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REMINGTON ARMS COMPANY, INC.

NEW PRODUCTS RESEARCH

MONTHLY PROGRESS REPORT -- JULY, 1984

FIREARMS RESEARCH

SHOTGUN PRODUCT DEVELOPMENT

• Model 1100 Functional Improvements

Gas System development is continuing with several concepts. The elastomer seal/brake has reduced the spread of terminal bolt velocities from the 3" magnum to 1 oz. target loads to 270 in./sec. (one sample) This is close to the 225 in./sec. goal. The tossed action bar design has also demonstrated an ability to reduce the spread of velocities by 70-80 in./sec. (one sample). Both of these designs are in the Test Lab or additional evaluation.

Other designs currently being evaluated include:

- o Bolt shock absorber
- o Tandem orifices
- o Leaf spring pressure relief
- o Dual expansion volume
- o Expansion cut-off/pressure vent

A purchase requisition for a redesigned strengthened web carrier release has been sent to the vendor.

Endurance items in test include stainless steel magazine tubes, a new operating handle detent system, a square wire action spring, and an injection molded extractor.

• Choke Tube Development

Preliminary cost estimates indicate that it would be less expensive to source choke tubes for at least the first year. Specification packages are being forwarded to several potential vendors.

Briley Manufacturing and Trulock Tool Company were visited. A separate report on these companies has been issued.

Testing of the redesigned Remington choke tube is expected to be complete in September.

• Model 870 Restyle

Production's 12 gauge trial and pilot guns are in the Test Lab for evaluation. Marketing is reassessing the specifications.

Research Department

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SHOTGUN PRODUCT DEVELOPMENT - Contd.● New Generation Autoloading Shotgun

The product development team has been assigned:

- o K.C. Rowlands - Technical Leader
- o S.R. Franz o R.S. Murphy
- o J.A. Lawrence o E.W. Yetter

The program objective and potential goals were outlined on July 11. Team assignments have been made towards completing the basic data package by October.

RIFLE PRODUCT DEVELOPMENT● Model 700 Mountain Rifle

The N/C Shop work on the stock has been stopped pending the receipt of a tool drawing. PE&C is preparing the drawing and is aware of a possible delay.

● New Bolt Action Rifle

A Marketing-Research meeting was held July 17 and a preferred design was selected. Questions remain regarding legal implications of the bolt lock, and customer preferences for the magazine box and bolt handle styling. Marketing will address these questions and supply estimated volumes and pricing.

A review with the business strategy team is expected in August.

● Model 7400 Functional Improvements

Research efforts to improve chambering, extraction, and feeding are continuing. The EDL work request to investigate chamber finish and friction has been approved and work has started. Prototype single lip stamped magazine boxes are in the Test Lab and work on the mold for a synthetic box is progressing.

Research Department

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AMMUNITION RESEARCHGENERAL• Research Consolidation

New range construction is approximately two weeks ahead of schedule. The first truckload of Research files and equipment has been transferred to Ilion. All surplus chemical laboratory supplies and library books have been donated to local schools and libraries. Armory equipment has been identified and tagged for Ilion. Test ammunition has been inventoried. Orders for disconnecting most equipment have been prepared. All exempt personnel relocations to Ilion will be complete by September 1, 1984 and the Bridgeport Research facility is expected to be completely shutdown by November 1, 1984.

SHOTSHELL PRODUCTS• New Unibody Process12 Ga. 2-3/4"

A bulge just above the cap has been observed in the target load. This is due to a tight wad fit caused by the tapered wall. Redesign extrusion, prehead and sizing punches have eliminated this bulge by thinning the taper .004" per side in the critical section. The body is currently being evaluated for function and casualty and severe reloading. Concurrently four sets of punches are being fabricated. We expect to have test results and tools ready by August 13 for production of 150M blue target bodies before shutting the machine down for transfer to Lonoke.

16 Ga.

Acceptable load fit and ballistics have been achieved in Semi-works using a multiple angle taper on the extrusion punch which thins the wall taper. However, body straightness has suffered. The front taper on the extrusion punch will be increased slightly to improve this condition.

Due to production schedules for 20 ga. target bodies, tool trim-in will not be completed prior to machine transfer to Lonoke as originally scheduled.

Research Department

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SHOTSHELL PRODUCTS - Contd.● New Unibody Process20 Ga.

Sizing punches have been adjusted to produce a full 3" body for the 15/16 oz. steel shot load. Tool modifications are being investigated to determine if a straight wall large volume body can be made for a 1 oz. steel shot load.

28 Ga.

The technical data package has been issued to production based on product results from one station of the body former. Full three station operation has been delayed due to unavailability of a spare heater for the heat-set unit. A decision was made to remove a heater from quadrant four so this demonstration can be completed before machine transfer to Lonoke.

.410 Bore

Production tools are expected to be ready by the end of July. Testing of Semi-works produced hand headed 3" and 2 1/2" brass cap product was successful. Due to production schedules for 20 Ga. target bodies, tool trim-in will not be completed prior to machine transfer to Lonoke as originally scheduled.

● Premier Shotshell

Due to our inability to develop an acceptable powder/primer with the existing body and wad, a major program is being outlined to investigate this problem and develop alternative solutions. We will be looking at process variability (e.g. component weights), ballistics history on current Remington and competitive products, contribution of the various components to ballistics, primer/powder characteristics, continued powder/primer development and goal specifications at temperature and storage extremes. The program objective is to define all variables which are major contributors to pressure deviation and develop a more forgiving shotshell system. All testing and data analysis are scheduled to be complete by early October.

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SHOTSHELL PRODUCTS - Contd.● Remington Target Load

The new 12 gauge RTL wad with minimum shot pouch flare for ease of factory loading is being produced in Bridgeport Semi-works equipment at a rate of 360 pieces/hour. 5-10M wads are being molded for an experimental loading run at Lonoke and additional wads will be produced for field tests. A capital equipment appropriation request has been prepared for procurement of a 24 cavity production mold.

● Steel Shot

20 Ga. 15/16 oz.

A sample of 15/16 oz. payload shot container wads molded by an outside vendor were test fired and recovered. The wads suffered 100% casualties with all failures ("blow through") occurring at the bridge section. The vendor is increasing the bridge thickness and will submit another sample.

● Brass Plated Steel Caps

A 534 pound sample of brass plated steel in the 12HB specification was received June 26 from Thomas Steel Strip Company. Preparations are presently being made to run this sample on the cap press. A request for economic evaluation has been sent to the Plant's Industrial Engineering section.

CENTERFIRE PRODUCTS● "Premier" CenterfireBullet Performance

A second experimental run was made on the bullet assembly machine June 27 - July 6. Meplats of .065" and .070" were produced versus .080" on the previous run. Core weight has been found to be critical in the formation of uniform nose tips. Core swaging and thinner wall jackets will be investigated.

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CENTERFIRE PRODUCTS - Contd.

• "Premier" Centerfire

Case Polishing

A Plant experimental run of this process has been postponed because of F. Schmidt's priorities at Lake City. I have ordered the required chemicals from R.H. Miller per information received from F. Schmidt on June 29, 1984 and delivery of these chemicals is expected July 27. New tentative run dates of August 20 or September 10 have been established and will be confirmed by the week of July 23.

WHColeman:js

Research Department

July 1984

NEW PRODUCTS RESEARCHPERSONNELREMINGTON ROLL

| | <u>Actual</u> <u>6/30/84</u> | <u>Actual</u> <u>7/31/84</u> | <u>Forecast</u> <u>12/31/84</u> |
|---------------------|---------------------------------|---------------------------------|------------------------------------|
| <u>Exempt</u> | | | |
| Ammunition Research | 9 | 9 | 8 |
| Firearms Research | <u>27</u> | <u>27</u> | <u>31</u> |
| Total Exempt | 36 | 36 | 39 |
| <u>Non/Exempt</u> | | | |
| Ammunition Research | 7 | 7 | 6 |
| Firearms Research | <u>12</u> | <u>12</u> | <u>12</u> |
| Total Non/Exempt | 19 | 19 | 18 |
| <u>Wage Roll</u> | | | |
| Firearms Research | 16 | 16 | <u>16</u> |
| Total Wage Roll | | | 16 |
| Total New Products | 71 | 71 | 73 |

Research Department

July 1984

RESEARCH PERSONNEL AS OF JULY 31, 1984ILION - FIREARMS NEW PRODUCTS RESEARCHExempt 27Non/Exempt 12Wage Roll 16

Balaska, Robert J.
 Bauman, Thomas G.
 Bower, James W.
 Calkins, Kevin L.
 Coleman, Wm., H., II
 Curry, Wm.
 Findlay, David S.
 Franz, Scott R.
 Hand, Charles J.
 Hennings, James H.
 Hugick, Adam H.
 Hutton, James C.
 Kast, Jack L.
 Lawrence, Jeffrey A.
 Martin, Fred E.
 Murphy, Randall A.
 Nightingale, Richard E.
 Plunkett, Thomas J.
 Powers, Thomas P.
 Rankins, Edwin D.
 Rowlands, Kenneth
 Sanzo, Robert J.
 Sassone, Richard L.
 Saunders, Eugene L.
 Smith, Robert
 Snedeker, James R.
 Yetter, Edward W., Jr.

Eskoff, Sophie
 Jones, Raymond A.
 Martin, James S., Jr.
 Pickett, Wm., F.
 Schuster, Joyce M.
 Scram, Wendy L.
 Smith, Floyd H.
 Smithson, Ronald
 Stephens, Charles
 Supry, Fred
 Urtz, Donald
 Weaver, Harold E.

Baggetta, Joseph A.
 Beader, Robert W.
 Bedworth, Gary R.
 Butler, Richard G.
 Fiorentino, Dominick J.
 Harter, James D.
 Howe, Robert W.
 Jennings, Dale E.
 Kozakowski, Robert J.
 Paslak, Wm., F.
 Sohns, Wm., A.
 Storne, Ramon
 Truax, Irving E.
 Williams, Clifford
 Williams, Donald
 Williams, Ronald

TOTAL ILION PERSONNEL - 55

RESEARCH PERSONNEL AS OF JULY 31, 1984

AMMUNITION NEW PRODUCTS RESEARCH

Exempt 9 Non/Exempt 7 Wage Roll _____

| | |
|-------------------------|-------------------------|
| Cole, Wm, T. | Alexander, Bruce R. |
| desJardins, CF (Ilion) | Buccitti, Dominick C. |
| Dwyer, John M. | Champine, Barry M. |
| Garrett, Thelma B. | Frauenberger, Marion O. |
| McDonald, A. Daniel | Greene, Jeffrey R. |
| Peterkin, Vinton A. | Raimundo, John A. |
| Simpson, Wm., R. | Suhy, Frederick A. |
| Sroka, Leon R. (Lonoke) | |
| Tomek, Warren L. | |

TOTAL AMMUNITION PERSONNEL: 16