PEE WEE

High Altitude Rocket

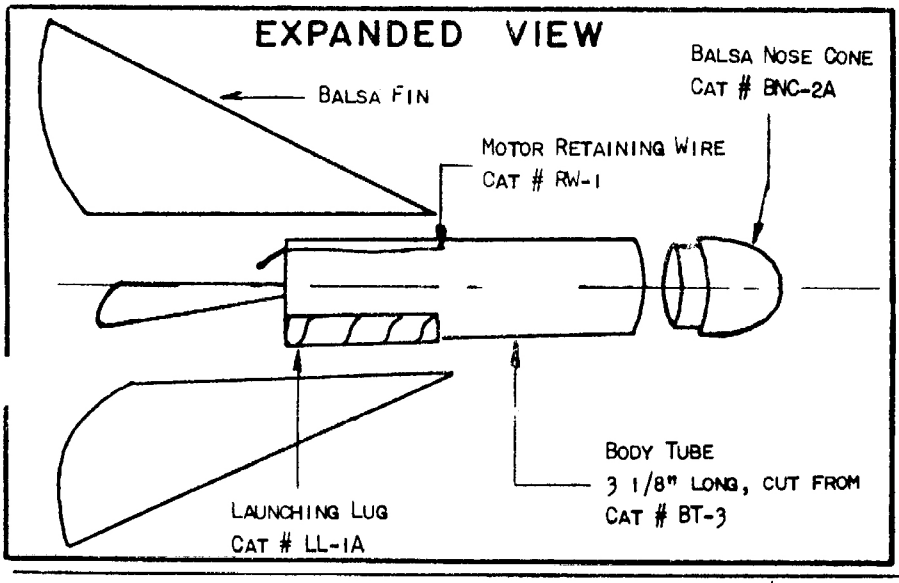
DESIGNED BY: *TOM RHUE* -- NAR No. 50

CAUTION: DO NOT USE SERIES TWO ENGINES IN THIS ROCKET.

THIS HIGH PERFORMANCE ROCKET, DESIGNED AND BUILT BY TOM RHUE, NAR# 50, WENT 580 FEET TO WIN FIRST PLACE AT THE 1961 NATIONALS IN THE PEE WEE ALTITUDE EVENT. THIS ROCKET ALSO TOOK SECOND PLACE IN THE NATIONALS IN THE 1B ALTITUDE EVENT WITH A HEIGHT OF 1380 FEET.

THE PEE WEE ROCKET IS VERY SIMPLE TO BUILD. FIRST, CUT THE 3 1/8" LONG BODY TUBE FROM A LENGTH OF BODY TUBE STOCK (CAT# BT-3). THEN, USING ELMERS GLUE OR EXTRA STRONG AIRPLANE CEMENT, GLUE INTO PLACE A BALSA NOSE CONE (CAT# BNC-2A). WHILE THE NOSE CONE IS DRYING, CUT OUT 3 FINS FROM 1/16" BALSA STOCK USING THE FULL SIZE PATTERN BELOW. BE SURE TO RUN THE GRAIN AS INDICATED. NOW, MARK THE BODY TUBE FOR POSITIONING THE FINS. THIS WILL REQUIRE 3 EQUALLY SPACED LINES RUNNING PERFECTLY PARALLEL TO THE AXIS OF THE BODY TUBE. NEXT, CAREFULLY GLUE ON THE FINS WITH EACH ALIGNED TO POINT EXACTLY FORWARD. GLUE ON THE LAUNCHING LUG (CAT# LL-1A) AND MOTOR RETAINING WIRE (CAT#RW-1) AS SHOWN IN THE DRAWING.

TO KEEP THE HIGHLY FLAMMABLE BALSA FINS FROM CHARRING OR BURNING, IT WILL BE NECESSARY TO PAINT THEM WITH AT LEAST TWO COATS OF FLAME RESISTANT PAINT. IF THE PAINT YOU USE DOES NOT PROTECT THE FINS SUFFICIENTLY, THEN WE WOULD SUGGEST BRUSHING ON A THIN COAT OF SILICATE OF SODA AROUND THE AREA WHICH WILL BE EXPOSED TO THE HOT EXHAUST GASES.



AS YOU WILL NOTICE, THE FINS ARE DESIGNED IN SUCH A WAY AS TO PROVIDE A HOLDER FOR A BOOSTER STAGE. FOR BOOSTER DESIGN, SEE OPPOSITE PAGE.

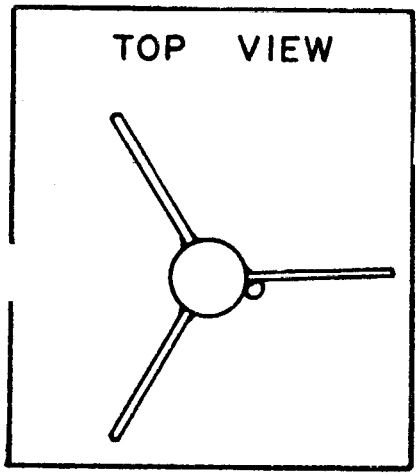
RECOVERY SYSTEM: THIS ROCKET MAKES USE OF ITS LIGHT WEIGHT (WITHOUT ENGINE) TO BRING IT BACK SAFELY. THIS IS KNOWN AS THE "FEATHER WEIGHT" RECOVERY SYSTEM. THE EXPENDED ENGINE CASING BLOWS OUT AT PEAK ALTITUDE THEN RETURNS SLOWLY BECAUSE IT IS LIGHT WEIGHT AND IS NOT AERODYNAMICALLY STABLE. THE ROCKET IS STABLE ON ITS RETURN FLIGHT, BUT BECAUSE OF THE AIR DRAG AGAINST SUCH A LIGHT WEIGHT, IT WILL NOT REACH A DANGEROUS VELOCITY. CAUTION: DO NOT TRY TO USE THE "FEATHER WEIGHT" RECOVERY SYSTEM ON ROCKETS OF YOUR OWN DESIGN WHICH:

A. HAVE HARD NOSE CONES (USE ONLY BALSA WOOD).

B. WEIGH MORE THAN .25 OUNCE (1/4 OUNCE) WITHOUT ENGINE.

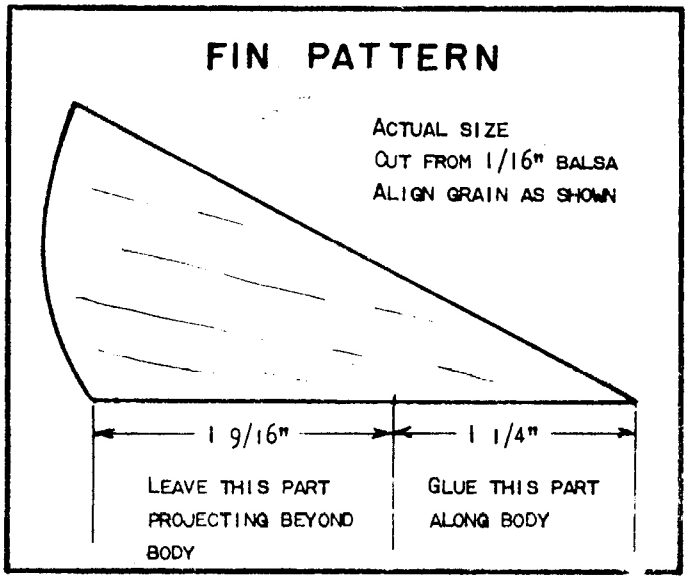
C. HAVE POINTED NOSE CONES OF ANY MATERIAL.

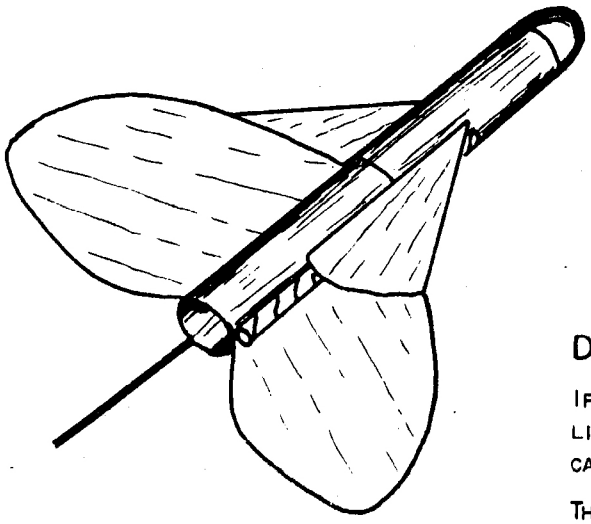
NOTE: WHEN ORDERING PARTS LISTED BELOW LEFT, PLEASE CONSULT CATALOG FOR CURRENT PRICES. (CATALOG NUMBERS ARE PRECEDED BY A 3 DIGIT NUMBER SUCH AS 162, 261, ETC. INDICATING WHICH CATALOG YOU ARE ORDERING FROM.



PARTS LIST

1-BT-3 BODY TUBE	.25
1-BNC-2A NOSE CONE	.30
1-LL-1A LAUNCHING LUG	3/.15
1-RW-1 RETAINING WIRE	.05
1-BFS-2 FIN STOCK	3/.45
TOTAL	$1.20





TWO STAGE PEE WEE

High Altitude Rocket

DESIGNED BY: *TOM RHUE* -- NAR No. 50

IF YOU HAVE NOT BUILT A TWO-STAGE ROCKET, PREVIOUSLY, YOU SHOULD FAMILIARIZE YOURSELF WITH MULTI-STAGING PRINCIPLES BY READING OUR TECHNICAL REPORT ON MULTI-STAGE ROCKETS.

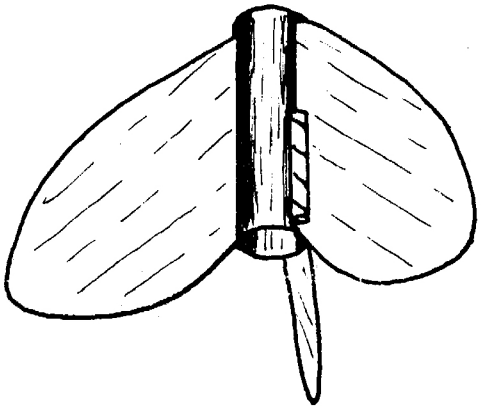
THIS BOOSTER STAGE CAN BE BUILT EASILY IN A FEW MINUTES. FIRST, CUT A LENGTH OF BODY TUBE (BT-3), 2 3/4" LONG. MARK THE BODY TUBE FOR THE FINS WITH 3 EQUALLY SPACED LINES RUNNING PERFECTLY PARALLEL TO THE AXIS OF THE BODY TUBE. NEXT, CUT OUT THREE BALSA FINS FROM 1/16" FIN STOCK, BEING CAREFUL TO ALIGN THE GRAIN OF THE WOOD AS INDICATED IN THE FIN PATTERN ILLUSTRATION. THEN, USING ELMERS GLUE OR EXTRA STRONG MODEL AIRPLANE CEMENT, GLUE THE FINS IN PLACE. BE CAREFUL TO HAVE THEM ALL POINTING EXACTLY FORWARD. GLUE THE LAUNCHING LUG, CAT# LL-1A NEXT TO A FIN, BUT ON THE OPPOSITE SIDE OF THE FIN FROM THE LUG ON THE UPPER STAGE.

THIS ROCKET IS DESIGNED SO THE TWO STAGES ARE COUPLED TOGETHER BY FITTING THE LOWER STAGE BODY INTO THE PROJECTING FINS OF THE UPPER STAGE. WHEN THE SECOND STAGE IGNITES (AT BURN-OUT OF THE LOWER STAGE) THE LOWER STAGE WILL DROP OFF. THE ROCKET ENGINE IS SECURED IN THE LOWER STAGE WITH A RUBBER BAND OR BY TAPING AS SHOWN IN THE ROCKET ENGINE INSTRUCTION SHEET. THE UPPER STAGE ENGINE IS HELD IN PLACE ONLY BY THE MOTOR RETAINING WIRE, SINCE IT MUST BE FREE TO BLOW OUT AT THE APEX OF THE FLIGHT.

THE BOOSTER STAGE, WHEN SEPARATED FROM THE FIRST STAGE, IS NOT STABLE IN FLIGHT. AFTER SEPARATION, IT WILL FLUTTER BACK SAFELY TO THE GROUND. THE PARTS LISTED FOR THE UPPER STAGE WILL GIVE YOU SUFFICIENT MATERIALS FOR BUILDING THIS BOOSTER STAGE, TOO.

TWO STAGE ROCKETS TEND TO WEATHER COCK VERY BADLY-----DO NOT FLY YOUR TWO STAGE ROCKET IN WINDY WEATHER.

BOOSTER DESIGN



PARACHUTE OR STREAMER RECOVERY SYSTEM

THE UPPER STAGE IS VERY HARD TO SEE WHEN IT IS 2000 FEET UP IN THE AIR. IN FACT, YOU WILL BE LUCKY IF YOU CAN SEE IT AT ALL.
TO IMPROVE THE VISIBILITY FOR THE RETURN FLIGHT, YOU MAY WISH TO REDESIGN YOUR ROCKET SO THAT A PARACHUTE OR STREAMER EJECTS AT THE APEX OF THE FLIGHT. TO ALLOW ROOM FOR THE STREAMER AND THE PROTECTIVE STUFFING YOU SHOULD ADD TWO INCHES TO THE LENGTH OF THE BODY TUBE (5 1/8" TOTAL). YOU WILL ALSO NEED THESE ADDITIONAL PARTS. USE 11" LENGTH OF SHOCK CORD CUT FROM 18" PIECE, CAT# SC-1, 20¢ EA; ONE ENGINE HOLDER, CAT# EH-1, 15¢EA; ONE 22" PIECE OF STREAMER MATERIAL, CAT#SM-1, 15¢ EA; AND ONE SMALL PIECE OF GAUZE REINFORCING MATERIAL, CAT# GR-2, 20¢ EA. PLEASE CONSULT OUR CURRENT CATALOG FOR CURRENT PRICES ON THE ABOVE ITEMS.

ASSEMBLE YOUR PARACHUTE OR STREAMER ACCORDING TO STANDARD PROCEDURE.

BOOSTER FIN PATTERN