

Now extensively rebuilt and renamed as the VanGrunsven RV-1, N-5827N, has an all-metal cantilever wing, and stands out in appearance and performance for its lack of wing struts. A new and lighter steel landing gear was fitted to compensate for the new more forward CG location.

## Cantilever-Wing "Playboy"

By Richard VanGrunsven, EAA 3204  
R. 2, Box 187, Forest Grove, Ore.

**T**HE VanGrunsven RV-1 "Playboy" began its life as a Stits SA3A "Playboy" and was fathered by Raymond Benckendorf of Streator, Ill. in 1955. Being one of the early "Playboys", it had a heavy structure which resulted in mediocre performance from a 75 hp Continental engine.

In 1962 I purchased the ship, minus engine, and needing some wing repair. Over a period of 15 months I rebuilt and modified it by adding Hoerner-type wing tips; larger vertical tail surfaces; a bubble canopy; a Lycoming O-290-G engine; a fiberglass cowl, spinner, and wheel pants. Although it was overweight and a bit nose heavy, it had safe flight characteristics and good performance. Between November, 1963, when it was test flown, and May, 1965, I flew it 275 hours which included several 2,000 mile flights. There was little reason to be displeased with the ship, but contentment seldom leads to improvement, so I decided to make some changes.

The main problems were high empty weight, nose heaviness, and excessive drag. I reasoned that these all could be greatly improved by installing cantilever wings and by positioning them farther forward in the fuselage.

Thus, I designed and built a pair of all aluminum wing panels identical to the original "Playboy" panels except that they were of monospar construction and included half-span flaps. The spars are located at 25 percent chord and are made very similar to those of a "Midget Mustang" with a .040 channel for a web and .125 by 1½ in. flange strips of varying length riveted on. The rear spar is a non-load carrying member and is made of .040

aluminum bent into a channel shaped to match the leading edge of the Friese ailerons used. Ribs were formed of .020 aluminum. Wing skins are .025 on the leading edge D-tube, .020 between the main spar and rear spar, .020 on the flap, and .016 on the aileron. All aluminum used was 2024 T-3 Alclad and flush rivets were used throughout.

In addition to aerodynamic cleanliness and light weight, ease of maintenance was a prime design consideration. The fiberglass wing tips are easily removable as are all the aileron mounting brackets. The only inspection opening is on the bottom of the wing for access to the aileron bell crank.

When completed, these wings weighed 62½ lbs. per panel, 15 lbs. less than the original Stits wings. The weight of the spar center sections which were added to the fuselage roughly equaled the weight of the wing struts which were eliminated. The spar center section was built around the rear A-frame of the landing gear truss, which resulted in relocating the wing 3½ in. forward. This change in center of lift made possible the removal of a 12 lb. lead ballast from the tail, which in turn changed the CG and necessitated moving the wheels forward. As there were already wheel extensions on the "Playboy's" modified Cessna landing gear, new "swept forward" gear legs were made and resulted in another 21½ lb. weight saving. A few more pounds were eliminated by building a new seat and gas tank, replacing the

((Continued on next page))



Cleaned up considerably from its original configuration, N-5827N was modified to a 125 hp engine, fiberglass cowl and wheel pants, new tail, bubble canopy and Hoerner-type wing tips.



## CANTILEVER WING PLAYBOY . . .

(Continued from page 51)

fuselage fabric, etc., bringing the total weight savings to a respectable 85 lbs.

I test flew the "Playboy" in August, 1965, and a vast improvement in handling and performance was immediately apparent. It was now possible to make good three-point landings which were not possible before because of the nose heavy condition. Aileron control, which was excellent before, was now little short of fantastic with only three seconds required to roll 360 deg. The glide angle improved nearly 50 percent and the overall aerobatic capabilities improved roughly 100 percent. During flight testing I was able to pull 5½ Gs before a high speed stall occurred. The wings are stressed for an ultimate load of 9 Gs.

One side effect of this modification is that it provided a practical answer to the age-old question of relative efficiencies of strut-braced vs. cantilever wings on low-wing airplanes. My metal cantilever wings were built to the same dimensions and airfoil contour as the original Stits wings. The resultant performance gained was considerable as can be seen in the accompanying specifications. Though a portion of this performance increase can probably be attributed to such factors as lower weight and improved wing-root intersections, I feel that it is due mainly to the lack of struts.

To me, the most pleasing aspect of my "Playboy" is its STOL capabilities. Its minimum power-off speed of

47 mph and excess of power for rapid acceleration gives short field performance approaching that of a "Super Cub." Since modification, I have been operating the "Playboy" out of a 600 ft. private airstrip. I have logged several hundred hours and made several hundred landings on this strip, including many when the turf was very wet and when strong cross-winds prevailed.

There are several reasons why the listed performance figures, particularly speeds, for the RV-1 may seem less impressive than those of some similar homebuilt airplanes. One is that this is a larger, roomier aircraft than



This is N-5827N at the time that Raymond Benckendorf, the builder, still owned it.

many homebuilts and uses 6:00 x 6 wheels and tires rather than the small 5:00 x 5 used on most higher speed homebuilts. Also, these figures are honest. They are all actual timings, not just instantaneous readings of fallible instruments. A speed ratio (top speed/power-off stall speed) of 3.62 shows that its "total performance" ranks high among both homebuilt and factory aircraft.

• • • • •

### "BEFORE AND AFTER" SPECIFICATIONS AND PERFORMANCE

	Stits SA3A N-5827N	VanGrunsven RV-1 N-5827N
Span	19 ft. 10 in.	19 ft. 11 in.
Length	18 ft.	18 ft.
Engine	Lycoming 0-290-G @ 125 hp	Lycoming 0-290-G @ 125 hp
Propeller	Sensenich 68x64	Sensenich 68x71
Empty weight	815 lbs.	730 lbs.
Gross weight	1,145 lbs.	1,070 lbs.
Fuel capacity	21.5 gals.	22 gals.
Top speed	152 mph	170 mph
Cruising speed	135 mph	148 mph
Stall speed, power-off	65 mph	47 mph
Take-off run	350 ft.	250 ft.
Landing roll	600 ft.	300 ft.
Rate of climb	1,350 fpm	1,600 fpm
Minimum descent rate, power-off	1,200 fpm	850 fpm
Speed ratio	2.34:1	3.62:1

### Re-Cover with New POLY-FIBER Process

Won't Burn, Crack or Peel, FAA Approved

POLY-FIBER mates our new POLY-DOPE with a long life heat shrinking synthetic fabric.

POLY-DOPE is a new, specially formulated, tough, flexible, non-tauting Polyurethane Dope with superior adhesive characteristics. Application and drying same as nitrate and butyrate dope, and competitively priced.

WRITE FOR FREE BROCHURE WITH PRICES

Or send one dollar (to cover postage) for sample test kit, including POLY-DOPE Fabric, and Procedure Manual.

Liberal Discounts to Repair Shops,  
Homebuilders and Antique Restorers

Developed and Manufactured by  
**STITS AIRCRAFT CORP.**

Box 3084S

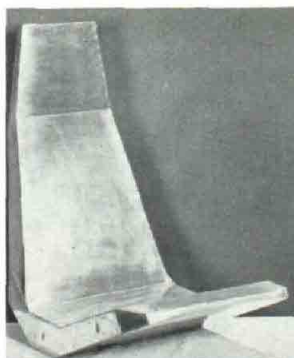
Riverside, Calif. 92509

### WEST COAST AIR SERVICE 931 LONGVIEW AVENUE PISMO BEACH, CALIF. 93449

GAS TANK CAPS AND NECKS	\$ 4.75
WELDABLE FLANGE FOR ABOVE	2.40
WELDABLE TANK BOSSES—3/8 pipe	.80
DELCO-REMY GENERATORS—25 amp. for Continental	35.00
NAV LITES—Teardrop	Pr. 5.00
QUIK DRAINS—1/4 Pipe	1.00
PT-22 WINDSHIELDS—Surplus	6.50
LEWIS EXHAUST TEMPERATURE GAUGE KIT	39.95
TURN AND BANKS—SPECIAL	8.50
T & B RESTRICTOR VALVES — NEW	1.25
PESCO VACUUM PUMPS—3P194—New Spline or Tongue Dr.	50.00
VACUUM REGULATOR VALVES	3.50
OIL TEMPERATURE GAUGES—2 1/4" Dials—NEW	10.50
OIL PRESSURE GAUGES—2 1/4" Dials	4.00
OUTSIDE AIR TEMPS	4.00
ELECTRIC TACH SETS—Complete M. O.	19.50
3 NEEDLE G METERS—3 1/8" Dial	12.50
FL. 3-WAY GAS VALVES—NEW	6.00
SCOTT TYPE GAS GAUGES—NEW	8.50
3-IN-1 GAUGES—NEW	10.00
AIR SPEEDS—0 to 200 Kts.—NEW	10.00
SPARK PLUGS—BG—Fit most engines—NEW	1.00
C-10S—For Franklin—Box of 10	6.00
1" PINKED TAPE	Roll 1.25
TURNBUCKLES, ROD ENDS, HARDWARE, ETC.	

ALL PRICES F.O.B. — POSTAGE WITH ORDER, PLEASE

### THE ULTRALITE "7G" AIRCRAFT SEAT



Weight: 6 lbs. 12 oz!  
Supports: 1,330 lbs. downward, and 300 lbs. aft\*.  
Dimensions: 18" w., 25" back height, 31" overall length. Beautiful, functional contours, for compact seating. Ideal for slip-on upholstery. Aluminum sandwich construction.  
Lowest priced ultralite: \$98.50 (shipped anywhere in U.S.). Tested and Guaranteed.  
\*Load tested to strength requirements of Federal Spec. NAS 809 for Type 2 Normal Category, forward facing pilot and co-pilot seats.  
Distributor, shop and manufacturer inquiries invited — discounts on quantity basis — certification service available — 618-594-3489 or 2681.

O'NEILL AIRPLANE CO., INC., Carlyle, Ill. 62231