# Tech Tips-009

## A help series

Dedicated to the dissemination of Detail model building methods and techniques.

Materials and methods presented here are not intended as the best or only solutions to the modeling challenge(s) discussed, rather as methods and procedures which have a proven record of success in actual use. Please keep experimenting with new materials and techniques as this is the only way to expand the fields of knowledge.

# Procedures in Plastic Model Conversion

John E. McCoy Sr. NAR-15731 revised: Dec 5, 2001. – Rev 04-21-2016

## 1.) PICKING THE MODEL:

a.) Decide the amount of **Detailing** and **TIME** you want to put in the model. Usually smaller models have less available "Stock" detail, However I have seen 1:72 scale F-100 Super Sabers with custom detailing so fine, from the proper angles you can't tell if it's a model or the real thing.

b.) Decide which type of kit you would like to attempt.

## 2.) STARTING CONSTRUCTION:

a:) Open the kit and arrange the parts you'll be needing, fuselage, wings, stabilizers, tail, canopy, nozzles, ordnance, etc.

b.) Layout the main body parts on heavy cardboard to get a top and side view cardboard cutout of the model. Balance these cutouts on the edge of a ruler to find the L.C.P. (Lateral Center of Aerodynamic Pressure) Include the rockets, bombs and other drop tanks etc., in your cutouts. This will avoid unfortunate consequences at the flying field.

c.) Find the **BEST** size body tube and nose plug, for your purpose. Cut tubes to approx. size and rough fit in the model body.

d.) Using masking tape, temporarily assemble as much of the model as practical. Insert a motor of the approx. impulse you plan to fly, and a test shockcord and recovery system in the tube for weight. Balance the model on the ruler or using the string method find the C.G. (Center of Gravity.)

e.) Compare the L.C.P. and C.G. locations. C.G. MUST be at least one caliber (Main body Diameter) forward of the L.C.P. this is usually about 1". This will give you a fair idea as to how much additional Nose wt. or added fin area will be needed to make the model stable. You can apply clay to the outside of the nose while the model is hanging from the string to bring the C.G. forward to the proper spot.

f.) Now decide where to cut the fuselage, or where to eject the recovery system. This is a most important point as it will determine the amount of detailing your will be able to do in the cockpit, and may make a difference in determining if the landing gear will be in or out. Cut the body carefully, I try to allow a small offset in the to halves to act as a auto alignment feature. Be Careful; Sometimes a very small error makes for an almost impossible fit.

g.) Trim the body tubes and Install as shown in Mr. Browns step by step P.M.C. instructions.

h.) Fabricate a Nose cone/plug adapter and centering parts. Omit this step if rear or other ejection method is being used.

i.) After main tube joints epoxy or CA has totally dried, mix and apply epoxy to the mounting end of the nose adapter you just made and carefully slide in place in the main tube. (MUCH care must be taken not to allow ANY epoxy to come in contact with the main body tube) Tape the nose section to the body and prop or hang the model NOSE DOWN. during the drying process. If all goes well the nose/body SHOULD have a good alignment joint.

j.) Assemble the remainder of the kit to your preference.

k.) Assemble, prime, paint and Finish bomb, rockets and other ordnance separate from the rest of the model.

l.) Prior to Painting wipe down All Parts with rubbing alcohol and let dry .

NOTE! Never wash parts in water with soap, this process can take weeks to dry and leaves a residue that ***will*** affect the adhering of the paint.

m.) Prime, Paint and Finish (decal) as you wish.

n.) Attach ordnance to completed model.

o.) Assemble Data/Difficulty packet, consisting of at least one view of the model as released by the manufacturer, and your difficult report on the kits conversion. (This is NOT a requirement of the event, however, I have been told by many, it does carry some weight with ***some*** judges.) Personally I think this is another example of a few purest in the hobby attempting to make a fun event a Bore. I encourage everyone entering a P.M.C. event to strongly challenge ANY judge who seems to be judging anything other than the model he is looking at, let's keep the Fun in our Craftsmanship events.

# Recommended First Plastic Model Conversions

Kenneth Brown -NAR-29354 & John McCoy NAR-15731
Revised Oct. 29, 2001

1. For A's and beginners

(1/72) X15-A2, Monogram, Kit 5908

(1/54) X15 Revell, Kit H164 re-release

(1/48) F-104 Testers, Kit 592 or any inexpensive 1/48$^{th}$ scale kit

(1/48) F-100 (any kit)

(1/48) Jupiter C rocket Kit 5103 Glenco

2. For B's and C's & Teams

(1/48) F-14A Monogram, Kit 5822

(1/32) F-16N Revell, Kit 4767

(1/48) F-106 Delta Dart Monogram, Kit 5809

(1/48) F-105 G Wild Weasel Monogram, Kit 5806

(1/72) Tornado Monogram, Kit 5426

(1:144) Mars Liner rocket Kit 5914 Glenco

(1/32) F104-G Starfighter, Kit 4731 Revell or other

# Some Suggested Tools for use in Plastic Model Conversion & General Modeling.

John E McCoy Sr. NAR-15731 - Revised Dec.5, 2001- Rev-2 04-21-3016

Most of the tools I am about to list, will probably already be in you workshop toolbox. This list is intended for the first time modeler, or those who may not have had the exposure to modeling, the rest of us rocket freaks have been privileged to wallow in. This list is by no means complete nor have I attempted to list everything you would want in a "Complete" modeling shop. You ***will*** find tools and Fixtures to add as time goes on. For starters here goes.

1. A CLEAN, Quiet place to work. Shop safety demands keeping debris and clutter to a minimum, anyone who has seen my pigsty shop knows what I mean.
2. Adequate Lighting: A well lit, shadow free work space is very important.

## ####Tools####

Assorted Files: Set of Needle files.
6" Half Round, Round & Flat files.

Saws: Xacto Razor Saws w/ #5 handles (variety of sizes available. A large cutting area is best.)
Xacto Razor Saw Miter Box.
coping saw

Hobby Knives: knife w/ #2, 11, 16, and 24 blades.
Hobby knife gouge set (Optional but a good idea.)
Sharpening Strop with rouge, make a habit of stropping your knife every time you pick it up.
Pencils, good old no. 2, 2H, and3H hard leads are helpful.

Drills and Bits: 1/4" or larger electric drill:
Assorted metal cutting bits (used to drill plastics at low speeds.)
1/8" Dia. Shank drum sander and sleeves.
Pin Vise(s)
Assorted Micro drill bits #60 to #80 (These are expensive)
Optional: A Dremel is very helpful with the right bits, mill ends and polishing fobs.
2pair of Scissors. 1for general work the other is used ONLY to cut DECALS.
6" needle nose pliers.
6" or 8" diagonal or side cutter pliers.

Sanding Blocks: Glit-Sticks in various grits, 80 to 600
An assortment of 1"x1" x12" balsa blocks with different grit sandpaper sheets, 80 to 600 grit.
#0000 or 4/0 steel wool or ***Ultra fine 3m Scotch bright pads #7448.***
12"or longer Metal ruler.

Alignment Jigs: Assorted size METAL Angles and Channels.( wood has a nasty habit of warping.)

Paint & Detail Brushes: A Few GOOD QUALITY artists letter brushes. 1each #0, #1 & #2 Gray Squirrel Quills will do very nicely.

Don't try to obtain all this stuff at once, gather a little at a time so Mom or the Wife or hubby won't complain to much HA! Ha! Have fun.

# *Model Conversion.*

*John E. McCoy Sr. - NAR-15731 - revised: Dec. 5, 2001*

Here is a partial list of some specialty items used in P.M.C. you may not have used in "normal" rocketry.

***Body Tube cutting Jig***: this is more of a tool but I ran out of room on the other sheet.

***Paints:*** Assorted bottles of Flat color model paints.
Assorted flat and gloss spray cans of paint.
Plastic seam fillers (there are many, all about the same.)

***Tapes:*** 1/4" 3m Fineline lettering tape.
1/2", 3/4" &1" paper masking tape
Scotch Magic transparent tape (for Fine Detail Masking)
Masking Liquid. (several on the market.)
Masking Films. (Tufbak is one brand.)
Parafilm M. (Fine detail masking film.)

***Adhesives, Epoxies & Glues:***
Medium and Slow C.A's
5 minute epoxy
30 minute epoxy
LIQUID plastic cement and a #2 Red Sable brush.
Methylene Chloride (MC) solvent welding agent.
Yellow Carpenters Glue. (Temporary bonds.)
Contact cement.

***Shock Cord Stock:***
Kevlar Line. (Braided or Twisted 70 & 100lb. Test)
1/8" Flat, Oval or round fabric elastic. (For heavy models you will need 3/16 or 1/4" elastic.)
*Learn to tie a butterfly knot.

***Others:*** Assorted .003 to .063 Steel Music wire.
5/32", 7/32" & 9/32" brass and alum tubing (launch lug) sizes. Do not buy 1/8", 3/16" & 1/4" unless you plan to telescope the tubes.
Assorted Styrene plastic Sheet, Rod and Tubing in various small diameters.
Assorted Threads and small dia. lines. (for detail cables, antenna, conduits and piping.)
3m Finesse-it II finishing material. (removes micro scratches for paints and plastic surfaces.)
In my tools list I also forgot to mention a 2/0, 3/0, 5/0 & 10/0 Extra fine sable touchup brushes. These ***very fine brushes*** are essential in detailing small parts and cockpits.

Again you will find all kinds of "Stuff" to use in enhancing you models. Here's to the fun in modeling.

# From the Eye of a Builder

Provided by Kenneth Brown NAR-29534

1. Intake ejection is worth ***more*** points than nose ejection, but parachute reliability is decreased.

2. Sixty percent of plastic models result in plastic death. Models should be flown first, then judged for flight and static points.

3. Reliability in flight is worth ***more*** than difficulty in a model.

4. The most difficult model ***seldom*** wins a meet.

5. Larger models are easier to build.

6. A lot of bombs and missiles tends to foul the parachute, but means more points.

7. Nose ejection is the best, but less detail in the cockpit.

8. The 500 gram limit has to be increased if 1/32 models are to be used extensively.

9. Two-engine models are more difficult and should receive a ***lot*** more points than one engine.

10. Swept-back wings give a straighter boost.

11. A model that rolls gives a straighter boost.

12. Models judged first are underscored. (Points tend to increase during judging.)

13. When choosing and building a model, work towards what the judges like and not what you crave.

14. Take three different models to a meet:
    - One for cold and windy days (F-100 or F-104)
    - One for light competition (1/32 F-16 or 1/48 F-105 G)
    - One for tight competition (1/48 F-14A or 1/32 Tornado)

15. Have excess data in your plastic model folder to hand in.

16. Have two covers for your data: one with your name and NAR number and division, and one with only your NAR number and division. Decide which one to use after judging the judges!

# From the Eye of a Plastic Model Judge

Provided by Kenneth Brown NAR-29354

1. The larger the model, the more the points.
2. More missiles and bombs means more points.
3. Wheels in means fewer points, but also fewer damage points.
4. Wheels out make more points, but also more damage points.
5. Fifty percent of the judges downgrade battle damage.
6. Fifty percent of the judges downgrade weathering.
7. Two engines will only receive a ***few*** points over one engine.
8. Cockpit detail is ***sometimes overlooked.***
9. A model that rolls in flight receives ***few*** points.
10. Swept-back wings (that are moveable) receive ***more*** points.
11. Points tend to increase as the judging proceeds.
12. The winners can be picked by first glances.
13. Lots of data ***has an influence.***
14. The name of the contest has an influence.

# Instructions (basic)

Provided by Kenneth Brown - NAR-29354 - of QCR

F-100 (Super Saber) 1/48th, F-104 (Starfighter) 1/48th, F-105 G (Wild Weasel) 1/48th

1. Put body together.

2. Check to see if 18mm tube will go through body to nose section. Cut out any plastic that interferes.

3. Glue body together.

4. Cut body at specified place.

5. Add more glue to both sections.

6. Add shock cord to nose piece. Spot glue into nose. Add lead, etc. [Total weight of nose cone, tube, and lead = (F-105, 46grams); (F-104, 29grams); and (F-100, 21grams). Weight should not interfere with the extension of the 18mm body tube into nose piece.

7. Glue shock cord into 18mm tube.

8. Put body together with both tubes in proper place, then add tape to outside cut joint. Spot glue in shims. Make sure shims don't interfere with the sliding body tubes, then remove tape.

9. Check fit of body section and nose section. Move tubes until body fits together at cut joint.

10. When sections fit, re-glue all shims and add more shims (if required).

11. Add additional weight to nose tube (if required) to move CG to proper distance. Make sure there is no interference with the lead and both tubes before gluing.

12. Cut pilots and seats to fit over tube (if required).

13. Wash all parts with soap and water before painting.

14. Paint pilot before gluing. Paint inside of canopy before painting outside the model and before gluing pilots.

15. Paint weapons before gluing to painted body.

16. Add launch lugs.
17. Finish and paint model.

18. Add decals.

19. Options: Wheels out or in, weathering model, and battle damage (by AA and aircraft cannons).
    - Power Selection: Total impulse (average) = mass/15
    - CG: Balance point of model (with engine in).
    - CP: Cut-out model (on cardboard). Two views, top, yaw axis and side, pitch axis.

    - Balance cut-out and measure from front = CP.

    - CP: Should be at least 1.0 caliber (dia.) behind CG (1" is average).
    - Move CG forward by adding weight to nose. You can add clear plastic fins, but judges don't like that concept.

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# A Concept in Plastic Models

by Kenneth Brown - NAR-29354 & John E. McCoy Sr. NAR-15731 revised Dec. 5, 2001

***Ken Brown***: **"**Plastic models are my favorite**. It is open to model rockets of guided missiles, rocket vehicles, space vehicles, or jets whose engines are in or near the rear of the fuselage**. A PMC is a model that the manufacturer did not produce as a model to be flown. "

***John McCoy Sr.:*** "I also enjoy PMC, and have been one of the events strong advocates for some time now."

## *Matrix ratings:*

***From Ken:***

Following on page 7b, are models that I have experience with and are rated 1-5 in the following 5 criteria:

I. Difficulty- One or two engines, ejection system, scale size.
II. Flight Characteristics - Straight boost, parachute ejection, model rolls.
III. Craftsmanship - Missiles, cockpit, bombs, wheels in or out, camouflage, parachute recovery.
IV. Reliability - Odds against plastic death.
V. Potential for winning first place.

**From John:**

page 7c, is a matrix of models I have flown in the recent past with success. I have used the same rating system and criteria Ken started while adding a few more manufacturers and model types,

Please keep in mind while selecting your model subject:

"**Plastic Model Conversion Competition comprises a single event open to model rockets that have been assembled from commercially-available plastic model kits of guided missiles, rocket vehicles, space vehicles, or jets whose engines are in or spaces apart to the rear of the fuselage**".

A Pink book insert of PMC rules 55 and scoring is located on page 9a of this handout.

***Manufacturers:***

A - Monogram
B - Academy (minicraft)
C - Testers
D - Revell
E - MPC
F - Lindberg
G - Kenner Products
H - AMT (ERTL)
I - Glenco

Note! Pages 7b and 7c are Data based Model selectors:
See PMC-07B-chart-(KB) and PMC-07c-Model Matrix-(JEM).
These model data bases and comments are just a sample of the models available but should help in selecting a PMC model for building.

***Plastic Model Conversion Selection Chart***

Kenneth Brown - NAR-29354 August, 1997



Rating System: I= DIFFICULTY; 1 or 2 motors, size,scale, conversion problems. II=Flilght Characteristics; straight boost , model rolls, lack of wobble.
III=Craftsmanship; Cockpit, Ordnance, wheels in or out, custom parts, IV= Reliability; odds against " Plastic Death"
V= Potential for winning 1st. place; Avg.= overall potential.

***1 to 5 values are listed with 1 being lowest and 5 highest.***

| Description | Kit No. | Manufacturer | Scale | eject sys | Motor(s) | Wt. g | I | II | III | IV | V | Avg. | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 1/72Scale | | | | | | | | |
| Tornado | 5426 | A | 1/72 | N | A10-3 (2) | 82 | 3 | 2.5 | 2.5 | 2.5 | 2.5 | 2.6 | Two engines. Excellent details |
| F-15 | | A | 1/72 | N | A10-3 | 60 | 4 | 1.5 | 5 | 1.3 | 4 | 3.2 | Two engines. Excellent details |
| F-104G | | B | 1/72 | N | A10-3 | 55 | 3 | 1.74 | 3.2 | 1.3 | 2.7 | 2.4 | One engine. Good detail |
| X-Wing fighter | 1-1971 | E | 1/72 | N | A10-3 | 85 | 4 | 3.5 | 3.5 | 2 | 3.9 | 3.4 | One engine. Godd detail. Heavy |
| Mig 21 | 1618 | B | 1/72 | N | A10-3 | - | 3 | 1.5 | 3 | 1.3 | 3 | 2.4 | Mig's are equal to F-100's |
| | | | | | 1/48Scale | | | | | | | | |
| F-106 Dart | 5809 | A | 1/48 | N | C5-3 | 238 | 2 | 2.9 | 1.3 | 2.2 | 1.5 | 2 | Good details. Heavy |
| F-104 Starfighter | 592 | C | 1/48 | N | C6-3 | 109 | 3 | 1.5 | 3 | 1.3 | 3 | 2.4 | |
| F-16A Falcon | 4562 | D | 1/48 | IN | C6-3 | 128 | 4 | 2.1 | 3 | 2 | 3 | 3 | |
| F18 BlueAngle | 5820 | A | 1/48 | N | C5-3 (2) | 176 | 3.7 | 3.3 | 3 | 3 | 3.2 | 3.2 | |
| F-14A Tomcat | 5822 | A | 1/48 | IN | C5-3 (2) | 340 | 1.2 | 2.9 | 1.2 | 2.5 | 1.2 | 1.8 | Two motor.Excellent Detail,Heavy |
| F100 SuperSabre | 2509m | E | 1/48 | N | C6-3 | 176 | 3 | 1.5 | 3 | 1.3 | 3 | 2.4 | |
| F100 SuperSabre | 5310 | E | 1/48 | N | C6-3 | 154 | 3 | 1.5 | 3 | 1.3 | 3 | 2.4 | |
| A72 Corsair II | 8861 | H | 1/48 | N | C5-3 | - | 1.5 | 4.5 | 1.5 | 5 | 5 | 3.5 | model unstable |
| F 104C Starfighter | 5433 | A | 1/48 | N | C6-3 | 125 | 2 | 1.5 | 2 | 1.3 | 2.7 | 1.9 | Good Detail |
| F100Thunderbirds | 5442 | A | 1/48 | N | C6-3 | 171 | 3 | 1.5 | 2 | 1.3 | 2.7 | 2.1 | |
| F105G Weasel | 5806 | A | 1/48 | N | C5-3 | 210 | 1.8 | 3.8 | 1.3 | 2.2 | 1.9 | 2 | Heavy. Excellent Detail |
| MIG 27 | 8877 | H | 1/48 | N | C6-3 | - | 3 | 1.5 | 3 | 1.3 | 3 | 2.4 | Mig's are equal to F-100's |
| | | | | | 1/32Scale | | | | | | | | |
| F104G/CStarfighter | 4722 | | 1/32 | N | D12-3 | 354 | 29 | 17 | 29 | 14 | 3 | 24 | Heavy Nosecone |
| F-16 Falcon | 4764 | D | 1/32 | IN | D12-3 | 388 | 1.8 | 1.9 | 1.9 | 2 | 1.6 | 1.8 | Good Detail. Intake |
| Tornado | 4780 | D | 1/32 | IN | C5-3 (2) | 410 | 2 | 2.2 | 2.2 | 2.5 | 2.2 | 2.2 | Two engine. Good detail |
| F-15 Eagle | 4800 | D | 1/32 | IN | D12-2 (2) | 594 | 1.3 | 3.1 | 1.3 | 2.8 | 1.4 | 2 | Over weight limit |
| Space Shuttle | 4736 | D | ? | N | D12-3 | 404 | 1.6 | 3.3 | 1.7 | 3 | 1.9 | 2.3 | Heavy Nose, Add Fins offset CG |
| | | | | | Oldies | | | | | | | | |
| X-wing Fighter | 1-1914 | E | ? | N | C6-3 | 148 | 4 | 3.5 | 3.5 | 2 | 3.7 | 3.3 | |
| Colonial Viper | 3617 | A | ? | N | C6-3 | 140 | 4 | 1.4 | 3.5 | 1.6 | 3.7 | 2.8 | |
| Marauder | 8031 | A | ? | N | C6-3 | 137 | 4 | 1.5 | 3.5 | 1.7 | 3.7 | 2.9 | |
| | | | | | Odd Balls | | | | | | | | |
| Droide A-Wing | 1618 | G | ? | N | D12-3 | 321 | 2 | 2.5 | 3.3 | 4 | 3.7 | 3.2 | Gona make noise |

Recovery system ejection type: N= Nose blow, IN= Intake eject, R= Rear eject, S= Side opening. ?= Other

## ***Plastic Model Conversion Selection Chart***

John McCoy NAR-15731 Jan. 2, 1998 Revised Dec. 5, 2001 

Rating System: I= DIFFICULTY; 1 or 2 motors, size,scale, conversion problems. II=Flilght Characteristics; straight boost , model rolls, lack of wobble.
III=Craftsmanship; Cockpit, Ordnance, wheels in or out, custom parts, IV= Reliability; odds against " Plastic Death"
V= Potential for winning 1st. place; Avg.= overall potential.

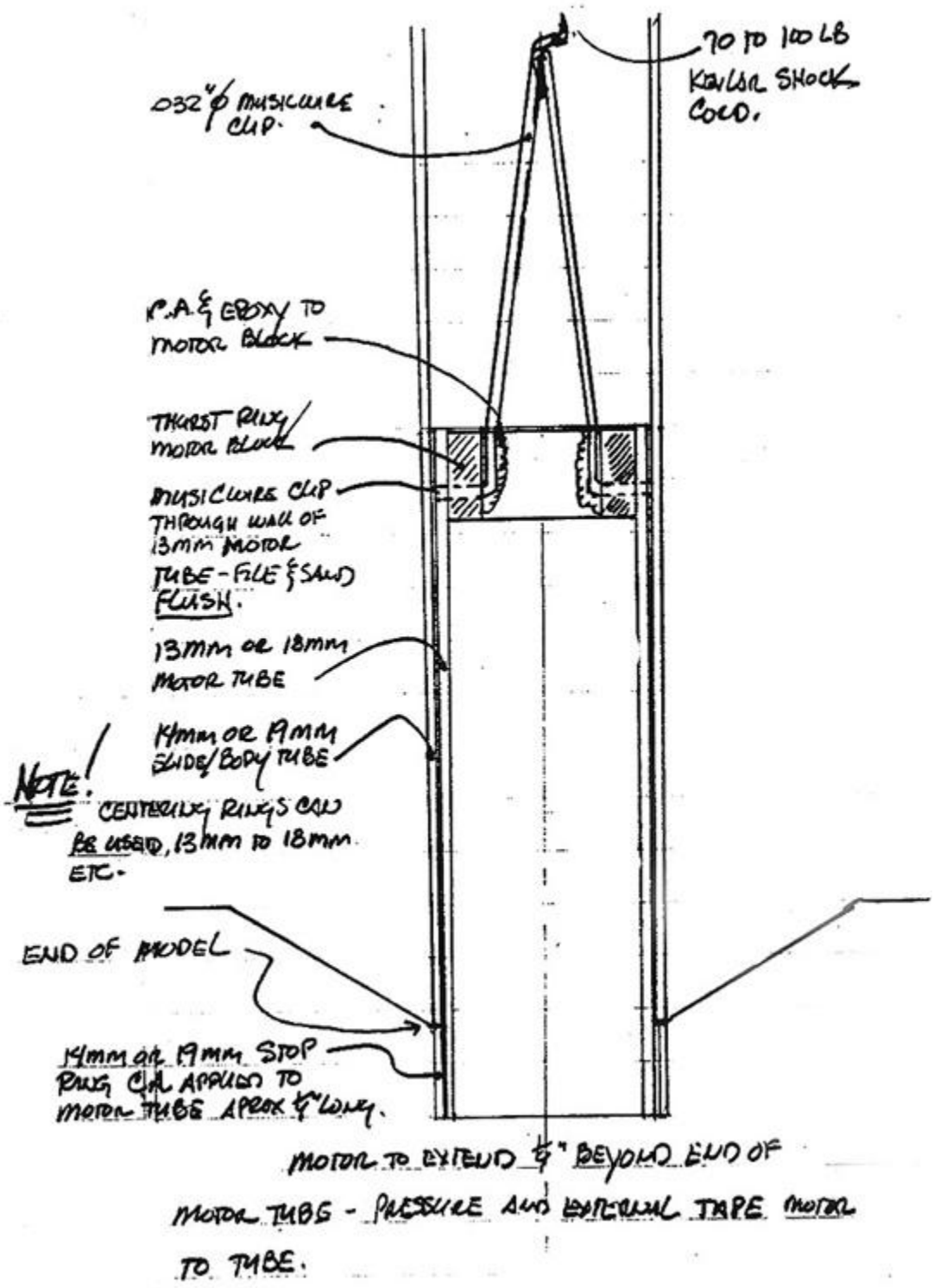
***1 to 5 values are listed with 1 being lowest and 5 highest.***

| Description | Kit No. | Manufacturer | Scale | eject sys | Motor(s) | Wt. g | I | II | III | IV | V | Avg. | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Nike- Hercules | H-1804:149 | Revell | 1:40.65 | N | A10-3T | 66.8g | 4.75 | 3 | 3.5 | 3.5 | 3 | 3.55 | difficult conv. great detail |
| Army Redstone | H-1832:79 | Revell | 1:110th | N | A10-3T | 25.3g | 1.75 | 2.5 | 1 | 3 | 1.5 | 1.95 | Smallest PMC I've done to date. |
| Mercury-ATLAS | H-1833:250 | Revell | 1:110th | N | A10-3T | 49.2g | 2 | 2.5 | 3 | 4 | 1.75 | 2.65 | use entire complex for more points |
| Apollo/Saturn V | 5082 | Monogram | 1:144th | N | 3 D12-3 | 465.4g | 3 | 4 | 3.5 | 3 | 3.5 | 3.4 | Good detail,heavy,2 chutes@77.5g |
| 3-stage ferry rocket | 5908 | Glenco | 1:288th | N | A10-3T | 51.7g | 1 | 2.5 | 2 | 3.5 | 1 | 2 | Fun Model, flys very well. |
| Jupiter C | 5103 | Glenco | 1:48th | N | C6-3 | 105.5g | 2.5 | 4 | 3.5 | 4 | 1.5 | 3.1 | very good first PMC. |
| Explorer I satellite | 5901 | Glenco | 1:6th | S | C6-3 | 71.2g | 4.25 | 2.5 | 4 | 2.5 | 1.5 | 2.95 | Very Difficult model, Much altering |
| XF-92A Dart | 941 | Testors | 1:72nd | R | A10-3T | 49.9g | 3 | 3.25 | 2.5 | 4 | 1.5 | 2.85 | Some altering but simple kit. |
| XFY-1 vto POGO | 536-39 | Lindberg | 1:48th | N | C6-3 | 120g | 4 | 2.5 | 3 | 2.5 | 1 | 2.6 | Judges may have problem with this |
| " | | | | | | | | | | | | | prop job with 2 chutes judgesMay? |
| X-15 rocket plane | H-164 | Revell | 1:64th | N | B4-4 | 57.6g | 2.5 | 4.5 | 3 | 5 | 0.75 | 3.15 | great flying , will take a "C"motor |
| X-15 A2 | 5908 | Monogram | 1:72nd | N | A10-3T | 63.8g | 3 | 2 | 3 | 2 | 0.75 | 2.15 | nice detail but small & heavy. |
| German A4- V-2 | 1 | Condor (Czech) | 1:72nd | R | A10-3T | 38.0g | 3 | 2.75 | 3.5 | 4 | 2.5 | 3.15 | launch pad only,fair detail, EASY |
| German A4 (V-2) | 560 | Revell | 1:54th | R | A10-3T | 51.3g | 3.25 | 4.75 | 2.5 | 4 | 2.5 | 3.5 | use launcher/wagon, good detail |
| F-8E Crusader | 4364 | Revell | 1:72 | R | A10-3T | 95.6g | 4 | 2.75 | 3.5 | 3.5 | 2 | 3.15 | Hi-wing,wheels up only, very Hard! |
| F-15 Eagle | 4755 | Revell | 0.06389 | N | 2-D12-3 | 695.6g | 4.5 | 4.66 | 3 | 4 | 1 | 3.43 | difficult ducting , thrust line very imp |
| F-100 C | 4351 | Revell | 1:65th | N | A10-3T | 72.0g | 2 | 2.5 | 2.25 | 3.5 | 2.5 | 2.55 | Good beginner model. |
| F-100 D | 72521 | Lindberg | 1:48th | N | C5-3 | 157.7g | 3 | 3.75 | 3.25 | 2.5 | 3 | 3.1 | FirePower series , good ordnance. |
| F-104 G starfighter | 4731 | Revell | 1:32nd | N | D12-3 | 266g | 2.75 | 4.75 | 3 | 4.25 | 3 | 3.55 | Great flyer on windy days. |
| F-104 A starfighter | 592 | Testors | 1:48th | N | C6-3 | 96.3g | 2.5 | 4 | 2.75 | 4.25 | 2.5 | 3.2 | Very good flyer wheels in ,nice roll |
| M48-A5 Vampire | 8642 | amt | 1:72nd | N | A10-3T | 77g | 4 | 0.75 | 2 | 0.5 | 0 | 1.45 | Bet you can't model, not an entry. |
| PamAm"Orion"2001 | 70060 | USAirfix | 1:144th? | N | C6-3 | 120.7g | 5 | 3.5 | 2 | 3 | 2.5 | 3.2 | Very difficult offset thrust, cl. fins. |
| Mars liner | 5914 | Glencoe | 1:144th | R | B6/C6-5 | 60.12g | 1 | 4 | 3 | 4 | 3 | 3 | interesting conv. Rear eject, cl. fins |

Recovery system ejection type: N= Nose blow, IN= Intake eject, R= Rear eject, S= Side opening. ?= Other

# ***Rear Ejection Pod - enlarged Diagram:***

Drawn by : John E. McCoy Sr. NAR-15731 Jan. 03, 1996



# 55 PLASTIC MODEL CONVERSION COMPETITION

## 55.1

Plastic Model Conversion Competition comprises a single event open to model rockets that have been assembled from commercially-available plastic model kits of guided missiles, rocket vehicles, space vehicles, or jets whose engines are in or spaced apart to the rear of the fuselage. The model must be one that the manufacturer did not produce as a model to be flown; and it must be modified for safe and stable flight by the contestant. The purpose of this competition is to produce a flying model from a kit originally intended as a static model; that shows maximum craftsmanship in construction, finish, and flight performance. The entry must be representative of the kit chosen, as designed by the manufacturer. It is not the purpose of this competition to allow entries which represent original and/or imaginative designs on the part of the contestant that incidentally are executed using parts from plastic kits as a basis.

## 55.2

With the exception of modifications necessary to convert the model for flight, the basic structure and configuration of the model must be as designed by the manufacturer of the kit. Details may be constructed from parts obtained from other commercially-available plastic kits, from plastic sheet, tubing, or shapes, and other materials as desired. Parts and assemblies necessary to convert the model for flight may be made of any safe material, and may be obtained from any source.

## 55.3

For stability purposes, the model may be fitted with transparent plastic fins to make it stable in flight. However, the transparent fins and their attachment shall be judged for craftsmanship along with the model.

## 55.4

Each entry must make a safe, stable flight. If the entry does not make a safe, stable flight, it shall be disqualified.

## 55.5

Static points shall be awarded according to the following schedule:

### 55.5.1 Craftsmanship: 500 points.

Points will be awarded in the following categories:

(a) Neatness and care in construction: 150 points.
(b) Craftsmanship of details: 100 points.
(c) Degree and quality of finish: 100 points.
(d) General appearance: 150 points.

### 55.5.2 Degree of Difficulty: 300 points.

Points shall be awarded according to the difficulty experienced by the modeler in building the model, according to the following schedule:

(a) Asymmetries inherent in the model: 40 points.
(b) Intricacy of paint pattern: 80 points.
(c) Degree of detailing required: 80 points. This category includes such items as the number of external or visible internal components and details that had to be added or reconstructed individually by the contestant.
(d) Difficulty of stabilizing model: 50 points.
(e) Difficulty of adapting the model for flight: 50 points.

The Judges should consider that entries exhibiting an equal level of craftsmanship may have required unequal amounts of time and effort because of the uniqueness of the kit chosen. (To facilitate judging, the contestant should point out difficult assemblies or construction problems in a note to the Judges.)

## 55.6 Flight Characteristics: 300 points.

300 flight points shall be awarded according to the following schedule:

### 55.6.1 Mission: 200 points.

Mission points are awarded for appropriate and scale-like operation of the model during flight. Examples of such operations are staging, simulated cloud seeding, operation of electronic payload, and smoke ejection. Any such operation must comply fully with the safety standards set forth in this NAR Sporting Code. If it does not, the entry shall be disqualified. The RSO is the only official who may judge the safety qualities of the operation.

### 55.6.2 General Flight: 100 points.

General Flight points are awarded for proper operation of the model during flight, including launch, lack of misfires, stability, recovery, and lack of damage on landing. No consideration should be given to staging or scale-like flight characteristics, as these are covered under Mission points; however, if the general flight performance of the model is adversely affected by the failure of one or more of these aspects, points may be deducted from General Flight.

## 55.7

Plastic Model Conversion Competition shall be scored as follows : the points awarded to the entry in static judging shall be added to the points awarded to the entry in flight. The contestant receiving the highest score is the winner.

# *Plastic model Conversion Worksheet (Jm - 03-02-98)*

**MEET NAME** _____

**CONTESTANT NAME:** _____

**NAR NUMBER:** _____

**PROTOTYPE NAME:** _____

55.1) Plastic Model Conversion competition comprises a single event open to model rockets that have been assembled from commercially available plastic model kits of guided missiles, space vehicles, or jets whose engines are in or spaced apart to the rear of the fuselage. The model must be one that the manufacturer did not produce as a model to be flown: and it must be modified for a safe and stable flight by the contestant. The purpose of this competition is to produce a flying model from a kit originally intended as a static model: that shows maximum craftsmanship in construction, finish, and flight performance. ***The entry must be representative of the kit chosen, as designed by the manufacturer.*** **It is not the purpose of this competition** to allow entries which represent original and/or imaginative designs on the part of the contestant that incidentally are executed using parts from plastic kits as a basis.

55.2) With the exception of modifications necessary to convert the model for flight, the basic structure and configuration of the model ***must be as designed by the manufacturer of the kit.*** Details may be constructed from parts obtained from other Commercially available plastic kits, from plastic sheet, tubing, or shapes, and other materials as desired. Parts and assemblies necessary to convert the model for flight may be made of any safe material, and may be obtained from any source.

55.3) For stability purposes, the model may be fitted with transparent plastic fins to make it stable in flight. However, the transparent fins and their attachment shall be judged for craftsmanship along with the model.

55.4) Each entry must make a safe, stable flight. If the entry does not make a safe, stable flight, it shall be disqualified.

55.5.1:) STATIC POINTS: ***CRAFTSMANSHIP:*** 500 Points.

| | | ***MAXIMUM POINTS*** | ***ACTUAL POINTS*** |
|---|---|---|---|
| a.) | Neatness and care in construction: | ***150*** | _____ |
| b.) | Craftsmanship of details: | ***100*** | _____ |
| c.) | Degree and quality of finish: | ***100*** | _____ |
| d.) | General appearance: | ***150*** | _____ |

55.5.2:) STATIC POINTS ***DEGREE OF DIFFICULTY:*** 300 Points.

Points shall be awarded according to the difficulty experienced by the modeler in building the model, according to the following schedule:

| | | | |
|---|---|---|---|
| a.) | Asymmetries inherent in the model: | ***40*** | _____ |
| b.) | Intricacy of the paint pattern: | ***80*** | _____ |
| c.) | Degree of Detailing Required: | ***80*** | _____ |
| d.) | Difficulty of stabilizing the model: | ***50*** | _____ |
| e.) | Difficulty of adapting the model for flight: | ***50*** | _____ |
| | ***STATIC TOTALS***: | ***800*** | _____ |

***55.6) FLIGHT CHARACTERISTICS:*** 300 Points.

| | | | |
|---|---|---|---|
| 55.6.1): | ***Mission:*** | ***200*** | _____ |
| 55.6.2): | ***General Flight:*** | ***100*** | _____ |
| | ***FLIGHT TOTALS:*** | ***300*** | _____ |

***GRAND TOTAL Static & Flight Points:*** ***1100*** _____

**********

# Sample Difficulty report

Remember to keep your report short, pointing out any and all "Extra" work you have done to make the model flight worthy and more "scale like". Include at least one Box top art photo and/or a photo of the real vehicle if you are simulating a full scale paint pattern. NONE of this is "required" by the pink book rule, but will help judges see things which might be overlooked.

## 1:48 scale: Lockheed F-104A Starfighter

### Plastic Model Conversion

Project Difficulty Report.

06/10/90 Model 75

Testors and Lindberg F-104 kits are good first PMC Model. Both have very few problem areas and the average modeler should have no trouble producing a fine flying model from either of these kits. I used the Testor kit for my reintroduction to PMC. It produced a Great looking, fine flying model which I have flown many many times.

* This model is trimmed to have a slight roll on boost.

* Please note amount of cockpit detailing and interior fabricated cockpit parts.

* Model fly' s on C6-3 motor only

John E. McCoy Sr.

NAR 15731

10/11/95

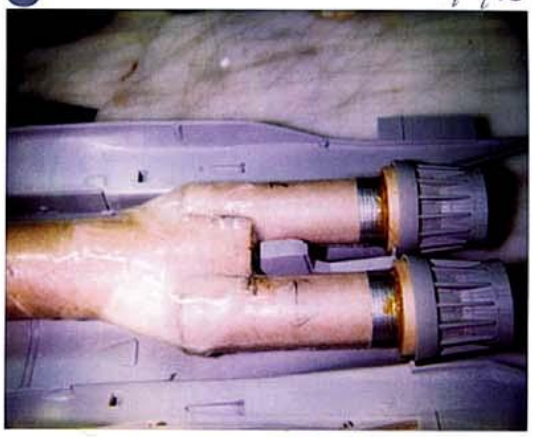
BASE CONVERSION ASSEMBLY - IN PLACE.
NOTE! CUT OFF INTAKE DUCTS 2" FROM FORWARD END ON DIAGONAL - PAINT WHITE.

10/11/95

FISD FUSELAGE BOTTOM W/ NOZZLES AND CUT DOWN INTAKE DUCTS IN PLACE. - NOTE OVAL COMPRESSED END 21/32" x 1 3/4" TO ALLOW TAPER OF UPPER & LOWER HALFS. CUSTOM CUT DOWN BT 55 "NOSE PLUG W/ SPACER AT FRONT

10/12/95

10/12/95



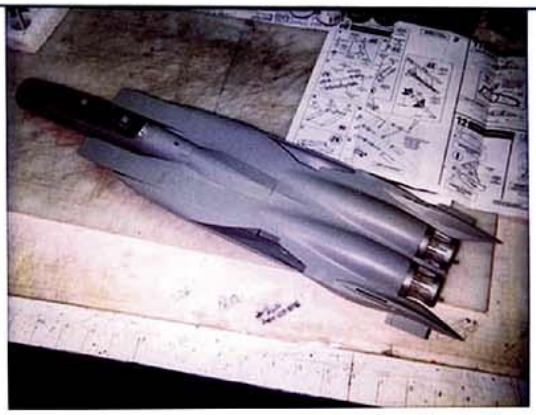
INSTALLED DUAL MOTOR TUBES W/ FIBERGLASS TRANSITION TO BT-55 MAIN. (SILVER ON MOTOR TUBES IS DUCT TAPE.

# Tech-Tip 009

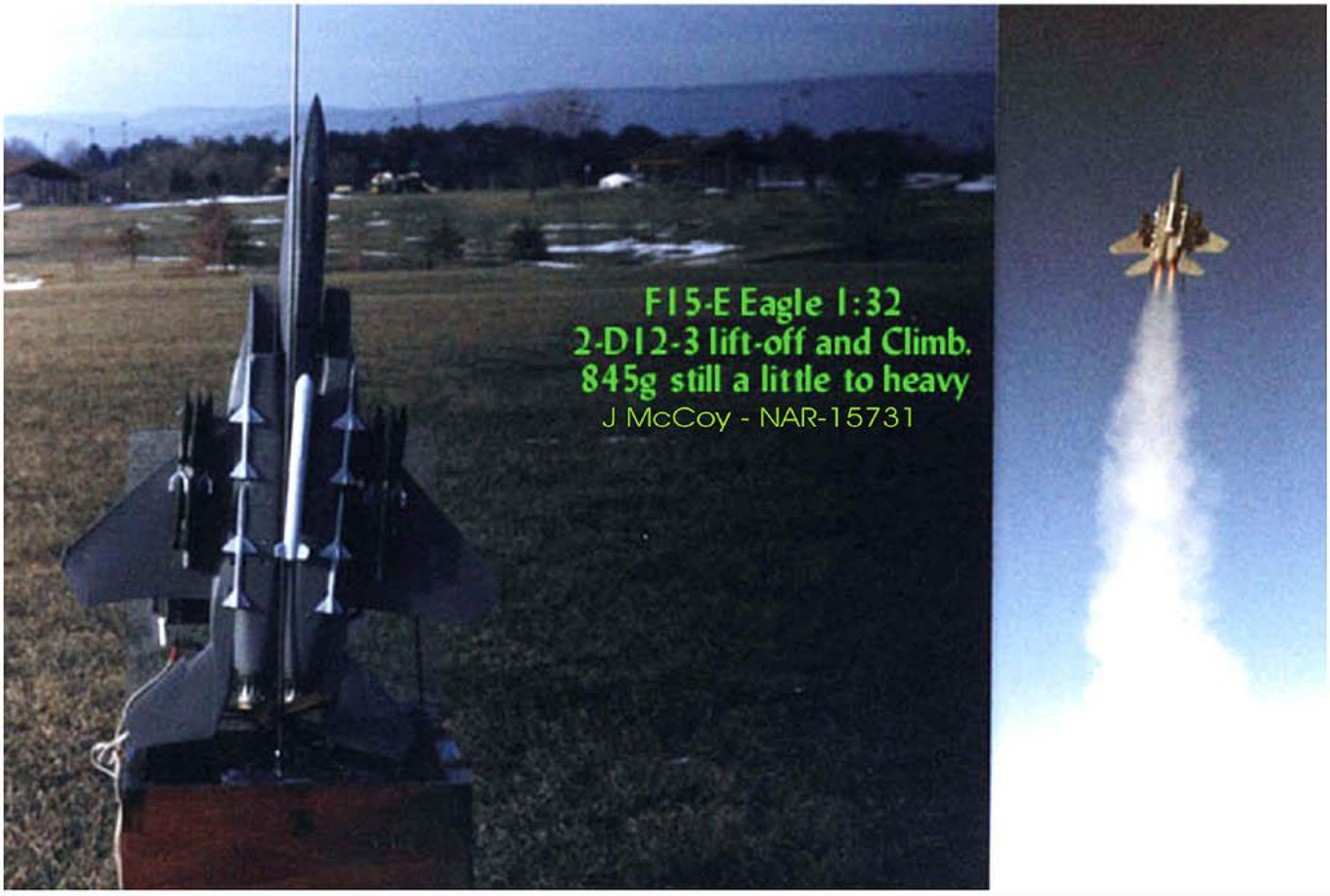
## Plastic model conversion

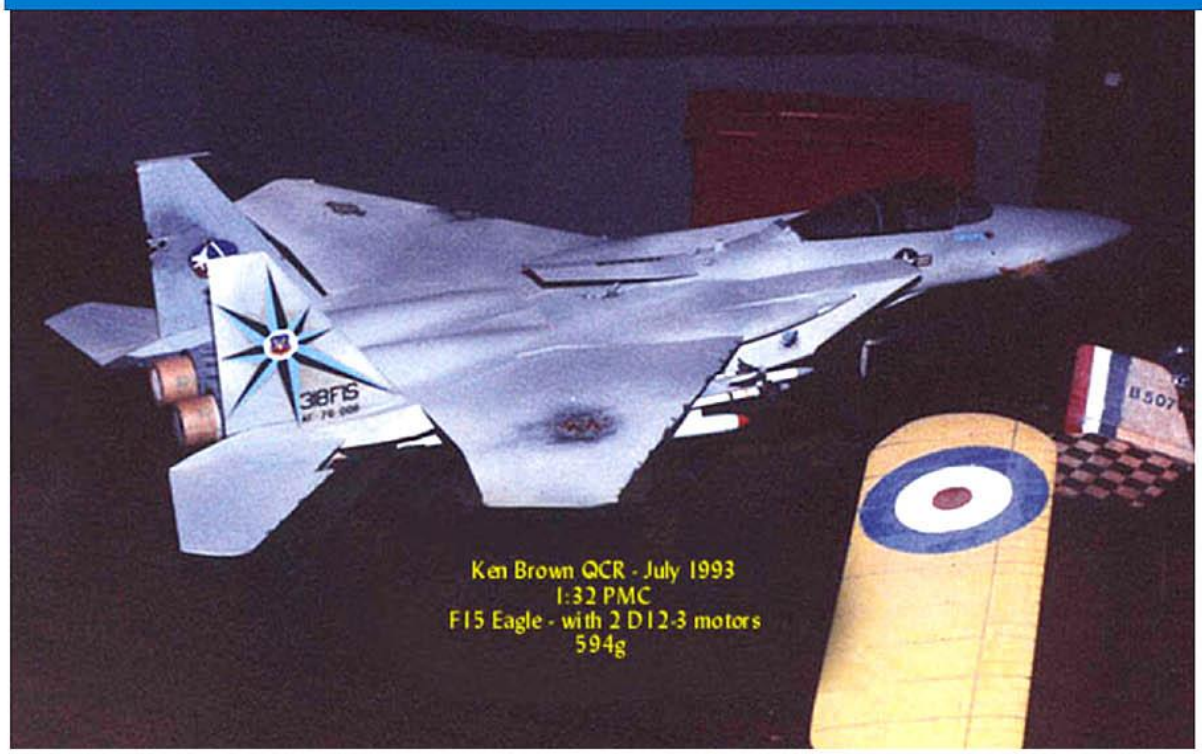
Revell 1/32" F15-E Eagle

Bt-55 stuffer tube to twin Bt 50 motor tubes. Fiber glass reinforced flattened transition



OCT 23, 1995 -
FUSELAGE COMPLETELY ASSEMBLED - COCKPIT DETAIL COMPLETE EXCEPT H.U.D. TO BE ADDED AFTER ALL PAINTING IS COMPLETE. - L.O. C.G. HAS BE OBTAINED BY CARDBOARD


F15-E Eagle 1:32
2-D12-3 lift-off and Climb.
845g still a little to heavy
J McCoy - NAR-15731


Ken Brown QCR - July 1993
1:32 PMC
F15 Eagle - with 2 D12-3 motors
594g


Ken Brown - QCR CapCon-I
Plastic Model Conversion class
1991

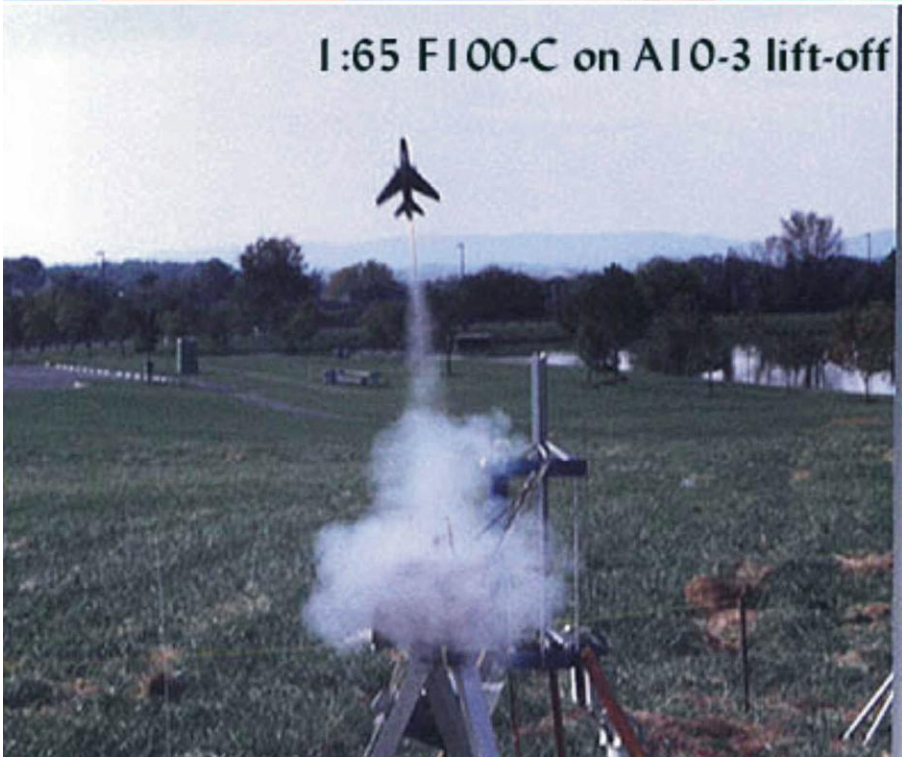

Do not throw
solids in sink

F104A and Tornado 1:48th 1991
Ken Brown - QCR CapCon-1
Plastic Model Conversion class

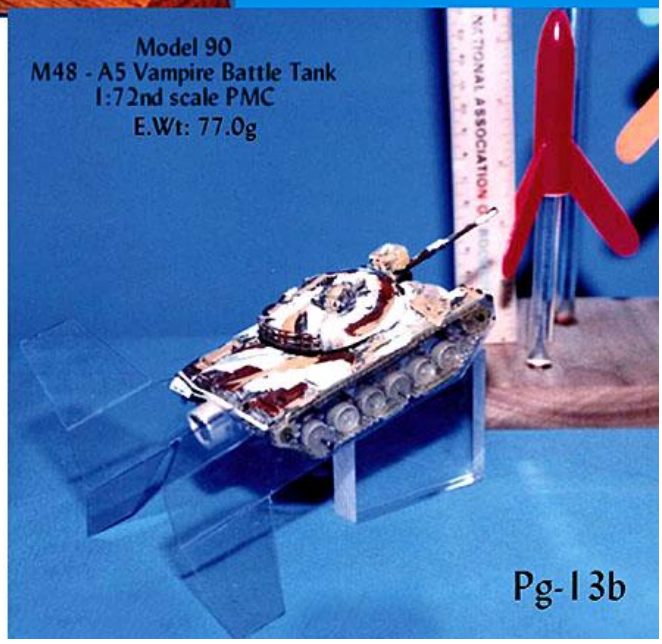

F105 Battle Damage
Ken Brown - QCR CapCon-1
Plastic Model Conversion class
JB
291
Pg -12c



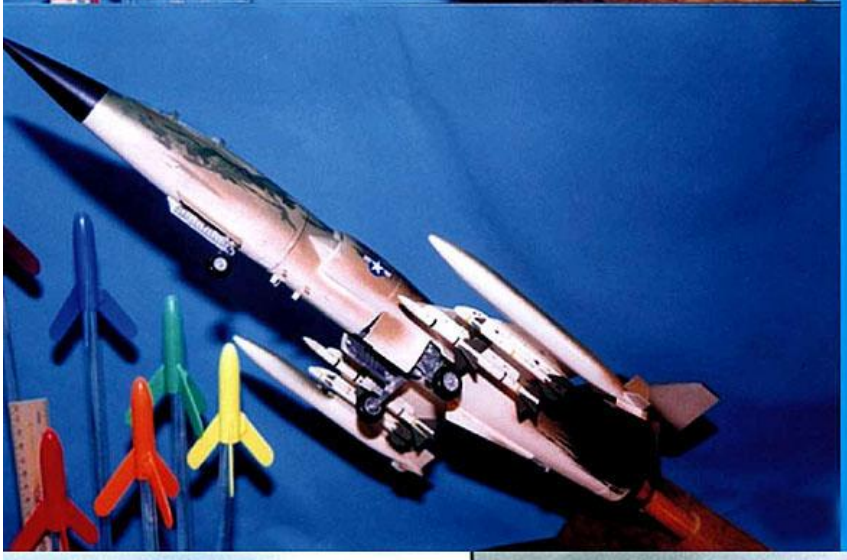
1:65 F100-C on A10-3 lift-off and Climb.




Converting Strange models
like Tanks,Cars, Trucks, Subs,
Ships and even prop driven
Aircraft is great fun.
These models however:
would not be allowed
in NAR Competition, see pink book
section 55.1-7 on pg 09.



Model 170
F-104G StarFighter
1:32 scale PMC
D12-3 - E.Wt 266g



## Larger scale models

1:32 and up tend to be very expensive and in most cases harder to "arm". We find very few Ordnance kit options for models larger than 1:48.

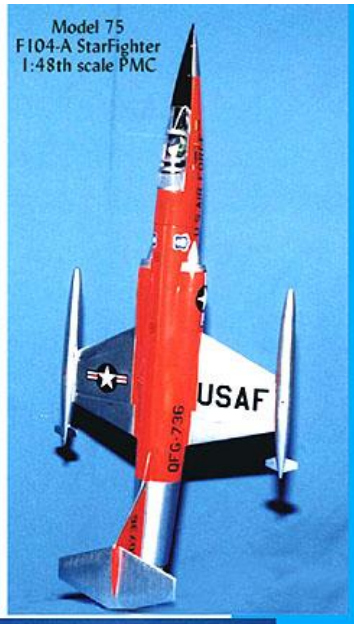
Weight is also a consideration. Most will require hogging out inside plastic to lighten the load.

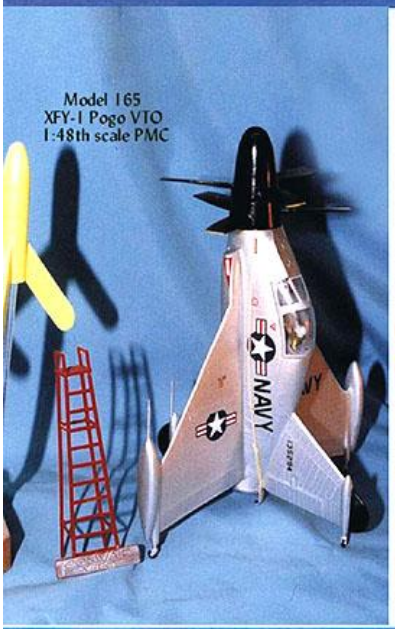
Watching the larger scale PMC's lift-off is always exciting, slow and usually easier to photograph.

Large Nylon chutes and heavy 1/4" elastic shock cords are essential for these hefty birds.

F104-G StarFighter 1:32 D12-3 lift-off and Climb anddual deploy.


Model 162
F-100D Super Sabre
1:48th scale PMC
USAF
53712
U.S. AIR FORCE


Model 75
F104-A StarFighter
1:48th scale PMC
USAF
OFG-736


Model 165
XFY-1 Pogo VTO
1:48th scale PMC
NAVY

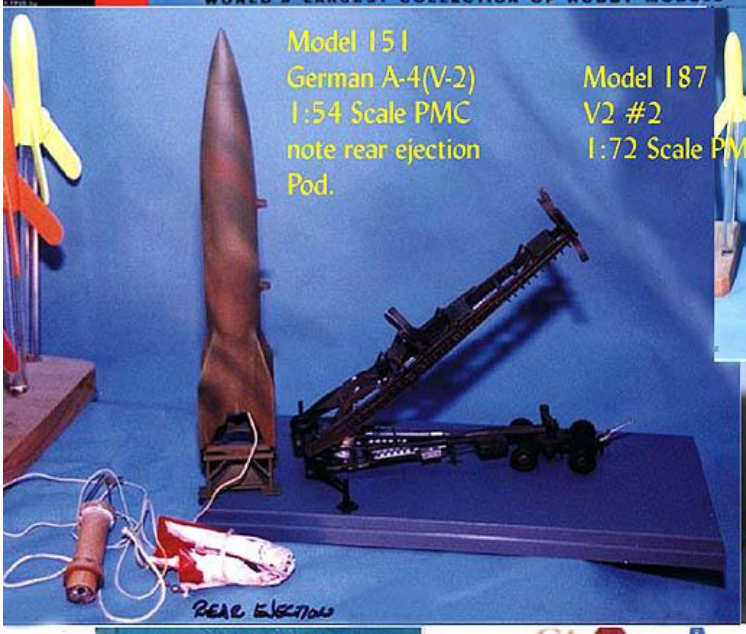

XF-92a Dart 1:72 Scale
model 172
72 XF-92A
DART P.M.C


Model 169
X-15 1:65 scale
PMC
USAF
U.S. AIR FORCE
NASA

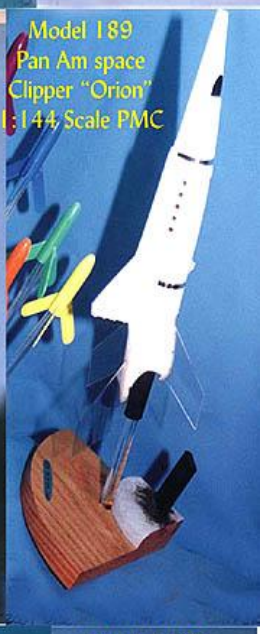

Model 109
X-15-A2 - 1:72 Scale
NASA
66671
U.S. AIR FORCE
USAF


Micro-Maxx Model 270 - packet box cover
Revell
Aerobee Hi
RECORD-BREAKING RESEARCH ROCKET
COMPLETELY FORMED PLASTIC EASY TO BUILD • READY TO PAINT
WORLD'S LARGEST COLLECTION OF HOBBY MODELS


Model 180
Army Redstone
1:110 Scale PMC
Model 202
Mars Liner
1:144 Scale PMC
REDSTONE


Model 151
German A-4(V-2)
1:54 Scale PMC
note rear ejection
Pod.
REAR EJECTION

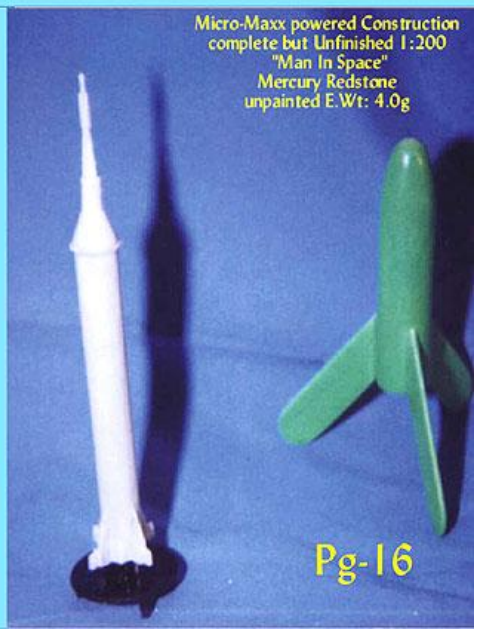

Model 187
V2 #2
1:72 Scale PMC
Model 182
3-D Cluster
Saturn V -Apollo 11
1:144 scale PMC


Model 189
Pan Am space
Clipper "Orion"
1:144 Scale PMC


Model 179
Nike-Hercules
1:40 Scale PMC
U.S. ARMY


Model 178
Von Braun
3 stage Ferry Rocket
1:288 scale PMC
Model 181
Mercury Atlas
1:110 Scale PMC


Micro-Maxx 7mm motors, have opened up a whole new segment of models previously to small for Conversion.
We can also incorporate the launch vehicles into the project, both for display and actually functioning as the launch platform if fitted with suitable launch rod and blast deflectors.


MM 249_Mercury Redstone 1/200 PMC:
Dia: .688"
Length: 4.265"
FinSpan: 13/16"
Motor: MMX-II
Ewt: 4.6g
LOWt: 5.7g
Complete: 11-29-01


MM 250_Mercury Altas 1/200 PMC:
Dia: .75"
Length: 5.875"
FinSpan: 2.0"
Motor: MMX-II
Ewt: 11.8g
LOWt: 12.9g
Complete: 12-22-01


MM 251_Gemini-Titan 1/200 PMC:
Dia: .688"
Length: 6.0"
FinSpan: 2.125"
Motor: MMX-II
Ewt: 17.5g
LOWt: 18.6g
Complete: 12-22-01


MM 252_ X-15 1:130 Scale PMC:
Heller Kit # 80202
Dia: .625" x .78125" Oval.
OA Length: 5.4375"
Wing Span: 2.063"
Motor: MMX-I or -II
NoseWt added: 20-#9 Shot (1.13g)
3/4" x 9" White Teflon Streamer.
Ewt: 8.9g
LOWt: 10.0g
Complete: 12-21-01


MM 254_Bell X-1 1:72 PMC:
Dia: .75"
OA Length: 6.0625"
Wing Span: 4.625"
Motor: MMX-II Only
6" -1/4Mil Chute.
Ewt: 18.65g
LOWt: 19.9g
Complete: 12-29-01


Model 289: MMX 1:144th PMC
F-104 target drone squadron
MMXII-.75 motor
Ewt:12g
Complete:10-13-03
After Decals: 07-20 04


Model 289: MMX 1:144th PMC
F-104 target drone squadron
Bottom view w/ Sidewinders
MMXII-.75 motor
Ewt:12g
Complete:10-13-03
After Decals: 07-20 04


Model 289: MMX 1:144th PMC
F-104 target drone squadron
Left Side view
MMXII-.75 motor
Ewt:12g
Complete:10-13-03
After Decals: 07-20 04


Model 289: MMX 1:144th PMC
F-104 target drone squadron
Top view
MMXII-.75 motor
Ewt:12g
Complete:10-13-03
After Decals: 07-20 04


MM 337: XB-70 Valkyrie 180th 6x micro Cluster PMC:
Lindberg Decals fell apart after soaking. Alps printed another set.
Dia: .625"
Length: 11.5"
wingspan: 7.75"
Motors: 6 - MMX-II only
Ewt w/ 6" mylar chute: 92.4g
Complete: 09-10-07


MM 384: F-15A Eagle 1/144th Revell Clustered PMC:
Dia: .281"
OA Length: 5.354"
WingSpan: 3.622"
Motors: 2- MMX-II
Recovery: 1/2" x 9"
Yellow Teflon Streamer.
Ewt: 17.0g
LOWt: 19.2g
Complete: 02-17-2012

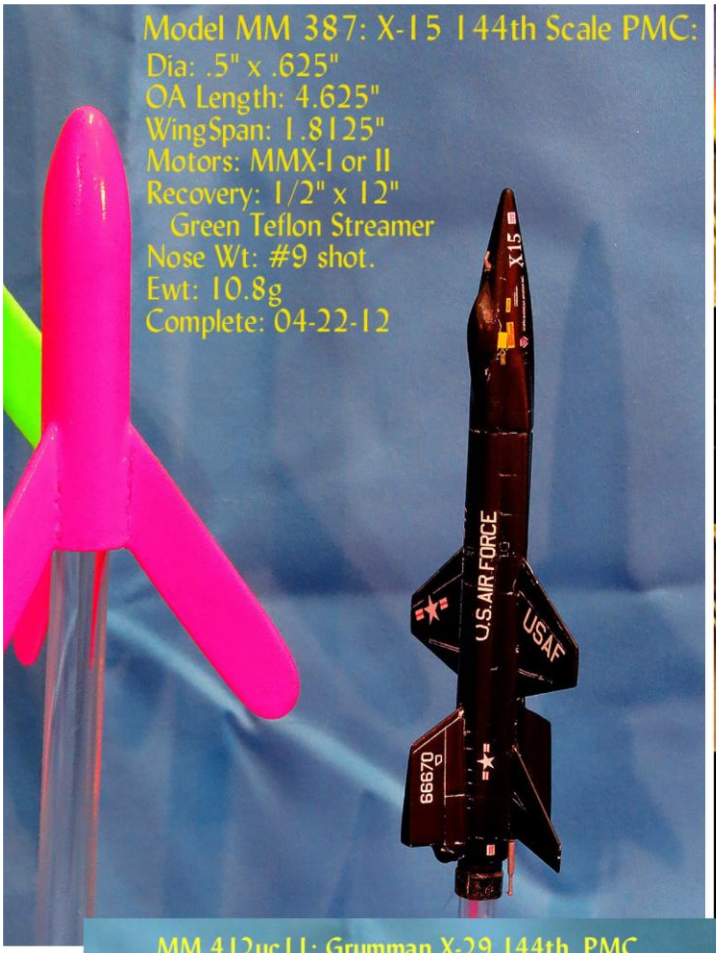

Model MM 388: F-14A Tomcat 144th Scale PMC:
Top-Left View:
Dia: .5" x 1.1562"
OA Length: 5.125"
WingSpan: flight: 3.0"
Landing: 5.25"
Motors: 2- MMX-II
MMX Cluster
Recovery: Twin 1/4" x 10"
Green Teflon Streamer
Nose Wt: 5.4g #9 shot.
Ewt: 22.3g
LOWt 24.5g
Complete: 04-26-12

Pg-16b


MicroMaxx-278 1:200 PMC 01-09-02
L.E.M. Note: real golfleaf on decent stage
and clear .030 lexan disc as drag fin.
First flight 01-12-02 EWt: 4.1g
Dia: 1.3125", Length: 1.1875", FinSpan Disc: 1.3125"
Motor: MMX-II, Ewt: 4.1g, LOWt: 5.2g
Complete: 01-12-02


Dia: 2-5/16",
Length: 1-11/16",
FinSpan Disc: 1.75"
Motor: MMX-II,
Ewt: 6.3g,
LOWt: 7.4
Lunar Module
April 16,2003
Ewt: 6.4g
MM #269 Micro Maxx
1:144 scale

Model MM 387: X-15 144th Scale PMC:
Dia: .5" x .625"
OA Length: 4.625"
WingSpan: 1.8125"
Motors: MMX-I or II
Recovery: 1/2" x 12"
Green Teflon Streamer
Nose Wt: #9 shot.
Ewt: 10.8g
Complete: 04-22-12



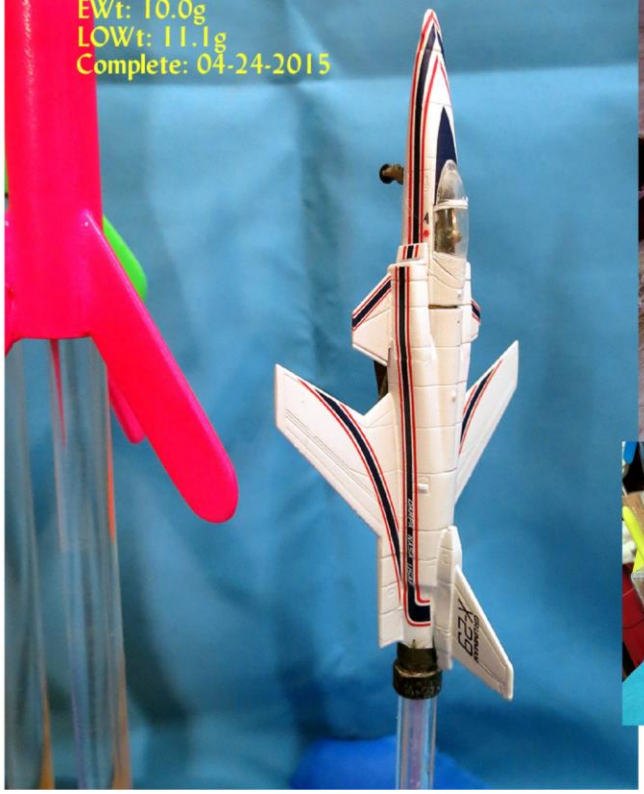


F-16XL (1:144th scale PMC)
Complete, hand painted & decaled
10-16-03

MM 287 F16XL 1:144th PMC
Dia: .5"
OA Length: 4.5"
Wing Span: 2.875"
Motor: MMX-II Only
4"-1/4Mil Cluster
Ewt: 13.2g
LOWt: 14.3g


F-16XL (1:144th scale PMC)
Complete, hand painted & decaled
EWt: 12.5g
10-16-03

MM 412uc11: Grumman X-29 144th PMC.
Dia: .46875"
OA Length: 4.125"
Wing Span: 2.28125"
Nose Wt: 4.1g #9 Lead Shot.
Motors: MM-II
1/4" x 6" Orange PTFE Streamer/Wadding.
EWt: 10.0g
LOWt: 11.1g
Complete: 04-24-2015



MM 397uc13e: U.S. Army Little John Missile:
Launcher Base Attachment and Model Complete.
U.S. Army Tactical Nuke.
1:40 Scale PMC
Dia: .3125"(5/16")
Length: 3.359375(3-23/32")
FinSpan: .875"(7/8")
Motors: MMX-I or II
1/4" x 9" Yellow Teflon Streamer.
Ewt: 2.4g
LOWt w/MMX-II: 3.5g
Complete: 01-07-14


MM 413uc11a: Patriot MIM-104 Missile Battery 1:48th PMC:
Completed Model/Launcher/Diorama with clear acrylic cover Labled
06-05-15

Pg-16c