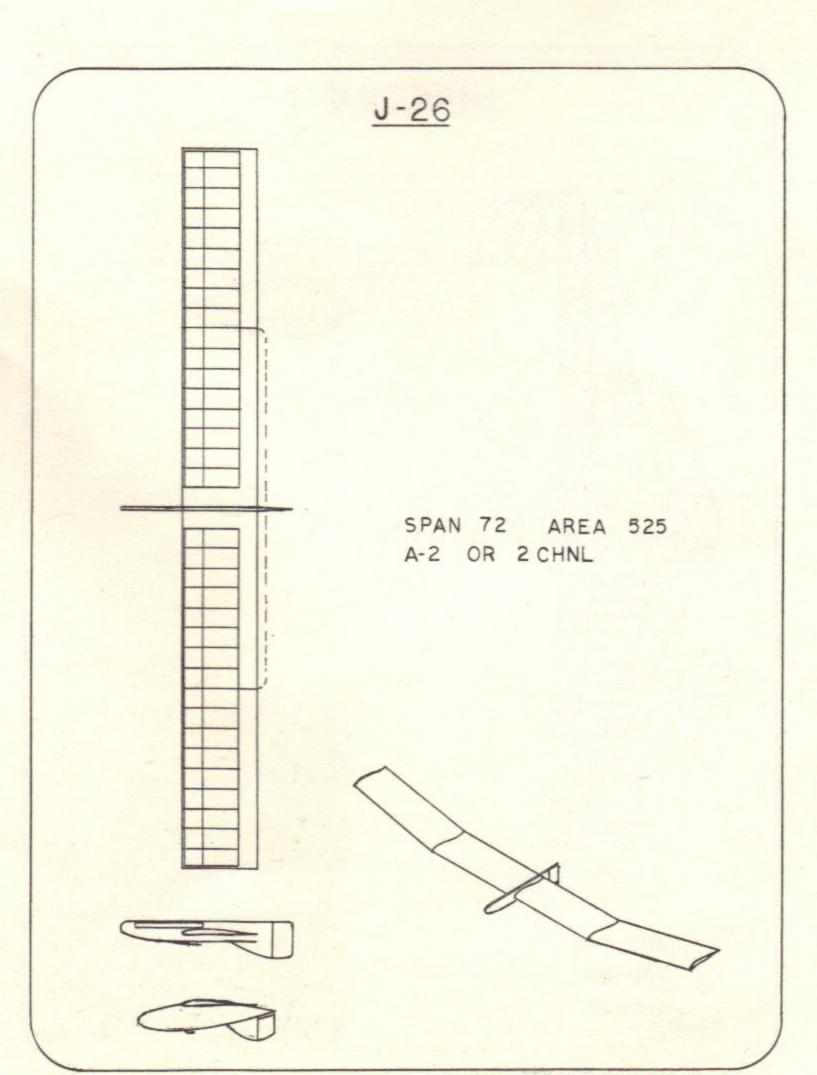


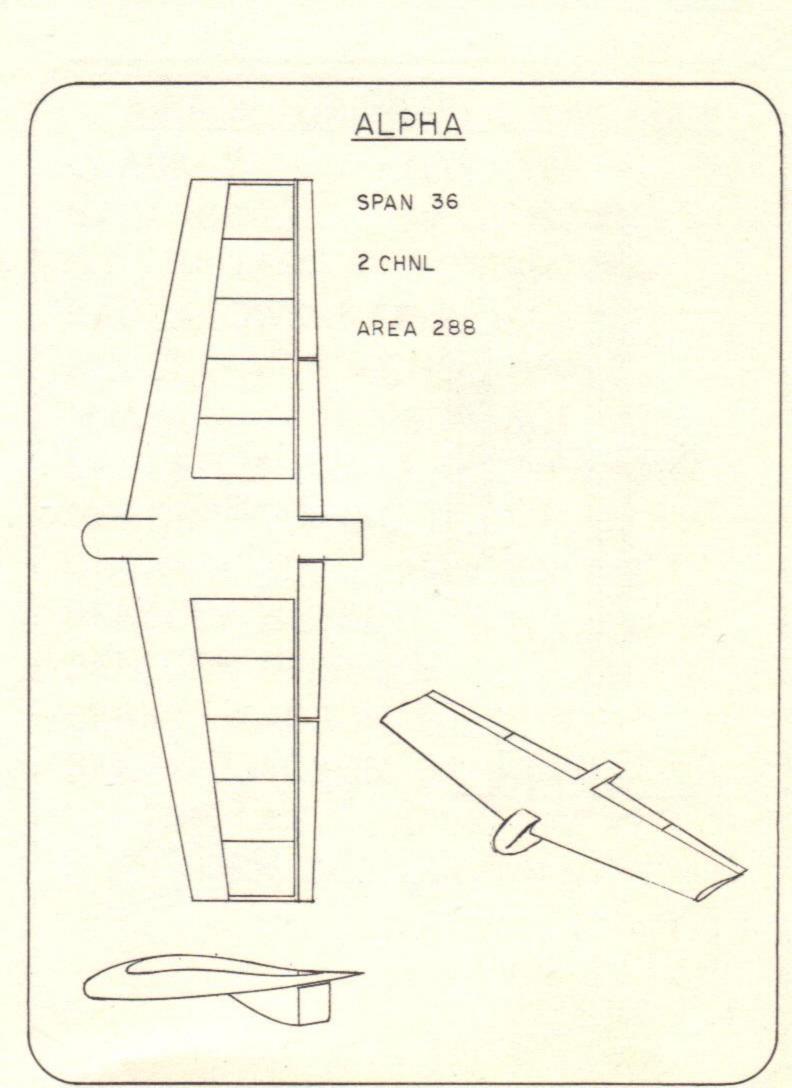


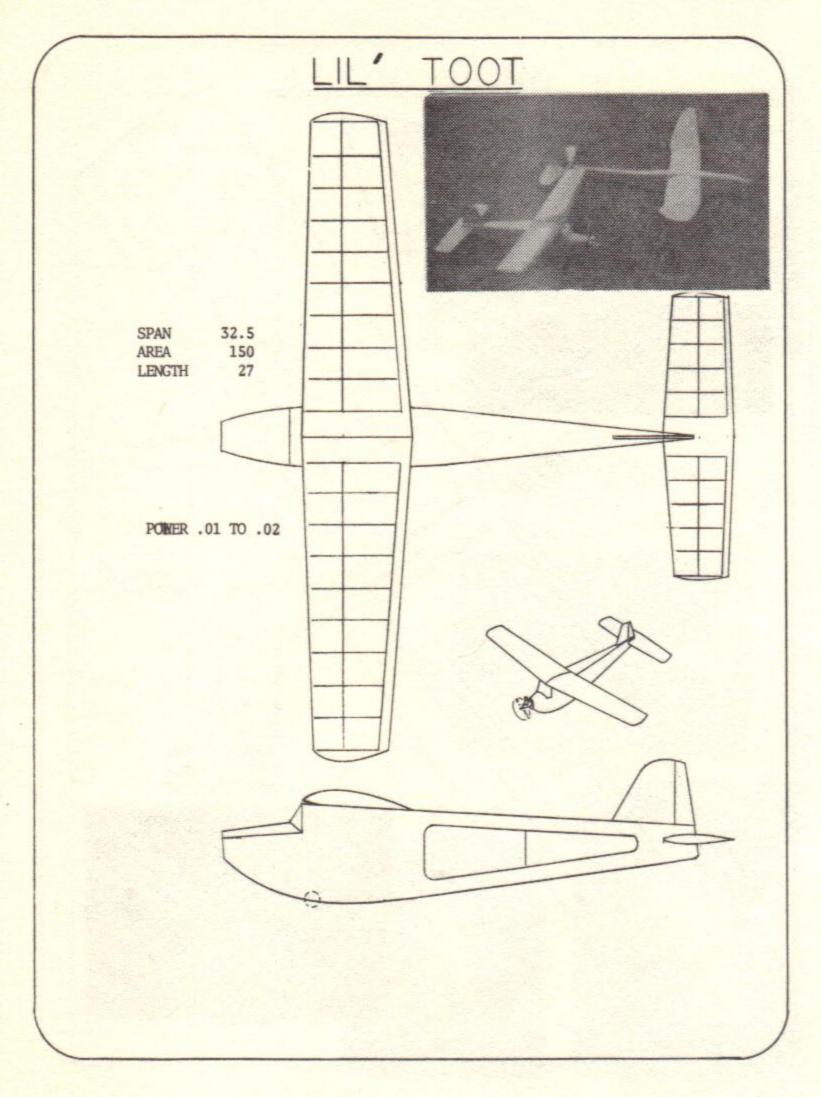


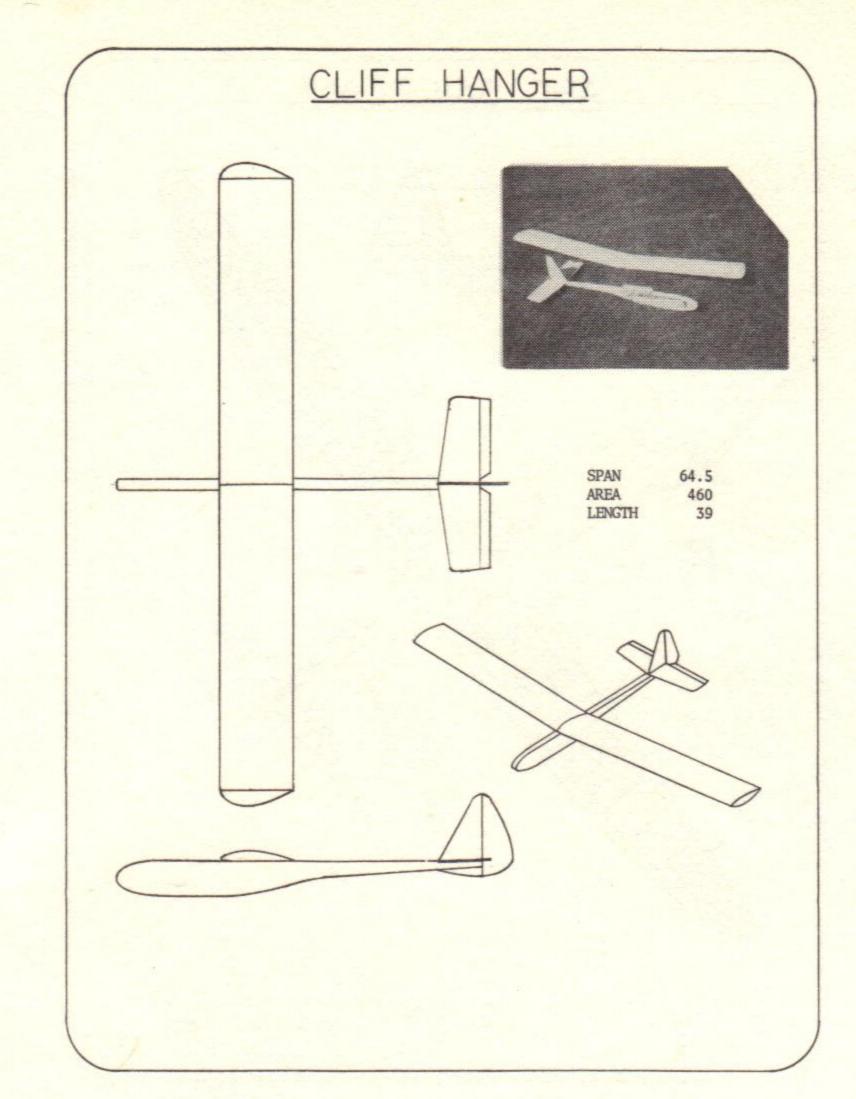


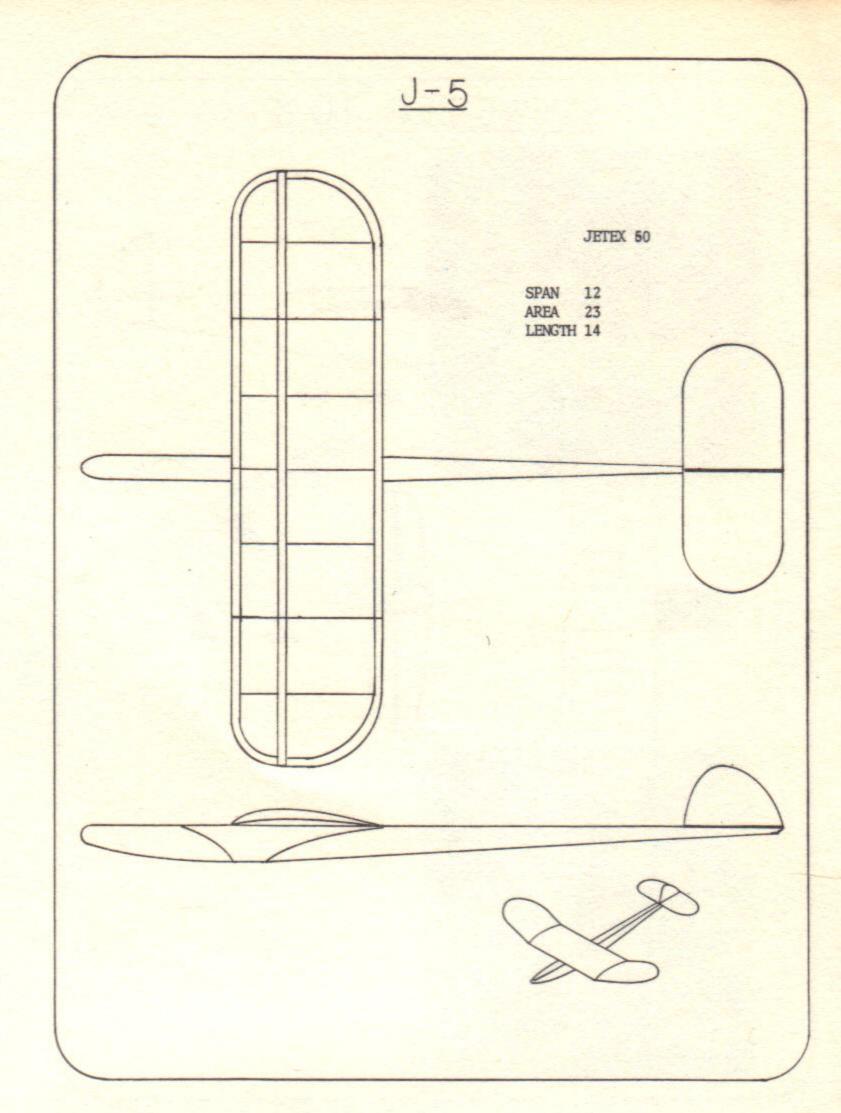


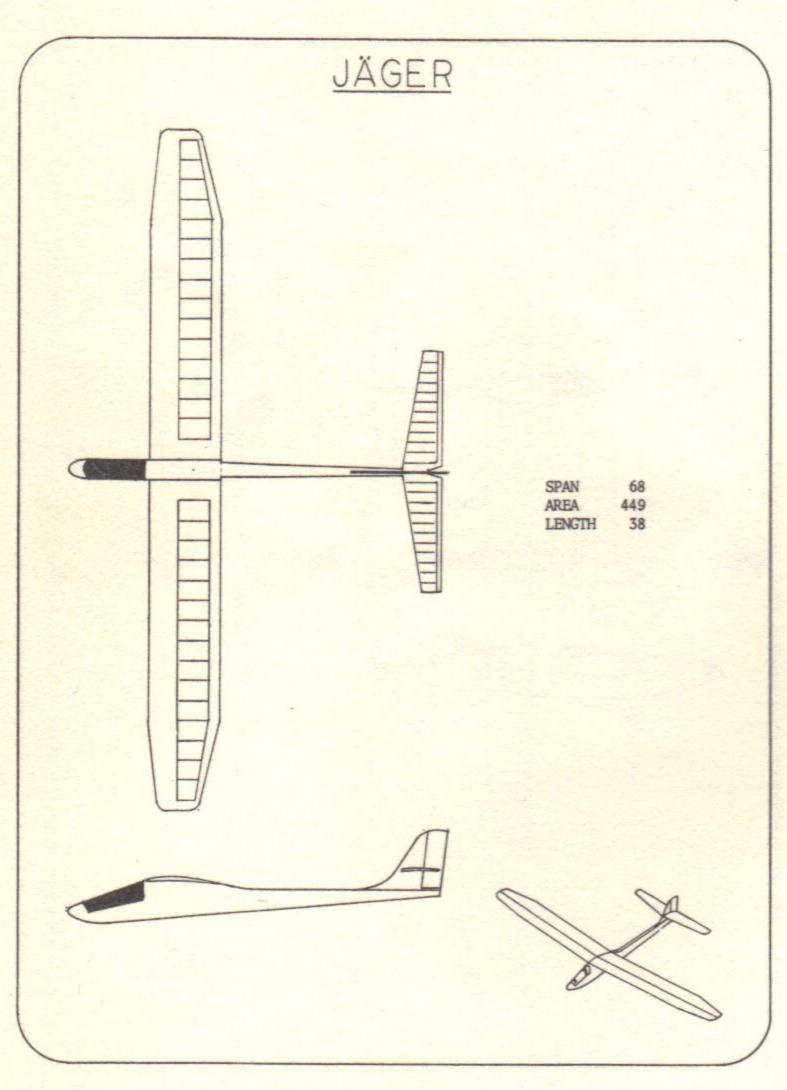


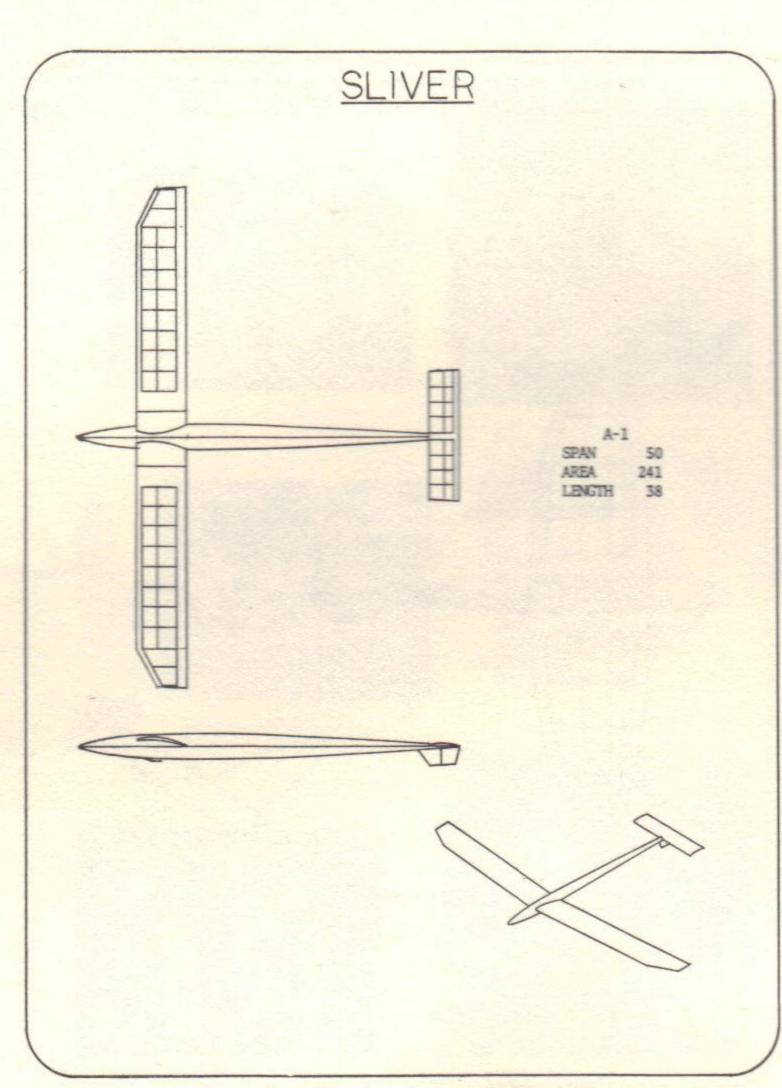


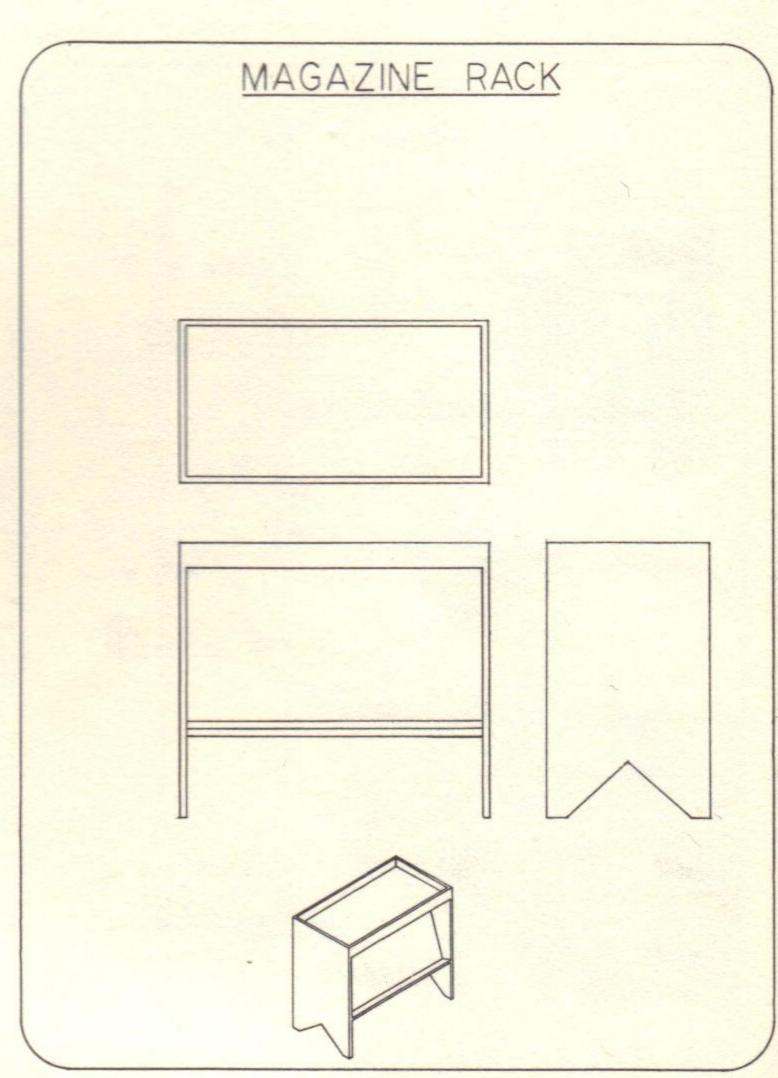


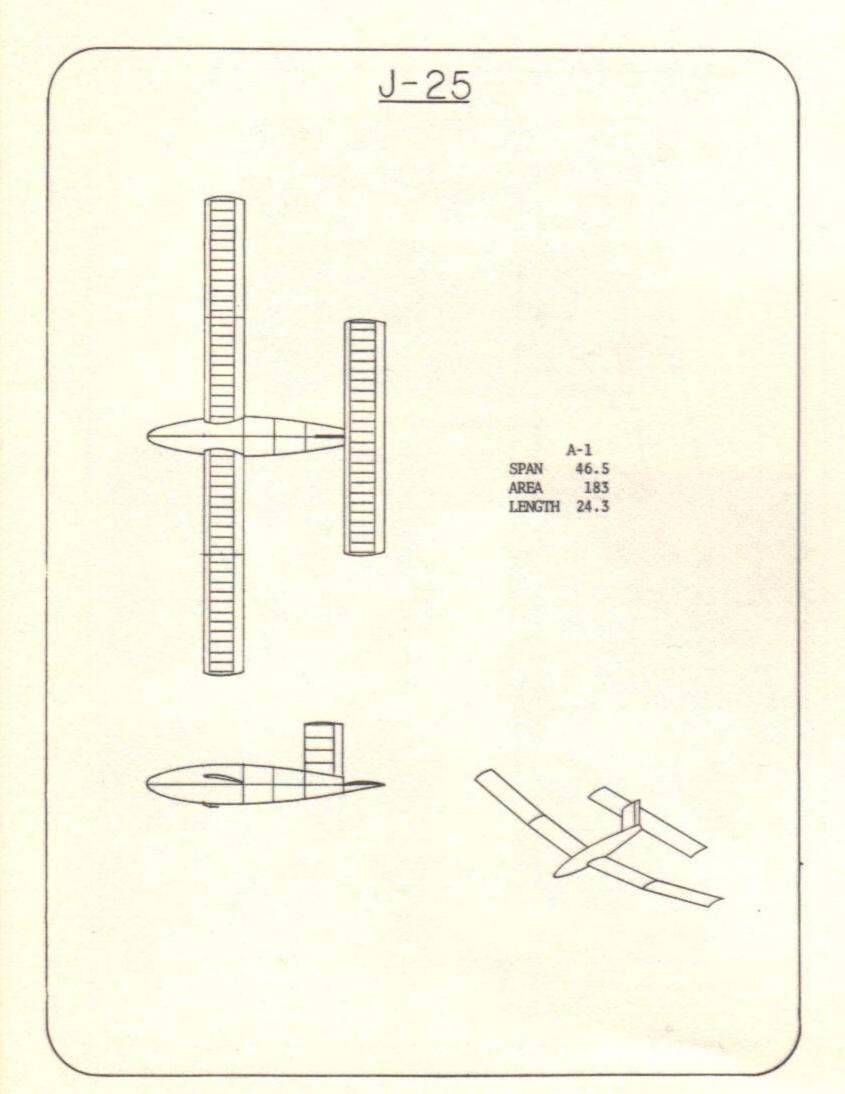


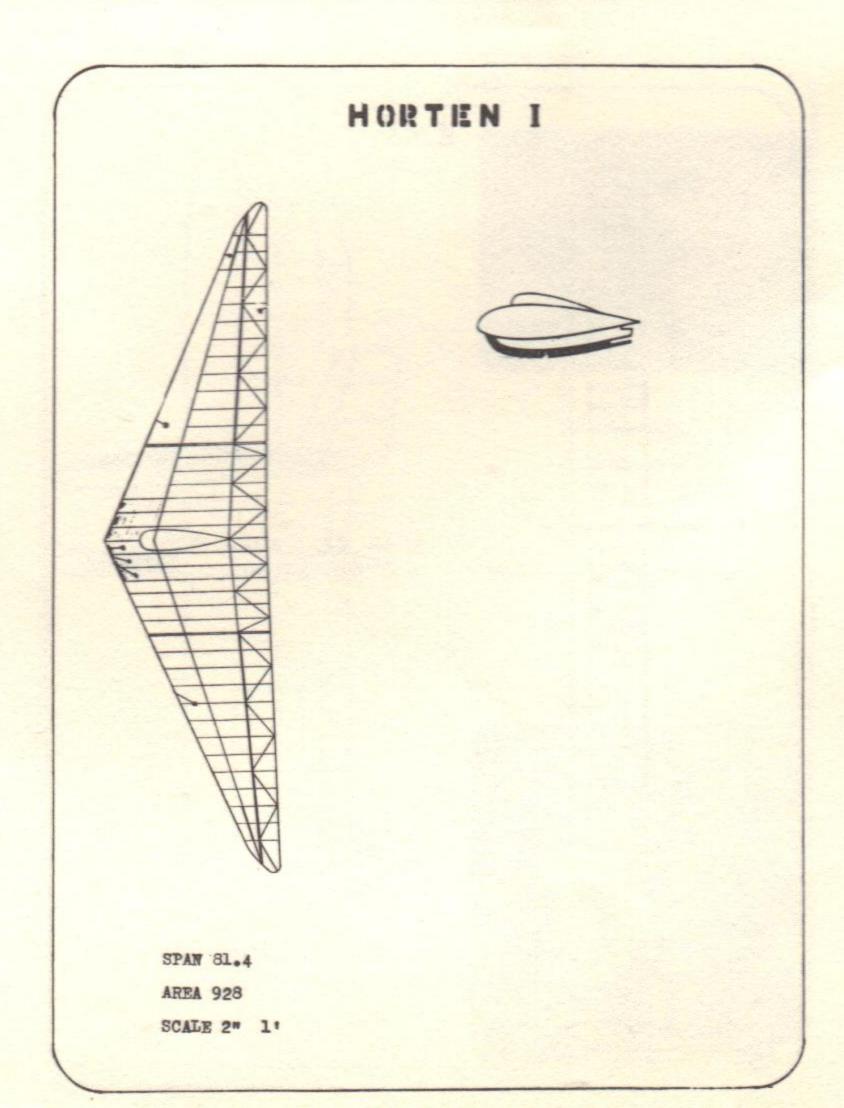


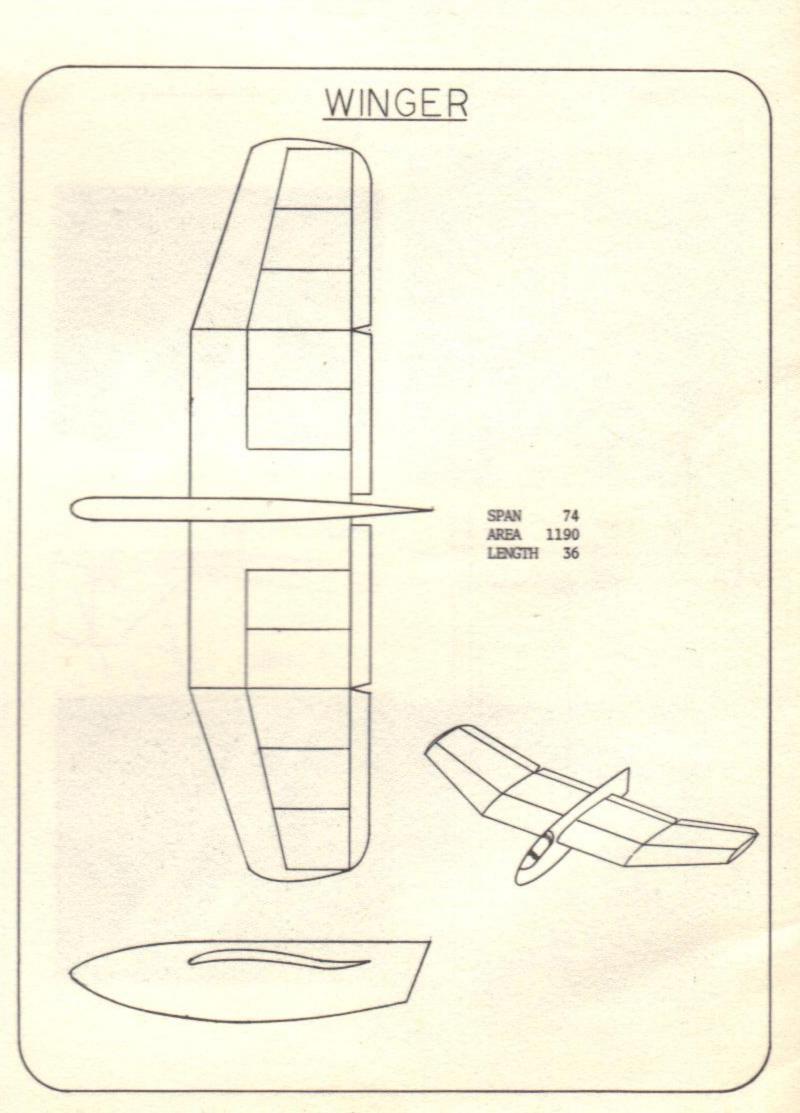


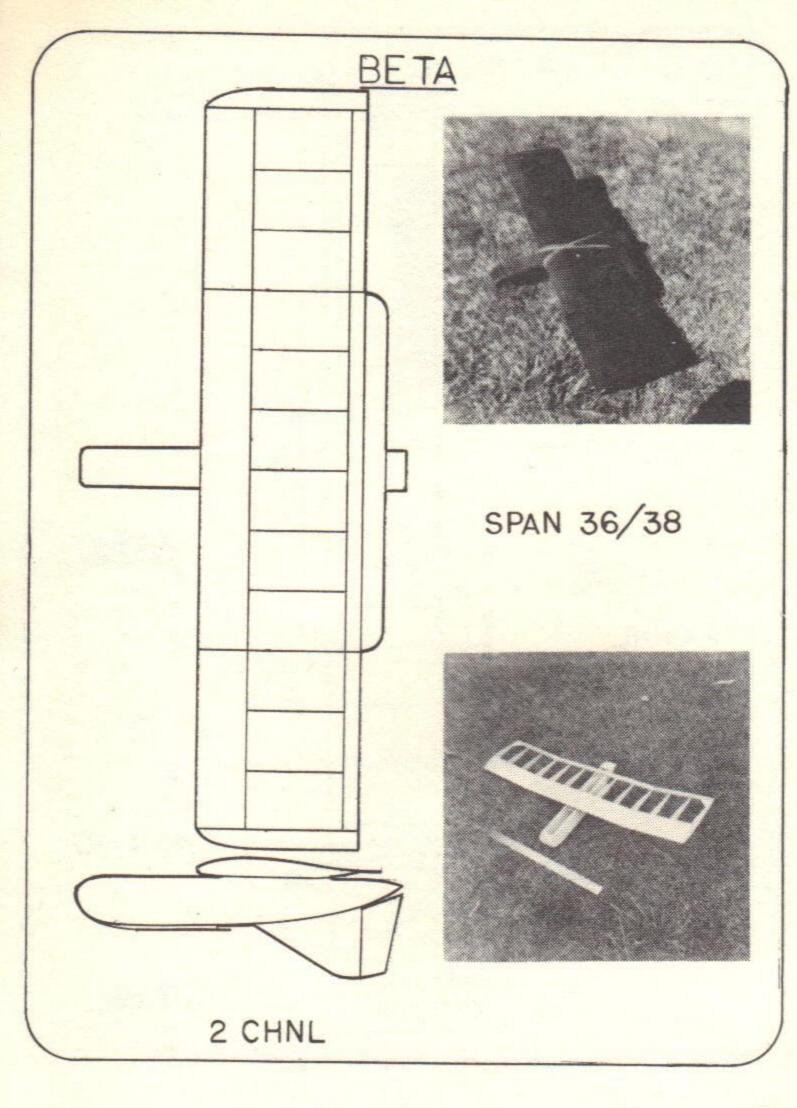


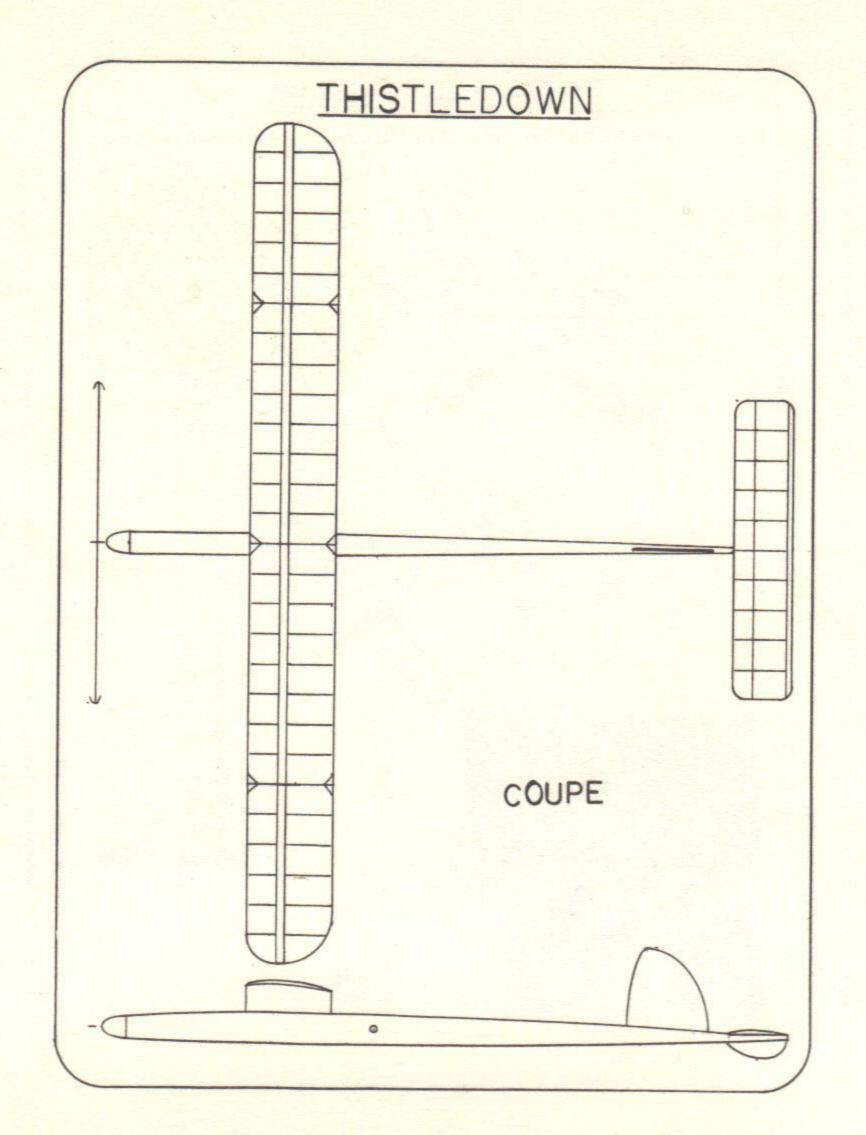


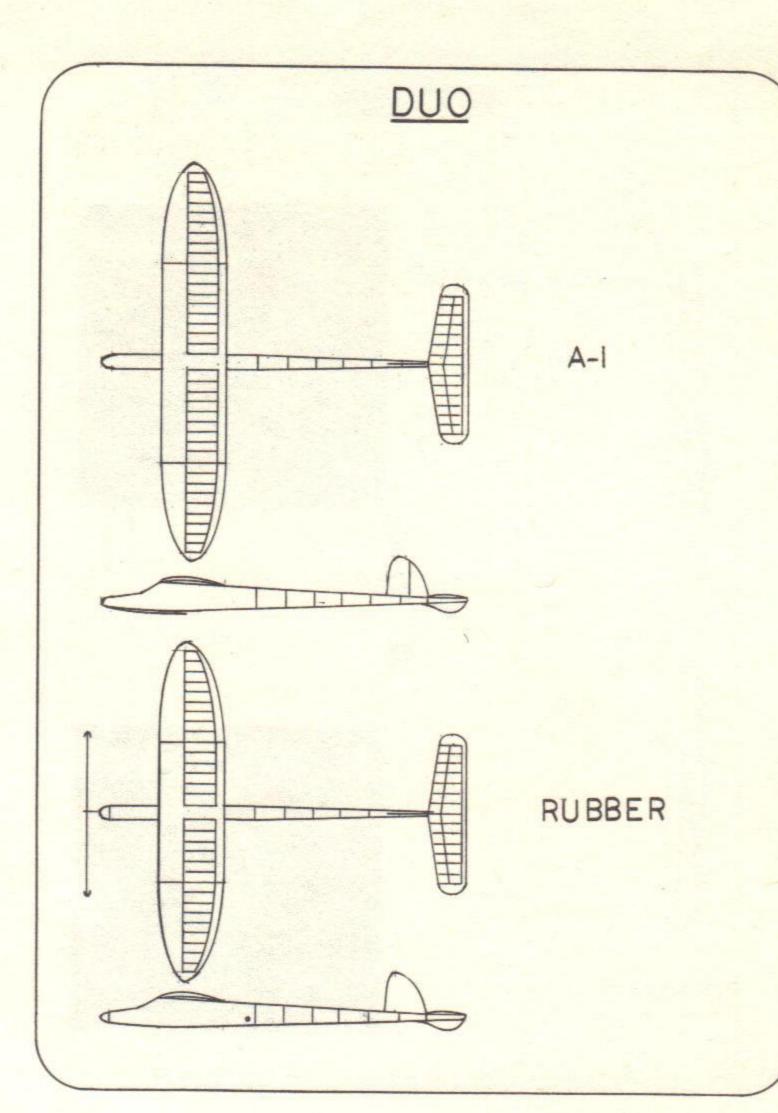


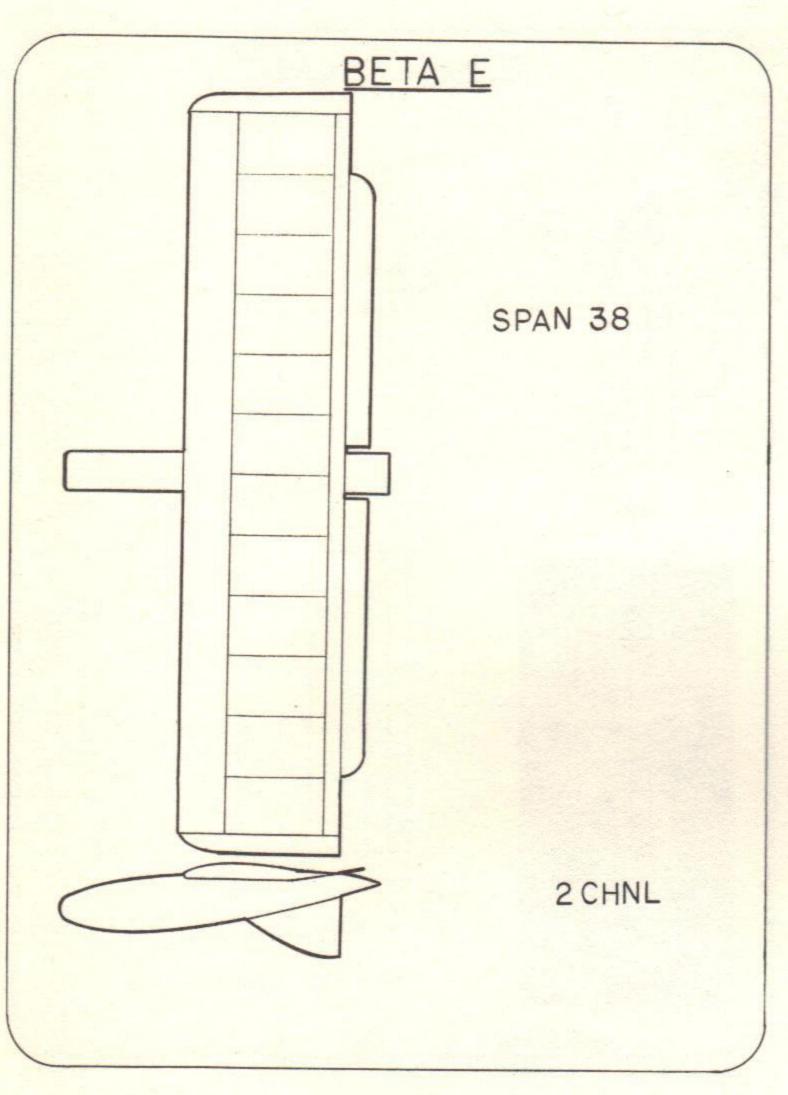


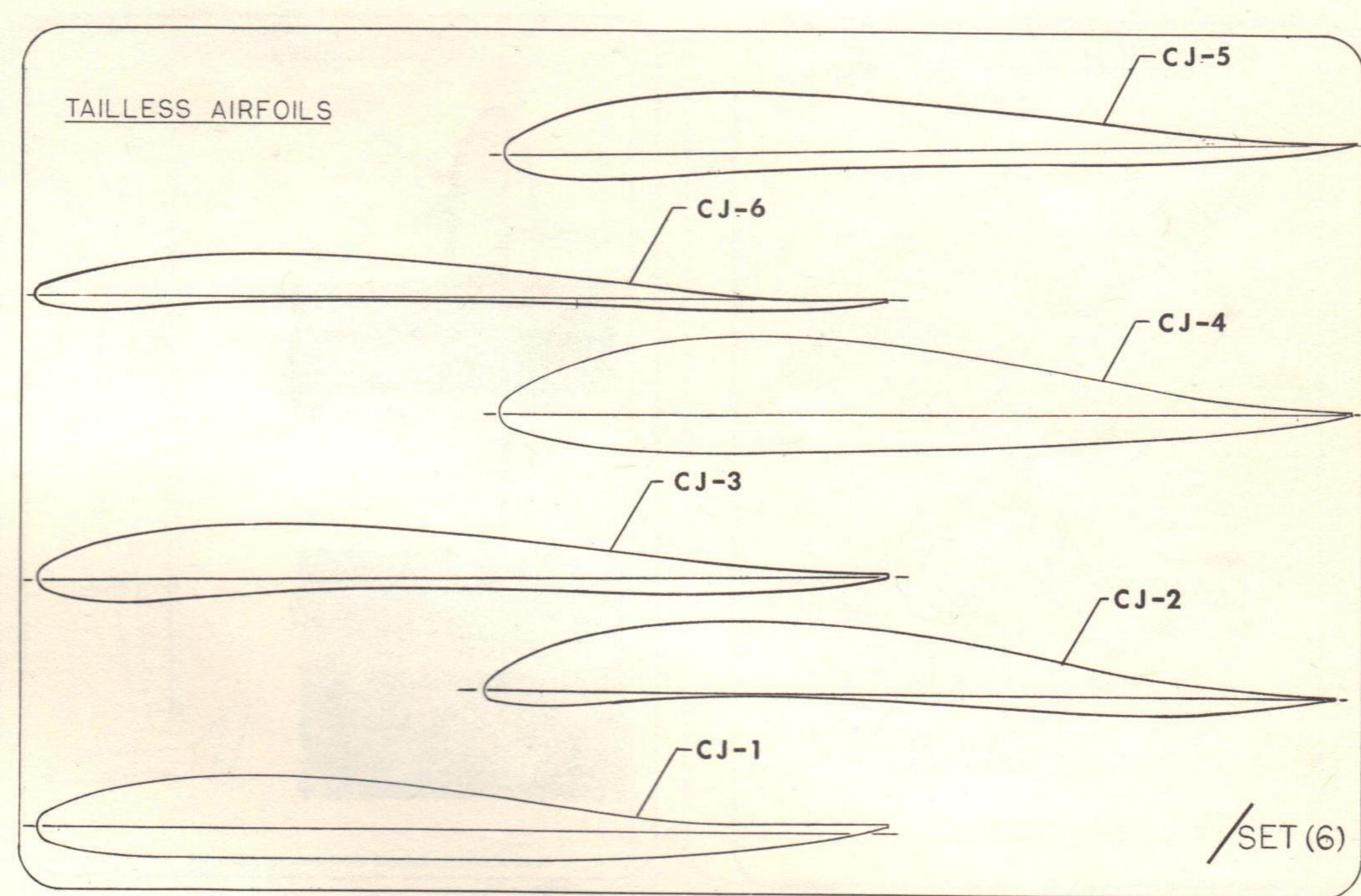


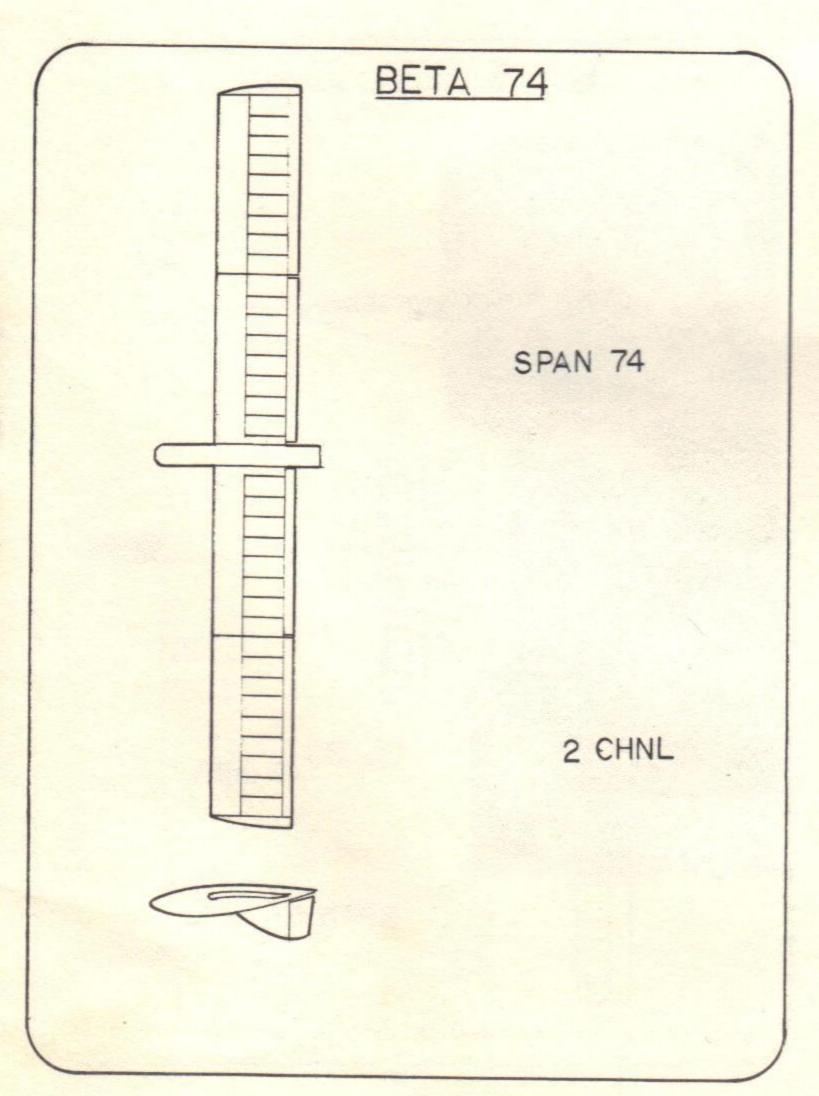


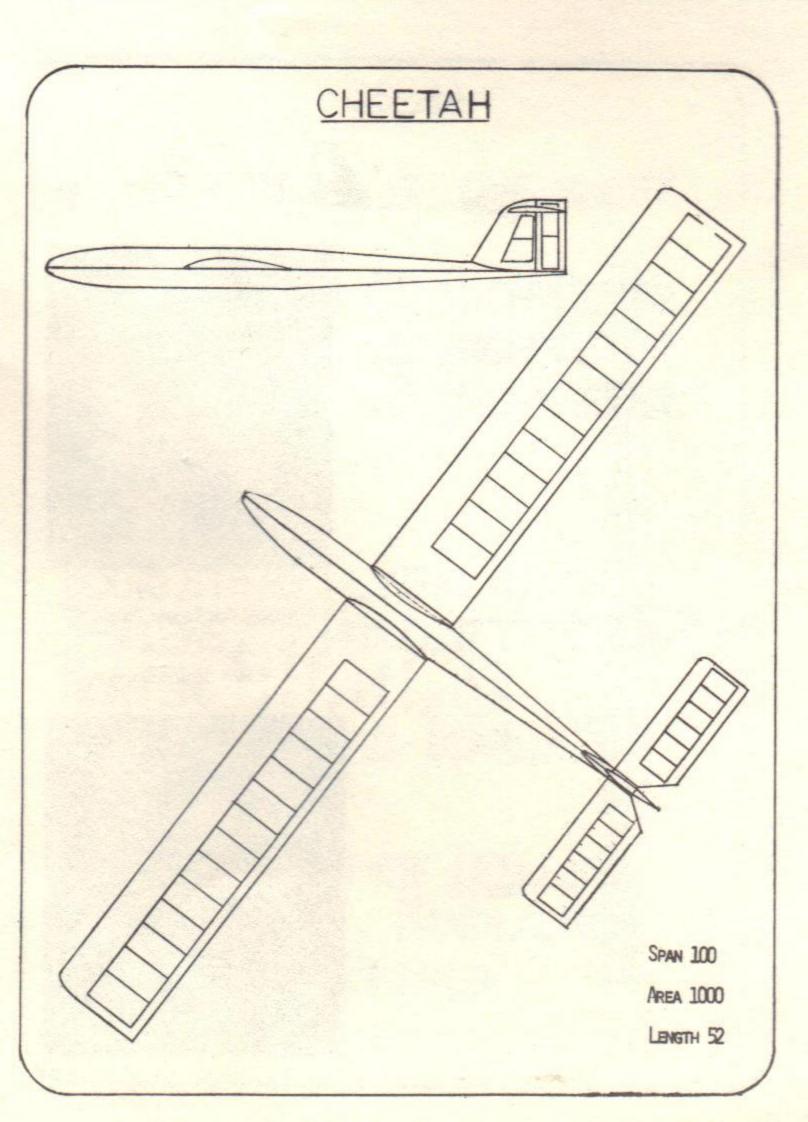




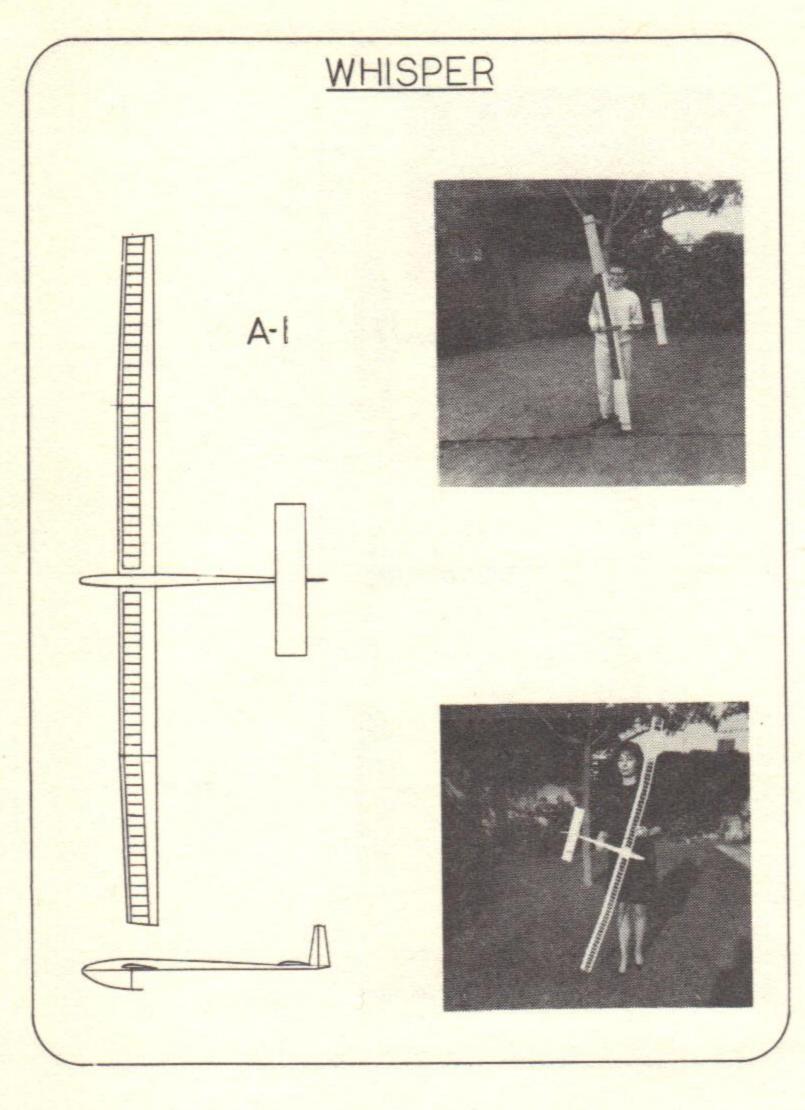


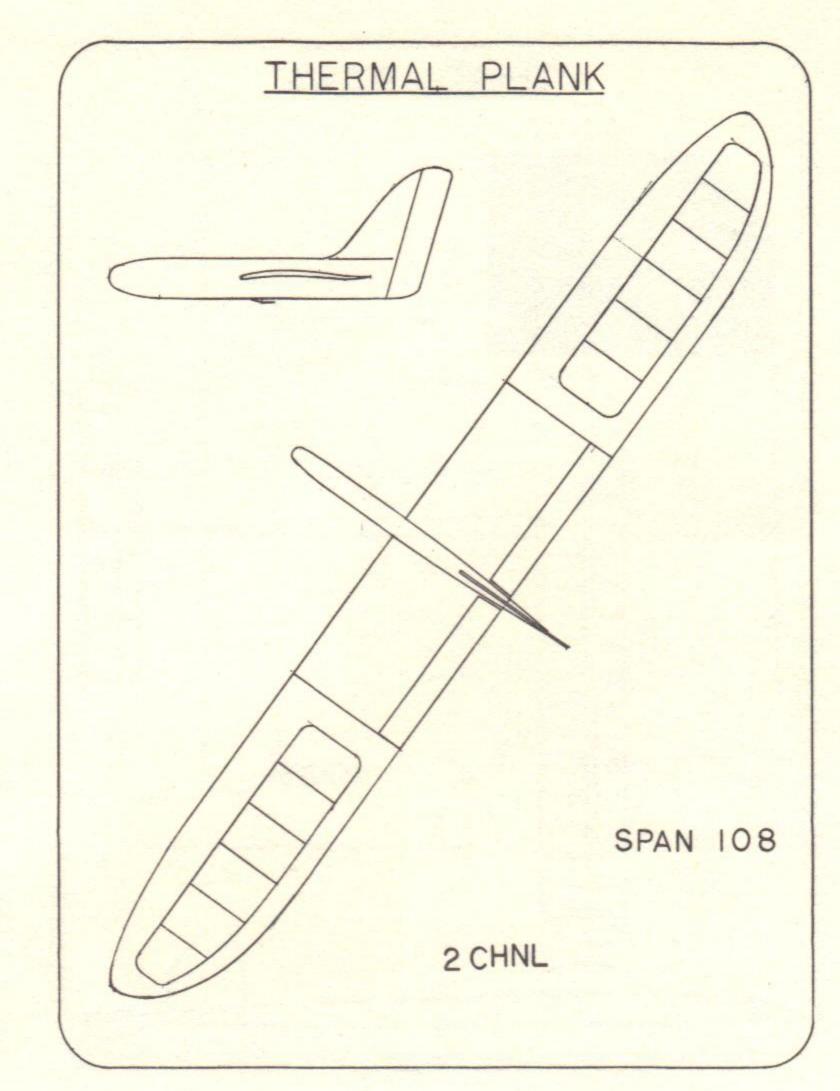


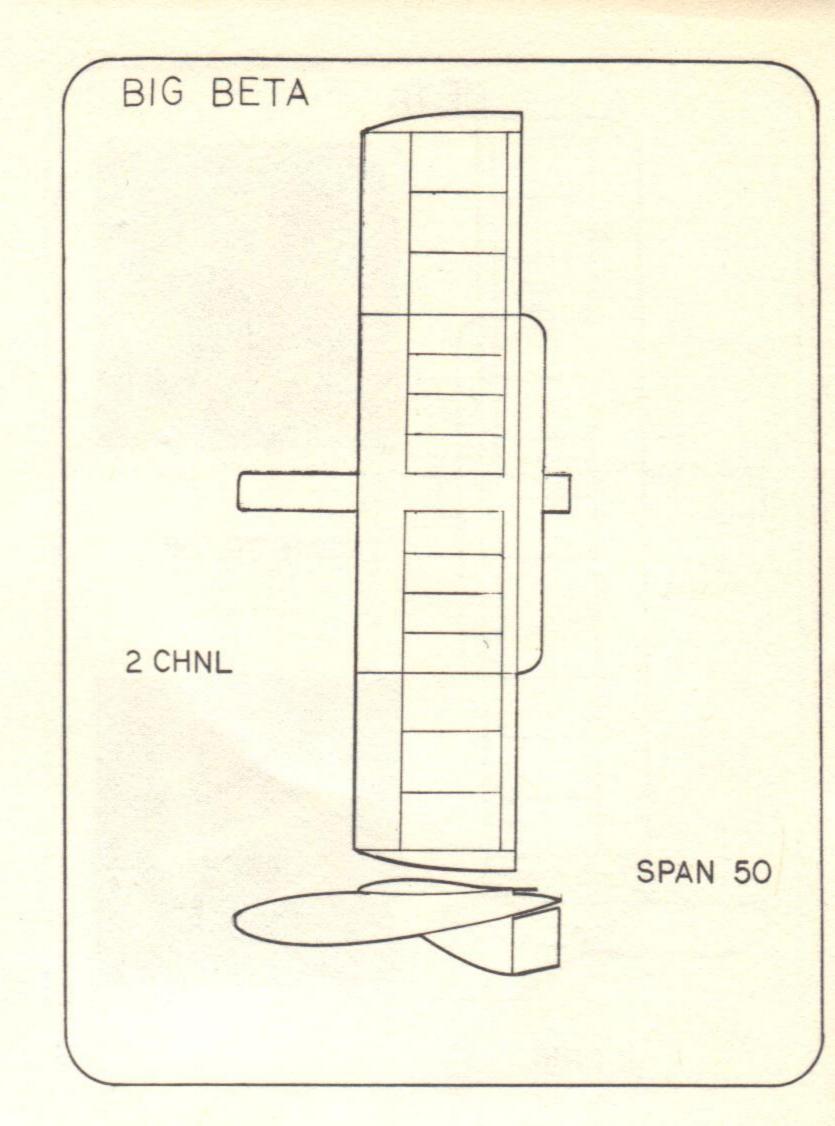




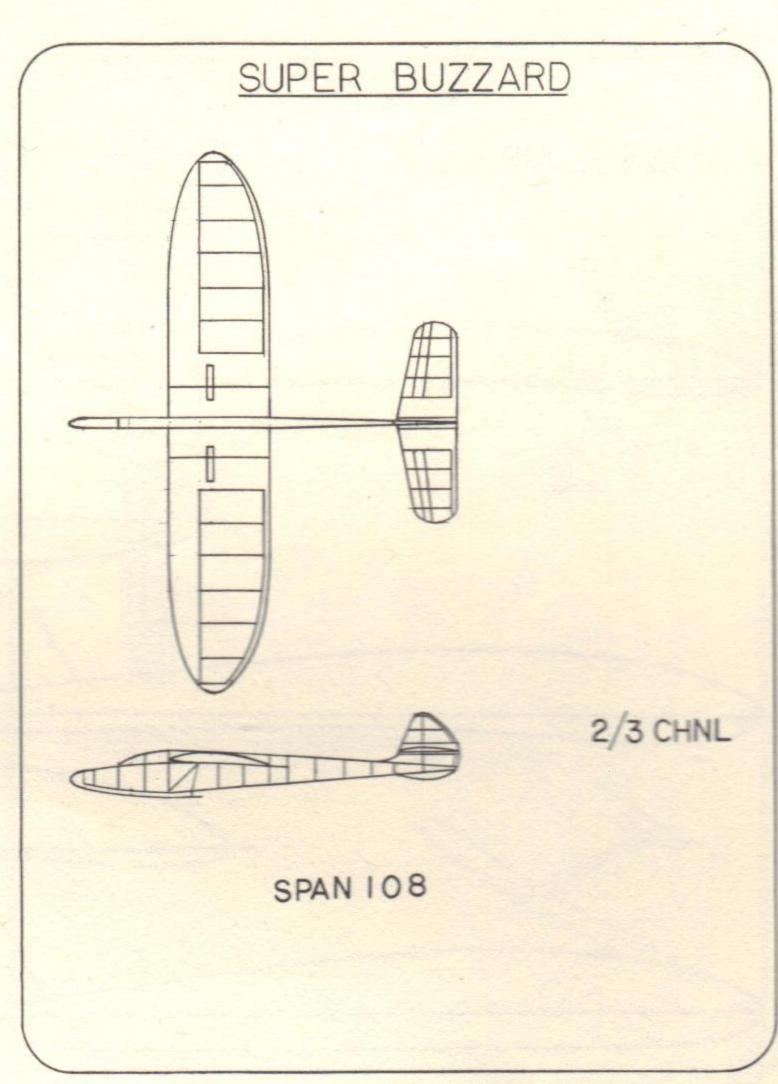
AIRFOIL ORDINATES AVAILABLE CLARK Y RAF 32 NACA 632015 NACA 6409 S.1. (TAILLESS) MONSON M-4 KACZANOWSKI GF-6 MODELL VERSUCHS ANSALT MVA-123 MVA-301 EPPLER E-385 EPPLER E-387 GOLDBERG G-610-B LUCKY LINDY HANSEN A-2 BENEDEK B-8356-6/3 BENEDEK B-8556- b SIGURD ISACSON S.I.-63008 SIGURD ISACSON S.I.-63010 LINDNER A-2 CJ-10 A-2 GÖTTINGEN 549 ODENMAN A-2

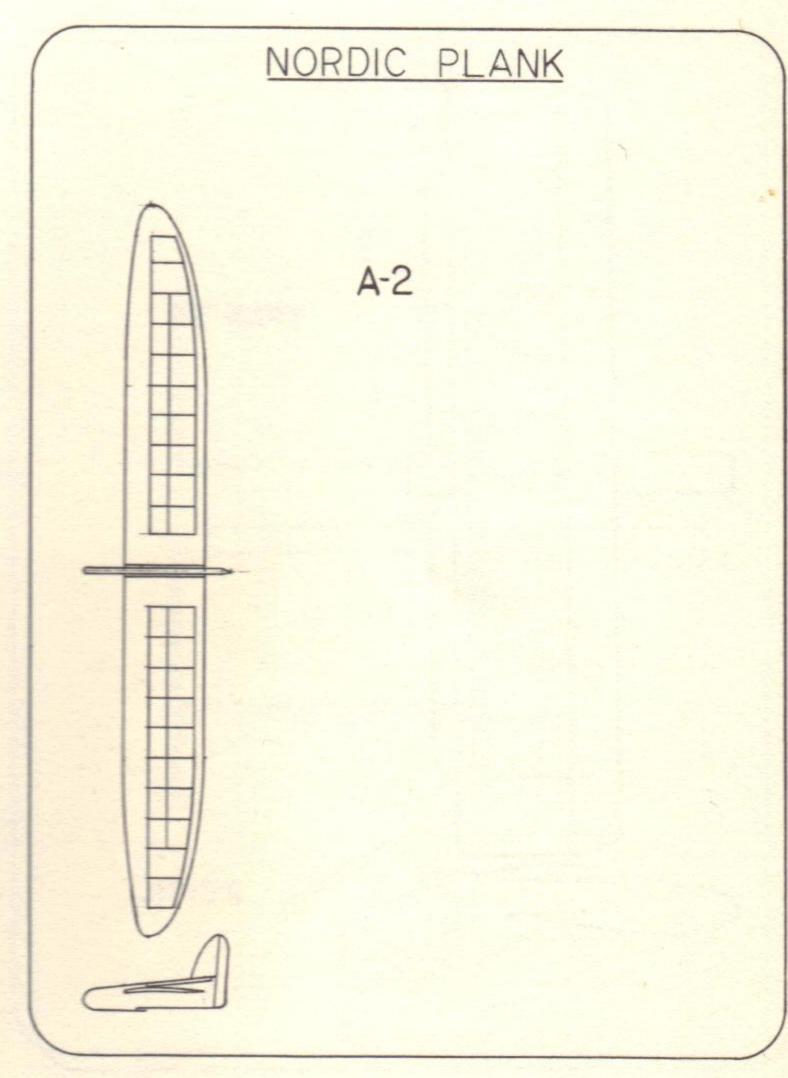


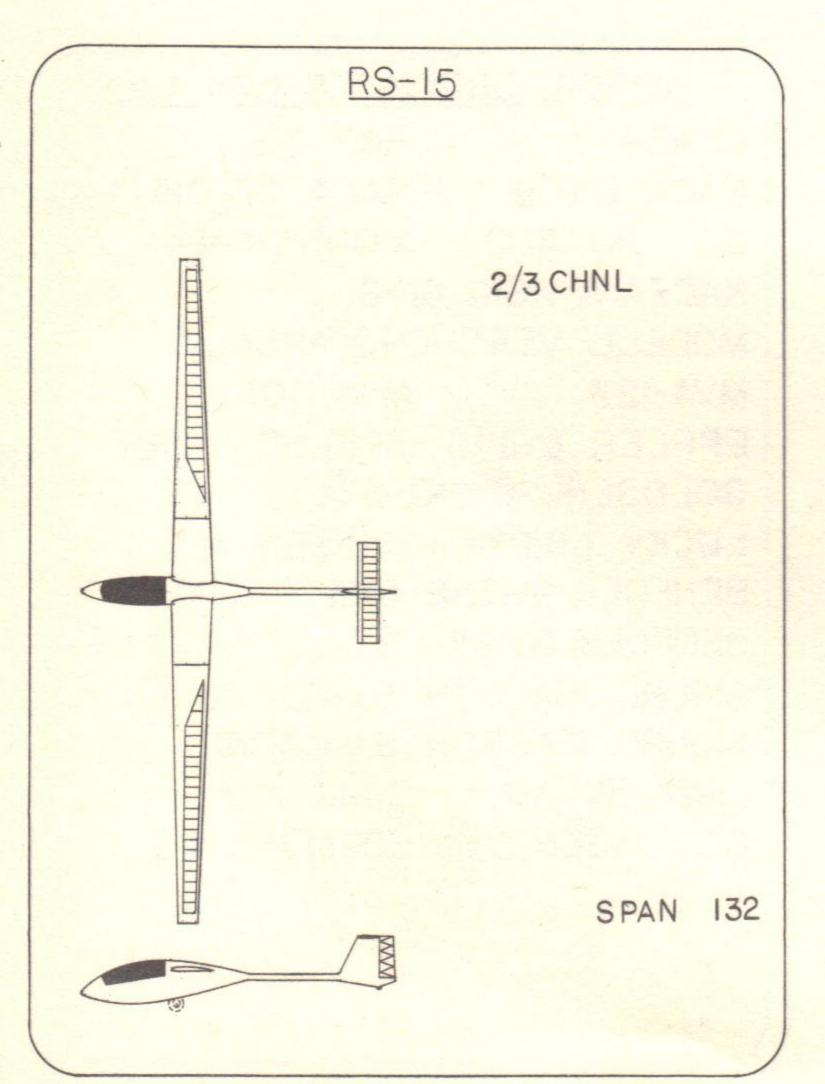


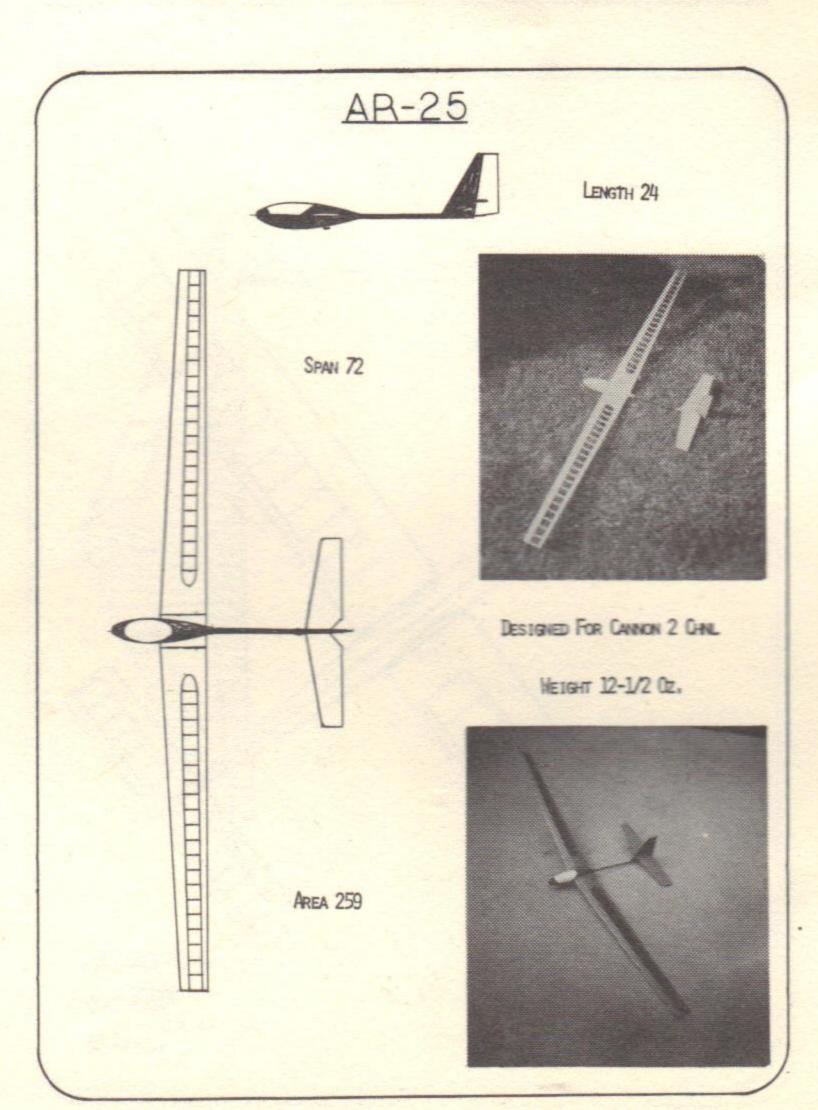


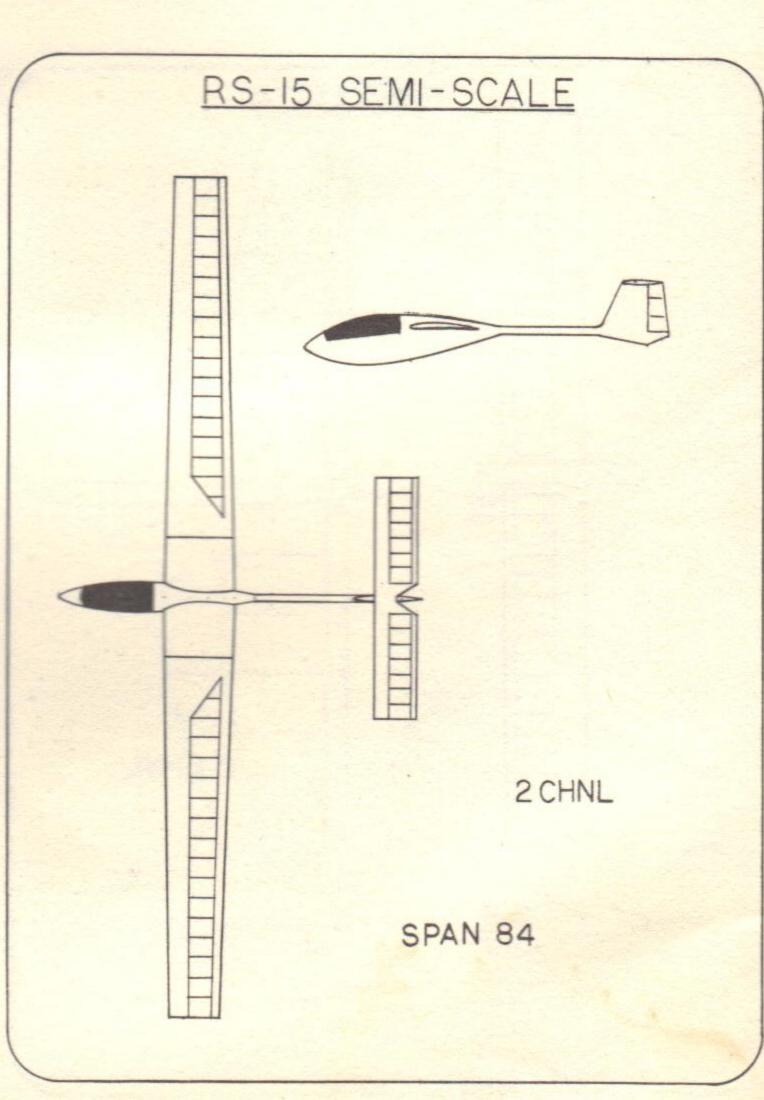


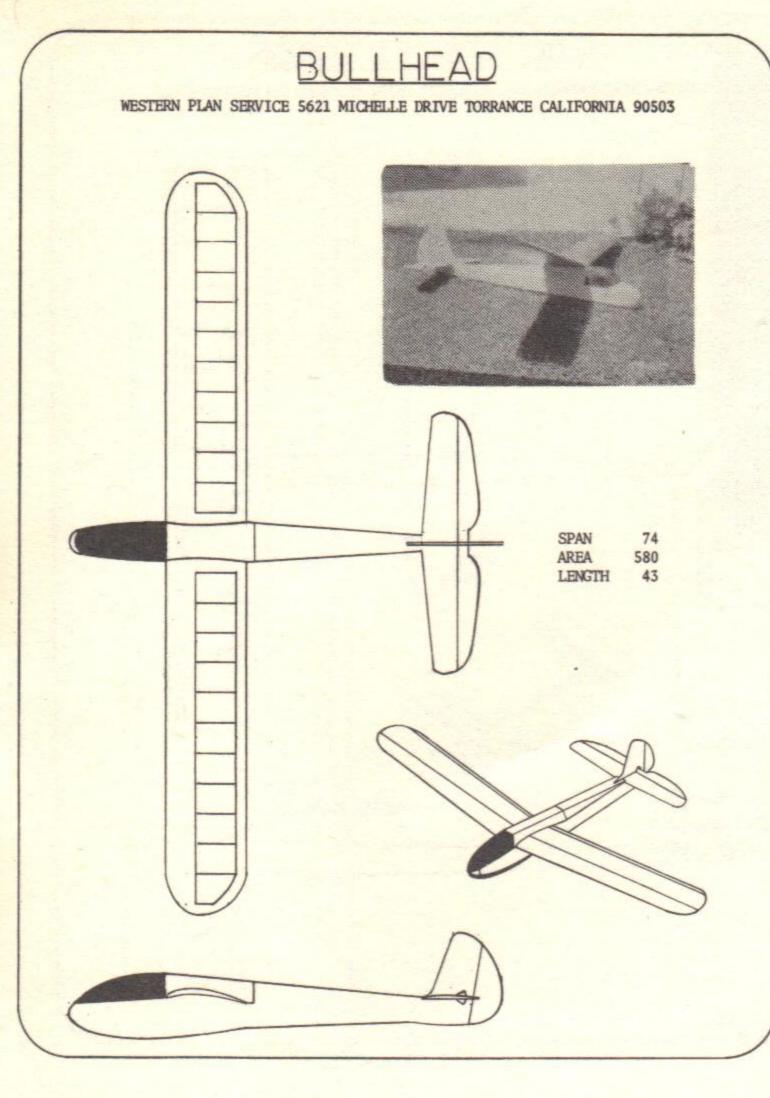


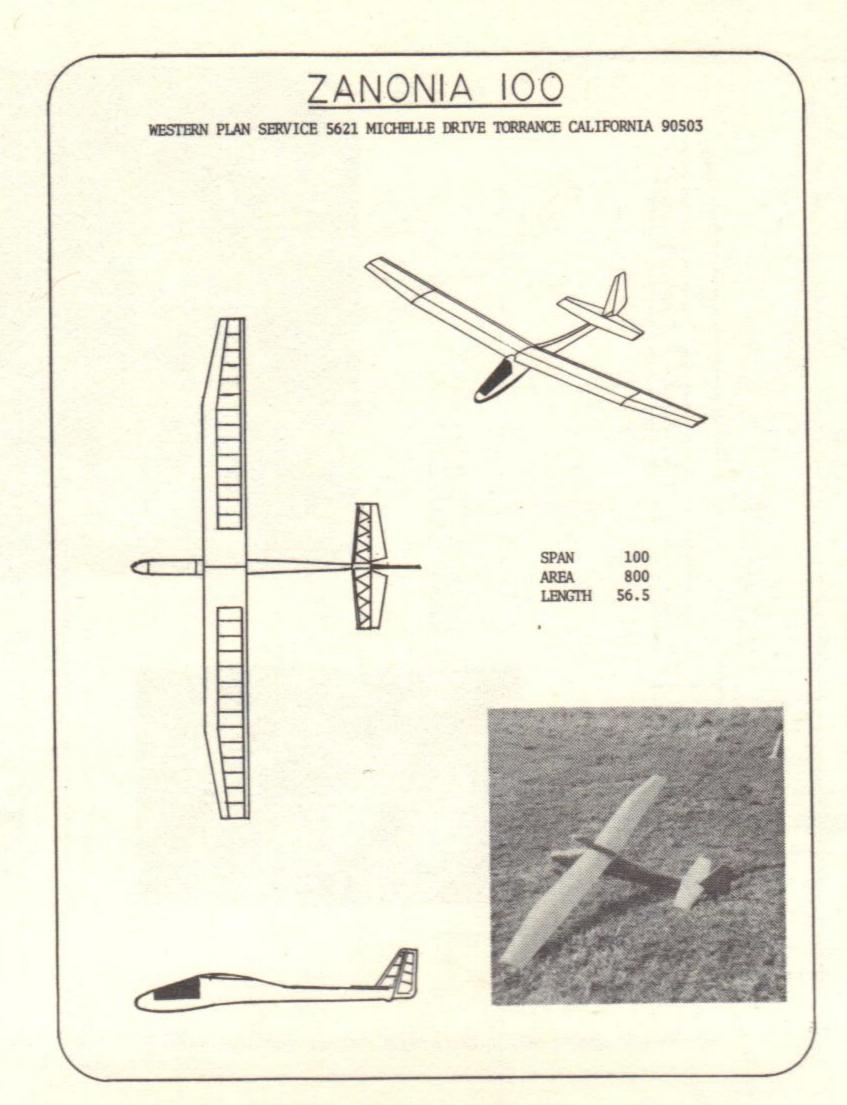


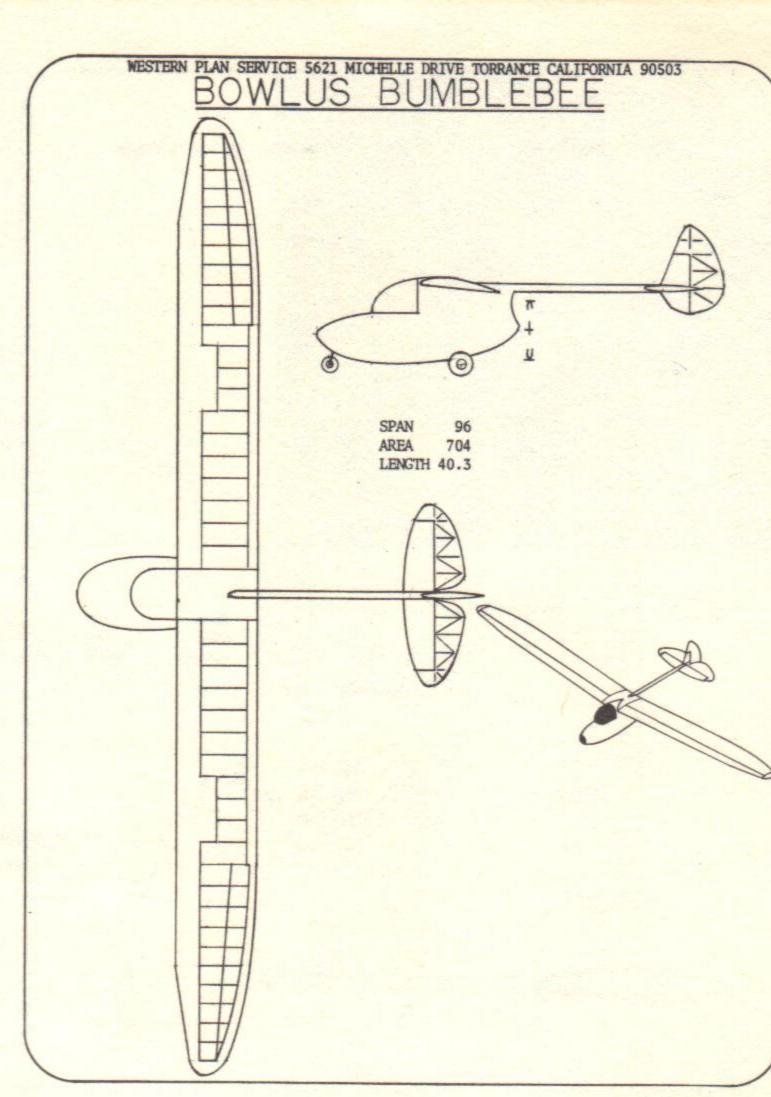


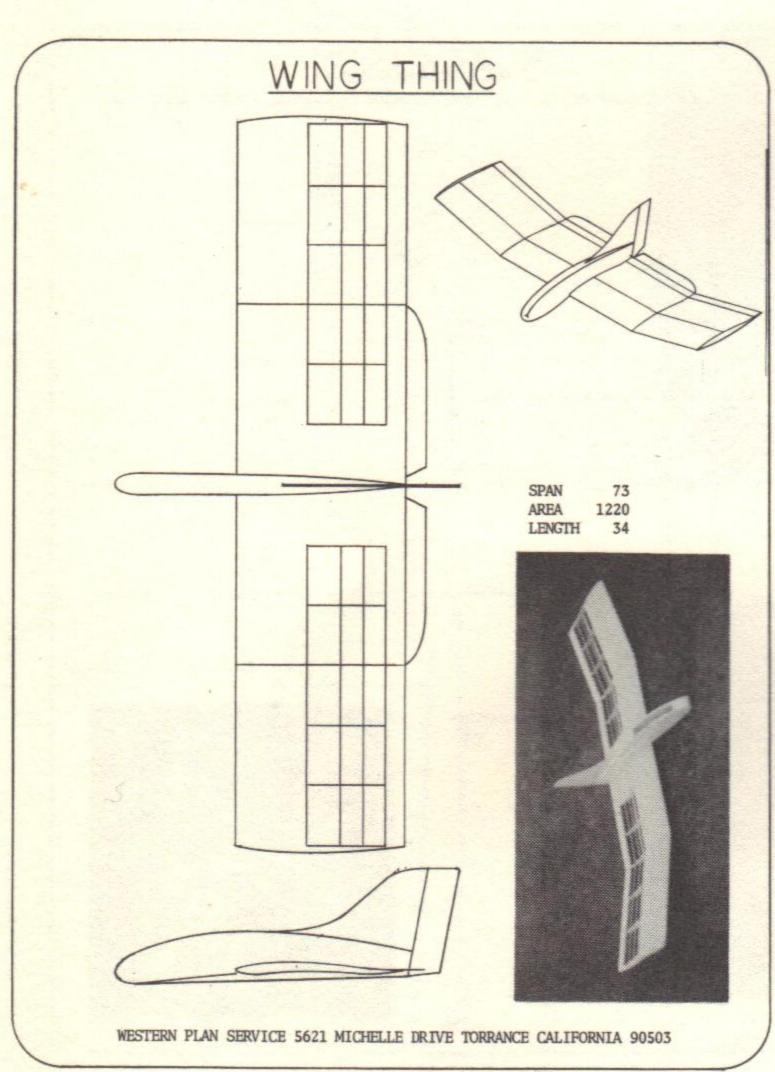


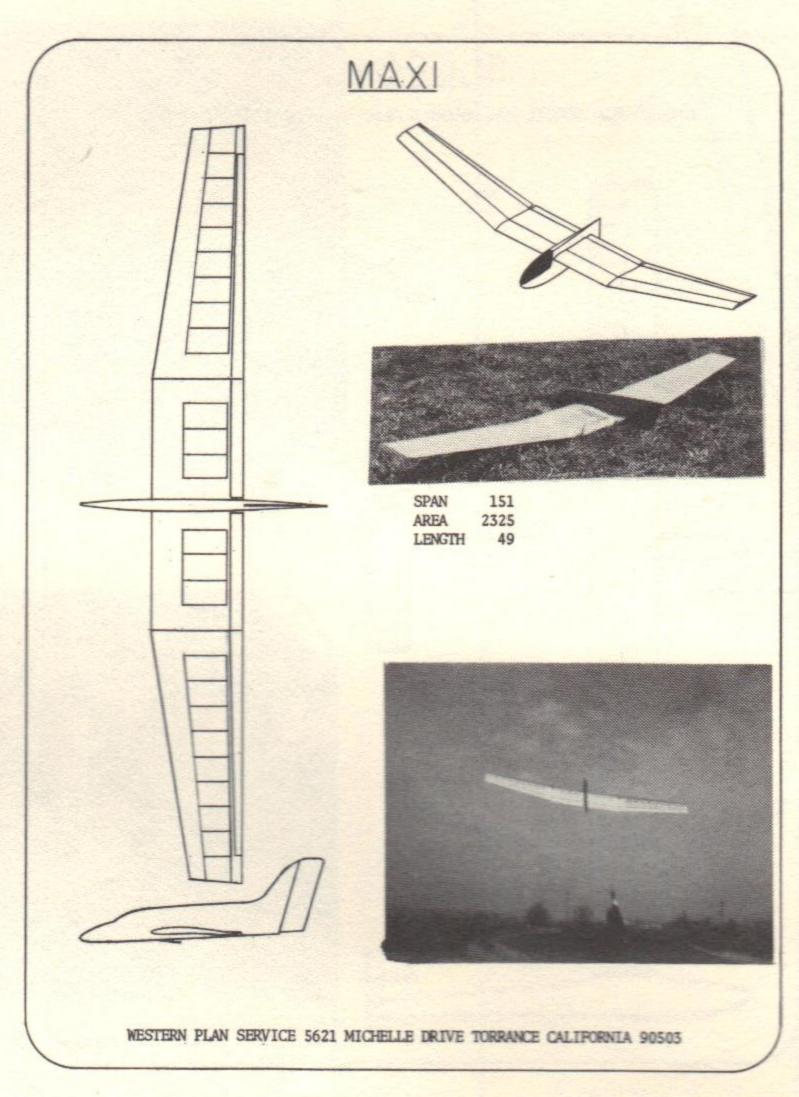


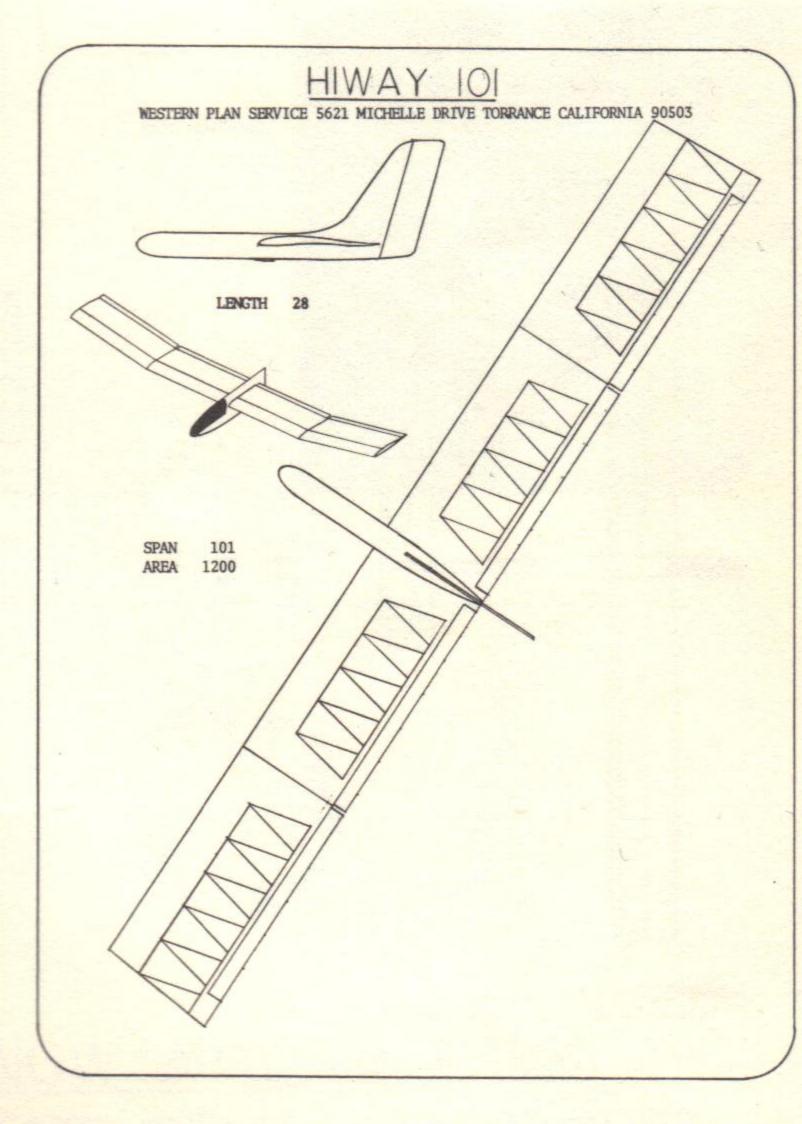


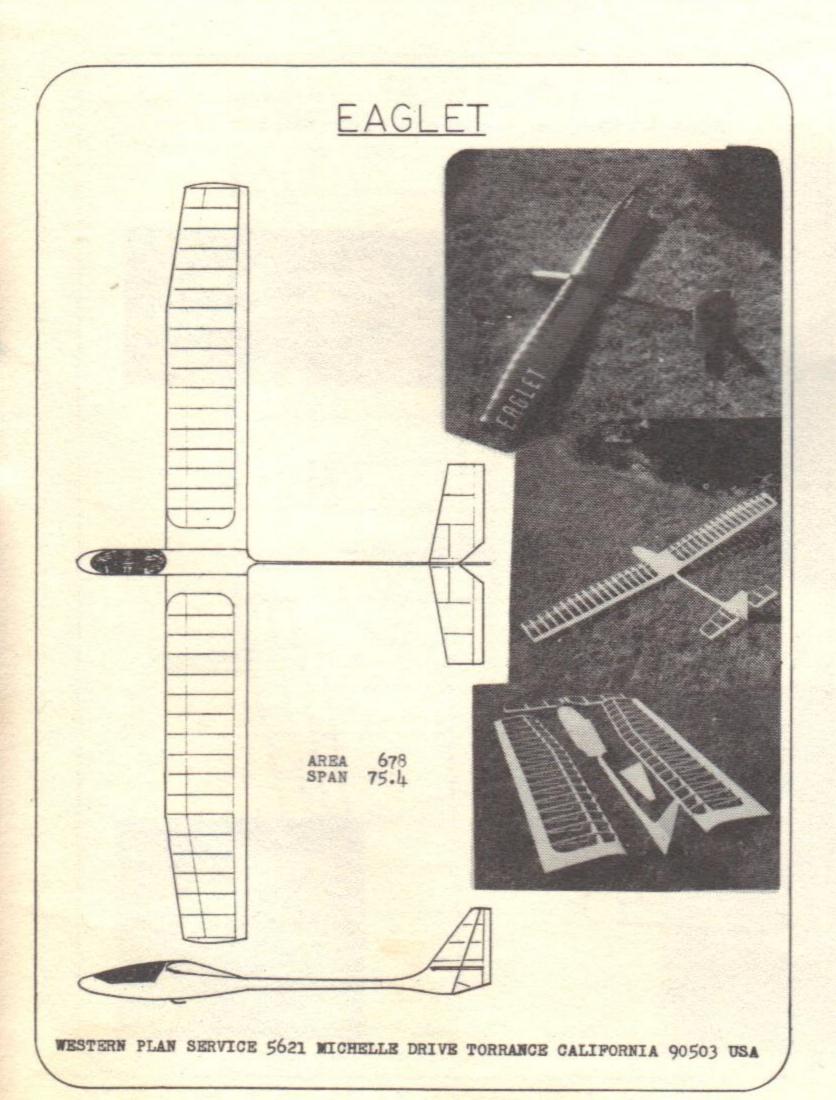








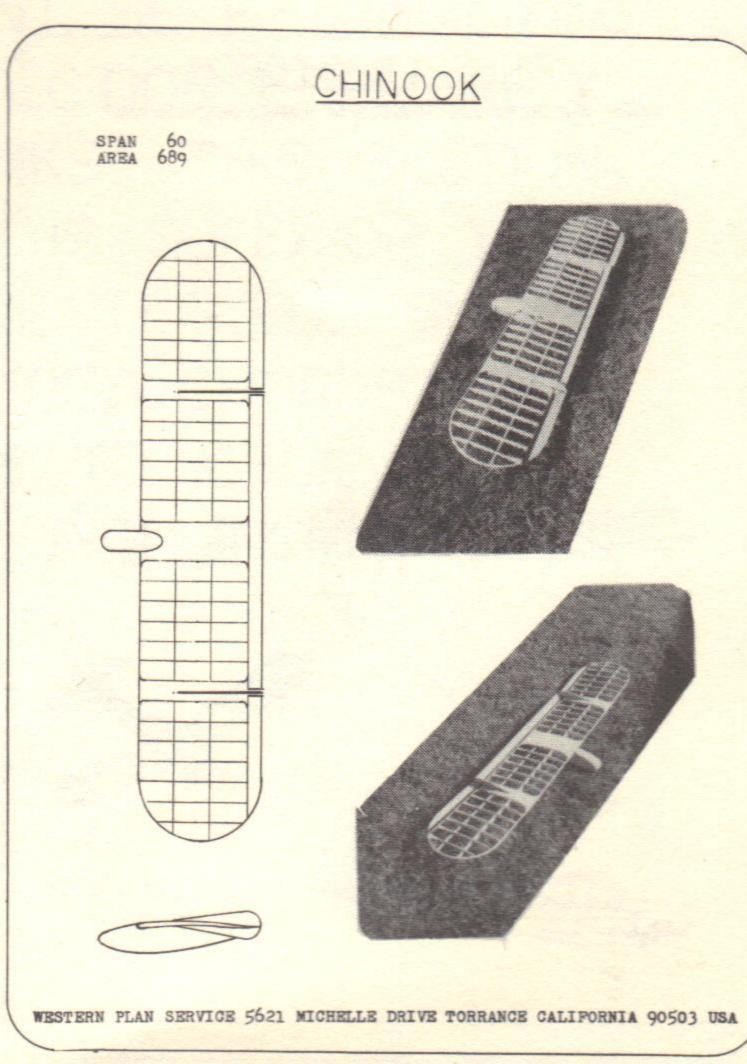


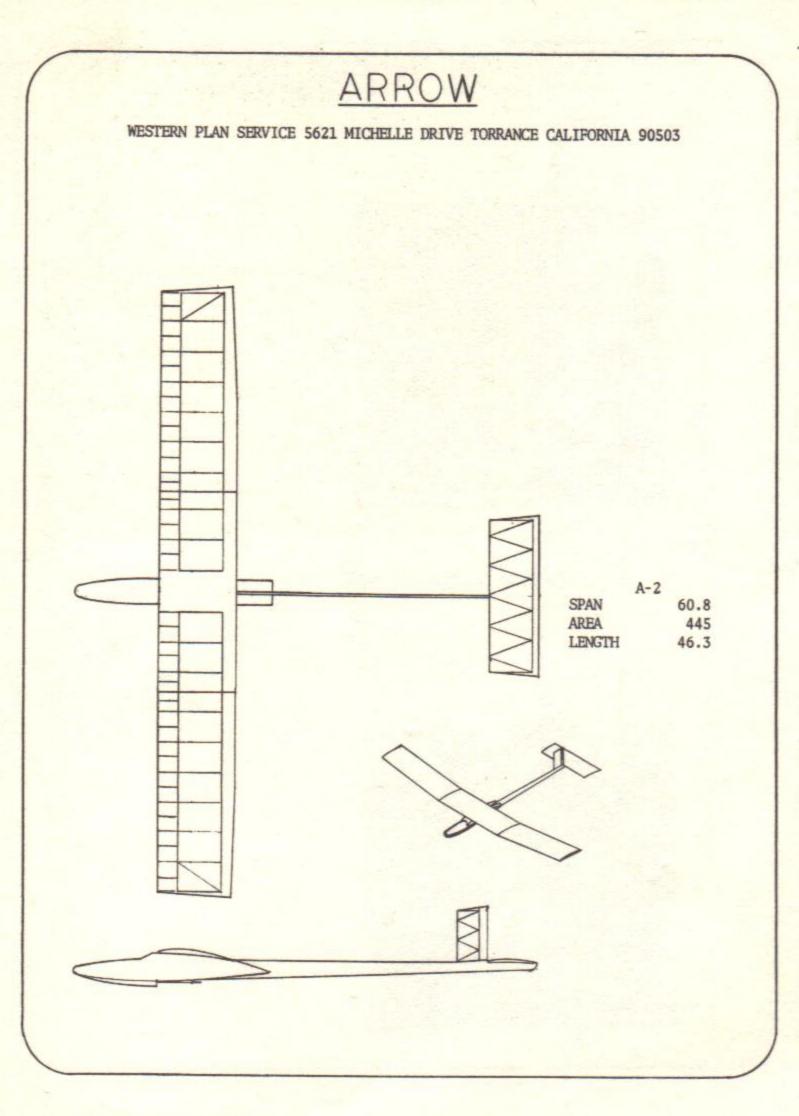


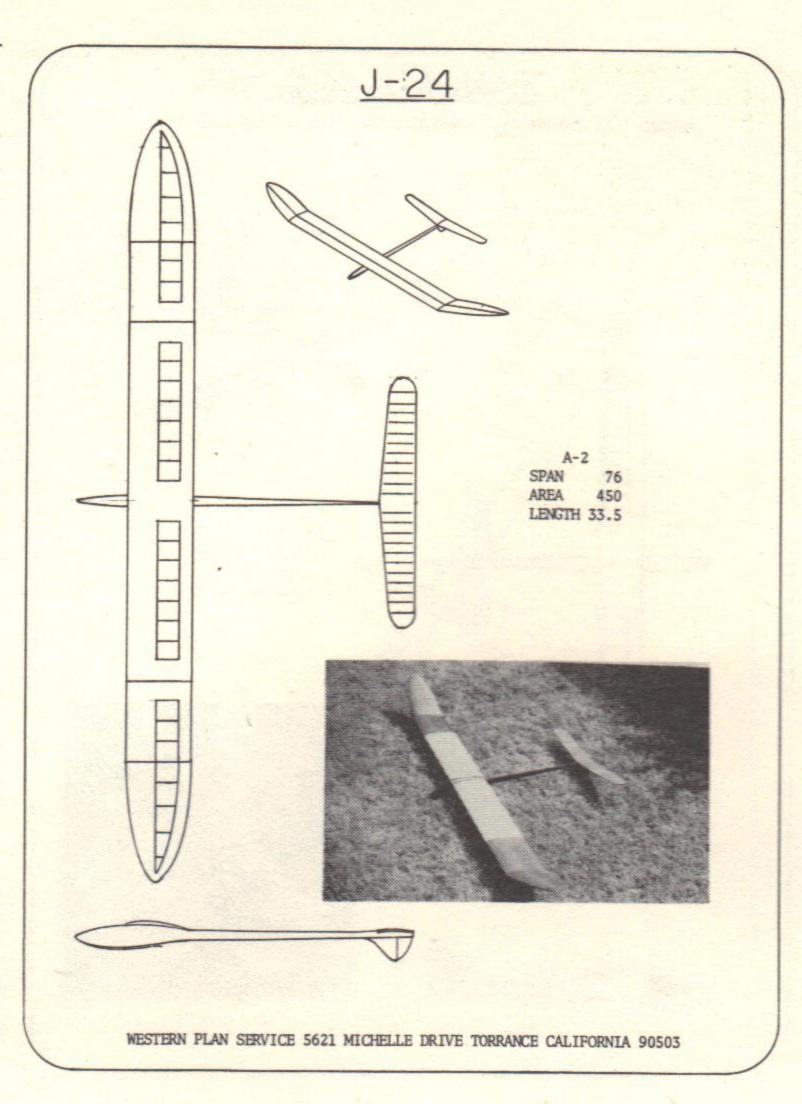
HORTEN I AND II INCH-METER HORTEN III .9 INCH-METER HORTEN IV .8 INCH-METER HORTEN IV .8 INCH-METER

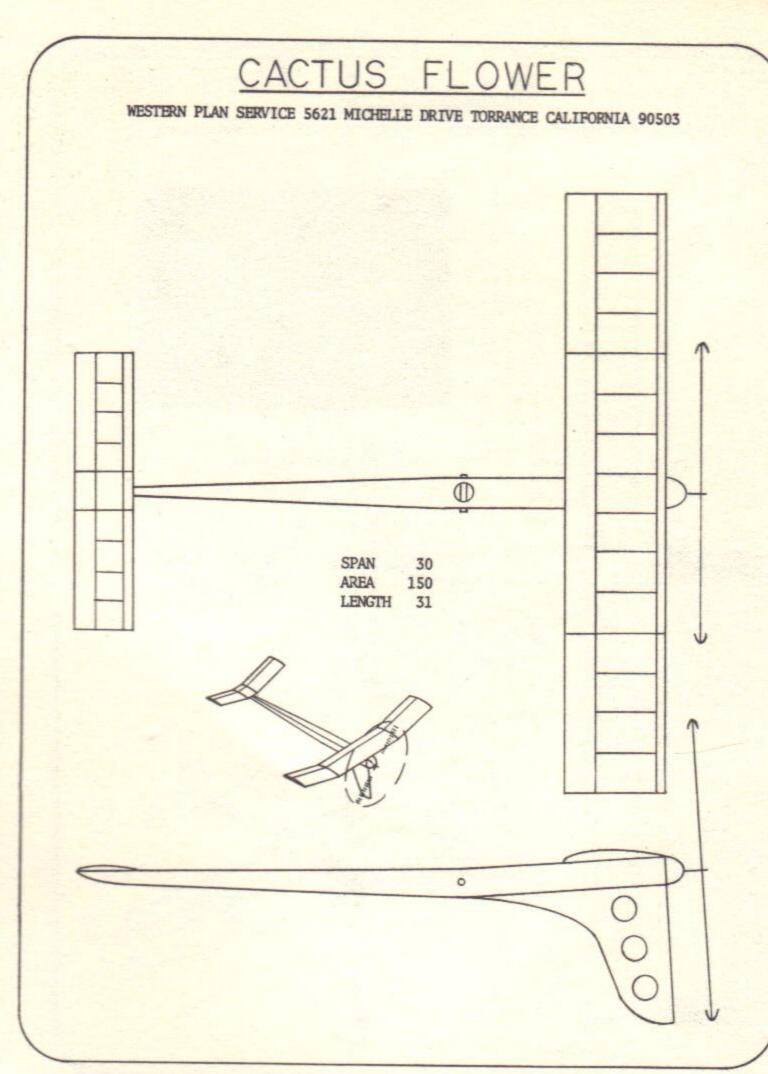
BOOKLET- 6 FLYING WINGS 3-VIEWS, 3 HORTEN IV PICS. HORTEN I, II, III, IV, PIONEER II AND ICARUS V

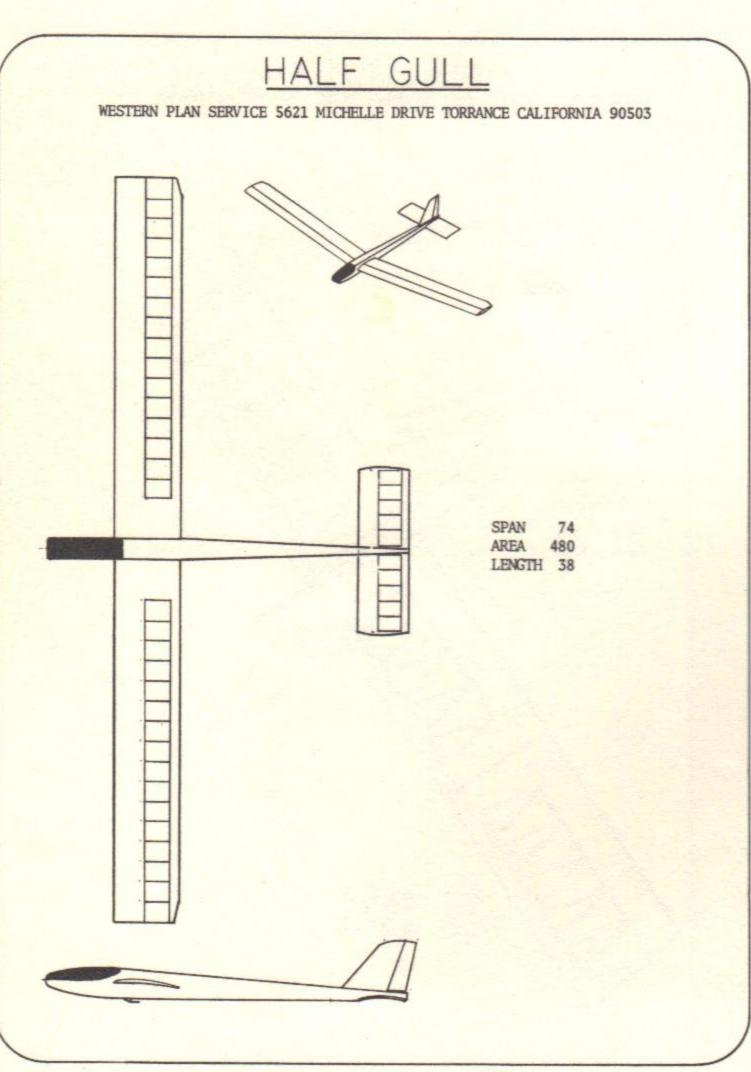
FOUR OLD TIMER TAILLESS 2 TOWLINERS, HANDLAUNCH AND RUBER POWERED

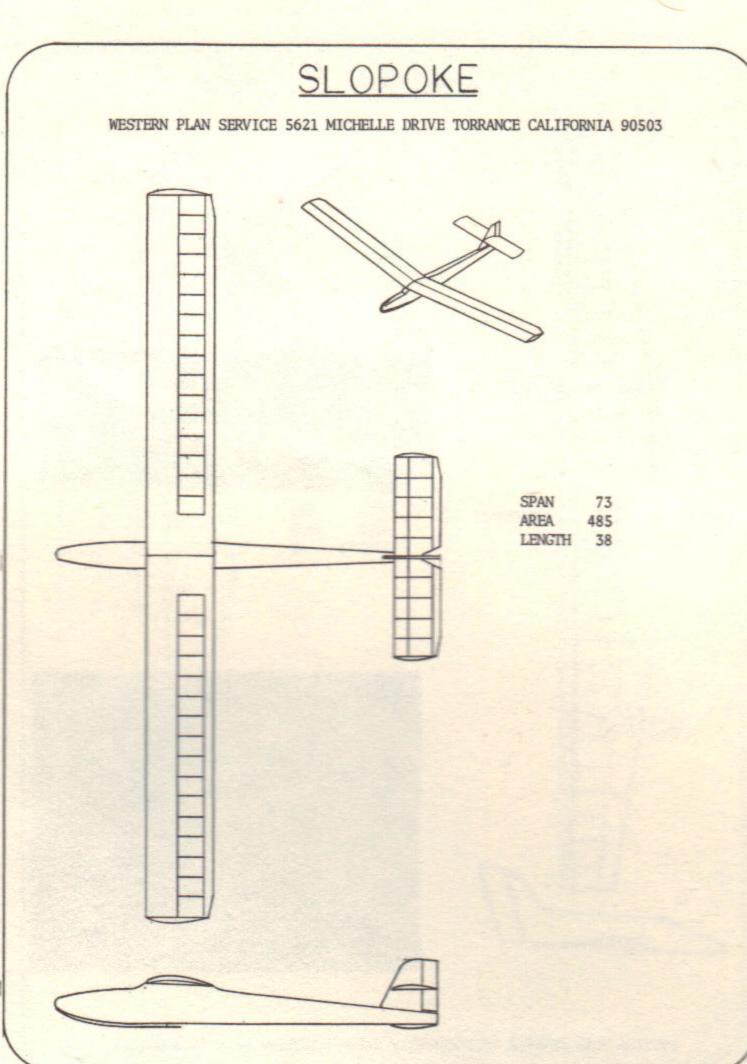


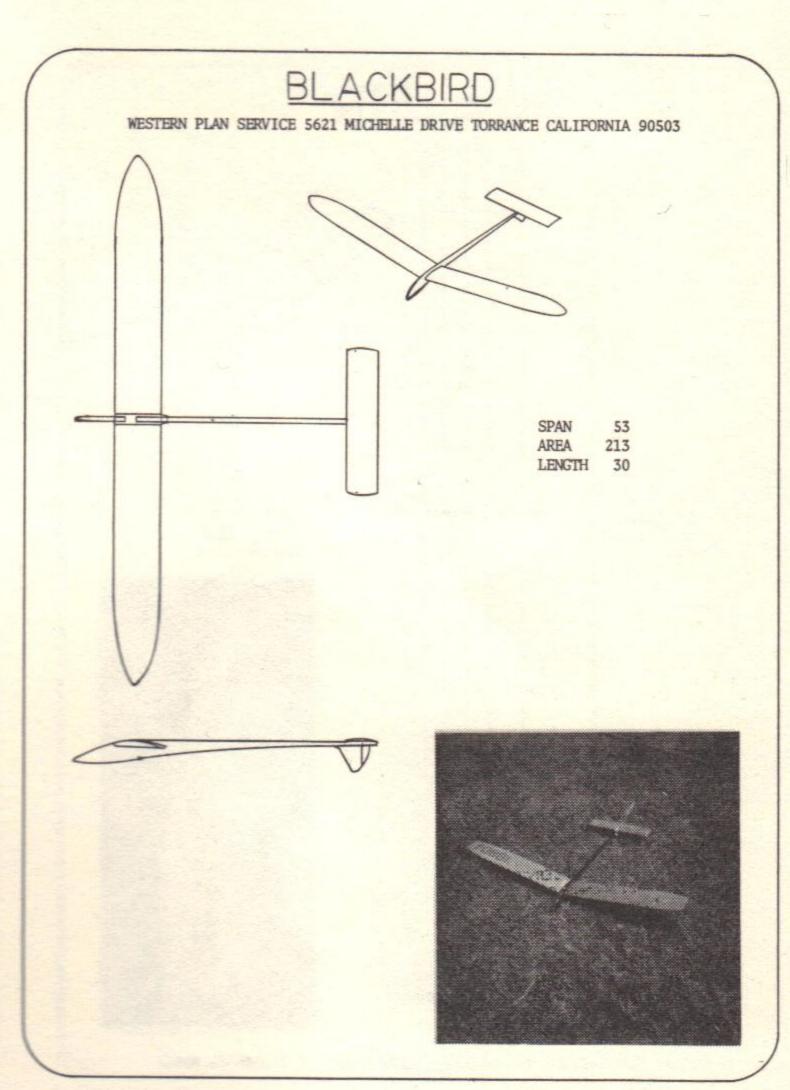


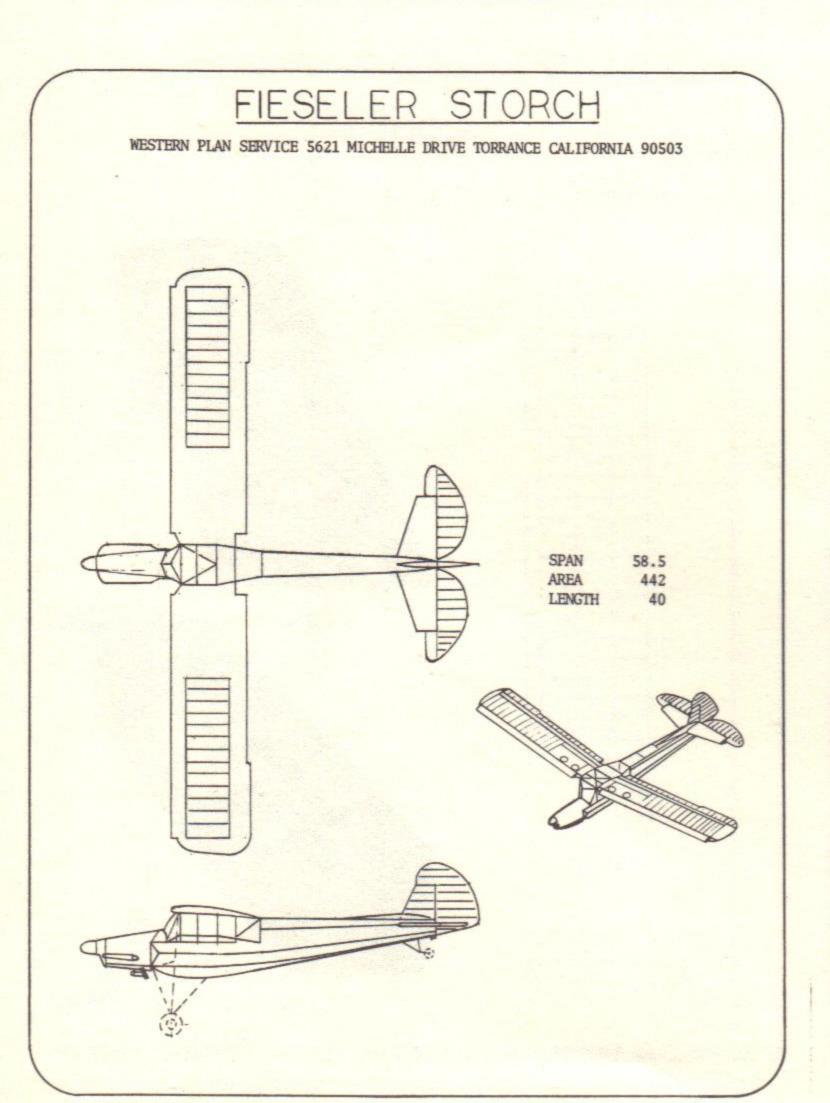




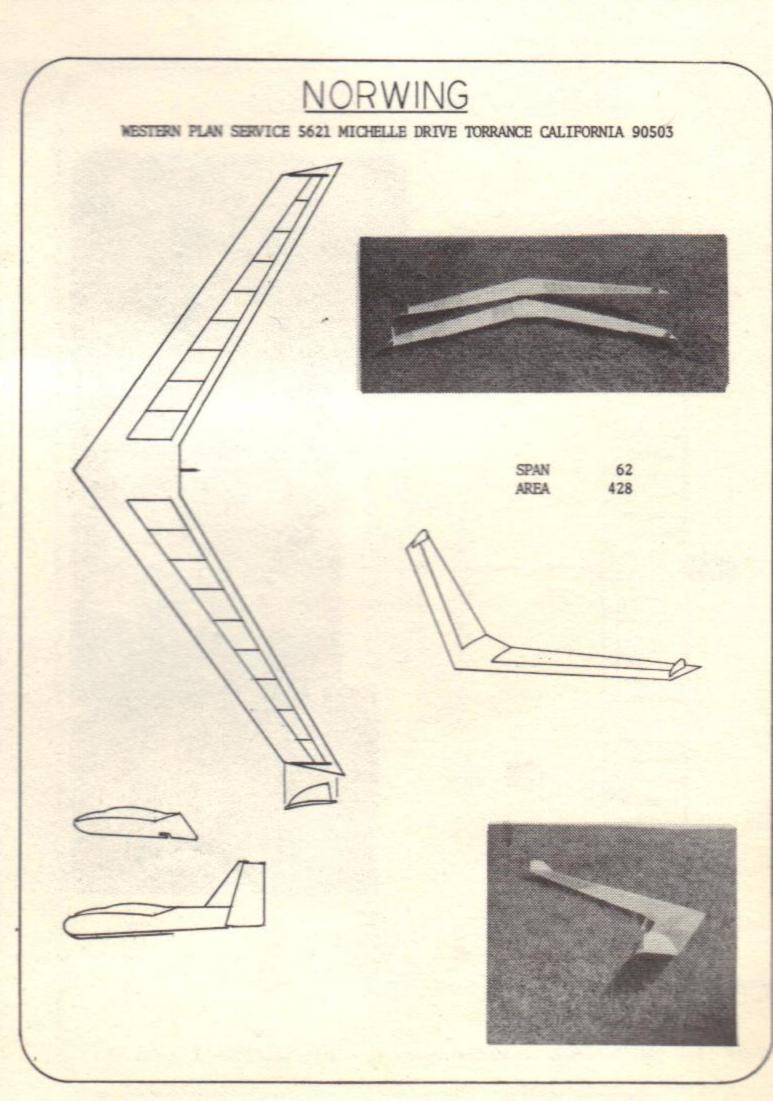


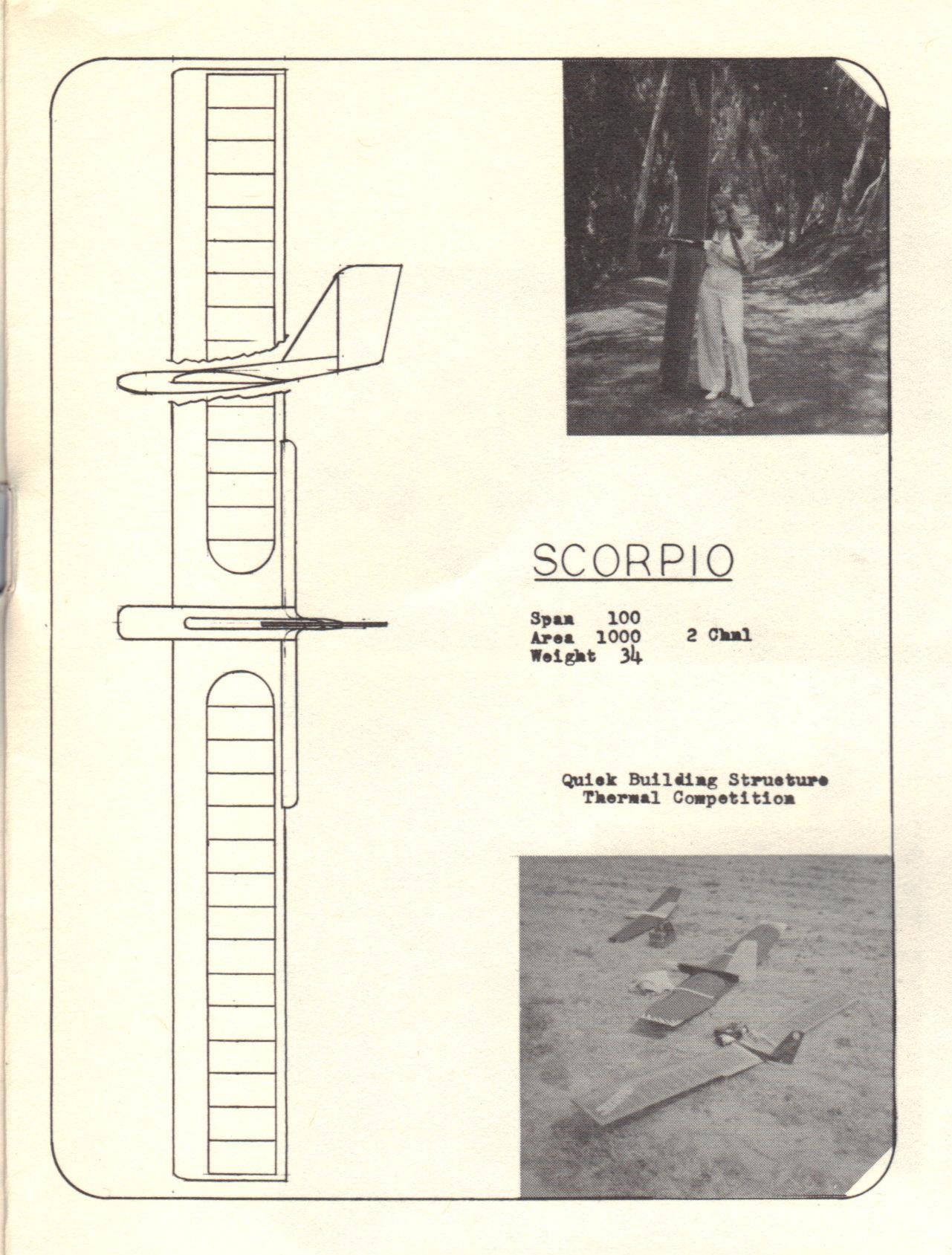


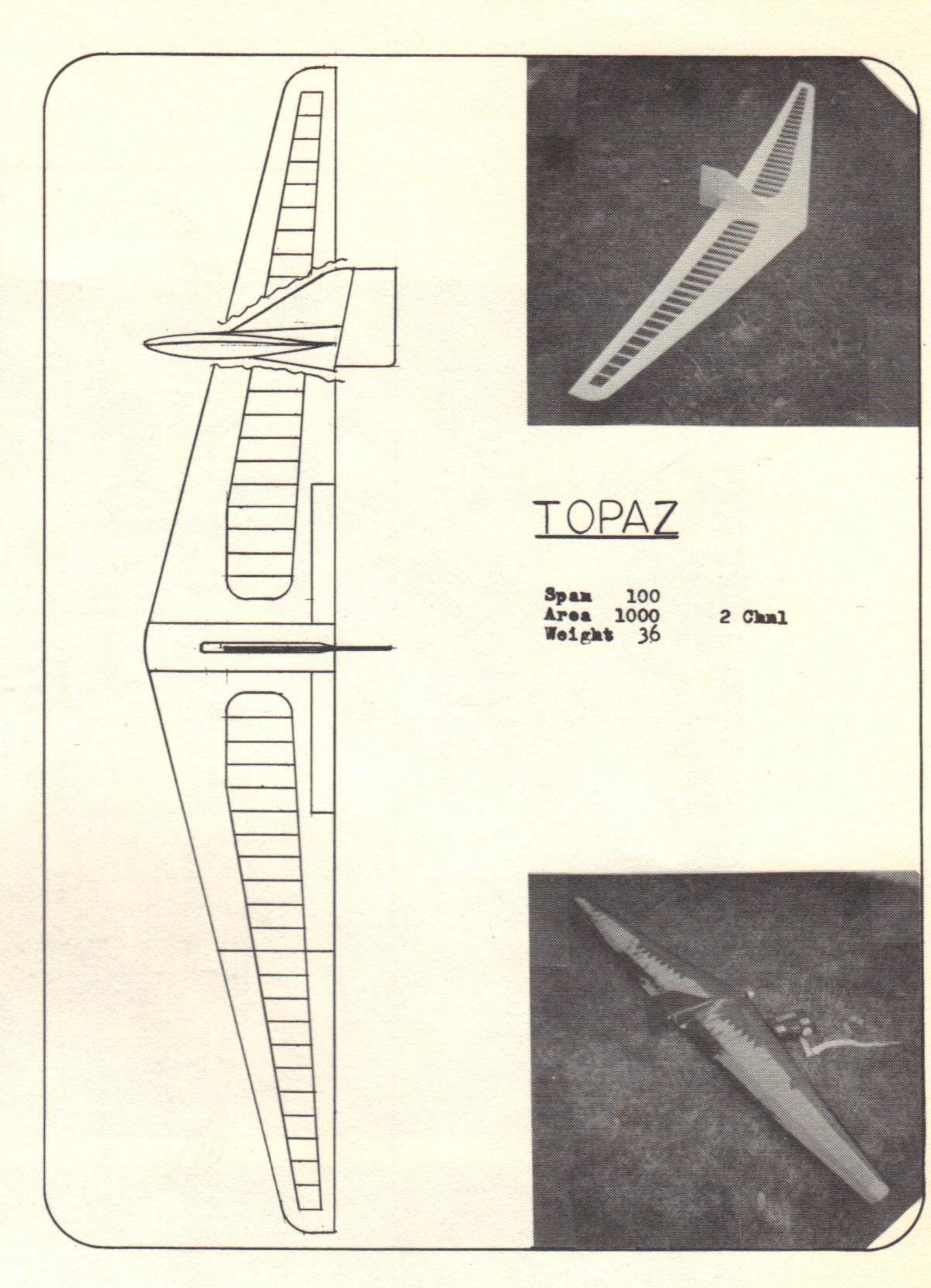


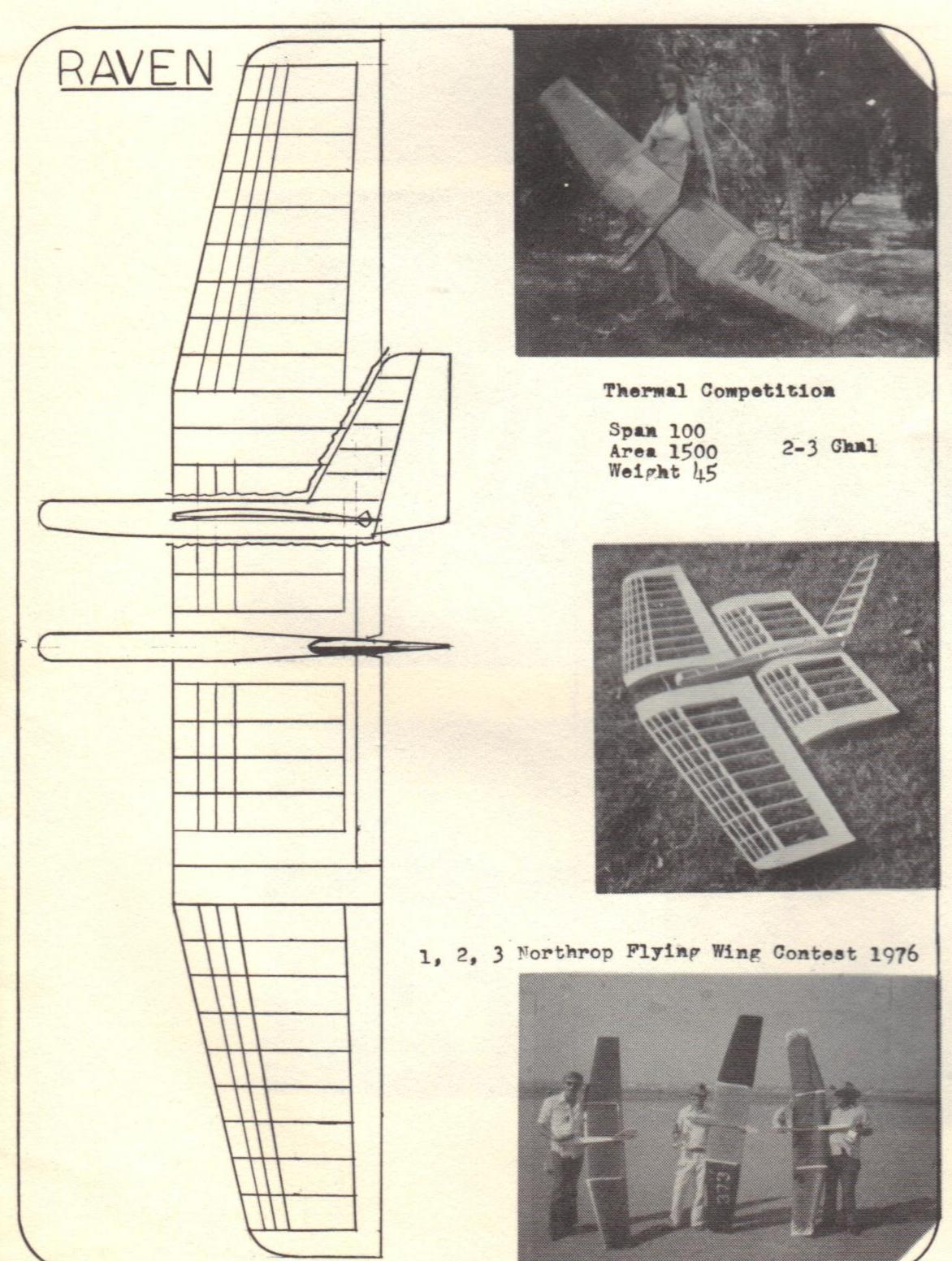














NOW AVAILABLE

EXCELLENT SELF - STABILIZING

WING SECTION ESPECIALLY

FOR PLANKS. THIS SECTION,

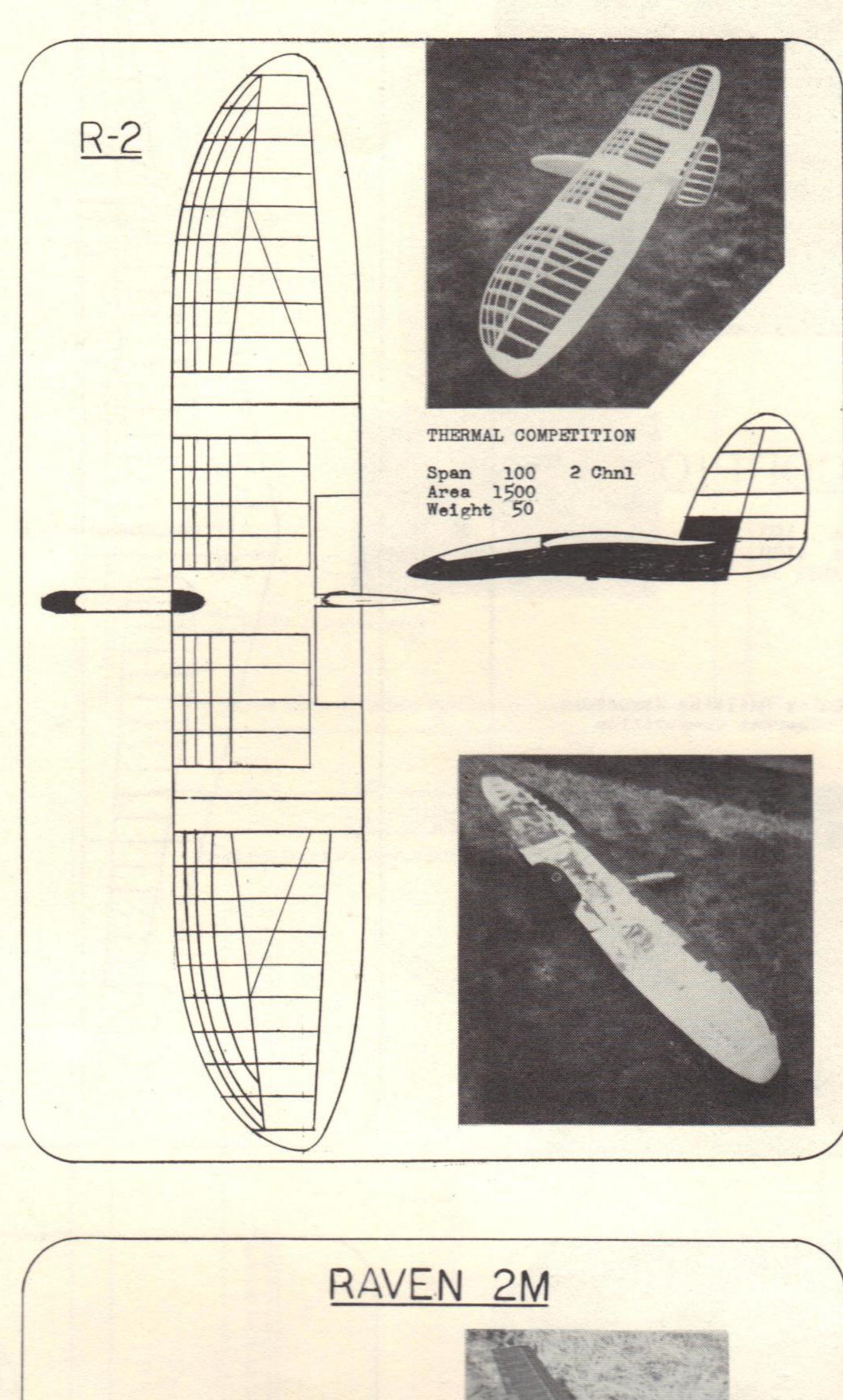
CJ-3406, IS SUPERIOR TO ANY

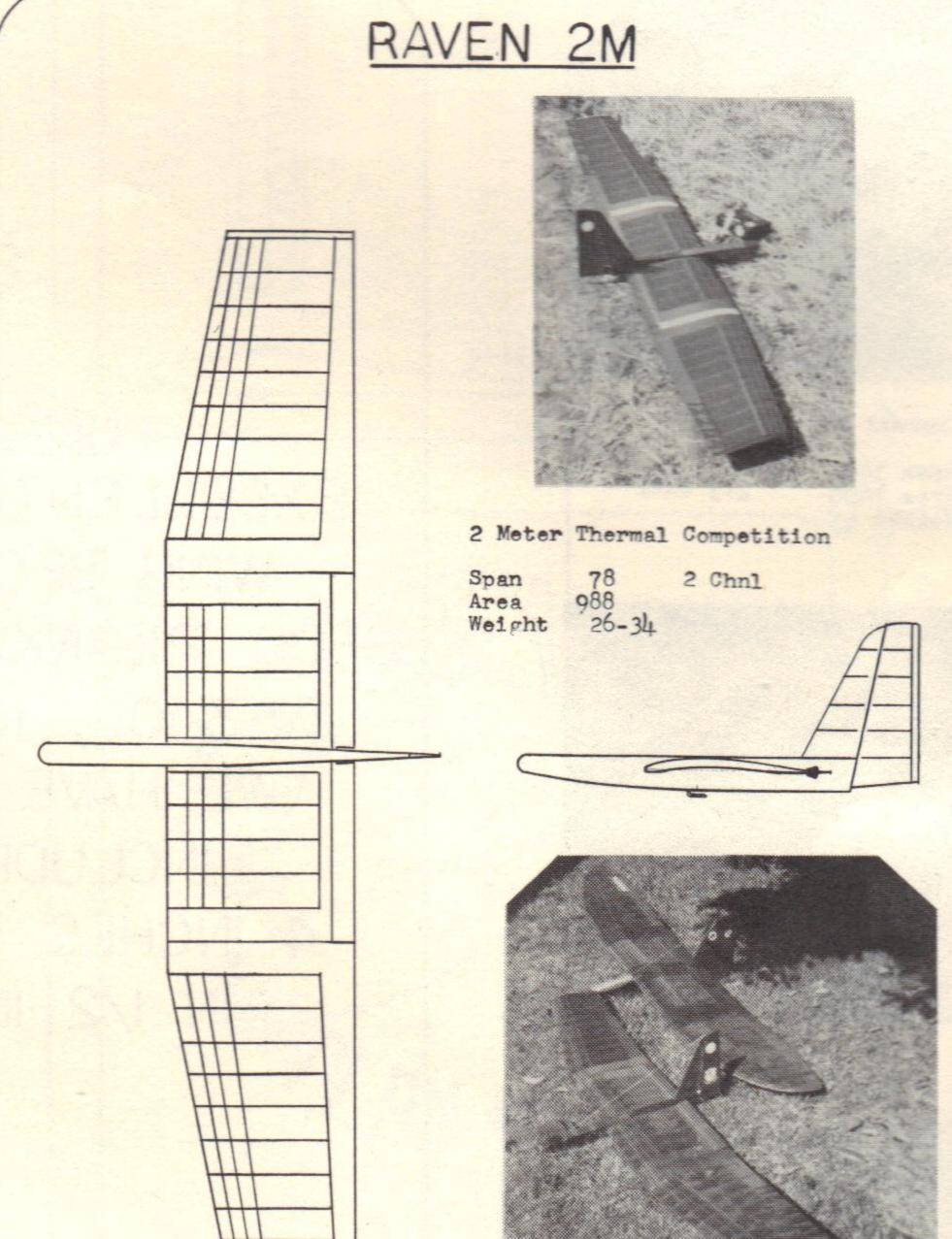
WE HAVE TESTED. SHEET

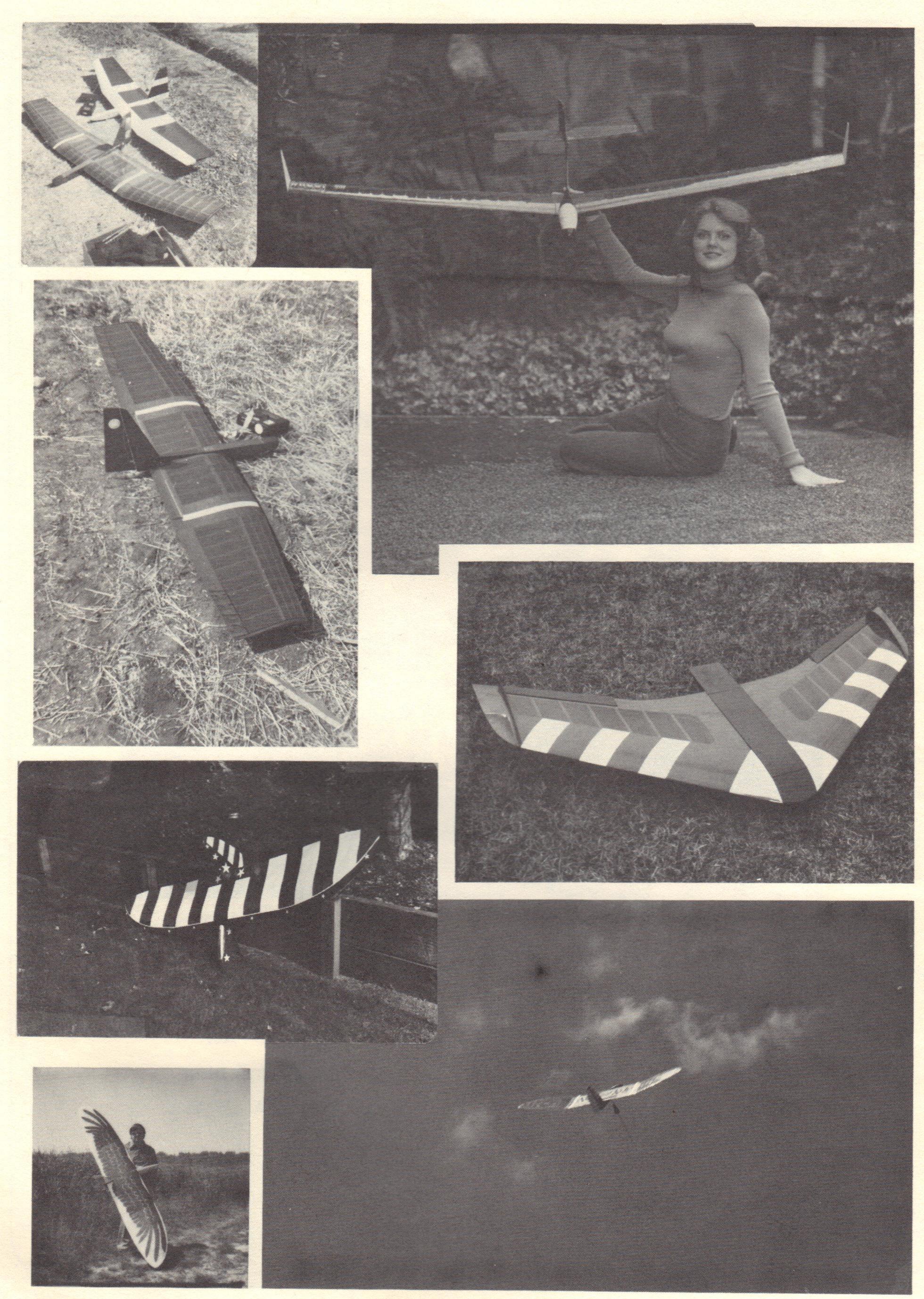
INCLUDES CHORDS FROM

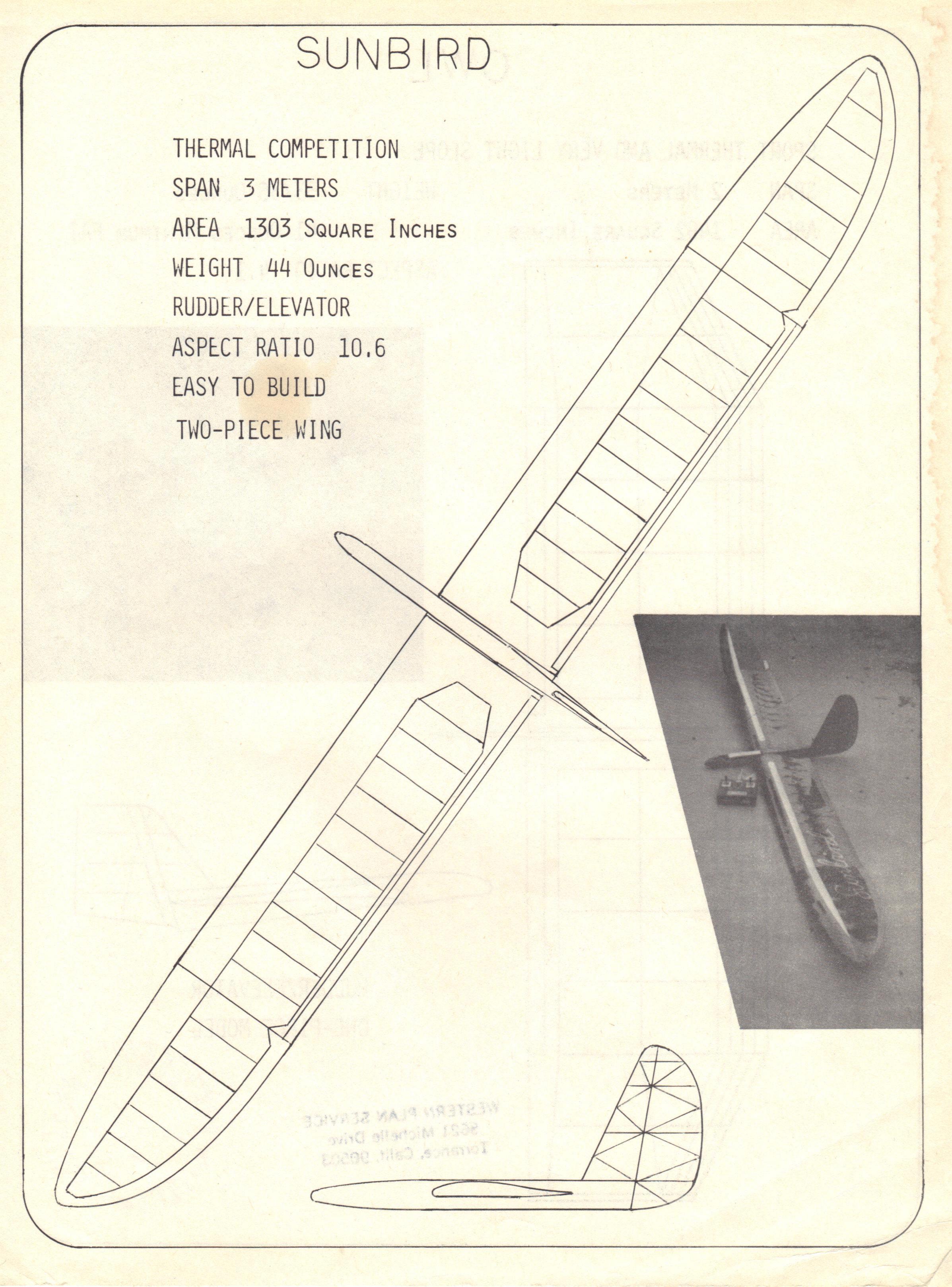
4 INCHES TO 16-1/2 INCHES

IN 1/2 INCH INCREMENTS.









# OWL

SPORT THERMAL AND VERY LIGHT SLOPE

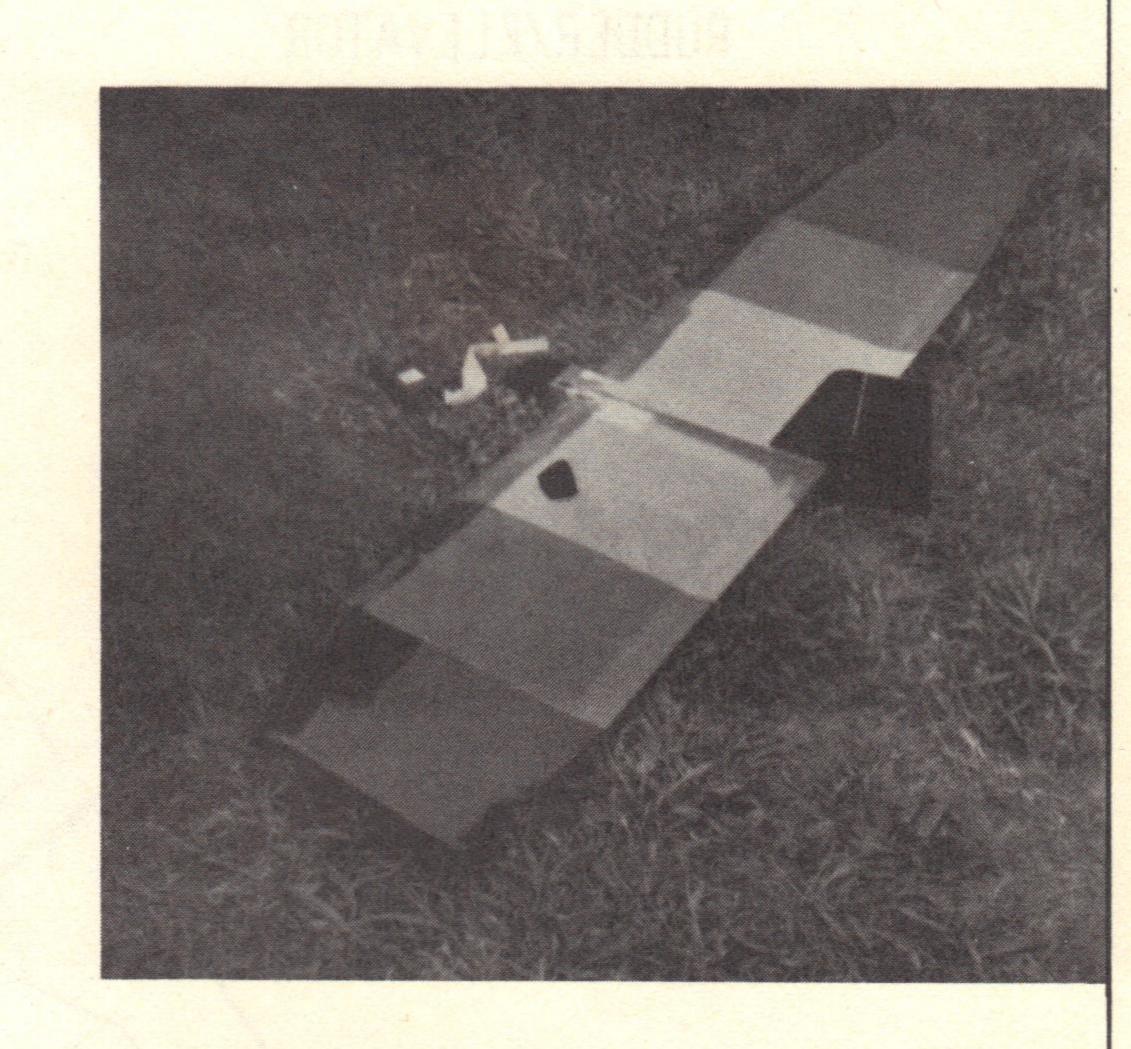
SPAN 2 METERS

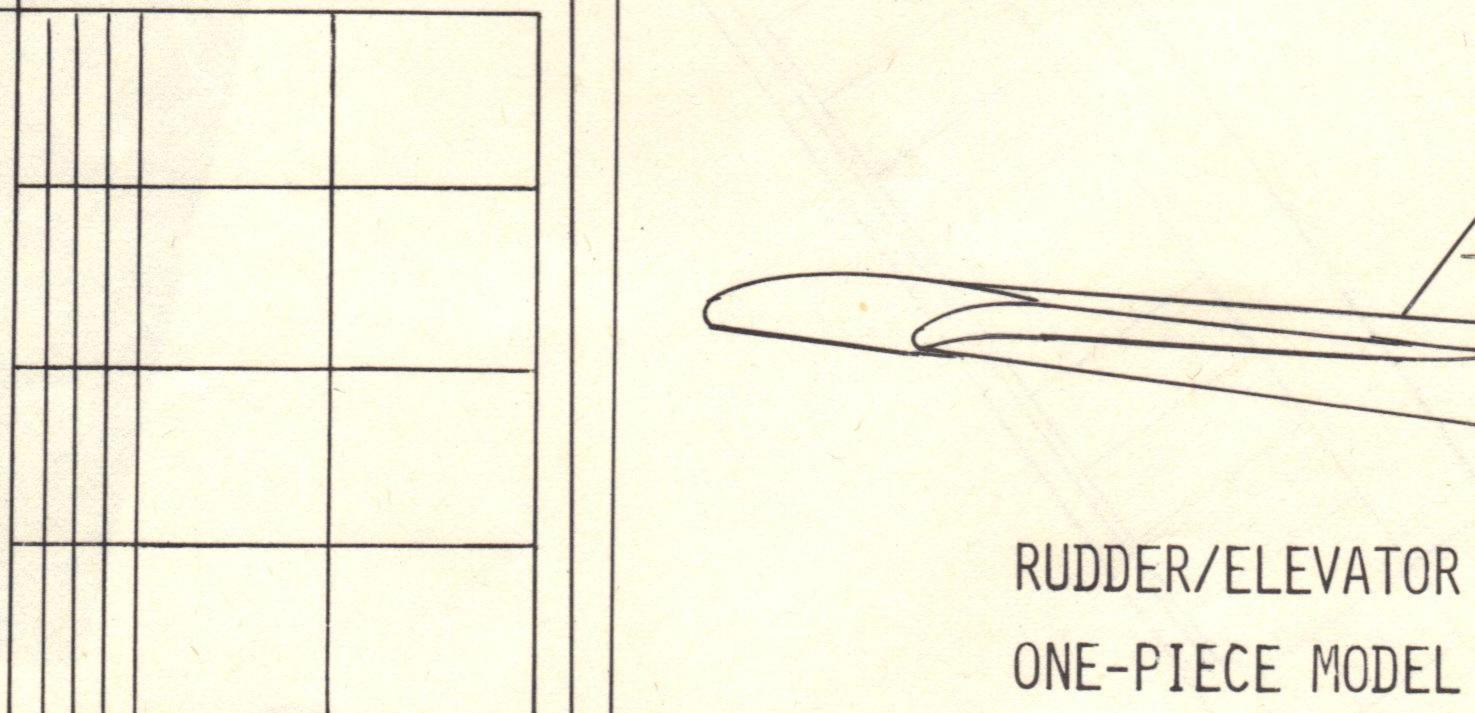
AREA 1492 SQUARE INCHES

WEIGHT 33/36 OUNCES

41 OUNCES MINIMUM FAI

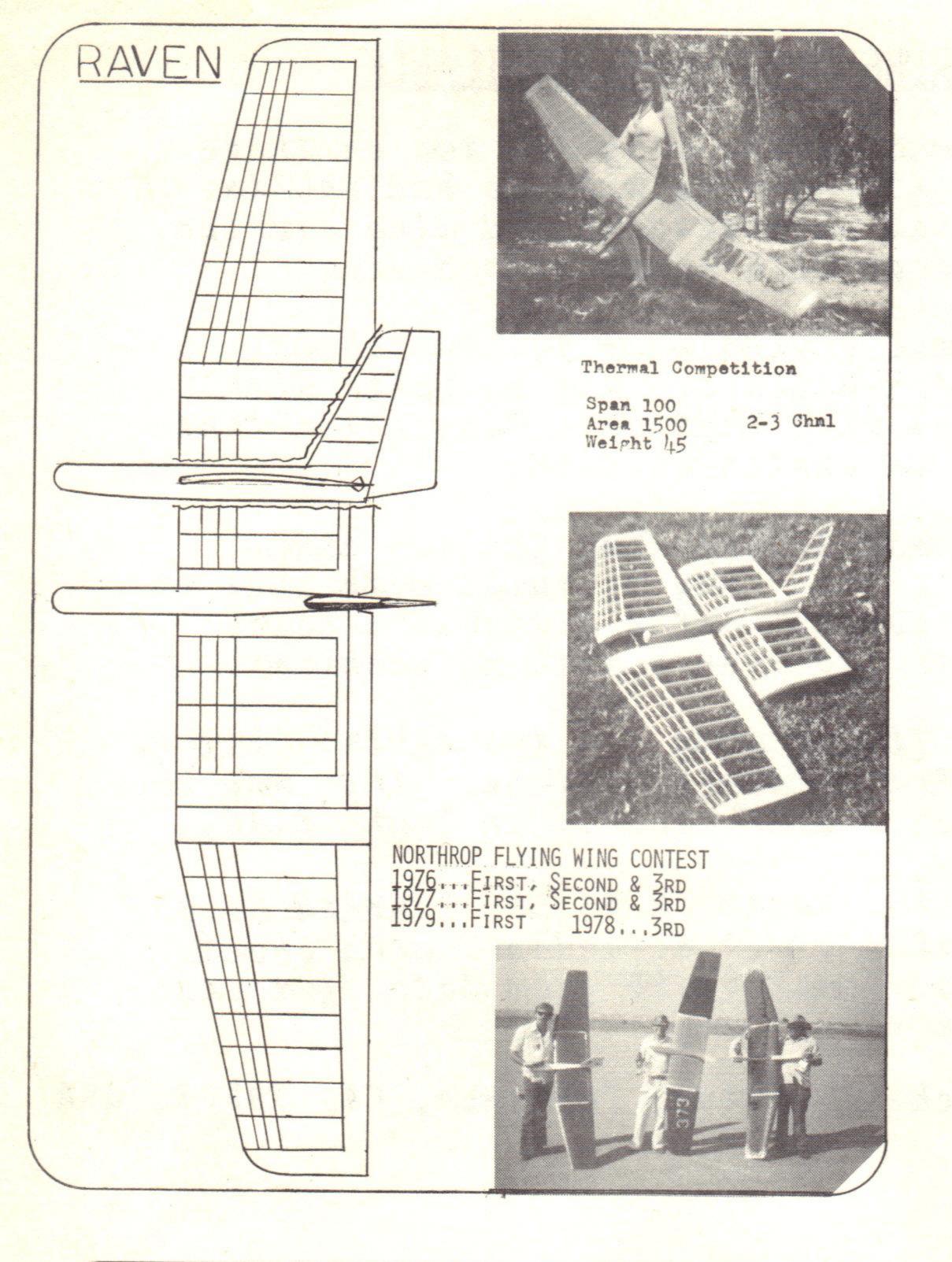
ASPECT RATIO 4.1

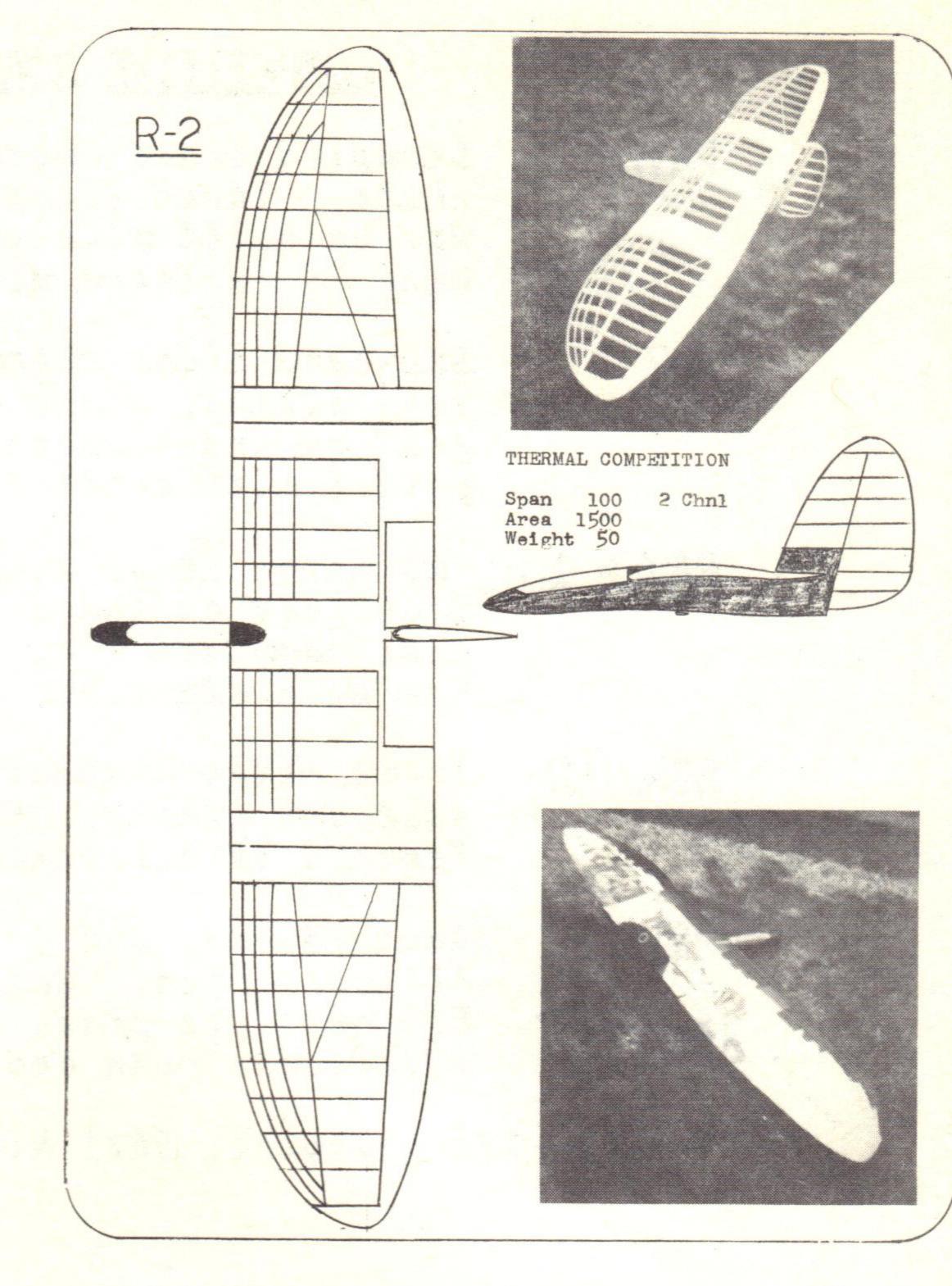


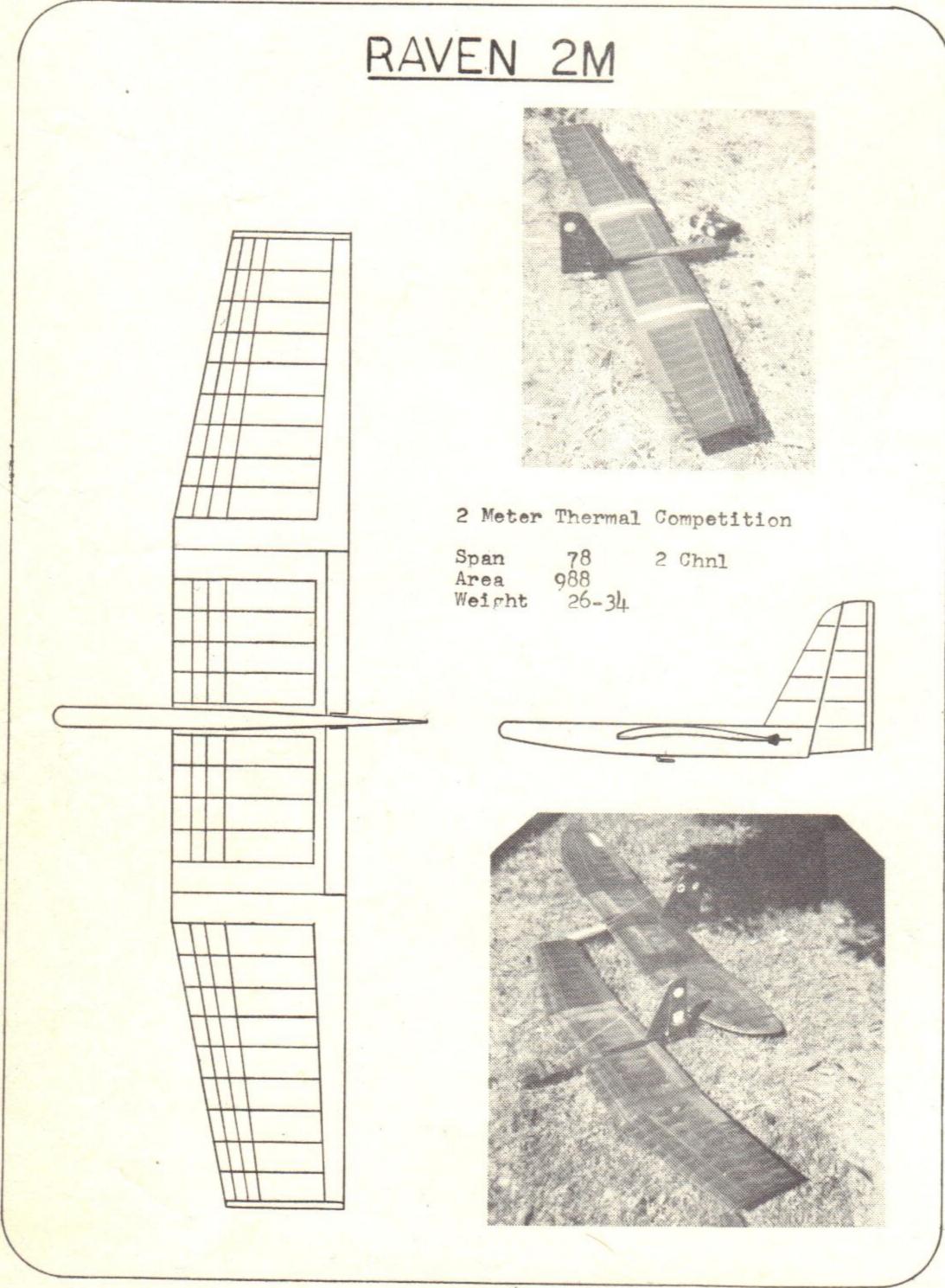


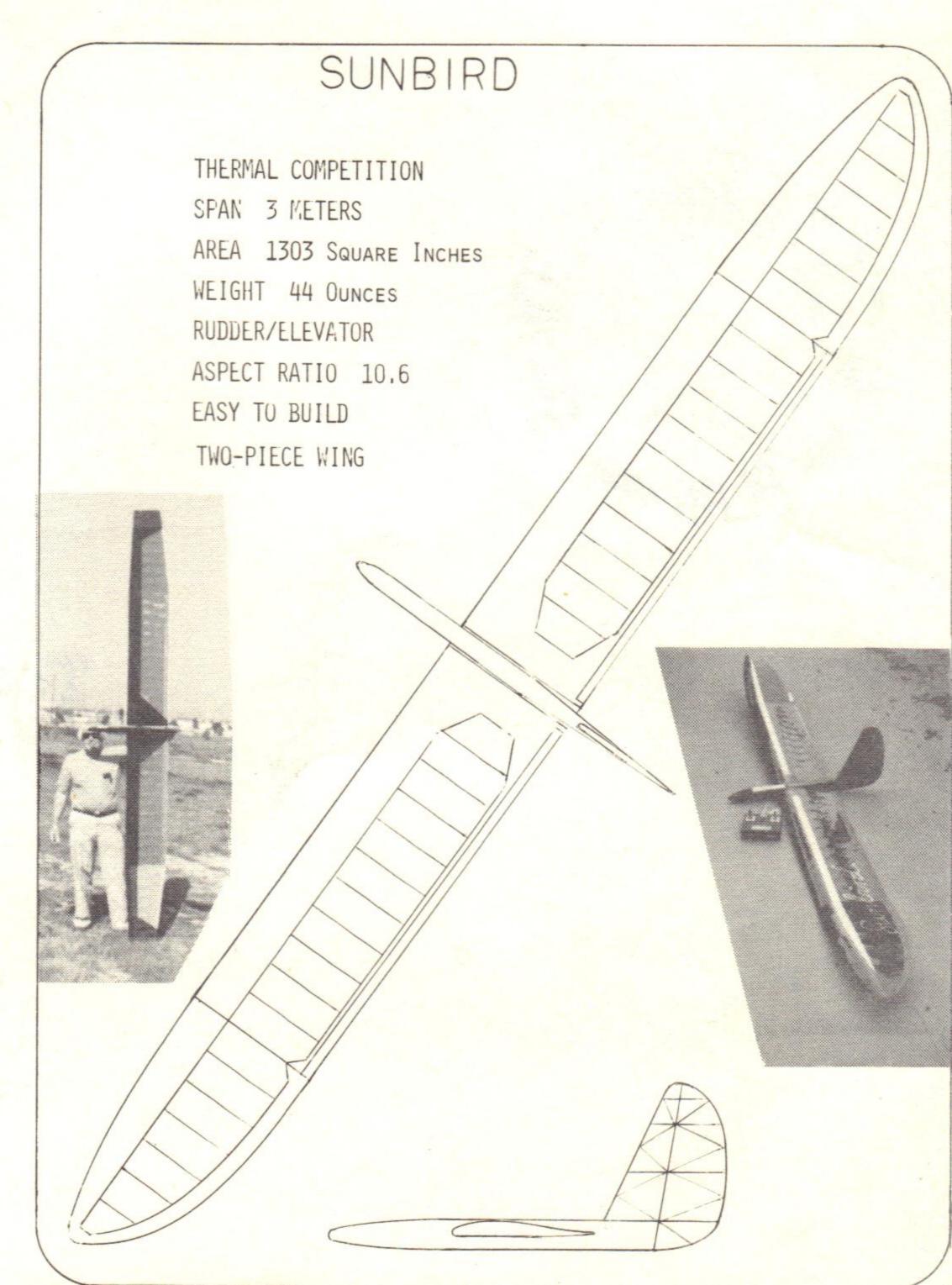
WESTERN PLAN SERVICE 5621 Michelle Drive Torrance, Calif. 90503











## COMPETITIVE SOARING WING PLANS AVAILABLE

RAVEN Standard class thermal flying wing for two or three chnls. Ideal first flying wing with no bad habits. May be built with flat or undercambered wing section. Wing is in three pieces with control in center.

R-2 Standard class thermal flying wing for two chnls. Very strong, space for ballast. May be built with flat or undercambered wing section. Wing is in three pieces with control in center section.

RAVEN 2M Two meter class thermal flying wing for two chnls. Very fast on the controls. May be built with flat or undercambered wing section. Flat bottomed version has been stretched to 110 inches with no problems.

SUNBIRD Three meter thermal flying wing for two chnls. Light, fast and strong. Flat bottomed section. Tips may be Tapered or elliptical. Will stay up in light lift.

PRICES

Raven \$6.33, R-2 \$6.83, Raven 2M \$5.50, Sunbird \$6.33.

All post paid. Catalog \$1.00 refundable with order.

For multiple plans subtract \$1.50 from total for each additional plan ordered.

Western Plan Service, 5621 Michelle Drive, Torrance, CA, 90503, USA



#### FLIGHT TEST

Note: If you have never flown or never used a winch or hi-start get someone who has to help you.

#### Center of Gravity

Use ballast and/or equipment to balance the aircraft as shown on the plan.

#### Surface Neutral

Wing is to have no twist or warp. Rudder is to be in neutral (zero deflection) position. Elevator is to be in neutral or as shown on plan.

#### First Flight

Hand launch is advised. Best have someone else launch <u>level</u> but firmly into the wind. Be ready with <u>some</u> up elevator. Be careful with down elevator as it is <u>very</u> powerful. Apply enough elevator to cause airplane to fly <u>level</u>. Trim elevator so level flight setting is the center of stick and trim lever.

#### First Launch

Hi-start, winch or hand tow are possible. Most important single factor is line tension. No problem with hi-start but winch must be pulling strongly before release. Best airplane launch is wings level and nose elevated at least 45 degrees. A firm thrust of the airplane into the air is best, like launching a hand launched glider. Don't test launch cross wind. Trim setting for first launch should be neutral. Second launch can be full up trim. Use rudder to correct any deviations from straight launch. Note: Correct climb attitude at beginning of launch is 70 to 80 degrees.

#### Coming Off The Line

With neutral trim, the airplane will fly off the line and may be flown as any tailed airplane. With up trim, the airplane may pull line from the winch. Fly straight ahead until line drops off. Immediately set up a small circle and retrim to neutral. Come out of the circle in the direction you wish to head. Alternate method is to retrim straight ahead. This requires good timing between line release and trim adjustment to prevent a stall.

#### Flying

You will find normal flight speed will approach that of a tailed airplane of twice the wing loading. However, the airplane can be slowed by using full up elevator applied slowly. The airplane will not speed up much from its normal flight speed, with down trim, without losing altitude quickly. Higher speeds will require some ballast.

Turns can be very tight if necessary. In lift, altitude can be attained very fast because of the low wing loading. The wide wing can be seen well at altitude. Returning from downwind can be difficult. Try to stay high if downwind, say 45 degrees above the horizon for 10-12 MPH wind. Coming from upwind is a delight and long trips are possible and quite fast. Try to stay away from directly overhead with your first flights. Pitch attitude is very hard to discern in that location.

#### Landing

Allow about half the distance for approach as with a tailed airplane. Cross wind approach is desirable if mastered. The attitude of the airplane is very important on final approach. Down trim should be added before landing. Attitude should be controlled with stick back pressure. Release of the stick, while the airplane is a few feet from the spot, will land you immediately.

#### Alternate Flight Trims

Some fliers prefer a more aft center of gravity. The center of gravity may be moved aft until no up trim is required for level flight. In other words, the elevator is in trail with the wing. More aft, I.E., elevator down trim required, is working against the wing section. Pitch sensitivity increases with aft center of gravity. This may cause you to want a very small elevator throw for thermal flying. Most tailless airplanes have excess elevator area and throw and are overcontrolled due to very low pitch inertia.

#### Acrobatics

Most rudder/elevator maneuvers may be done including inverted flight but not spins.

#### Tow Hook Location

Optimum towhook location is just in front of the longitudinal center of gravity. A figure of 1/8 inch is nominally used. Hook aft of the center of gravity may lead to launch instability. Airplanes with fixed hooks may be adjusted by filling in the throat of the hook with plywood and epoxy. Bridles or pivoting tow hooks are not required.

### Getting Down

Try to get out of the core of lift. Position the airplane about 100 meters to the side of directly over head. Enter a dive of about 30 degrees. As the speed increases, slowly turn the airplane in a circle around your position. This allows you to keep good control over the dive angle. Keep diving until you reach the altitude you want. One tight turn will kill off excess speed before you set up your landing.



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STANDARD PLANK II Competitive thermal sailplane  ALAR 2 & 2.5 Small slope acrobatic gliders.  ZANONIA Competitive thermal/slope sailplane  LITTLE PLANK II Acro. thermal/slope sailplane or power.  POWERED LAUNCH SYSTEM. Electric winch system  CONDOR Competitive thermal sailplane  ALAR 4 Sport thermal/slope sailplane	2.90 3 6.70 7 2.90 3 1.20 1 3.80 4
SCHWEIZER TG-2. Stand-off scale sailplane.  ABC SAILPLANE. Stand-off scale sailplane.  GROSS VOGEL. Acrobatic powered flying wing.  TRIO. 3 novel bodies for 450/550 sq. in. wings.  SUPERMARINE SPITFIRE. Slope glider.  ZIP. Acrobatic 4 chnl, 15 engine  BANANA. Competitive thermal sailplane.  J-26. Sport free flight sailplane.  ALPHA. Sport acrobatic slope glider.	6.50 7 4.80 5 2.90 3 3.10 3 1.90 2 2.40 3 1.40 2
LIL' TOOT	1.90 2 .60 1 2.60 3 1.70 2 .60 1 1.30 2 3.80 4
BETA	1.40 2 1.40 2 1.40 2 .60 1 1.40 2 3.60 4 1.00 1
WHISPER	2.90 3 1.90 2 1.20 1 4.80 5 1.40 2 6.00 6 1.80 2 2.40 3

BULLHEAD	3.20 4.30 5.80 2.90 10.10 4.60 2.60 2.90 .60 2.50	5 6 3
ARROW	2.60 2.20 1.70 1.70 1.70 3.80 1.90 Free	3 2 2 2 2 4 2
RAVEN	2.90	
OWL	4.00 3.00 <b>2.4</b> 0	5 5 5 6 5 3 5 4 3 6 6

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2. Add postage as shown below.

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E	.60	.96	1.32	1.68	2.14	2.60	3.06	3.52	3.98	4.44
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