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Model Rocket News

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VOLUME 1 No. 3

THE MODEL ROCKET NEWS IS PUBLISHED APPROXIMATELY 4 TIMES ANNUALLY BY ESTES INDUSTRIES INC, BOX 227, PENROSE, COLORADO. IT IS DISTRIBUTED FREE OF CHARGE TO ALL OF OUR MAIL ORDER CUSTOMERS FROM WHOM WE HAVE RECEIVED ORDERS WITHIN A PERIOD OF ONE YEAR. THE MODEL ROCKET NEWS IS DISTRIBUTED FOR THE PURPOSE OF ADVERTISING AND PROMOTING A SAFE FORM OF YOUTH ROCK-ETRY, AND FOR INFORMING YOU OF NEW PRODUCTS AND SERVICES AVAILABLE FROM OUR FIRM. YOU ROCKETEERS CAN CONTRIBUTE IN THREE WAYS TO HELP US IN ADVANCING THIS SCIENTIFIC HOBBY.

- (1). WRITE US CONCERNING THINGS YOU AND YOUR CLUB ARE DOING IN THIS FIELD WHICH YOU THINK WOULD BE OF INTEREST TO OTHERS.
- (2). KEEP SUPPORTING US IN OUR DEVELOPMENT PROGRAM BY PURCHASING YOUR ROCKET SUPPLIES FROM US. WE ARE WORKING AS FAST AS WE CAN. EVERY SPARE DIME WE GET GOES BACK INTO RESEARCH AND DEVELOPMENT BUT IT TAKES A HECK OF A LOT OF DIMES TO DEVELOP A NEW KIT OR A NEW ROCKET ENGINE.
- (3). WRITE US ABOUT OUR PRODUCTS, WHAT YOU LIKE, WHAT YOU DON'T LIKE, NEW IDEAS, SUGGESTIONS, ETC. WE MAY NOT HAVE TIME TO ANSWER ALL OF YOU PERSONALLY BUT BELIEVE ME WE WILL READ EVERY WORD.

1000 ROCKETS LAUNCHED AT MEET

NO SINGLE ROCKET RANGE IN THE WORLD HAS EVER MATCHED THE LAUNCHINGS WHICH TOOK PLACE AT THE 1961 NAR NATIONALS; OVER 1000 ROCKET FLIGHTS IN FOUR DAYS. 1000 ROCKETS MAY NOT SEEM LIKE A LOT OF ROCKETS; BUT IF YOU ARE THERE AND HAVE THE JOB OF SAFETY CHECKING 1000 ROCKETS, OR FIRING THEM, OR TRACKING THEM, OR JUDGING THEM, THEN BROTHER YOU KNOW THAT ONE THOUSAND ROCKETS IS A HECK OF A

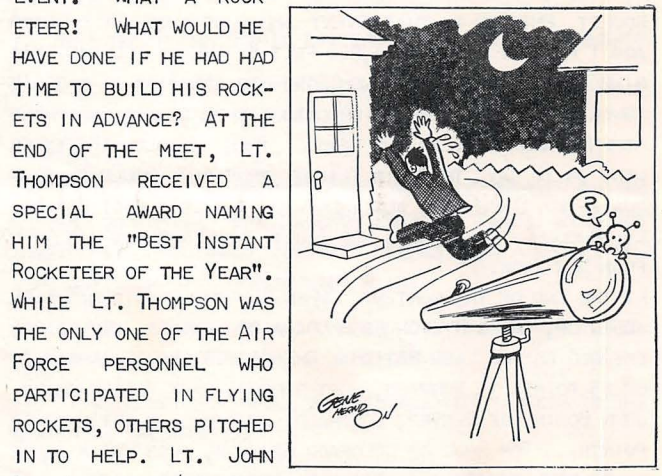
LOT OF ROCKETS. NOT ONLY DID WE FLY (PARTICIPANTS, JUDGES, ETC.) 1000 ROCKETS IN THOSE FOUR DAYS, WE ALSO WENT ON A TOUR OF THE MARTIN PLANT, HAD A GOOD OLE PICNIC WITH ALL THE TRIMMINGS INCLUDING MUSIC FURNISHED BY A COUPLE OF SINGING, GUITAR STRUMMING TROUBADOURS FROM THE HOST SECTION, DAN OBERHAUSEN AND JOHN WONG. ALSO, WE VISITED THE PLANT AT ESTES INDUSTRIES TO WATCH "MABLE" MAKE ROCKET ENGINES. (MABLE IS THE NICKNAME FOR A "FANTABULOUS" MACHINE WHICH AUTOMATICALLY MAKES, INSPECTS, AND PRINTS ONE COMPLETE MODEL ROCKET ENGINE EVERY 5 1/2 SECONDS.)

IF YOU ARE ONE OF THE FELLOWS WHO CAME ALL THE WAY FROM NEW YORK, AND IF ALL YOU HAD BEEN ABLE TO DO WAS TOUR THE MARTIN PLANT, AND SEE THOSE BIG TITAN MISSILES ON THE PRODUCTION LINE, I'M SURE YOU WOULD HAVE FELT THE TRIP WAS WELL WORTH WHILE.

IT WAS FUNNY ABOUT THAT ENGINEER AT MARTIN THOUGH----- WHEN ASKED FOR SAMPLES HE SAID NO. THEN, WHEN WE TOLD HIM WE WOULD BE SATISFIED WITH JUST ONE FOR THE WHOLE GROUP HE STILL SAID NO! (EMPHATICALLY SO). I GUESS HE JUST DIDN'T REALIZE WHAT AN IMPORTANT BUNCH OF ROCK-ETEERS HE WAS TALKING TO.

IT WAS VERY INTERESTING TO NOTE HOW MUCH INTEREST THE AIR FORCE IS TAKING IN MODEL ROCKETRY. ON THE FIRST DAY I WAS A LITTLE LATE GETTING OUT TO THE RANGE. I NOTICED ALL THESE COLONELS AND CAPTAINS, LIEUTENANTS AND SER-GEANTS STANDING AROUND LOOKING QUITE OFFICIAL. THEN I STARTED LOOKING AROUND, UP AND DOWN THE ROAD, THINKING, MAYBE SOMEONE WAS GOING TO BRING IN ONE OF THOSE PORT-ABLE MINUTE MAN ROCKETS OR SOMETHING; BUT NO SUCH LUCK. THEN, SUDDENLY, LT. THOMPSON WENT INTO ACTION. HE EMERGED AS THE MAN SELECTED BY THE AIR FORCE TO FLY MO-

DEL ROCKETS IN THIS COMPETITIVE EVENT. HE BROUGHT NO ROCKETS WITH HIM; ONLY SOME MODELING TOOLS AND HIS KNOW-LEDGE OF MODEL BUILDING. HE ASKED A FEW QUESTIONS AND THEN WENT TO WORK. HIS FIRST ROCKET (A DURATION ROCKET) WON A WHITE RIBBON. BUILDING AND DESIGNING EACH ROCKET AS THE DAYS PROCEEDED, HE MANAGED TO END UP TAKING FIRST PLACE IN THE B PAYLOAD EVENT, SECOND PLACE IN OPEN PAY-LOAD AND DRAG RACE, AND THIRD PLACE IN THE DURATION EVENT. WHAT A ROCK-ETEER! WHAT WOULD HE HAVE DONE IF HE HAD HAD TIME TO BUILD HIS ROCK-ETS IN ADVANCE? AT THE END OF THE MEET, LT. THOMPSON RECEIVED A SPECIAL AWARD NAMING HIM THE "BEST INSTANT ROCKETEER OF THE YEAR". WHILE LT. THOMPSON WAS THE ONLY ONE OF THE AIR FORCE PERSONNEL WHO PARTICIPATED IN FLYING ROCKETS, OTHERS PITCHED IN TO HELP. LT. JOHN BARNES AND A/IC CARL KLAUCK FROM THE AIR



"Life on Mars! Life on Mars!"

ACADEMY HELPED WITH PROCESSING AND OTHER OFFICIAL TASKS. COL. BERNARD W. MARSCHNER, HEAD OF THE ASTRONAUTICS DE-PARTMENT OF THE AIR FORCE ACADEMY, PRESENTED THE AWARDS AND TROPHIES. BEFORE THE MEET WAS OVER I HAD THE PRIVI-LEGE OF MEETING SOME OTHER IMPRESSIVE AIR FORCE PERSON-NEL. MAJOR UPRIGHT, WHO WAS IN CHARGE OF RECENT NAR

DEMONSTRATION AT LANGLEY AIR FORCE BASE, HAD COME ALL THE WAY TO COLORADO TO ATTEND THE MEET; COL. RUSSELL G. PANKEY, WHO IS WITH THE PERSONNEL SERVICES DIVISION OF THE USAF, FLEW IN FROM WASHINGTON, D.C.; CAPT. LANIS PINCHUK, ASSISTANT DIRECTOR OF TRAINING WITH THE ROCKY MOUNTAIN REGION OF THE CIVIL AIR PATROL; CAME FROM LOWRY AIR FORCE BASE. ALSO IN ATTENDANCE WAS MARJORIE MILLER, RECREATION SPECIALIST WITH THE AIR DEFENSE COMMAND FROM ENT AIR FORCE BASE.

SOME OF YOU FELLOWS WHO DIDN'T GET THERE MAY STILL HAVE AN OPPORTUNITY TO SEE WHAT WENT ON. THE AIR FORCE WAS THERE WITH THEIR BIG 35MM NEWSREEL CAMERAS, TAKING PICTURES ALL OVER THE PLACE. DON'T BE TOO SURPRISED IF YOU WALK INTO YOUR LOCAL THEATRE SOME DAY AND SEE MODEL ROCKETS FLYING ALL OVER THE SCREEN.

THE MOST INTERESTING CONTEST OF ALL WAS THE RESEARCH AND DEVELOPMENT EVENT. IN THIS CONTEST, EVERY ONE TRIES TO OUT-DO HIS FELLOW ROCKETEERS WITH SOMETHING NEW. WE SAW A ROCKET LAUNCHED FROM UNDERWATER; A ROCKET WHICH TURNED INTO A HELICOPTOR FOR RECOVERY; A ROCKET WHICH CARRIED A CAMERA TO TAKE PICTURES OF THE RANGE; TWO UNIQUE ROCKETS WHICH WERE DESIGNED SO THEY WERE UNSTABLE (ACCORDING TO MATHEMATICS), BUT YET FLEW VERY NICELY; AND MANY OTHERS. OF COURSE, WE HERE AT ESTES INDUSTRIES ARE PROUD OF THE ENTRY, BY OUR VICE PRESIDENT JOHN SCHUTZ, OF A VTO ROCKET PROPELLED GLIDER. IT GOES UP AS A ROCKET AND THEN, SUDDENLY, AT THE APEX OF FLIGHT, TURNS INTO A SOARING GLIDER. WHAT A BEAUTIFUL BIRD! IN A FEW MONTHS IT WILL BE AVAILABLE IN A KIT.

MEMORIES OF THE NARAM-3 MEET WILL LINGER ON FOR A LONG TIME. I DON'T THINK I WILL EVER FORGET THE CONVERSATION I HEARD BETWEEN ONE OF THE JUNIOR ROCKETEERS AND MR. STINE, PRESIDENT OF THE NAR. WELL, THIS YOUNG MAN HAD JUST BROKEN ONE OF THE OLD RECORDS AND WAS JOYESSLY SAYING, "I DID IT! I DID IT! MY ROCKET WENT OVER 1400 FT AND THE OLD RECORD WAS ONLY 1200 FT." "HOLD ON THERE A MINUTE," THE OLD ROCKETEER ANSWERED BACK, "I'VE GOT A ROCKET ENTERED IN THAT EVENT AND JUST A COUPLE OF DAYS AGO I FLEW IT TO OVER 35,000 FEET." WELL, YOU CAN IMAGINE HOW JOY SUDDENLY CHANGED TO DESPAIR. I DON'T THINK I HAVE EVER SEEN A BOY'S FACE LOOK SO HAPPY ONE MOMENT AND SO BLEAK THE NEXT. THEN THE OLD ROCKETEER WENT ON TO SAY THAT HIS FLIGHT PROBABLY WOULD BE DISQUALIFIED SINCE THIS ALTITUDE WAS REACHED ALMOST ENTIRELY THROUGH THE EFFORTS OF A JET AIRLINER ON HIS TRIP FROM NEW YORK.

AT THE END OF THE CONTEST, WHEN ALL THE POINTS HAD BEEN ADDED UP, DOUG HYLTON FROM COLORADO SPRINGS, COLORADO, EMERGED AS THE NEW NATIONAL CHAMPION. DOUG HAD RACKED UP 85 POINTS TO SURPASS, JUST BARELY, LAST YEAR'S CHAMP, JOHN BONINE OF DENVER, COLORADO, WHO HAD A TOTAL OF 82 POINTS. TOM RHUE OF COLORADO SPRINGS, ALSO WAS A CLOSE CONTENDER, TIEING FOR SECOND PLACE WITH 82 POINTS.

FOR THE FIRST TIME IN HISTORY, THE MILE HIGH SECTION LOST ITS POSITION OF THE CHAMPION SECTION. THE PEAK CITY SECTION, ALWAYS A STRONG CONTENDER, REALLY MOVED OUT IN FRONT WITH A GRAND TOTAL FOR THE YEAR OF 767 POINTS AS COMPARED TO MILE HIGH SECTION'S 691 POINTS.

SOME BEAUTIFUL TROPHIES, DONATED BY THE MARTIN COMPANY, THE HUYCK CORPORATION, HOLLY SUGAR COMPANY, UNITED AIR LINES, AND ESTES INDUSTRIES, WERE GRACIOUSLY RECEIVED BY DAN OBERHAUSEN, WINNER OF THE SCALE EVENT; PAUL HANS,

FOR HAVING ACCUMULATED THE MOST SCALE POINTS; TOM RHUE, FOR WINNING THE PEE WEE ALTITUDE EVENT; AND DOUG HYLTON, WHO WALKED AWAY WITH TWO TROPHIES, ONE FOR ACCUMULATING THE MOST PAYLOAD POINTS AND ONE FOR HIS EFFORTS WHICH WON HIM THE NATIONAL CHAMPIONSHIP.

BESIDES THE TROPHIES, BLUE, RED AND WHITE RIBBONS WERE AWARDED FOR 1ST, 2ND AND 3RD PLACE IN SEVENTEEN EVENTS. THEY WERE AWARDED AS FOLLOWS:

- DURATION: 1ST: DIETER SCHNEIDER, NAR#863
2ND: STEVEN HANSEN, NAR#1194
3RD: DOUG HYLTON, NAR#66
- SCALE: 1ST: DAN OBERHAUSEN, NAR#282
2ND: JOE WALD, NAR#80
3RD: DOUG HYLTON, NAR#66
- PLASTIC SCALE: 1ST: WESLEY WADA, NAR#935
2ND: PAUL HANS, NAR#654
3RD: STEVEN KUSHNIR, NAR#469
- CLASS A PAYLOAD: 1ST: DOUG HYLTON, NAR#66
2ND: SCHUMAN-MENNEMEYER TEAM, NAR#456 & 771
3RD: JOHN ROE, NAR#33
- CLASS 2-B SCALE ALTITUDE: 1ST: PAUL HANS, NAR#554
2ND: DOUG HYLTON, NAR#66
3RD: JOE WALD, NAR#800
- SPOT LANDING: 1ST: RANDY WEIGEL, NAR#893
2ND: DOUG HYLTON, NAR#66
3RD: JIM PETRENAS, NAR#951
- CLASS 4-BA ALTITUDE: 1ST: JOHN E. BONINE, NAR#46
2ND: JIM RHUE, NAR#452
3RD: SCHUMAN-MENNEMEYER TEAM, NAR#456 & 771
- OPEN SCALE ALTITUDE: 1ST: JOE WALD, NAR#800
2ND: TOM JAWORSKI, NAR#860
3RD: MICHAEL KONSHAK, NAR#896
- OPEN ALTITUDE: 1ST: WARD CONRAD, NAR#871
2ND: CAROL WILCOX, NAR#897
3RD: JIM PETRENAS, NAR#961
- B PAYLOAD: 1ST: BRYANT THOMPSON, NAR#1203
2ND: DOUG HYLTON, NAR#66
2ND: JIM PETRENAS, NAR#951
3RD: JOHN BONINE, NAR#46
- RESEARCH AND DEVELOPMENT: 1ST: SCHUMAN-MENNEMEYER TEAM, NAR#456 & 771
2ND: WESLEY WADA, NAR#935
3RD: JOHN SCHUTZ, NAR#PENDING
3RD: HORST SCHNEIDER, NAR#865
- OPEN PAYLOAD: 1ST: STEVEN KUSHNIR, NAR#469
2ND: BRYANT THOMPSON, NAR#1203
3RD: JIM DURMEYER, NAR#1063
- PEE WEE ALTITUDE: 1ST: TOM RHUE, NAR#50
2ND: DOUG HYLTON, NAR#66
2ND: DIETER SCHNEIDER, NAR#863
3RD: STEPHEN BLAKELY, NAR#641
- 1B-ALTITUDE: 1ST: WESLEY WADA, NAR#935

1A-SCALE
ALTITUDE

2ND: TOM RHUE, NAR#50
3RD: DOUG HYLTON, NAR#66

1ST: DOUG HYLTON, NAR#66
1ST: PAUL HANS, NAR#554
2ND: TOM RHUE, NAR#50
3RD: JIM PETRENAS, NAR#951

DRAG:

1ST: JOHN ESSMAN, NAR#43
2ND: BRYANT THOMPSON, NAR#1203
3RD: GREG MCBRIDE, NAR#1043

CLASS 2-B
ALTITUDE:

1ST: JIM DURMEYER, NAR#1063
2ND: SCHUMAN-MENNEMEYER TEAM, NAR#456
& 771
3RD: JOHN ESSMAN, NAR#43

Survey Report

IN FEBRUARY, 1961, A QUESTIONNAIRE WAS SENT OUT AT RANDOM TO 1000 ROCKETEERS SUCH AS YOURSELF. MANY OF YOU PARTICIPATED IN THIS SURVEY AND TO EACH OF YOU WE WISH TO EXTEND OUR HEART-FELT THANKS. YOUR ANSWERS HAVE BEEN A BIG HELP TO US AND TO ROCKETEERS ALL OVER THE COUNTRY.

FOR THE BENEFIT OF THOSE WHO DID NOT PARTICIPATE IN THIS SURVEY WE WILL DESCRIBE, BRIEFLY, THE QUESTIONS ASKED. 12 QUESTIONS ON PERSONAL INFORMATION INCLUDING AGE, SCHOOLING, INTERESTS, ETC.

7 QUESTIONS ON CLUB ASSOCIATION---BOY SCOUTS, CLUB PROJECTS, ROCKET CLUBS, PARTICIPATION, ETC.

10 QUESTIONS ON AFFILIATION WITH THE NATIONAL ASSOCIATION OF ROCKETRY; MEMBER, NUMBER, WHETHER MEMBER OF SECTION, DESIRE TO START SECTION, ETC.

27 QUESTIONS ON MARKETING SURVEY; WHAT NEW PRODUCTS DO YOU ROCKETEERS WANT, PRODUCTS USED, COMPANIES YOU ARE BUYING FROM, ETC.

13 QUESTIONS ON SAFETY; ACCIDENTS WITH OUR PRODUCTS, ACCIDENTS WITH HOMEMADE PROPELLANTS, SAFETY SUGGESTIONS. ETC.

THE FOLLOWING RESULTS WERE OBTAINED.

WE FOUND THAT THE LARGEST PERCENTAGE OF MODEL ROCKETEERS IS 14 YEARS OLD. THE YOUNGEST WAS 8 AND THE OLDEST 54. OVER 90% WERE BETWEEN THE AGES OF 11 AND 19. WE DISCOVERED THAT MOST OF YOU FLY ROCKETS AS A SCIENTIFIC STUDY OR HOBBY WITH VERY FEW (LESS THAN 1%) CONSIDERING IT SIMPLY AS AN AMUSEMENT.

THE SURVEY SHOWED THAT 25% OF YOU ARE BOY SCOUTS AND THAT 92% OF THE BOY SCOUTS ANSWERING THINK THAT THEIR ORGANIZATION SHOULD OFFER A MERIT BADGE IN MODEL ROCKETRY.

18% OF THE BOYS ANSWERING THE QUESTIONNAIRE WERE NAR MEMBERS. MANY MORE WERE PLANNING TO JOIN. OVER 55% EXPRESSED A DESIRE TO START OR JOIN AN NAR CHARTER SECTION. THE MARKETING SURVEY PROVED TO BE VERY INTERESTING TO US. AS A RESULT OF THE SURVEY, WE HAVE COMPLETELY REVAMPED OUR WHOLE PACKAGING SYSTEM. WE DISCOVERED THAT MANY ITEMS, ESPECIALLY BODY TUBES, WERE ARRIVING IN A DAMAGED CONDITION. THIS PROBLEM NOW HAS BEEN COMPLETELY ELIMINATED. WHAT NEW ITEMS DID YOU ROCKETEERS WANT? WELL. JUST ABOUT EVERYTHING. OUR CATALOG HAS BEEN EXPANDED TO INCLUDE MANY OF THE ITEMS YOU REQUESTED---MORE ARE ON THE WAY. THANKS FOR THE TIPS.

BY FAR THE MOST INTERESTING INFORMATION RECEIVED WAS ON ACCIDENTS IN ROCKETRY. WE WERE PLEASED, OF COURSE, TO FIND THAT MODEL ROCKETRY IS QUITE SAFE AS COMPARED TO OTHER FORMS OF ROCKETRY. THE INFORMATION GAINED ON ACCIDENTS HAS BEEN MADE INTO A SEPARATE REPORT WHICH IS INCLUDED IN THIS ISSUE OF THE MODEL ROCKET NEWS.

New NAR Safety Code

THE CONTINUED PROGRESS OF KNOWLEDGE AND TECHNIQUES IN THE FIELD OF MODEL ROCKETRY HAS NECESSITATED THE REWRITING OF THE NAR SAFETY CODE. THE NATIONAL ASSOCIATION OF ROCKETRY HAS ADVISED US OF THIS CHANGE AND WE ARE MOST HAPPY TO PASS THE REVISED CODE ALONG TO OUR READERS.

Safety Code

AS A MEMBER OF THE NATIONAL ASSOCIATION OF ROCKETRY, I WILL DO MY BEST TO MAINTAIN THE SAFETY RECORD OF THE HOBBY OF MODEL ROCKETRY, AND I WILL OBEY THIS NAR MODEL ROCKET SAFETY CODE:

1. I WILL OBEY THE LAWS REGARDING ROCKETS.
2. I WILL NOT MIX MY OWN ROCKET PROPELLANTS, DELAY TRAINS, EJECTION CHARGES, ETC.
3. I WILL NOT MAKE MY OWN ROCKET ENGINES. I WILL USE PRELOADED, FACTORY-MADE COMMERCIAL MODEL ROCKET ENGINES THAT DO NOT REQUIRE MIXING THE PROPELLANT.
4. I WILL TREAT ALL ROCKET ENGINES WITH CARE, KEEPING THEM FROM HEAT AND NOT DROPPING THEM.
5. MY MODEL ROCKETS WILL CONTAIN NO SUBSTANTIAL METAL PARTS.
6. MY MODEL ROCKETS WILL CONTAIN A RECOVERY DEVICE TO RETURN THEM SAFELY TO THE GROUND SO THAT THEY MAY BE FLOWN AGAIN.
7. MY MODEL ROCKETS WILL NOT CONTAIN EXPLOSIVE WARHEADS.
8. I WILL FLY MODEL ROCKETS WITH ADULT SUPERVISION IN OPEN AREAS AWAY FROM HOUSES, BUILDINGS, TREES, AND POWER LINES.
9. I WILL USE A REMOTELY-OPERATED ELECTRICAL FIRING SYSTEM TO IGNITE MODEL ROCKET ENGINES, AND I WILL NOT INSTALL THE ELECTRICAL IGNITION ELEMENT IN A ROCKET ENGINE UNTIL SHORTLY BEFORE LAUNCHING.
10. I WILL ALWAYS USE A LAUNCHING DEVICE THAT IS POINT-ED WITHIN 30 DEGREES OF THE VERTICAL.
11. I WILL NOT FLY MODEL ROCKETS AGAINST TARGETS IN THE AIR OR ON THE GROUND.
12. I WILL NOT FLY MODEL ROCKETS IN WINDY WEATHER OR IN CONDITIONS OF LOW VISIBILITY.
13. I WILL NOT FLY MODEL ROCKETS WHERE THEY MAY ENDANGER AIRCRAFT IN FLIGHT.
14. I WILL ALWAYS ACT IN A MATURE MANNER WITH SAFETY UPPERMOST IN MIND.
15. I WILL NOT ENGAGE IN ANY OPERATION THAT MAY ENDANGER MYSELF OR OTHERS.

Multi-Stage Rockets

Preliminary Report

A COMPLETE TECHNICAL REPORT ON MULTI-STAGE ROCKETS WILL BE AVAILABLE SOMETIME IN THE NEAR FUTURE. UNTIL THE ABOVE REPORT IS AVAILABLE, WE ARE SENDING OUT THIS PRELIMINARY REPORT TO ALL WHO REQUEST INFORMATION ON MULTI-STAGE ROCKETS.

STABILITY: MULTI-STAGE ROCKETS, LIKE SINGLE STAGE ROCKETS, ARE STABILIZED BY AIR CURRENTS ACTING AGAINST THE FINS. (SEE TECHNICAL REPORT No. TR-1.) SINCE TWO OR MORE ENGINES ARE MOUNTED NEAR THE REAR OF THE ROCKET IT HAS A TENDENCY TO BECOME TAIL-HEAVY. TO COMPENSATE FOR THIS REARWARD MOVEMENT OF THE CENTER OF GRAVITY, EXTRA LARGE FINS MUST BE USED ON THE BOOSTER OR LOWER STAGES. AS A GENERAL RULE THE LOWER SET OF FINS ON A 2-STAGE ROCKET HAS TWO TO THREE TIMES THE AREA OF THE UPPER STAGE. EACH SUCCEEDING ADDITIONAL BOOSTER MUST ALSO HAVE INCREASED FIN AREA.

BOOSTER RECOVERY: MOST LOWER STAGES OR BOOSTER SYSTEMS ARE DESIGNED SO THEY ARE UNSTABLE AFTER SEPARATION. THIS IS BECAUSE THE BOOSTER BY ITSELF IS "NOSE LIGHT" THUS PUTTING THE CENTER OF GRAVITY BEHIND THE CENTER OF PRESSURE. ROCKET BOOSTERS DESIGNED THIS WAY REQUIRE NO PARACHUTE OR STREAMER FOR RECOVERY. THEY WILL TUMBLE OR FLUTTER GENTLY BACK TO EARTH MUCH THE SAME AS THE ASTRON SCOUT.

TRANSITION: THE COUPLING BETWEEN STAGES CAN BE ACCOMPLISHED IN SEVERAL WAYS. THERE ARE TWO BASIC DESIGN FEATURES TO KEEP IN MIND. (1). THERE MUST BE AN UNRESTRICTED GAS PASSAGE BETWEEN STAGES. (2). THE STAGES MUST BE COUPLED IN A MANNER WHICH WILL MAKE THE COMPLETED ROCKET SUFFICIENTLY RIGID TO WORK AS A UNIT BUT YET MUST BE EASILY SEPARATED BY SIMPLY PULLING THE STAGES APART. THE FOLLOWING ARE THREE BRIEF DESCRIPTIONS OF METHODS WHICH WILL PROVIDE EFFECTIVE TRANSITION.

(1) LEAVE THE ENGINE OF THE MAIN STAGE PROJECTING APPROXIMATELY $1/2$ " BEYOND THE REAR OF THE UPPER STAGE ROCKET BODY. WRAP THE EXTENDED PORTION WITH SCOTCH OR MASKING TAPE TO FORM A BUILT UP AREA WHICH EXACTLY FITS INTO THE UPPER PORTION OF THE BOOSTER BODY. BE SURE THE FIT IS TIGHT ENOUGH TO ALIGN THE SEPARATE ROCKET SECTIONS BUT LOOSE ENOUGH TO BE EASILY SEPARATED. BOTH ENGINES MUST BE SECURELY MOUNTED USING MOTOR MOUNTS, RUBBER BANDS, OR TAPE. SEPARATION IS ACCOMPLISHED BY BLOWING OFF THE LOWER STAGE WHEN THE LOWER STAGE ENGINE BURNS THROUGH AND PRESSURIZES THE ENCLOSED BODY AREA BETWEEN STAGES.

(2) THE SECOND METHOD IS SIMILAR TO THE FIRST, BUT, INSTEAD OF EXTENDING THE ROCKET ENGINE REARWARD FROM THE ROCKET BODY, THE ENGINE IN THE FIRST STAGE IS POSITIONED ABOUT $3/8$ " FORWARD FROM THE REAR OF THE ROCKET BODY AND THE BOOSTER ENGINE IS POSITIONED IN THE BOOSTER BODY SO THAT IT EXTENDS FORWARD INTO THE REAR OF THE UPPER STAGE. AGAIN, A PROPER FIT IS OBTAINED BY WRAPPING THE EXTENDED ROCKET ENGINE WITH SCOTCH OR MASKING TAPE TO BRING IT TO

THE PROPER DIAMETER. THIS SECOND METHOD GAINS SOME ADVANTAGE OVER THE FIRST BECAUSE THE WEIGHT OF THE ENGINES IS SHIFTED APPROXIMATELY $3/4$ " FORWARD, THUS PROVIDING A GREATER DEGREE OF STABILITY. CAUTION: DO NOT PLACE THE NOZZLE OF THE ROCKET ENGINE FARTHER THAN $3/8$ " FORWARD FROM THE REAR OF THE ROCKET BODY. SO DOING WILL RESULT IN A REDUCED THRUST AS WELL AS CHARRING AND BURNING THE END OF THE ROCKET BODY.

(3) THE THIRD METHOD REQUIRES THE USE OF A HOLLOW TRANSITION BLOCK. (ENGINE BLOCK--PART # EB-1, EB-1A ETC.) ONE END OF THIS ENGINE BLOCK IS GLUED INTO THE UPPER END OF THE BOOSTER ROCKET BODY. APPROXIMATELY $3/8$ " IS LEFT PROJECTING TO FIT INTO THE UPPER STAGE BODY. THE UPPER STAGE ENGINE IS SECURELY POSITIONED $3/8$ " FORWARD FROM THE REAR OF THE UPPER STAGE ROCKET BODY. THE BOOSTER ENGINE IS SECURELY POSITIONED BELOW THE TRANSITION BLOCK.

TYPES OF ENGINES: LOWER AND INTERMEDIATE STAGE ENGINES ARE ALWAYS ENGINES WHICH HAVE NO TIME DELAY OR EJECTION CHARGE. ENGINES DESIGNATED BY OFFICIALLY APPROVED NAR MEANS WHICH ARE SUITABLE FOR THIS USE WILL ALWAYS HAVE A DESIGNATION ENDING IN ZERO. I.E., B.8-0, A.8-0, B16-0, ETC. THE UPPER OR FINAL STAGE MUST HAVE A DELAY OR COASTING CHARGE AND A PARACHUTE EJECTION CHARGE. ENGINES DESIGNATED BY OFFICIALLY APPROVED NAR MEANS, SUITABLE FOR UPPER STAGE USAGE, ARE THE B.8-6, A.8-4, ETC.

IGNITION: THE LOWER OR FIRST STAGE IS ALWAYS IGNITED BY STANDARD APPROVED ELECTRICAL MEANS. WITH THE STAGES CONNECTED AS DESCRIBED ABOVE, IGNITION OF SUCCEEDING STAGES WILL BE AUTOMATIC. AS YOU WILL NOTICE, THERE IS NO PAPER RETAINING CAP IN THE INTERMEDIATE OR BOOSTER STAGE ENGINES, AND THE END OF THE SOLID PROPELLANT GRAIN IS EXPOSED TO VIEW. WHILE OPERATING, THE COMBUSTION CHAMBER IS UNDER A HIGH PRESSURE. AS THE PROPELLANT GRAIN IS CONSUMED THE REAR "WALL" OF PROPELLANT BECOMES THINNER AND THINNER. WHEN IT IS NO LONGER ABLE TO WITHSTAND THE CHAMBER PRESSURE, A MINIATURE EXPLOSION OCCURS, BLOWING HOT GASES AND PIECES OF BURNING PROPELLANT INTO THE NOZZLE OF THE FOLLOWING STAGE. THIS SYSTEM OF IGNITION IS VERY DEPENDABLE. IT REQUIRES NO BATTERIES OR SWITCHES WHICH ADD WEIGHT AND BULK, OR COMPLICATE THE SYSTEM.

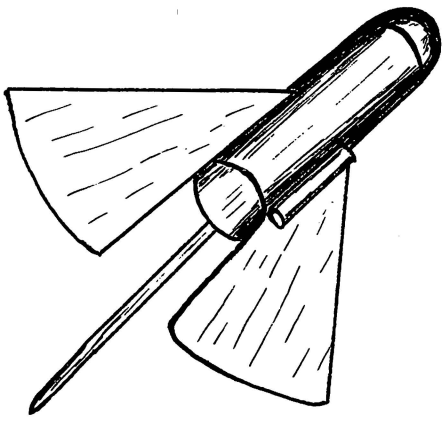
THIS IS A PRELIMINARY REPORT. THE FINAL REPORT ON MULTI-STAGING WILL BE ILLUSTRATED AND COVER ADDITIONAL SUBJECT MATTER. YOUR COMMENTS ON THIS REPORT AS WELL AS ANY IDEAS OR SUGGESTIONS YOU HAVE FOR THE FINAL REPORT, WILL BE GREATLY APPRECIATED. SEND ALL CORRESPONDENCE TO:

VERNON ESTES, PRESIDENT
ESTES INDUSTRIES, INC.
BOX 227
PENROSE, COLORADO

PEE WEE

High Altitude Rocket

DESIGNED BY: TOM RHUE -- NAR No. 50



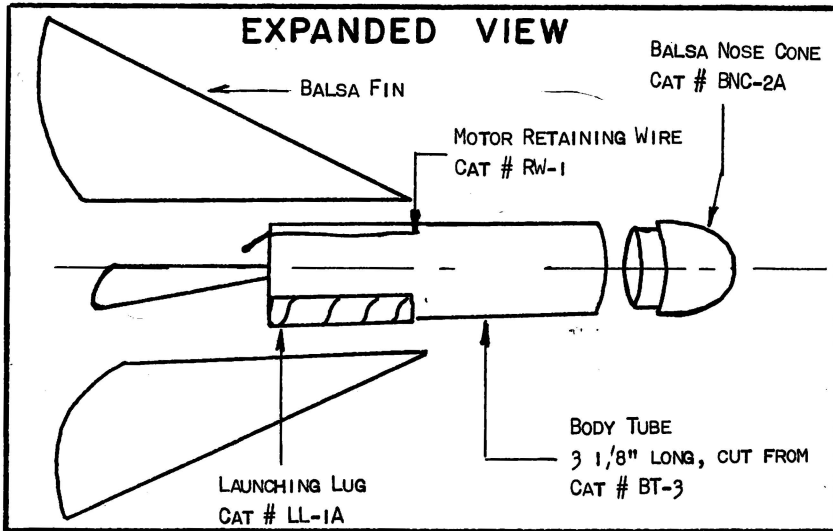
CAUTION: DO NOT USE SERIES TWO ENGINES IN THIS ROCKET.

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

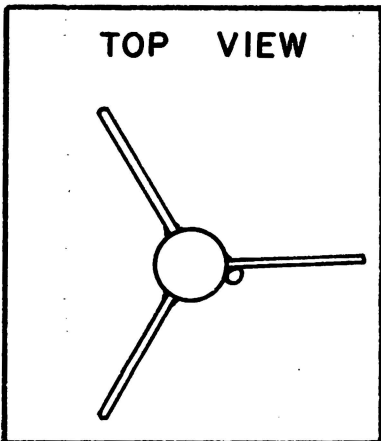
RUN THE GRAIN AS INDICATED. NOW, MARK THE BODY TUBE FOR POSITIONING THE FINS. THIS WILL REQUIRE 3 EQUALLY SPACED LINES RUNNING PERFECTLY PARALLEL TO THE AXIS OF THE BODY TUBE. NEXT, CAREFULLY GLUE ON THE FINS WITH EACH ALIGNED TO POINT EXACTLY FORWARD. GLUE ON THE LAUNCHING LUG (CAT# LL-1A) AND MOTOR 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 EXPANDED 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).

PARTS LIST

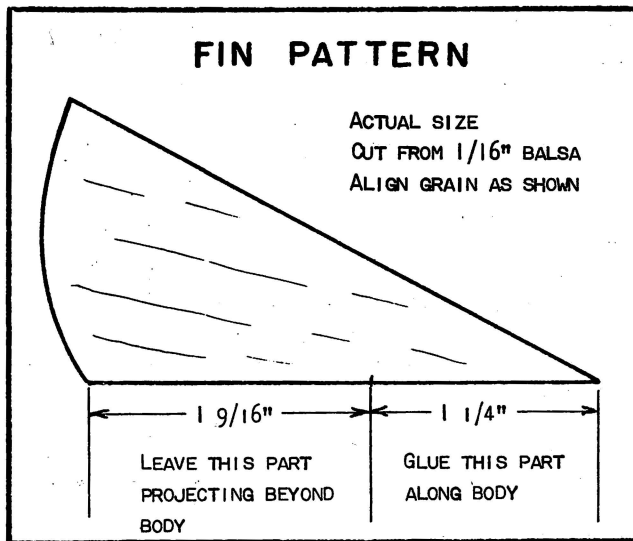
1-BT-3	BODY TUBE	.25
1-BNC-2A	NOSE CONE	.30
1-LL-1A	LAUNCHING LUG	3/.15
1-RW-1	RETAINING WIRE	.05
1-BFS-2	FIN STOCK	3/.45

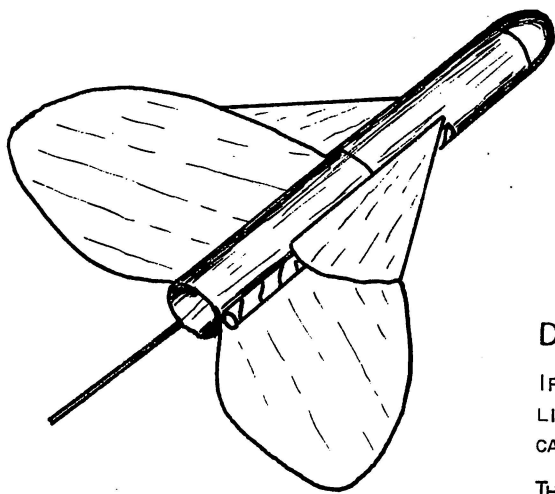
TOTAL \$1.20

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.





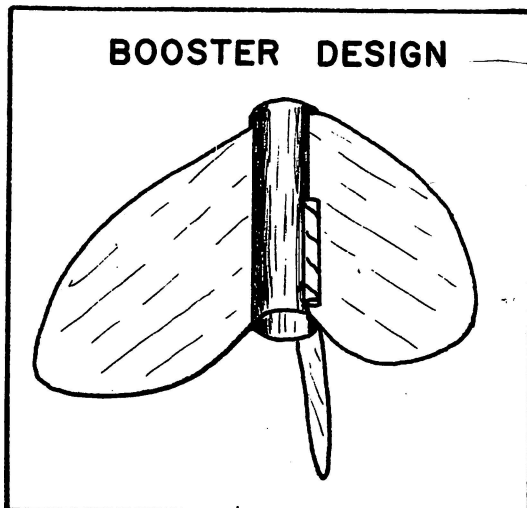
TWO STAGE PEE WEE

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.

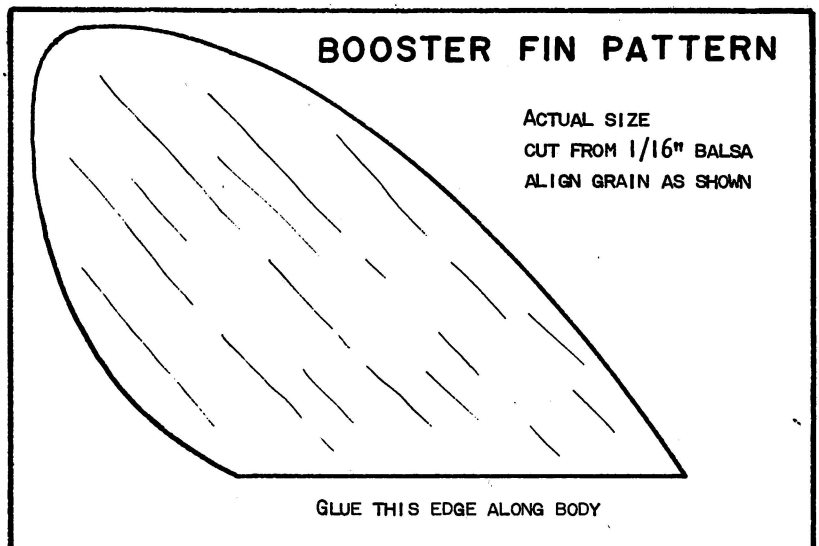
THE BOOSTER STAGE, WHEN SEPARATED FROM THE FIRST STAGE, IS NOT STABLE IN FLIGHT. AFTER SEPARATION, IT WILL FLUTTER BACK SAFELY TO THE GROUND. THE PARTS LISTED FOR THE UPPER STAGE WILL GIVE YOU SUFFICIENT MATERIALS FOR BUILDING THIS BOOSTER STAGE, TOO.

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

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.



MODEL ROCKETRY versus AMATEUR ROCKETRY SAFETY SURVEY REPORT

SEPTEMBER, 1961

THERE IS A VAST DIFFERENCE IN THE RELATIVE SAFETY OF MODEL ROCKETRY AND AMATEUR ROCKETRY. MANY ADULTS, OFFICIALS, YOUNG ROCKETEERS AND POTENTIAL ROCKETEERS DO NOT REALIZE THIS DIFFERENCE. IN FACT, MANY DO NOT EVEN REALIZE THE DISTINCTION BETWEEN THE TWO FORMS OF ROCKETRY. IT IS THE PURPOSE OF THIS REPORT TO POINT OUT THE DIFFERENCES FROM THE SAFETY STANDPOINT ONLY. FOR OUR REFERENCE WE SHALL DEFINE THESE TWO NON-PROFESSIONAL FORMS OF ROCKETRY AS FOLLOWS:

MODEL ROCKETRY: THE ART, SPORT, OR HOBBY OF STUDYING, DESIGNING, CONSTRUCTING, AND FLYING LIGHT WEIGHT, NON-METALLIC, RECOVERABLE, AND RE-FLYABLE ROCKETS USING COMMERCIALY PRODUCED ROCKET ENGINES, WHICH DO NOT REQUIRE THE HANDLING, LOADING, OR COMPOUNDING OF THE PROPELLANT OR OTHER EXPLOSIVE MATERIALS BY THE USER.

AMATEUR ROCKETRY: THE ART OF STUDYING, BUILDING, EXPERIMENTING WITH AND LAUNCHING ROCKETS OF VARIOUS DESCRIPTIONS (HEAVY AND LIGHT), OFTEN USING METALLIC COMPONENTS, WHERE THE USER OR EXPERIMENTER IS USUALLY REQUIRED TO HANDLE, FORMULATE OR LOAD HIS OWN PROPELLANT OR OTHER EXPLOSIVE COMPOUND.

IN FEBRUARY, 1961, ESTES INDUSTRIES, INC., SENT OUT 1000 QUESTIONNAIRES TO A GROUP OF MODEL ROCKET ENTHUSIASTS SELECTED AT RANDOM FROM THEIR CUSTOMER LIST. INCLUDED IN THIS QUESTIONNAIRE WERE TWO QUESTIONS DESIGNED PRIMARILY TO ESTABLISH THE RELATIVE SAFETY OF MODEL ROCKETRY AND AMATEUR ROCKETRY. THE FOLLOWING RESULTS WERE RECEIVED AND RECORDED.

NUMBER OF QUESTIONNAIRES SENT OUT	1,000
NUMBER OF QUESTIONNAIRES RETURNED	340
PERCENTAGE OF QUESTIONNAIRES RETURNED	34%

ACCIDENTS IN MODEL ROCKETRY

FROM THE 340 REPORTING, THE FOLLOWING RESULTS WERE OBTAINED.

TO THE QUESTION-----DO YOU KNOW OF OR HAVE YOU HEARD OF ANY ACCIDENTS USING OUR PRODUCTS? (MODEL ROCKET PRODUCTS)

DID NOT ANSWER	14	4%
NO (ANSWERS)	326	96%
YES (ANSWERS)	0	0%

ACCIDENTS IN AMATEUR ROCKETRY

FROM THE 340 REPORTING, THE FOLLOWING RESULTS WERE OBTAINED.

TO THE QUESTION-----DO YOU KNOW OF OR HAVE YOU HEARD OF ANY ACCIDENTS USING HOME MADE PROPELLANTS?

DID NOT ANSWER	18	6%
NO (ANSWERS)	124	36%
YES (ANSWERS)	198	58%

NATURE OF YES ANSWERS; 148 OF THE AFFIRMATIVE ANSWERS TO THIS LAST QUESTION WERE SIMPLY YES, CARRIED LITTLE DETAIL, OR WERE STRICTLY SECOND HAND NEWSPAPER REPORTS. 50 OF THE 198 YES ANSWERS TO ACCIDENTS INVOLVING AMATEUR ROCKETRY APPEAR TO BE FIRST-HAND ACCOUNTS AND GIVE SOME INFORMATIVE DETAILS OF THESE ACCIDENTS. THESE ARE RECORDED AS FOLLOWS:

"YES, HAPPENED TO SOME OF OUR CLUB MEMBERS."

"A FUEL CHARGE OF KNO_3 PLUS C_2H_5O FLASHED IN A BOY'S HOUSE."

"A FRIEND LOST A FINGER AND SUFFERED FACIAL DEFORMATIONS."

"A TWELVE YEAR OLD BOY LOST SIGHT OF ONE EYE EXPERIMENTING WITH HOME MADE PROPELLANTS."

"A NEAR ACCIDENT OCCURRED WHEN ONE BOY MIXED HIS OWN FUELS---THE ROCKET WENT WILD."

"YES, A BOY ALMOST BURNED HIS THUMB OFF."

"YES, FOR ONE, A BOY TRIED IT AND GOT KILLED."

"YES, BUT IT HAPPENED WHERE LITTLE KNOWLEDGE OF BASIC SAFETY RULES WERE USED."

"HOME MADE ROCKET EXPLODED IN BOY'S FACE, NEARLY BLINDING HIM."

"YES, A BOY HAD HIS HAND BLOWN OFF."

"FELLOW IN AREA USED METAL FINS AND LOST AN EYE AND DEFORMED AN EAR."

"YES, A FRIEND OF MINE FAILED TO FOLLOW MY DIRECTIONS AND SUFFERED A SLIGHT SKULL INJURY."

"SEVERAL YEARS AGO A BOY IN MY CLASS BURNED HIS HAND WHILE WORKING WITH ZINC-SULPHUR."

"YES, BUT I WAS A FOOL OF TWELVE AND I DON'T RECOMMEND IT AT ALL. I ALMOST BLEW MY EYE OUT."

"THERE WAS AN EXPLOSION IN AN AREA SCHOOL LAST WEEK. A CHEMISTRY CLASS WAS ATTEMPTING TO MAKE A LIQUID-FUEL ROCKET."

"YES, NUMEROUS, THAT'S WHY WE ARE STICKING WITH N.A.R."

"I WAS MAKING SOME HOME MADE ROCKET FUEL, PUT IT IN A BOTTLE, LIT IT AND IT EXPLODED AND I GOT BURNED BADLY."

"YES, A BOY TRIED MATCH HEADS AS FUEL AND LOST HIS HAND."

"SOME BOYS USED MATCHES FOR FUEL AND IT BLEW UP, INJURING THEM."

"A BOY (MY FRIEND) MADE ONE OUT OF BLACK POWDER (HOME MADE) AND HE LOST PART OF HIS FINGER WHEN IT EXPLODED."

"I GOT WOUNDS CLEAR TO THE BONE WHEN A MOTOR BLEW UP WHILE I WAS MAKING IT. I JUST FINISHED RECOVERING."

"ONLY FROM HOMEMADE ROCKET ENGINES USING EXPLOSIVES FOR FUEL AND METAL CONTAINERS FOR ROCKETS."

"MY COUSIN'S HOMEMADE ROCKET BLEW UP THE CORN CRIB."

"YES, STUDENT LOST A FINGER."

"ONE OF MY FRIENDS HAD A ROCKET BLOW UP ON THE LAUNCHING PAD."

"YES, OUR NEIGHBOR GOT BURNED ON GUNPOWDER AND SULPHUR."

"YES, A BOY FROM TEXAS HAD THREE FINGERS BLOWN OFF AND ANOTHER HAD AN EYE PUT OUT."

"YES, THERE HAVE BEEN MANY INCLUDING ONE FELLOW USING RED PHOSPHORUS AND $KClO_4$."

"I HEAR ABOUT THEM FREQUENTLY. THAT IS WHY I SWITCHED TO COMMERCIALLY MADE MOTORS."

"YES--MYSELF. LACERATIONS OF LEFT HAND IN PREMATURE DETONATION OF ROCKET."

"A BOY LOST TWO FINGERS IN OUR AREA ABOUT TWO YEARS AGO."

"ONCE A BOY GOT THE SIDE OF HIS FACE BLOWN OFF WHEN HIS HOMEMADE ROCKET BLEW UP."

"A BOY IN OUR SCHOOL WAS BLINDED FROM AN EXPLOSION."

"THROUGH HIS OWN CARELESSNESS, A BOY I KNOW MUTILATED HIS RIGHT THUMB AS THE RESULT OF AN EXPLOSION."

"YES, A BOY LOST HIS FINGERS AND ONE EYE ABOUT A MONTH OR TWO AGO IN CHICAGO."

"A BOY WAS SEVERELY INJURED USING MATCH HEADS AS A PROPELLANT."

"YES, MYSELF. I BURNED MY HAND BADLY LAST MAY 14 ON HOMEMADE PROPELLANT."

"A BOY WAS INJURED TAMPING AN IGNITER INTO A ROCKET."

"YES, BY USING COMPRESSED AIR TO FORCE THE FUEL DOWN TO THE ENGINE."

"AT OWESCO HIGH SCHOOL SOME KIDS WERE USING GUNPOWDER FOR ROCKET FUEL, IT WENT OFF, 10 WERE INJURED."

"YES, THE EXPLODING OF A ROCKET USING GUNPOWDER AS A PROPELLANT."

"A FRIEND OF MINE KNEW A BOY WHO LOST A HAND FOOLING AROUND WITH CO_2 MATCH HEAD ROCKETS."

"A FRIEND OF MINE WAS USING ZINC AND SULPHUR--SLIGHTLY BURNED."

"YES, BUT FEEL IT WAS DUE TO IGNORANCE AND CARELESSNESS."

"A ROCKET BLEW UP NEAR HERE AND HURT A BUILDING."

"I KNOW A BOY WHO STUFFED AN EMPTY RIFLE SHELL WITH MATCH HEADS; IT EXPLODED AND HE NEARLY LOST A HAND."

"YES, A BOY RECENTLY BLEW HIS HAND OFF WHEN HIS ROCKET EXPLODED."

"YES, I HAVE HAD MANY WHEN I BUILT THEM, BUT NOW I ONLY USE COMMERCIAL MOTORS."

"YES INDEED. MANY KIDS AROUND HAVE MADE PROPELLANTS, WHICH HAVE BLOWN UP, AND HURT THEMSELVES."

"YES, ONE FRIEND OF MINE CUT HIS HAND SERIOUSLY WHEN HE TRIED IT."

SUMMARY

SUMMARY: THIS SURVEY IS THE LARGEST OF ITS KIND EVER CONDUCTED, AND THE COMPILATION OF THE REPORTS, MANY OF A FIRST-HAND NATURE, INDICATE THAT BEYOND A SHADOW OF A DOUBT THERE IS AN ENORMOUS DIFFERENCE BETWEEN THE SAFETY OF MODEL ROCKETRY AND THAT OF AMATEUR ROCKETRY. THE REPORTED FACTS TEND TO SUBSTANTIATE THE FACT THAT CAREFUL MODEL ROCKETEERS WHO FOLLOW THE RULES OF THE NATIONAL ASSOCIATION OF ROCKETRY ACTUALLY FACE LESS DANGER THAN IN MANY OTHER SPORTS AND HOBBIES SUCH AS BASEBALL, SWIMMING, SKIING, BOATING, MODEL AIRPLANES, AND GO-KARTING. THE SURVEY REPORTS ALSO INDICATE THAT THE AMATEUR ROCKETEER FACES HAZARDS WHICH, BECAUSE OF LACK OF KNOWLEDGE, TRAINING, OR EXPERIENCE, DO NOT MAKE THEMSELVES APPARENT TO HIM UNTIL IT IS TOO LATE. AMATEUR ROCKETEERS, ACCORDING TO THE SURVEY, NORMALLY DO NOT HONESTLY REALIZE THE TERRIBLE DANGERS INVOLVED IN THEIR WORK, AND THEY WILL OFTEN ATTEMPT TO DO THINGS WHICH MAKE A PROFESSIONAL ROCKET ENGINEER SCREAM AND RUN FOR COVER. THE SURVEY RESULTS ALSO CONFIRM OTHER STUDIES WHICH HAVE SHOWN THAT THE DANGER IN NON-PROFESSIONAL ROCKETRY LIES IN THE HOME PREPARATION OF ROCKET PROPELLANTS AND THE MANUFACTURE OF ROCKET ENGINES.

WHAT CAN BE DONE TO PREVENT THESE ACCIDENTS? EACH OF YOU CAN HELP BY:

1. STOP BUILDING YOUR OWN PROPELLANTS BEFORE IT IS TOO LATE.
2. ENCOURAGE YOUR FRIENDS TO CONFINE THEIR ROCKET ACTIVITIES TO THE SAFE N.A.R. FORM OF MODEL ROCKETRY.
3. FOLLOW THE N.A.R. SAFETY CODE AS INCLUDED WITH THIS REPORT.
4. ENCOURAGE AND SUPPORT LEGISLATION WHICH WILL KEEP THE FIELD OF MODEL ROCKETRY OPEN AND UNRESTRICTED.
5. IF NEED BE (IF ACCIDENTS CONTINUE) ENCOURAGE AND SUPPORT LEGISLATION WHICH WILL IMPOSE SEVERE RESTRICTIONS ON THE BUILDING AND FIRING OF AMATEUR ROCKETS.
6. EVERY TIME SOMEONE REFERS TO YOUR ROCKET ACTIVITIES AS "AMATEUR ROCKETRY", SET HIM STRAIGHT. TAKE THE TIME TO EXPLAIN TO HIM THE DIFFERENCE BETWEEN MODEL ROCKETRY AND AMATEUR ROCKETRY. LET HIM KNOW THAT THERE IS A SAFE FORM OF ROCKETRY AND THIS IS THE TYPE OF ROCKET ACTIVITY IN WHICH YOU ARE ENGAGED.

THE SCIENTIFIC MINDED YOUTH OF AMERICA NEED A ROCKETRY PROGRAM-----TO THIS WE WILL ALL AGREE. BUT, REMEMBER, OUR COUNTRY NEEDS LIVE SCIENTISTS AND ENGINEERS WHO HAVE BOTH HANDS, TEN FINGERS AND TWO EYES. ONLY A SAFE AND SANE PROGRAM OF ROCKETRY CAN HELP IN PRODUCING THESE SPACE MEN OF TOMORROW.

IT IS INTERESTING TO NOTE THAT MODEL ROCKETRY IS APPROVED AS A HOBBY FOR UNITED STATES AIR FORCE PERSONNEL, WHEREAS AMATEUR ROCKETRY IS NOT APPROVED BY THE USAF AND IS CONSIDERED UNSAFE.

Letter Section

THE FOLLOWING ARE LETTERS AND EXCERPTS FROM LETTERS RECEIVED FROM YOU ROCKETEERS. KEEP SENDING THEM IN AND WE WILL TRY TO PRINT THE ONES WHICH SEEM TO HAVE THE MOST GENERAL INTEREST.

WE HAVE RECEIVED MANY LETTERS AND NEWSPAPER CLIPPINGS TELLING OF THE LAUNCHING OF VARIOUS LIVE PAYLOADS INCLUDING LADY BUGS, CRICKETS, BLACK BEETLES, ANTS, GRASSHOPPERS, MICE, ETC.

WE ARE SORRY THAT WE DO NOT HAVE SPACE TO PRINT ALL OF THEM. THE FOLLOWING LETTER IS A TYPICAL EXAMPLE, TELLING OF THE LAUNCHING OF A "TOADENAUT".

DEAR SIRs:

JAMES DASCOLA AND I READ YOUR ARTICLE PUBLISHED IN THE JULY EDITION OF MODEL ROCKET NEWS, "CRICKENAUTS LAUNCHED". WE FOUND IT AMUSING AND INSPIRING. THAT DAY WE DECIDED TO TRY SOMETHING ALONG THAT LINE, SO WE ORDERED THE PARTS FOR THE "BUG A BYE" ROCKET.

WE THOUGHT THAT LAUNCHING AN INSECT, AS BILL WALDON DID, WOULD NOT SUIT OUR PURPOSE. WE WANTED SOMETHING THAT BREATHED AND HAD A HEART. WE THOUGHT OVER VARIOUS POSSIBILITIES AND DECIDED ON A TOAD. NEXT, WE WENT TO MUD LAKE AND CAPTURED ABOUT TEN OF THEM.

WHEN OUR ROCKET ARRIVED, WE ASSEMBLED THE PARTS. THE NEXT DAY WE SELECTED ONE OF OUR TOADENAUTS AND PLACED HIM (HER) IN AN AIRCONDITIONED JAR (A FEW HOLES IN THE LID) AND TOOK OFF FOR THE LAUNCHING SITE. WHEN ALL WAS READY, WE PLACED THE TOADENAUT IN THE PADDED CAPSULE, SLID THE ROCKET DOWN THE LAUNCH RAIL AND LAUNCHED THE ROCKET.

EVERYTHING WENT PERFECT. WHEN THE PARACHUTE OPENED WE RACED IN THE DIRECTION IT WAS FALLING. WHEN WE GOT THERE WE PULLED OFF THE NOSE CONE AND PUT HIM (HER) IN THE JAR. HE LOOKED A LITTLE DAZED BUT IN A FEW SECONDS HE WAS ALL RIGHT. AFTER A FEW DAYS WE GAVE IT ITS FREEDOM.

WE COULD NOT HAVE DONE IT IF IT WAS NOT FOR THE HELP OF ESTES INDUSTRIES.

SINCERELY,
BOB NEITZKE

DEAR SIRs:

MY START IN ROCKETRY WAS A BLOODY ONE WITH AN EXPLOSION OF A HOMEMADE ROCKET WHICH SENT A FRIEND OF MINE TO THE HOSPITAL.

EVER SINCE I RECEIVED MY FIRST SHIPMENT OF ENGINES AND SUPPLIES FROM YOUR COMPANY, I HAVE ALWAYS HAD FINE RESULTS. YOUR SERIES B.8-4 REACHES AN ASTOUNDING ALTITUDE WITH THE ASTRON SCOUT ROCKET KIT.

I HAVE INSTALLED A PARACHUTE IN MY ASTRON KIT, AND I THINK IT MIGHT SELL BETTER IF YOU DID THE SAME.

I HAVE FOUND THAT AN OLD CAR ANTENNA MAKES A VERY FINE LAUNCHING ROD.

ENCLOSED IS A PICTURE OF A HOME BREW LAUNCHER AND YOUR ASTRON KIT ABOUT TO BE LAUNCHED. KEEP UP THE GOOD WORK.

YOURS TRULY,
ROBERT ROHDE

DEAR BOB:

I'M GLAD YOU HAVE GIVEN UP MAKING YOUR OWN PROPELLANTS. I'LL BET YOUR FRIEND HAS, TOO.

WE WILL SOON HAVE A KIT OUT WITH A PARACHUTE. THE ASTRON SCOUT WORKS WELL WITH A PARACHUTE. HOWEVER, THIS ROCKET IS DESIGNED TO TEACH THE IMPORTANCE OF THE CENTER OF PRESSURE---CENTER OF GRAVITY RELATIONSHIP. FOR THIS REASON WE ARE NOT ANTICIPATING ANY CHANGES IN THE ASTRON SCOUT.

SINCERELY,
VERNON ESTES

DEAR MR. ESTES:

AT A FIRING TODAY MY PARACHUTE WOULD NOT OPEN BECAUSE OF IMPROPER FOLDING. WOULD YOU PLEASE SEND ME INFORMATION WITH THIS ORDER ON THE PROPER WAY TO FOLD A PARACHUTE AND SOME INFORMATION ON TWO-STAGE ROCKETS? THANK YOU.

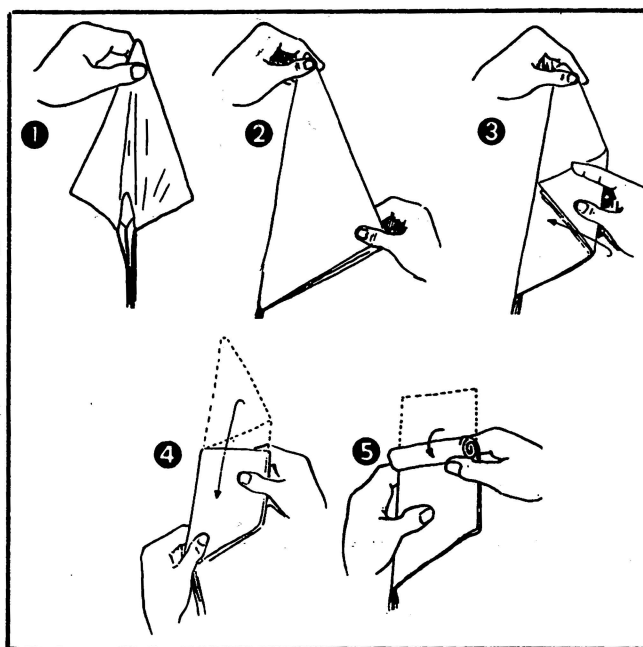
SINCERELY,
BILL BIGELOW

DEAR BILL:

WELL, I HAVE SEEN THEM FOLDED AT LEAST A DOZEN DIFFERENT WAYS. THE METHOD SHOWN BELOW WILL WORK VERY NICELY FOR A FOUR CORNERED CHUTE. DON'T FORGET, THE PLASTIC MUST BE PROTECTED FROM THE HOT EJECTION GASSES. A WAD OF COTTON OR A PIECE OF KLEENEX TISSUE STUFFED IN AHEAD OF THE CHUTE WILL DO AN EXCELLENT JOB OF KEEPING IT FROM BURNING.

ALSO, THE TWO STAGE INFORMATION YOU REQUESTED IS ENCLOSED.

SINCERELY,
VERNON ESTES



DEAR MR. ESTES:

SINCE I CANNOT RECEIVE ANY ROCKET MOTORS FROM YOU (BECAUSE I LIVE IN CANADA) WOULD YOU PLEASE TELL ME WHERE OR HOW I MIGHT OBTAIN THEM. IF I AM NOT ALLOWED

TO RECEIVE ANY KIND OF MOTOR FROM THE STATES, WILL YOU TELL ME HOW TO MAKE A SAFE MIXTURE OF FUEL.

I HAVE BEEN USING ZINC AND SULPHUR (1 PART OF EACH BY VOLUME). IS THIS A SAFE AND RELIABLE COMPOUND?

ALSO, WOULD YOU PLEASE SEND ME A COPY OF ALL ACCIDENT REPORTS ALONG WITH MY ORDER. THANK YOU.

SINCERELY,
GARY NEWBY

DEAR GARY:

IT IS INDEED REGRETTABLE THAT WE CANNOT SHIP OUR ROCKET ENGINES TO YOU. THE REASON WE CANNOT IS THAT ROCKETS OF ALL TYPES ARE ILLEGAL IN YOUR COUNTRY.

THE ACCIDENT REPORT YOU HAVE REQUESTED IS INCLUDED WITH THIS ISSUE OF THE MODEL ROCKET NEWS. I'M SURE, AFTER YOU HAVE READ IT, YOU WILL AGREE THAT YOU SHOULD NOT ATTEMPT TO MAKE YOUR OWN PROPELLANTS.

WE WISH WE COULD HELP YOU. HOWEVER, IT APPEARS THAT YOU FELLOWS WHO LIVE IN CANADA WILL HAVE TO WORK ON THIS ONE YOURSELVES. WHY NOT WRITE TO YOUR LOCAL AND NATIONAL OFFICIALS AND EXPLAIN YOUR PROBLEMS TO THEM. DON'T FORGET TO TELL THEM THE DIFFERENCE BETWEEN AMATEUR ROCKETRY AND MODEL ROCKETRY. EXPLAIN THAT IF MODEL ROCKETRY WERE NOT RESTRICTED, YOU WOULDN'T HAVE TO EVEN CONSIDER BUILDING YOUR OWN PROPELLANTS. SHOW THEM HOW THIS WOULD HELP PREVENT ACCIDENTS IN ROCKETRY.

WE WILL BE GLAD TO HELP YOU OUT BY FURNISHING YOU WITH ANY OF OUR PRINTED INFORMATION YOU MAY NEED, SUCH AS SAFETY SURVEY REPORTS, NAR INFORMATION, ETC.

SINCERELY,
VERNON ESTES

DEAR SIR:

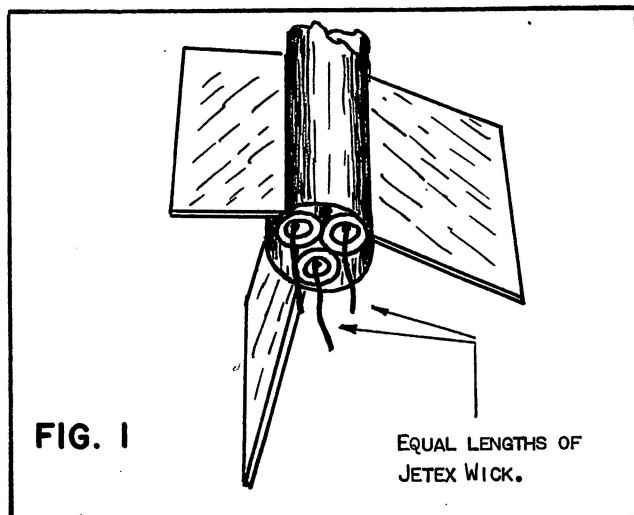
I ENJOY DOING BUSINESS WITH YOUR COMPANY VERY MUCH. YOU SEEM TO GO OUT OF YOUR WAY TO INSURE PROMPT DELIVERY AND YOUR PRODUCTS ARE TOP QUALITY.

I WOULD LIKE TO KNOW HOW TO IGNITE THE ENGINES IN A CLUSTER ARRANGEMENT AT THE SAME TIME.

CORDIALLY,
J. K. LEWIS

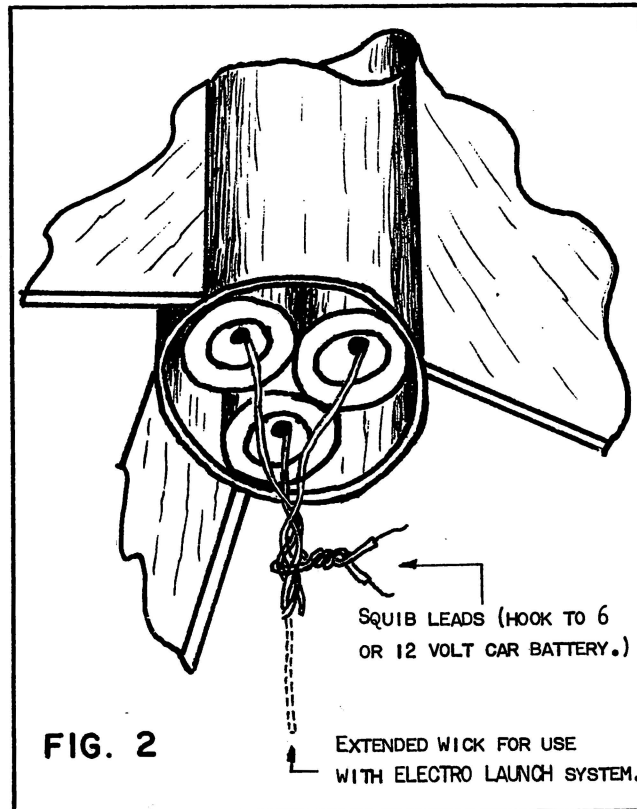
DEAR MR. LEWIS:

WHEN USING ROCKET ENGINES IN A CLUSTER, IT IS A GOOD IDEA TO TAPE ALL OF THE ENGINES TOGETHER SO THAT THEY WILL FUNCTION AS A UNIT. THEN CAREFULLY SECURE THE



CLUSTERED UNIT SO THE COMBINED THRUST OF THE ENGINES CANNOT PUSH IT FORWARD IN THE ROCKET BODY.

THE SERIES 1 ENGINES ARE PREPARED FOR IGNITING BY PRIMING WITH EQUAL LENGTHS OF JETEX WICK. SEE FIGURE 1. SECURE THE JETEX IN THE NOZZLE BY THE SAME METHOD USED WITH THE ELECTRO LAUNCH SYSTEM (SEE ROCKET ENGINE INSTRUCTION SHEET.). NEXT, TWIST THE ENDS OF THE JETEX TOGETHER SO THAT ALL OF THE LENGTHS OF THE JETEX WILL START BURNING AT THE SAME TIME. BE SURE THE JETEX IS TWISTED IN SUCH A WAY THAT THE REMAINING SEPARATE STRANDS



RUNNING INTO THE NOZZLES ARE ALL OF EQUAL LENGTH. NEXT, MAKE AN ELECTRICAL SQUIB BY HOOKING A PIECE OF JETEX IGNITER AROUND THE TWISTED END. SECURE THIS SQUIB INTO POSITION BY TWISTING THE TWO ENDS AS SHOWN IN FIGURE 2. IF YOU ARE LAUNCHING YOUR ROCKET WITH THE ELECTRO LAUNCH SYSTEM IT WILL WORK VERY NICELY TO EXTEND A SINGLE STRAND OF JETEX BELOW THE TWISTED PORTION FOR POSITIONING UNDER THE NICHROME IGNITION LOOP. (SEE DOTTED LINE IN FIGURE 2) CAUTION: THE SERIES TWO ENGINES (16#) CANNOT ADEQUATELY BE IGNITED BY THIS MEANS. AS YOU WILL NOTE, THE IGNITION TIME FROM ONE ENGINE TO ANOTHER MAY VARY BY A FEW HUNDREDTHS OF A SECOND. IF THIS WERE TO HAPPEN WITH THE 16# THRUST ENGINE, ONE ENGINE MIGHT VERY WELL BE COMPLETELY BURNED OUT BEFORE A SECOND ONE WAS IGNITED.

WE ARE WORKING ON NEW SYSTEMS FOR INSTANT IGNITION OF BOTH SINGLE AND CLUSTERED ENGINES. LOOK FOR THEM IN 1962.

SINCERELY,
VERNON ESTES

DEAR MR. ESTES:

BEFORE I STARTED USING YOUR PRODUCTS I MADE MY OWN ROCKETS AND FUELS. I HAD NO ACCIDENTS BUT WAS SURPRISED AT THE POOR PERFORMANCE OF HOMEMADE ROCKETS.

ONE OF MY BUDDIES AND I MADE TWO SMALL ROCKETS. WE SET ONE ON THE PAD, LIT THE FUSE AND RAN. THE FUSE MADE ITS WAY INTO THE TUBE. THE FUEL CAUGHT AND SPATTERED AND SMOKED, ATTAINING NO THRUST. A MASS OF WHITE AND BROWN GOO FLOWED OUT OF THE TUBE.

ANOTHER PAL OF MINE MANAGED 30' WITH ONE OF HIS. THEN I FOUND OUT ABOUT YOUR ORGANIZATION. WHEN I FIRED MY FIRST ROCKET WITH YOUR ENGINES, MOST OF MY PALS WERE WATCHING. WE ABOUT DROPPED IN OUR TRACKS WHEN IT TOOK OFF. FROM THAT DAY ON WE WERE SOLD ON YOUR ENGINES.

SINCERELY,
BOB COON

DEAR BOB:

I AM SURE OTHER ROCKETEERS WILL BE INTERESTED IN YOUR EXPERIENCE.

ACTUALLY, IF THE POOR PERFORMANCE YOU MENTION WAS THE BIGGEST PROBLEM WE WOULDN'T GET TOO SHAKEN UP. A LOT OF THOSE THINGS EXPLODE---YOU ARE FORTUNATE TO HAVE GIVEN IT UP BEFORE IT HAPPENED TO YOU.

SINCERELY,
VERNON ESTES

DEAR SIR:

WILL YOU PLEASE TELL ME, IF I HAVE ADULT SUPERVISION, WOULD IT BE ALRIGHT TO CONSTRUCT A LIQUID BI-PROPELLANT ROCKET?

I AM TWELVE YEARS OLD BUT I KNOW EVERYTHING ABOUT ROCKETS.

SINCERELY YOURS,
JOHN ENHOFFER.

DEAR JOHN:

NO TWELVE YEAR OLD SHOULD BUILD A LIQUID PROPELLED ROCKET. HE MIGHT NOT LIVE TO THE RIPE OLD AGE OF 13.

SINCERELY,
VERNON ESTES

Science Clubs Adopt Model Rocketry

A FEW YEARS AGO, WHEN THE U.S. ROCKETRY PROGRAM BEGAN TO COME INTO PROMINENCE, MANY SCIENCE AND CHEMISTRY CLASSES STARTED EXPERIMENTING WITH ROCKETS AS A PART OF THEIR REGULAR CURRICULUM. BECAUSE OF THE OCCURRENCE OF NUMEROUS ACCIDENTS, MANY SCHOOLS WERE FORCED TO BAN ALL OF THEIR ROCKET ACTIVITIES. THIS TREND IS CHANGING AGAIN NOW THAT THE SAFER FORM OF MODEL ROCKETRY IS BECOMING MORE WIDELY KNOWN.

PERHAPS YOU WOULD LIKE TO START A ROCKETRY PROGRAM IN YOUR SCHOOL. IF SO, WE WILL BE GLAD TO HELP YOU. SEND US THE NAME OF YOUR INSTRUCTOR AND NAME OF YOUR CLASS OR CLUB. WE WILL FORWARD A CATALOG, SAMPLE TECH REPORT, MODEL ROCKET DESIGN BOOK, MODEL ROCKET NEWS, ETC. FREE OF CHARGE.

CUT ALONG LINE

CATALOG REQUEST

DO YOU HAVE A FRIEND OR BUDDY WHO IS INTERESTED IN MODEL ROCKETRY? IF SO, FILL OUT THIS SPECIAL CATALOG REQUEST FORM. WE WILL SEND HIM (HER) A CATALOG FREE OF CHARGE. ADDITIONAL REQUESTS FOR CATALOGS MAY BE LISTED ON THE REVERSE SIDE OF THIS FORM.

YOUR NAME

NAME

ADDRESS

CITY, ZONE AND STATE

SEND CATALOG TO:

NAME

ADDRESS

CITY, ZONE AND STATE

Important Notice

THE MODEL ROCKET NEWS IS SENT FREE OF CHARGE TO ALL OF OUR CUSTOMERS WHO HAVE PLACED A SUBSTANTIAL ORDER WITH US WITHIN THE TWELVE MONTH PERIOD PRECEDING THE PUBLICATION DATE. BEFORE THE NEXT PUBLICATION DATE APPROXIMATELY 1000 ROCKETEERS' NAMES WILL BE DROPPED FROM OUR LIST. IF YOU ARE ONE OF THESE, AND WOULD LIKE TO RECEIVE THE MODEL ROCKET NEWS FOR ANOTHER YEAR, YOU MAY BE ASSURED OF RECEIVING IT BY REMITTING \$1.00 WITH THIS COUPON.

ENCLOSED IS \$1.00. PLEASE CONTINUE SENDING THE MODEL ROCKET NEWS TO ME FOR ONE FULL YEAR.

NAME _____ ADDRESS _____

CITY _____ STATE _____

DON'T FORGET MODEL ROCKETS MAKE EXCELLENT CHRISTMAS GIFTS

ONE FOR YOUR BROTHER-----ONE FOR YOUR FRIEND-----AND ONE FOR YOURSELF, TOO!!.....(IF YOU HINT THE RIGHT THING, TO THE RIGHT PEOPLE, AT THE RIGHT TIME).....AND REMEMBER, IF POP BUYS ONE FOR YOU---IT WOULD BE A GOOD IDEA TO BUY ONE FOR HIM. THEN, COME CHRISTMAS MORNING, YOU WILL HAVE ONE TO FLY, TOO!!!!!!

NEXT ISSUE

THE NEXT ISSUE OF THE MODEL ROCKET NEWS WILL PROBABLY INCLUDE, AMONG OTHER THINGS, SOME OF THE FOLLOWING ARTICLES.

- (1) INTERESTING ARTICLE ABOUT AIR FORCE APPROVING MODEL ROCKETRY FOR AIR FORCE PERSONNEL.
- (2) DESIGN OF "DIRTY BIRD" ROCKET-----EASIEST BUILT MODEL ROCKET KNOWN, DESIGNED BY NOTED ROCKET ENGINEER, G. HARRY STINE.
- (3) AMUSEMENT SECTION-----SEND US SOME SUGGESTIONS.

(4) LETTER SECTION-----LETTERS, QUESTIONS AND ANSWERS, SEND US YOURS.

(5) START OF A SERIES OF CARTOONS SHOWING THE INSANITY OF THE PRACTICE OF AMATEUR ROCKETRY BY NON-PROFESSIONALS.

YOU ARE INVITED TO HELP US WITH OUR NEXT ISSUE BY CONTRIBUTING TO THE ABOVE ARTICLES. WE ALSO WOULD LIKE TO SOLICIT NEWS ITEMS INFORMING US OF NEWSWORTHY ACTIVITIES OF YOUR ROCKET CLUB OR SECTION.

Estes Industries, Inc.

BOX 227
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