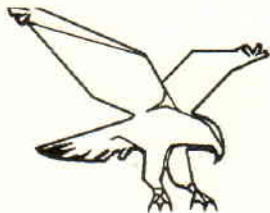


ET 120  
1/72 Scale  
Decals Included



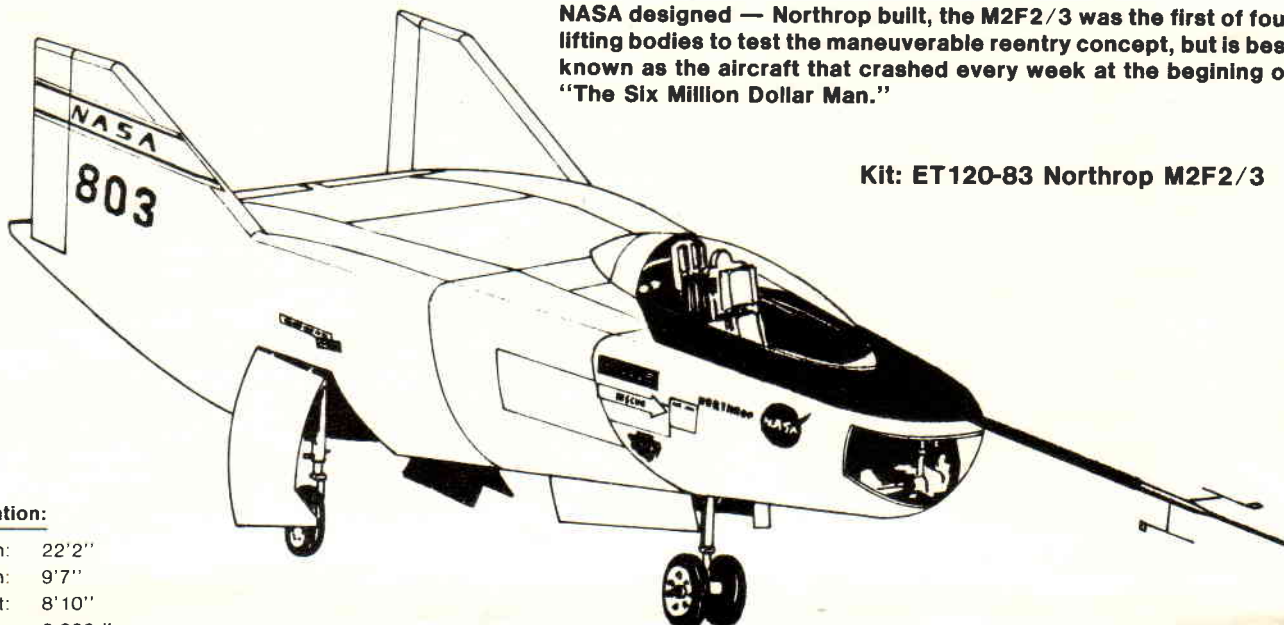
EAGLES TALON

PO BOX 190084, ST. LOUIS, MO. 63119

## Northrop M2F2/3

NASA designed — Northrop built, the M2F2/3 was the first of four lifting bodies to test the maneuverable reentry concept, but is best known as the aircraft that crashed every week at the beginning of "The Six Million Dollar Man."

Kit: ET120-83 Northrop M2F2/3



### M2F2 Specification:

Length:	22'2"
Width:	9'7"
Height:	8'10"
Weight-empty:	6,000 lbs.
Weight-loaded:	9,400 lbs.
Fuel:	Ethyl-alcohol-water, and liquid oxygen (233 gals/210 gals)
Control rockets:	Four hydrogen-peroxide rockets of 400 lbs/thrust for flare control.
Powerplant:	Thiokol XLR-11, four chambered rocket engine (8,000 lbs/thrust total) for 100 seconds. Replaced later with three Bell hydrogen-peroxide rockets of 500 lbs/thrust each.

### M2F2/3 History:

The concept of lifting reentry bodies was conceived in 1957 by Dr. Alfred J. Eggers of NASA's Ames Research Center in California. His original conceptional vehicle was shaped like a half cone on its side, with the curved area on the bottom and the top being flat. A manned test vehicle was built of plywood in 1963. It was originally called M2, but was redesignated M2F1 (Manned, Modification 2, Fuselage 1). This 1,200 pound test bed conducted over 500 glide flights in two years, being towed behind both cars and a DC-3. It firmly established the feasibility and controllability of a reentry vehicle of this shape.

NASA initiated development of two full scale flight vehicles, one designed by the Ames facility based on the M2F1, and called the M2F2, the other by NASA's Langley Virginia facility and designated HL-10 (**The Eagles Talon kit ET121-83**). Both aircraft were built by Northrop for NASA. The purpose of these programs was not to build an actual usable reentry vehicle, but rather to verify wind tunnel data and evaluate handling characteristics and pilot-vehicle compatibility.

Completed in June, 1965, the M2F2 was shipped to Ames to be tested in their windtunnel, and then shipped to Edwards AFB for flight testing. Both the M2F2 and the HL-10, as well as the soon to arrive Martin X-24 (**The Eagles Talon kit ET118-83**), were designed to be air launched from the B-52 that had launched the X-15's. A special Northrop adaptor allowed the Northrop aircraft to connect to the X-15 pylon. Preparations for the pilots to fly the M2F2 included time in the modified X-15 simulator and profile descents in both F-104's and F5D's.

The first M2F2 flight was on July 12, 1966. Several pilots were checked out in the first 14 glide flights after which the four chambered XLR 11 rocket, left over from the X-1 and early X-15's, was installed. Even with the rocket installed, flights 15 and 16 were both glide flights.

During flight 16, on May 10, 1967, NASA pilot Bruce Peterson was to check aircraft controllability. Just prior to entering his flare for landing he experienced lateral oscillations. This caused him to drift off course and onto a converging course with a crash rescue helicopter. The end result was the M2F2 impacting the ground with the gear only partially extended. The aircraft tumbled end over end several times before coming to rest inverted. Peterson was severely injured including the loss of an eye, but eventually recovered and resumed flying. The film of this accident was used as the opening sequence for the television series "The Six Million Dollar Man".

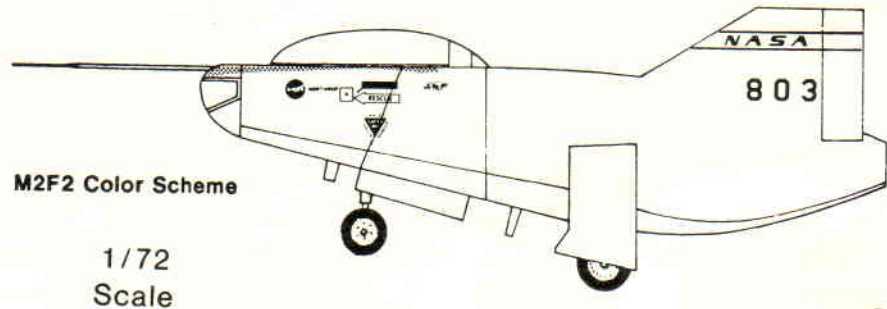
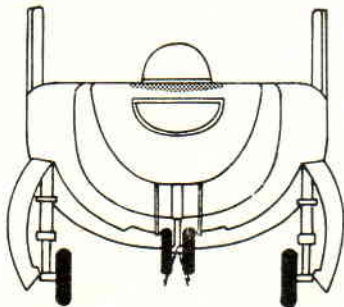
The crumbled M2F2 was returned to Northrop where it was rebuilt, and a center fin for stability was added. The rebuilt M2F3 (third fuselage) made its first glide flight on June 2, 1970, and its first powered flight on November 25, 1970. The M2F3 made 27 flights and achieved an altitude of nearly 90,000 feet and a speed of Mach 1.7.

A typical M2F2/3 flight lasted 4 minutes from the launch at 45,000 feet to landing. Typical decent rates ranged from 15,000 ft/min. at altitude, to 300-600 ft/min. at the landing flare altitude of 1,200 feet.

While the M2F2/3 and HL-10 were externally very different, they used identical systems internally. Both used the XLR-11 rocket, a modified ejection seat from a F106, a T-39 nose gear and main landing gear made from F-5 struts and T-38 wheels.

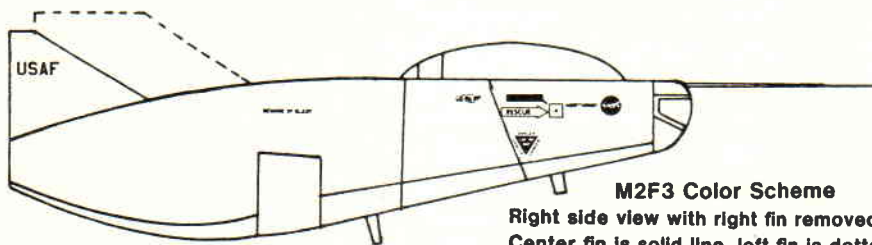
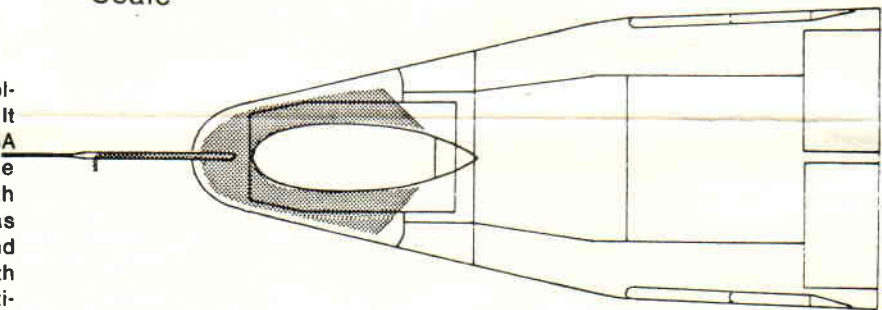
M2F2 pitch and roll control was provided by a large lower and two upper flaps. Yaw was controlled by flaps on the rear outer faces of the two vertical fins which served as speed brakes when extended simultaneously.

The M2F1 is presently at the Paul E. Garber Preservation, Restoration and Storage Facility (formerly Silver Hills) of the National Air and Space Museum (NASM), while the M2F3 is displayed in the Space Gallery of the museum.



#### M2F2/3 COLORS

**M2F2:** The M2F2/3 airframe remained polished natural metal throughout its career. It operated with the yellow/black NASA stripe on the outside of each fin with the large serial '803' in black below it. On both sides of the nose was a series of insignias and warning/rescue emblems. The round NASA emblem is closest the nose of both sides of the aircraft. A large black anti-glare panel extended at an angle from the rear of the canopy to the round edge of the flat fuselage top and extended out the nose boom to where it began to taper. The cockpit was grey with the exception of the conspicuously red pilots head rest. "BEWARE OF BLAST" goes on the right side directly above the wheel door, halfway between its top and the top of the fuselage.



**M2F3:** Identical markings were carried on the rebuilt M2F3 as it had as the M2F2. Initially there were no markings on the center fin, but later a 'USAF' was added to both sides, parallel the NASA bands. The center support down the new nose cone was natural metal.

**DECALS:** Complete markings for the M2F2/3 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.

#### M2F2/3 References:

- Aeroplane Monthly, Aug., 1978
- Air Enthusiast #8
- Air Progress Fe/Mr 1962; Dec, 1966
- Aviation Week & Space Tec., Se-9, 1963; JI-13, 1964; Ju-28, Oc-11, Oc-18, 1965; JI-25, 1966; Ja-16, My-15, Au-7, 1967
- Flight Se-12, 1963; JI-8, 1965; My-5, JI-21, 1966
- Flying Review, Vol 21 #10 (June 1966)
- Flying the Frontiers of Space, Don Dwiggin, 1982
- Janes, 1971/72, 1972/73, 1973/74
- Janes Pocket book of Research and Experimental Aircraft
- Northrop: An Aeronautical History, 1976
- The National Air and Space Museum, Vol. 2, Space Remarkable Flying Machine, H.R. Palmer, 1972
- Denotes color

Many of the AW&ST references have no photos. The two best references which include many photos are Northrop: An Aeronautical History, and Air Enthusiast #8.

**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.

**M2F2 Instructions:**

Before you begin construction of the M2F2/3 read the entire instructions thoroughly and determine if you will be modeling the F2 or the F3 version. **M2F2 use:** Clear part #31. **M2F3 use:** Clear part #34, and center fin (#32 & 33)

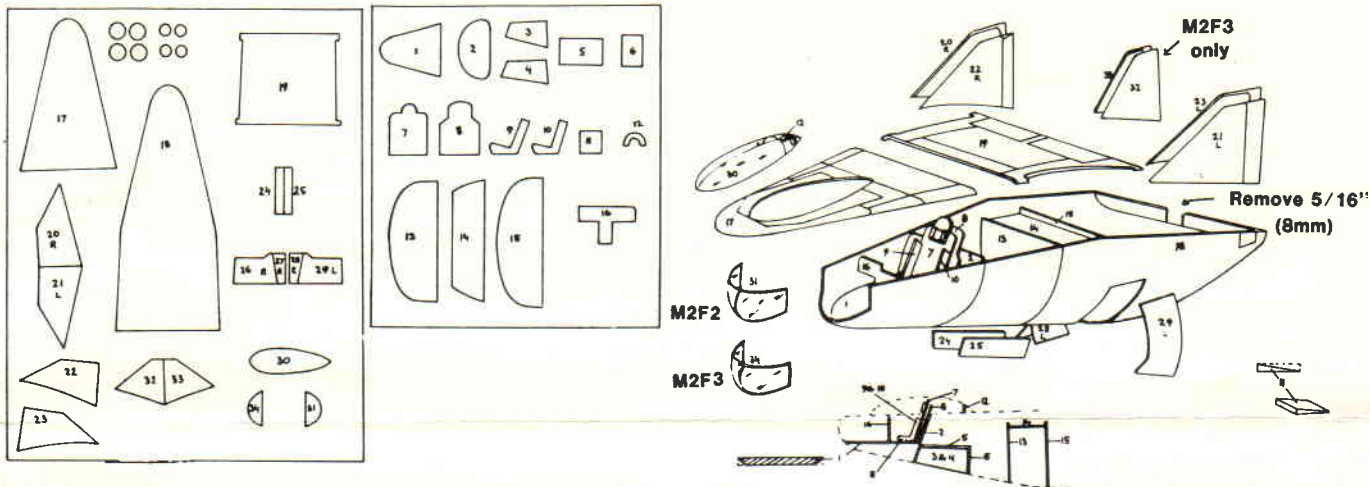
Build up the cockpit and wheel wells (parts #1 thru #15) in the lower fuselage (#18) after you have removed the well doors. Part #1 (cockpit floor) should be beveled along its front and rear edges, while #11 (ejection seat bottom) should also be beveled.

Remove from the center of the bob-tail on #18, 5/16 of an inch or 8mm. Cut a piece a little longer than the opening from scrap and glue it in on the inside to form the recessed area where the rocket motors stick out.

The outer sides of the fins (#20 & 21) should have their bases trimmed to sit on the top of #18, while on the insides of the fins (#22 & 23) you should leave some excess plastic forward of the rudder line so that it will fit down into #18.

Scratch build the gear struts and test nose probe.

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.



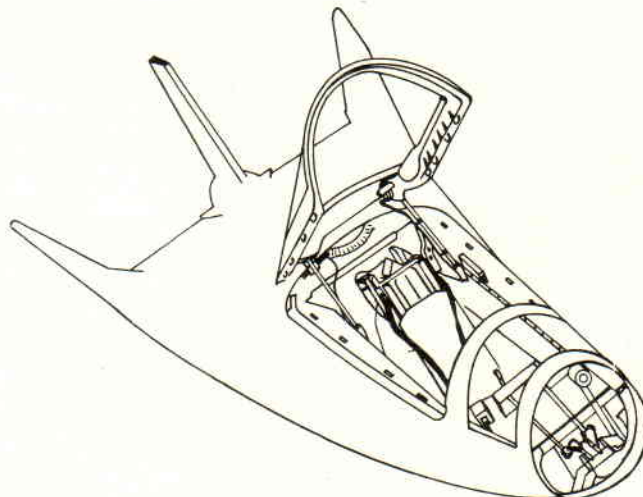
**Notes of interest:**

The two upper and one lower control flaps are molded in the closed position.

Outboard rudders extend down into #18. The inside of the fins are fixed, while the outer portions (rudders) can deflect outboard only. Both sections have blunt trailing edges.

The center fin has a blunt trailing edge with no taper at all.

This kit was molded from contractor blueprints.



This rear view shows the rocket end of the M2F3. The four rocket motors protruding very little from the recessed rectangle in the center of the bobbed tail. On both sides of this rectangle extend three tubes, a short, and medium thin, and a long large one. Note the blunt trailing edges of the fins and rudders and the flat insides of the flap openings. The small rectangles above the long tubes are white with red lettering and read "BEWARE OF BLAST". Prior to installation of the XLR-11 the recessed area was plated over and the four control rockets stuck out where the two shortest tubes stick out near the bottom, and directly above these near the top of the bobtail.

**Cockpit:** Both the M2F2 and HL-10 had similar cockpits with only the instruments necessary for their missions installed. Note the wide flange on either side of the cockpit with four slots into which the canopy locks. The modified F106 ejection seat is snuggled between two side consoles and a meager instrument panel. On the left flange is a motion picture camera. The back of the instrument panel, all the wires etc. as well as support brackets were visible through the nose. HL-10 cockpit is depicted and this is the best we could decipher.



# EAGLES TALON

PO BOX 190084, ST. LOUIS, MO. 63119 USA

## 1/72 Aircraft Vacuum Kits

ET	Kit Name	Kit Code	Manufacturer	Price	QUANTITY	TOTAL
ET 101	Sukhoi		SU-2	\$7.50		
ET 102	Kawasaki	KI-32	May	\$7.50		
ET 103	Heinkel	He-178	May	\$6.00		
ET 104	Yokosuka	E14Y-1	Glen	\$7.50		
ET 105	Milkoyan Gurevich	MiG-3		\$6.00		
ET 106	Sukoda Kauba	V-4		\$6.00		
ET 107	Nakajima		Kikka	\$7.50		
ET 108	Kayaba	KA-1	Kago	\$6.00		
ET 109	Hansa Brandenburg		C-1	\$7.50		
ET 110	Hansa Brandenburg		Ufag	\$7.50		
ET 111	Yokosuka	R2Y	Kelun	\$9.50		
ET 112	Aichi	B7N	Grace	\$7.50		
ET 113	K9W/K1/BU131		Cypress	\$6.00		
ET 114	Temco	TT-1	Pinto	\$7.50		
ET 115	Nakajima	B6N	Jill	\$7.50		
ET 116	Curtiss	F9C	Sparrowhawk	\$6.00		
ET 117	Bell	XV-3		\$9.00		
ET 118	Martin Marietta	X24A/X24B		\$14.00		
ET 119	Douglas	XB-42/42A	Mixmaster	\$13.00		
ET 120	Northrop	M2F-2/3		\$9.50		
ET 121	Northrop	HL-10		\$9.50		
ET 122	Northrop	N-9M		\$8.50		
ET 123	Kawanishi	N1K1	Rex	\$9.50		
ET 124	Lockheed	GTD-21		\$7.50		
ET 125	Ryan	X-13	Vertijet	\$9.50		
ET 126	Vought	V-173		\$10.50		
ET 127	Commonwealth	CA-15	Kangaroo	\$10.00		
ET 128	Ryan	FR-1	Fireball	\$10.00		
ET 129	Ryan	XF2R-1	Dark Shark	\$10.00		
ET 130	Yakovlev	Yak-25		\$12.00		
ET 131	Aichi	M6A-1	Seiran	\$12.00		
ET 132	Aichi	M6A-1K	Nanzan	\$12.00		
ET 133	Kawasaki	KI-60		\$12.00		

Customer Name \_\_\_\_\_  
 Address \_\_\_\_\_  
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## 1/48 Aircraft Vacuum Kits

ET	Kit Name	Kit Code	Manufacturer	Price	QUANTITY	TOTAL
ET 201	Lockheed	GTD-21		\$13.00		
ET 202	Mitsubishi	A5M	Claude	\$13.00		
ET 202a	with resin propeller and engine			\$15.50		
ET 203	Lavochkin	LA-7		\$14.00		
ET 204	Yokosuka	E14Y-1	Glen	\$14.00		
ET 205	Ryan	FR-1	Fireball	\$14.00		
ET 206	Ryan	XF2R-1	Dark Shark	\$14.00		
ET 207a	Mitsubishi	KI-46-III	Dinah	\$29.45		

## 1/48 Aircraft Resin Kits

ET 507	Blohm und Voss	BV 40	Glider	\$30.00
ET 508	Curtiss	Hawk 75		\$40.00
ET 509	Mitsubishi	J8M1	Shusui	\$36.00
ET 510	Messerschmitt	Bf 109 V1		\$30.00

## 1/35 Armor Resin Kits

ET 401	Russian Airborne Assault Vehicle	BMD-1		\$45.00
ET 402	Russian Armored Car	BA-64		\$30.00

## 1/48 Spacecraft Kits

ET 301	Gemini-Titan II			\$40.00
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## Postage Domestic and Canada

Subtotal				
Europe	for first 2 kits	add	\$3.00	
	for each add'l kit	add	\$1/kit	
Asia, Australia	for first 2 kits	add	\$7.00	
	for each add'l kit	add	\$1/kit	
	for first 2 kits	add	\$12.00	
	for each add'l kit	add	\$1/kit	

Missouri residents, for sales tax add 5.725%

Total