1/72
Scale

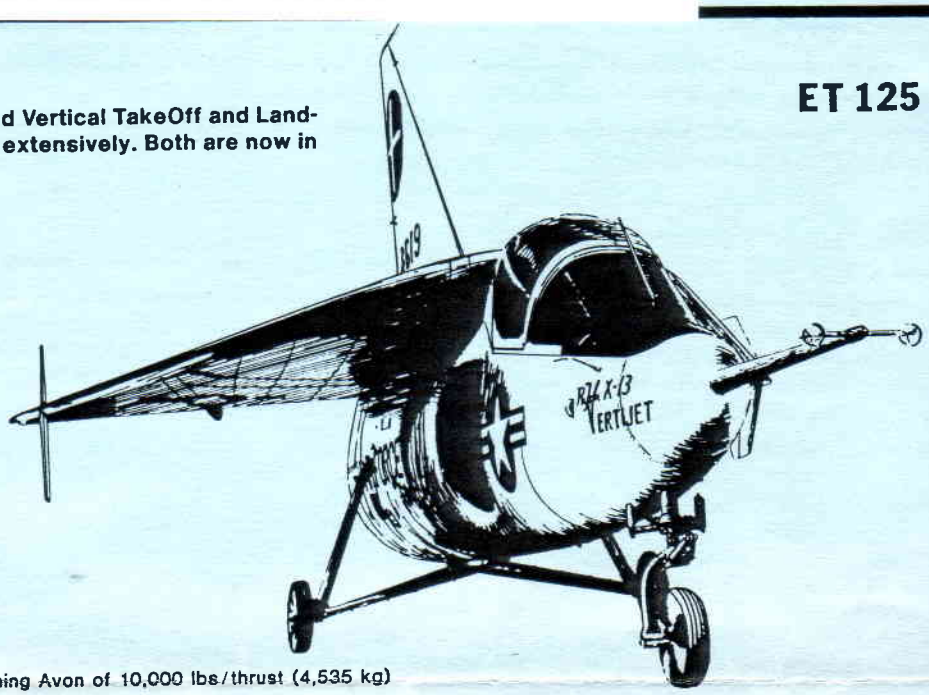
RYAN
X-13
"Vertijet"

THE EAGLES TALON, INC

P.O. Box 23984, St. Louis, Mo. 63119

ET 125

The Ryan X-13 was the worlds first jet-powered Vertical TakeOff and Landing (VTOL) aircraft. Two were built and tested extensively. Both are now in museums.



Ryan X-13 "Vertijet" Specification:

Wing Span : 24' (7.32m)
Length : 21' (6.4m)
Height : 15' (4.57m)
Weight-gross : 7,500 lbs (3,401 kg) approx.
Speed-cruise : 350 mph
Max-altitude : 30,000 ft
Range : 350 miles
Powerplant : One Rolls Royce non-afterburning Avon of 10,000 lbs/thrust (4,535 kg)

Ryan X-13 'Vertijet' History:

The seeds for the X-13 program were sowed by the U.S. Navy in 1947 when they awarded to Ryan Aeronautical Company of San Diego, California, a contract to "Explore the feasibility of reaction control for jet aircraft." Using a J33 engine, Ryan experimented in controlling the thrust of the jet by various means including the use of eyelids over the exhaust, nozzles with bleed air from the engine, vanes in the exhaust and special rotating rocket motors.

This research was followed by another Navy contract in 1949 to apply this research to a VTOL testbed. The J33 was mounted on a vertical stand and controlled from a remote panel. Initially mounted on a vertical track, the J33 eventually was modified so that it could make free hover flights. Then a cockpit was fashioned from a B-47 wing tank and a pilot sat on top of it and made the first jet powered hover on November 24, 1953. A joint U.S. Navy/U.S. Air Force contract was issued to Ryan in August of 1953 for two full scale VTOL test beds under the designation of X-13.

VTOL flight requires that the engine thrust be greater than the weight of the aircraft. For this reason a small airframe was essential. The planform selected was that of a shoulder mounted broad thick delta wing with a 60° swept leading edge and a large vertical stabilizer nearly as tall as the length of one wing. At the tip of each wing was a small stabilizer and a jet control nozzle. Overall weight would be under 8,000 lbs and the engine selected to offset this weight was the Rolls Royce Avon RA 14, a non-afterburning turbojet that generated 10,000 lbs/thrust. The large intake directly ahead of the engine was bifurcated by the cockpit section which offered the pilot a tiltable seat that also had zero-zero ejection capability.

The problem of a landing gear for a jet propelled tail sitter was overcome by the utilization of a trapeze set up. Under the nose of the aircraft where a nose wheel would normally be installed was a large hook. The X-13 would be transported on a large flat-bed trailer which used two surplus hydraulic lift cylinders from Nike missile lauchers to raise the bed into a vertical position. Takeoff posed no problem, but on returning, the pilots vision would be restricted. At the upper end of the trailer was a metal basket from which an observer would guide the X-13 in, and assist with the final operations. On each side of the trailers upper end, was a hydraulic arm with a heavy cable between them. On one side was a long striped pole. As the X-13 would hover closer to the trailer, the pilot could use the pole for orientation. When near enough, the observer would actuate the arms which would raise the cable, catching the X-13 under the nose hook. The pilot would then cut power and the aircraft would settle against the bed of the trailer and be lowered to the horizontal position.

After being trucked to Edwards A.F.B., the first X-13 (A.F. serial 54-1619) was fitted with a nose gear in place of its hook, and wheels where its landing pads were. Pete Girard made the first flight on December 10, 1955. Within weeks the conventional flight envelope had been explored. Most noticeable was the rapid acceleration afforded by the 1.25:1 thrust

to weight ratio. The wheels were removed and Girard made the first hovering flight on May 28, 1956. For these first tests though, the trialers hadn't been finished so a large tubing affair like a skirt was fitted below the aircraft, forcing the removal of the rudder.

A year after the arrival of the first, the second X-13 arrived (A.F. serial 54-1620) and began using the wheels for conventional operations during which transitions to a hover were done at altitudes like 3,000 feet. On November 28, 1956, Girard and the X-13 made the first transition to a hover from horizontal flight by a jet aircraft. This was two years to the month after the first VTOL conversion was made by the turboprop Convair XFY-1.

After extensive testing the project was terminated in 1958. The highlight being a demonstration to brass in the parking lot of the Pentagon in Washington D.C.. There Girard performed a a delicate dance around the parking lot, with the X-13 poised on its tail. The tail-sitting vertical riser was deemed too difficult for the pilot and most VTOL research concentrated on the flat-riser, such as the Ryan XV-5 Vertifan and the first production VTOL aircraft, the Hawker Harrier. Both X-13's survived, the first being stored by the National Air and Space Museum at their Paul E. Garber Preservation, Restoration and Storage Facility (formerly Silver Hills), while the second aircraft is in storage at the U.S. Air Force Museum.

Instructions for kit construction:

Tools: Sharp hobby knife, sandpaper (medium to x-fine), liquid plastic cement, 5 min. epoxy, and available reference material.

General Instructions: Remove the parts to be assembled by scribing around the edges with a sharp knife, and then bending on the scribe. Sand the parts down the thickness of the plastic on wet / dry, or similar fine grain sandpaper. Medium grit can be used initially but care must be taken to not sand off the nose, or to melt the edges. Finish up sanding with fine or x-fine grit. On a fuselage it is best to leave on the nose extension if there is one (protrusion from cowling) until after sanding. Liquid plastic cement is recommended for vacuforms, with a white glue being used for the addition of small and clear parts.

Ryan X-13 'Vertijet' Instructions:

— Cut out and sand down pieces just prior to using them, dry fit prior to assembly, sanding high spots to assure a good tight fit.

Fit bulkhead (4, 5 & 15) and cockpit floor (3) into one fuselage half. Glue inside of the intakes, (13L & 14R) into the corresponding fuselage half so that they fit against the fuselage walls and bulkhead 15.

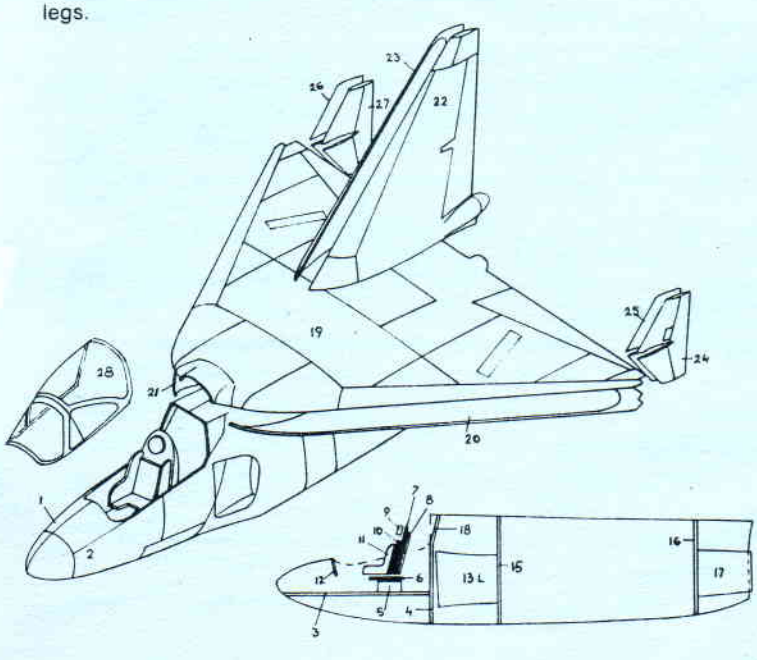
Build up cockpit and pilots seat (5-12), and fit into fuselage halves (1 & 2), gluing assembly together.

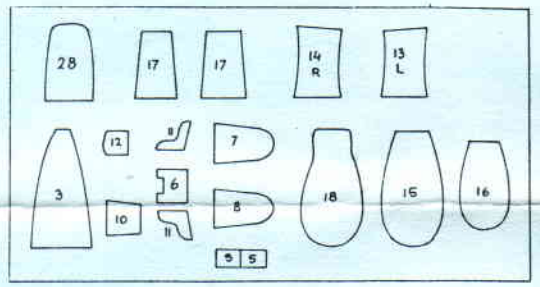
Add lower wing halves (20 & 21) to upper wing (19), fitting finished assembly on fuselage.

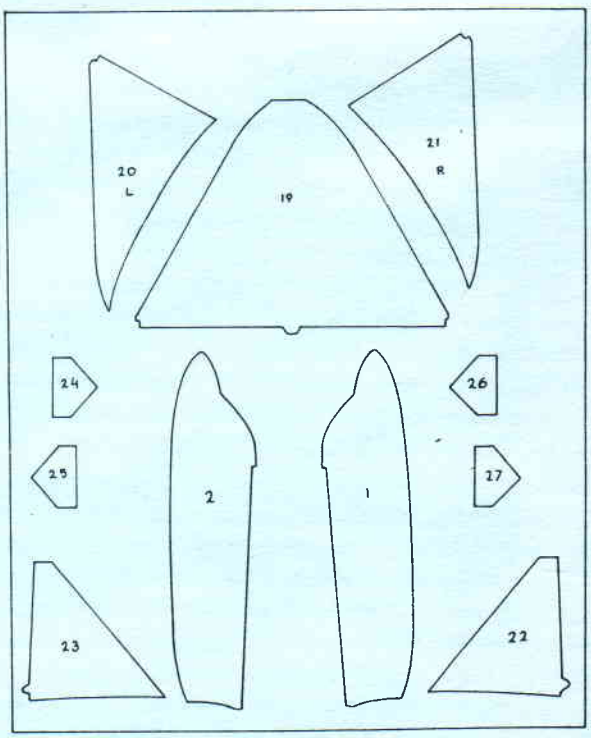
Assemble vertical surfaces (22-27), glueing the large fin on the centerline and the smaller surfaces over the corresponding area near each wing tip.

Add canopy and exhaust nozzle (25 & 17). The nozzle should actually appear to be coming out of a ball slightly larger than its own diameter, which would be the large diameter bearing that permitted the nozzle to swivel.

Gear struts with or without wheels can be added — check references for the configuration for your desired model. Small diameter metal tubing is suggested for the gear legs.

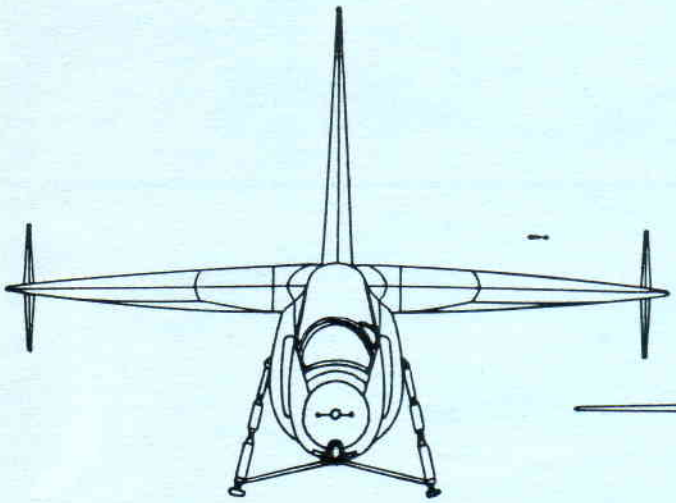






READ ALL instructions several times...
STUDY ALL drawings thoroughly...

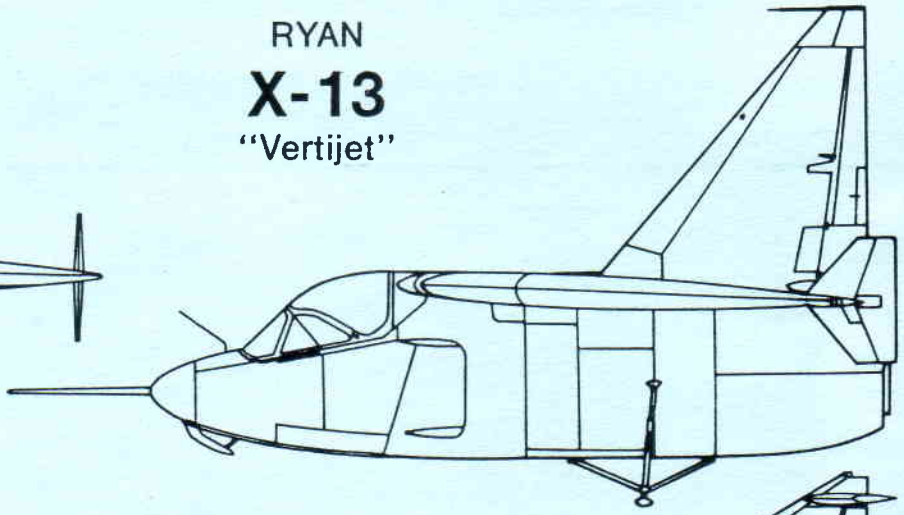
Before painting sand down and polish the seams and exterior surface. Silver finishes show up all scratches and imperfections in the plastic. A thin coat of liquid glue, brushed or sprayed on the model (NOT ON CLEAR PARTS) will give it a high gloss finish, but give it a day to dry hard.

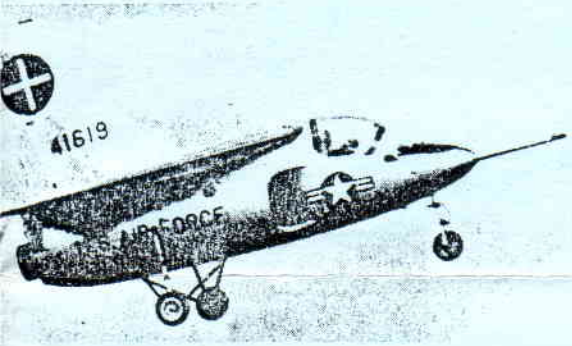


RYAN

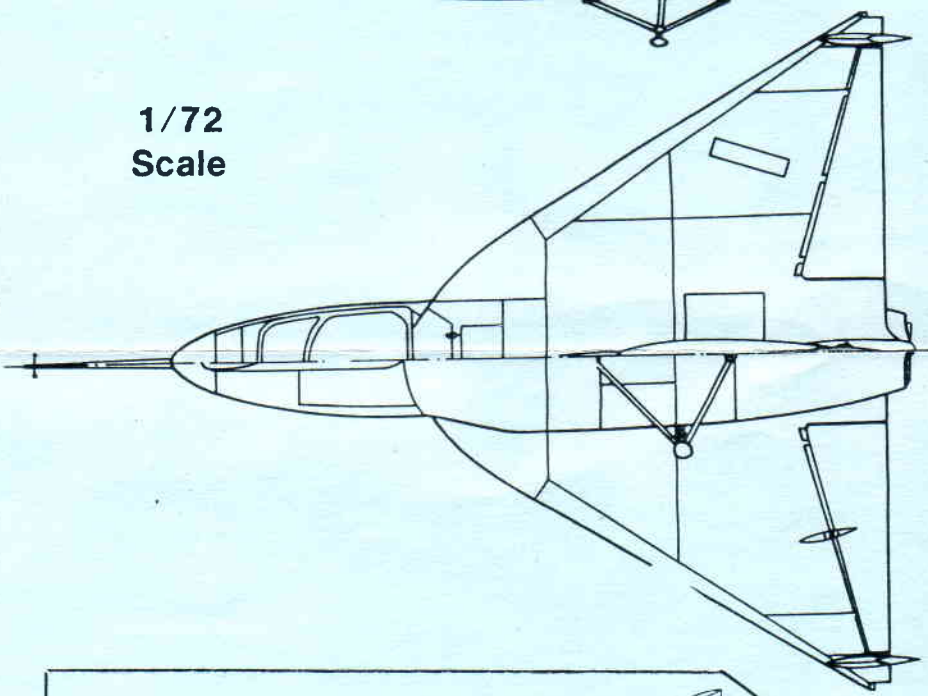
X-13

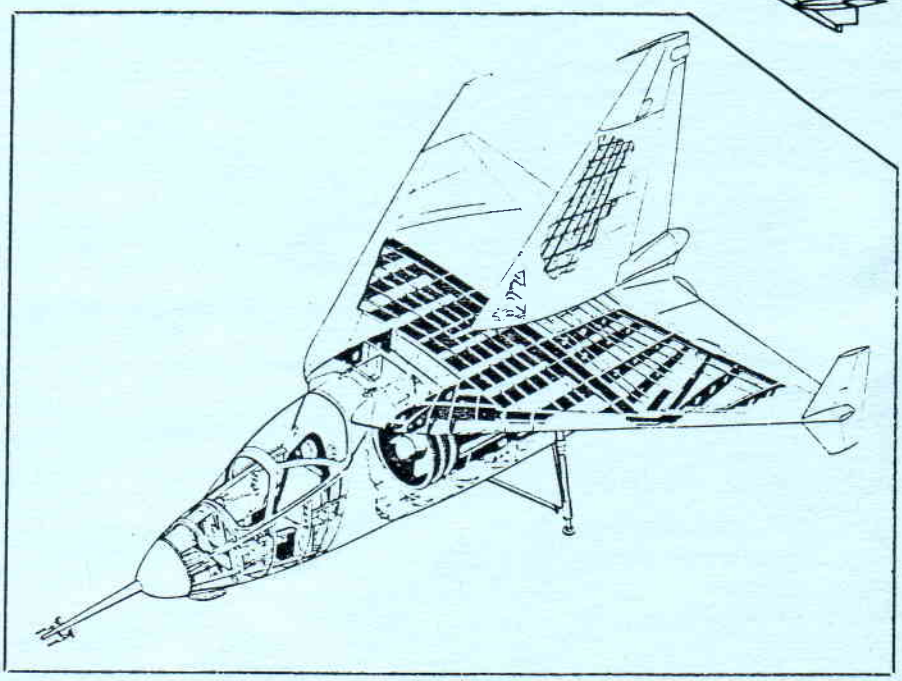
"Vertijet"





1/72 Scale



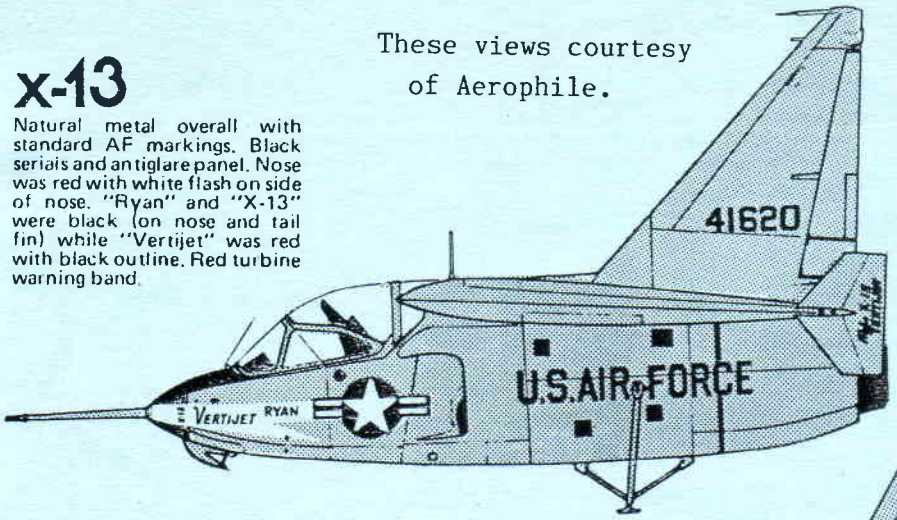


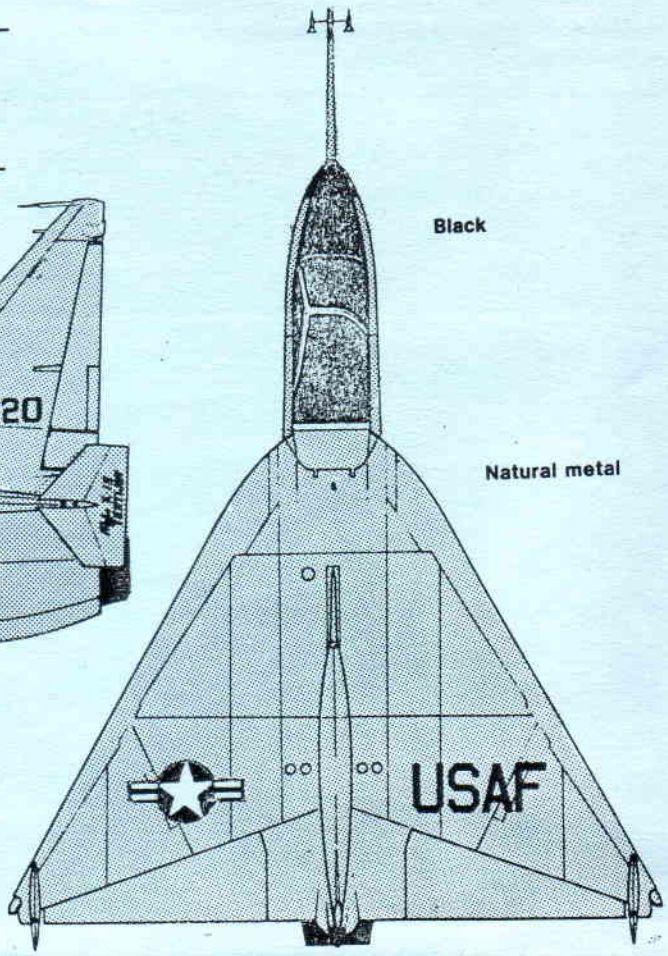
DECALS: Complete markings for the Ryan X-13 'Vertijet' are provided on the enclosed Eagles Talon decal sheet. Future kits will usually have the decals required less national insignias, if they are not readily available elsewhere.

These views courtesy of Aerophile.

X-13

Natural metal overall with standard AF markings. Black serials and antiglare panel. Nose was red with white flash on side of nose. "Ryan" and "X-13" were black (on nose and tail fin) while "Vertijet" was red with black outline. Red turbine warning band.





Ryan X-13 'Vertijet' References:

Aerophile, Vol.1-1
Aeroplane Monthly, May 1981, Vol.9-5
Aviation Week & Space Technology: May 13, May 20 & Aug. 26, 1957
The Illustrated Encyclopedia of Aviation & Space, Vol. 14
Janes Pocket Book of Research & Experimental Aircraft, J. R. Taylor
\+ RAF Flying Review, March 1968
Ryan Guidebook,
X-Planes, X-1 to X-29, Jay Miller

\+ Denotes Color

READ ALL instructions several times...
STUDY ALL drawings thoroughly...

CONSULT the Eagles Talon tip sheet for hints on construction and finishing your model.