

CONFIDENTIAL

REMINGTON ARMS COMPANY, INC.
NEW PRODUCTS RESEARCH

THIRD QUARTER PROGRESS REPORT - 1985
SEPTEMBER 30, 1985

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HIGHLIGHTS

FIREARMS RESEARCH

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Shotgun Development

- o Research successfully completed design verification testing of the Model 1100 Functional Improvements, including a new gas system, and transmitted the design to Production. 1
- o Transmittal of the 12-gauge Model 1100 cosmetic changes is complete; transmittal of the 20, 28, and 410 gauge packages is expected by the end of the year. 1,2
- o Design verification testing of the Model 870 Functional Improvements should begin by the end of September. 2
- o The 20, 28, and 410 gauge Model 870 Restyle will be transmitted to Production in October. 2
- o The Model 870 and Model 1100 Special Purpose Deer Gun has been transmitted to Production. 2
- o Research has completed its preliminary engineering evaluation of a foreign-made over and under shotgun. 3
- o A prototype, redesigned Parker fire control should be available for testing by the end of the year. 3
- o A prototype New Concept Shotgun fire control will be complete in January. A meeting with the Engineering Department is scheduled for September 26. 3,4

HIGHLIGHTS

FIREARMS RESEARCH

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Rifle Development

- o Fabrication of New Bolt Action test rifles
and focus panel rifles is progressing. 4
- o Research has authorized Production to put
Model 700 Mountain Rifles in the warehouse. 4

HIGHLIGHTS

AMMUNITION RESEARCH

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Shotshell Development

- o Seven of the nine previously sourced shotshell products have been approved for shipment. Tests of the remaining two should be completed by October. 5
- o A new 1 oz., 20 ga. 3" magnum steel load is being developed in place of the unsatisfactory 7/8 oz. load. 5
- o Samples of a new Remington Target Load wad have been molded. 5,6

Centerfire Development

- o Cost and timing estimates for eleven new "Premier" centerfire bullets have been prepared. 6
- o The mold for a 38 Special plastic case is being altered to provide more support for the primer. 6

FIREARMS RESEARCH

SHOTGUN DEVELOPMENT

Model 1100 Functional Improvements

This program, along with the Model 1100 Restyle Program, is aimed at maintaining the Model 1100's position in the marketplace until its replacement by the New Concept Shotgun. Research efforts have been concentrated on a new gas system, which will allow the customer to shoot all field and magnum loads in one gun, a stainless steel magazine tube for improved corrosion resistance, and a thicker extractor and two piece firing pin retactor spring for improved endurance. Product introduction is scheduled for 1987.

Research successfully completed the design verification test and transmitted the design to Production on August 30. Thirty improvement guns and ten control guns (standard Model 1100's drawn at random from the warehouse) were fired 4,000 rounds each, or until the gun was removed from test. Guns were removed from test when a failure occurred that would have required the customer to return the gun to the factory for repair. Ammunition used during the test consisted of several loads, from the lightest 1-Oz. target load through the heaviest 2-Oz. Federal magnum.

Program goals were realized for both reliability and endurance. Malfunction rates were significantly lower for the Improvement guns than for the control guns. The average first part failure occurred at 2,614 rounds on the Improvement guns, and 1,287 rounds on the control guns. All 30 of the Improvement guns finished the test, whereas 9 of the 10 control guns did not finish. There was no part breakage or deformation to the pressure vent spring.

Production is completing the engineering estimate and economics. They are scheduled to have project approval by the end of the year.

Model 1100 Restyle

This cosmetic program is a complement to the Model 1100 Functional Improvement program. Originally scheduled for a 1986 introduction, the 12 gauge has been rescheduled for 1987 to correspond with the functional improvements, with the 20, 28, and 410 gauges to follow a year later. Specifications include cut checkering, 30-gloss wood finish, screw machine magazine cap, and choke tubes.

Model 1100 Restyle - Contd.

The 12 gauge parts list and drawings package was transmitted to Production in June. The package for the 20, 28 and 410 gauges is 75% complete, with transmittal expected by the end of the year.

Model 870 Functional Improvements

Similar to the Model 1100 Functional Improvement program, this, along with its complementary Restyle program, is designed to maintain the Model 870's position in the marketplace until its replacement by the New Concept Shotgun. Major improvements are a new rivetless, moving Delrin® base and Injectalloy® ejector rod, revised camming angles on the action bars and latches, improved shell latch staking, new detent, and firing pin spring. Introduction is scheduled for 1987.

Start of the design verification test has been delayed due to an interference that was evident on some guns during feeding. The heights of the ejector base and ejector rod are being reduced. Modified parts should be available to start the test by the end of September.

Model 870 Restyle

This cosmetic program is a complement to the Functional Improvement program. Specifications include choke tubes, 30-gloss wood finish, cut checkering, and a new recoil pad. Research previously approved Production's 12 gauge trial and pilot sample. The 12 gauge is included in the 1986 catalogue. Introduction of the 20, 28, and 410 gauges is due in 1988.

Work has begun again on the 20, 28, and 410 drawings package and parts list. They will be given to Production in October.

Models 870, 1100 Special Purpose Deer Gun

These guns have been developed to address the special deer gun market. Specifications include a 21" parkerized barrel and parkerized receiver, oil finish birch stock and fore-end, and a Cordura® sling strap. Introduction is scheduled for 1986.

The parts list and drawings package have been transmitted to Production.

International Over/Under

International is considering a sourced over/under shotgun for sale in Europe. Because it will bear Remington's name, Research has been asked to verify that the shotgun meets Remington standards. Sabatti has been identified as a potential supplier.

Research has completed its preliminary engineering evaluation. The guns supplied to Remington were considered to be of generally good quality. However, two safety related design defects, jar-off and fire-out-of battery, must be corrected. International has relayed this information to Sabatti. New guns are due in Ilion in November.

Parker Shotgun

The Parker is considered to be one of the finest side-by-side shotguns ever produced. Originally made by Parker Brothers, a Meridan, Connecticut firm founded in 1868, it was later manufactured by Remington, when Remington purchased the firm in 1934. Remington ceased production of the Parker in 1947. Consideration is now being given to marketing a limited number of Parkers each year that would have the look and feel of the original guns, but would be updated to meet current design standards. Research has decided to modify the proven Model 3200 fire control for assembly to the Parker frame.

Engineering and design of the fire control is being completed by Kolar Arms, Racine, Wisconsin, under contract to Research. A trip to Kolar, to review progress, is tentatively scheduled for mid-October. Kolar will also build the first prototype fire control. That is due for delivery to Ilion by the end of the year.

New Concept Shotgun

The Model 870 and Model 1100 have been in the line since 1950 and 1963 respectively. This program is designed to replace those guns, probably in the early 1990's, with new products that will utilize state-of-the-art technology and materials. Long lead design areas are the fire control and action system.

Purchase requisitions have been submitted for Research's consultant, Product Development Services, to move into the next phase of work on the fire control. Working prototypes, designed to fit into a Model 1100, should be demonstrated in January.

New Concept Shotgun - Contd.

A meeting will be held in Ilion on September 26 between the Engineering Department and Research. The Engineering Department will report on progress on the various action system alternatives they have been investigating.

Drawings of a synthetic Model 870 Stock and fore-end are being prepared. Visits to potential vendors capable of making temporary mold tooling will be scheduled shortly.

RIFLE DEVELOPMENT

New Bolt Action Rifle

A new Bolt Action Rifle is being developed as a replacement for the Model 700 BDL. Introduction is scheduled for 1988. Technical improvements include a safety to block both the sear and trigger, a detachable magazine box, a revised extractor, an independent bolt lock, and integral scope mounts.

Fabrication of development test guns is progressing. Receivers, which are the critical path component, are in Production for broaching. After broaching they will come back to Research for final machining.

Five guns are also being prepared for Marketing focus panels. They should be available in October.

Model 700 Mountain Rifle

The Mountain Rifle is a lightweight version of the Model 700. Initially offered in 270, 280, and 30-06, this gun will have a new, cut checkered stock, and a slim barrel contour with iron sights. OT

Research completed their evaluation of Production's trial and pilot sample and authorized production to the warehouse.

AMMUNITION RESEARCH

Shotshell Development

"Premier"

Competitive shotshell products with buffered and/or hard copper plated shot have gained acceptance among upland game and waterfowl hunters. Marketing has requested a similar line of products to maintain our competitive position.

A priority program has been underway by Research and Production to develop loads which were being sourced. Seven of the nine previously sourced products have been approved for shipment. An experimental run of 12 ga. 3" - 1 7/8 oz. "Premier" is expected in October. For the 20 ga. 2 3/4" - 1 1/8 oz., a load has been identified that has successfully passed designed experiment and long term environmental storage tests using Du Pont powder and 150X primers. This information has been transmitted to Lonoke. An experimental run is scheduled for the end of this month.

Steel

Federal and state regulations mandate that steel pellets be used in many waterfowl hunting areas to decrease the incidence of lead poisoning in waterfowl.

Field test of 20 ga. 3" - 7/8 oz. loads, using a rotary cam shell, were unsatisfactory. Approximately 50% of the shells fired in a Model 1100 resulted in a "fail-to-eject" malfunction. Because of the problem with volume in the rotary cam body, Research has requested a quantity of 20 ga. SP bodies, .25" long plastic basewad slugs, and half headed caps from Lonoke for hand assembly into SPLV shells. A new 1 oz. capacity shot container, compatible with the SP shell configuration, is being designed. The wad will be molded from HDPE, have molded-in container slits, and will feature improved shot nesting characteristics.

Remington Target Loads

Marketing has determined a need to introduce a new line of target loads to enhance our competitive position. This new load would consist of the new unibody shotshell, Remington 209 primer, brass cap in all gauges, and the "Figure 8" wad in 12 gauge.

Remington Target Loads - Contd.

Factory tooling for one cavity of the new wad configuration, compatible with existing RXP wad mold frames, is complete and samples have been made. Authorization of funds to scale up one-24 cavity production mold was approved by the Ammunition Business Team.

Centerfire Development

"Premier" Centerfire

Competitive "Premier" centerfire rifle products with superior downrange ballistics, accuracy, and appearance have gained acceptance among big game hunters. Marketing has requested a similar line of products to maintain our competitive position.

Costs and timing estimates for introduction of eleven new bullets in twenty loadings have been prepared. Expenditure for full commercialization of the three-year program total \$2,209M.

38 Special-Plastic Case

The lower factory cost of a plastic cartridge case has been the incentive for several previous attempts to develop a suitable plastic substitute for brass. The Du Pont engineering plastic Rynite® has properties that may be suitable for such use. Design Specialists, Inc. are under contract to build and mold and supply 100-38 Special Centerfire handgun cartridges for evaluation.

Initial evaluation has shown that a primer, seated in the Rynite case would not fire in a revolver. The hammer drove the primer forward in the primer pocket and did not strike it hard enough to fire. The mold is being altered to make the primer pocket .008" shallower to preload the primer in the relatively soft plastic. Also, the web will be made .008" thicker to further improve rigidity.

J.W. Bower:js

RESEARCH PERSONNEL AS OF SEPTEMBER 30, 1985

FIREARMS

Exempt <u>24</u>	Non/Exempt <u>12</u>	Wage Roll <u>17</u>
Bauman, Thomas W.	Frost, Helen B.	Baggetta, Joseph A.
Bower, James W.	Jones, Raymond A.	Beader, Robert W.
Calkins, Kevin L.	Miller, Steven M.	Bedworth, Gary R.
Coleman, Wm., H., II	Pickett, Wm., F.	Butler, Richard G.
Curry, Wm., M.	Saunders, Susan P.	Dickison, Wm.
Douglas, Terry C.	Schuster, Joyce M.	Failing, Marvin
Ericson, Wm., L.	Smithson, Ronald L.	Florentino, Dominick
Findlay, David S.	Stephens, Charles J.	Harter, James D.
Franz, Scott R.	Supry, Fred L.	Howe, Robert
Hand, Charles J.	Urtz, Donald J.	Jennings, Dale E.
Hennings, James H.	Weaver, Harold E.	Kozakowski, Robert
Hugick, Adam H.	Webster, Ronald A.	McManus, Owen
Hutton, James C.		Paslak, Wm., A.
Lawrence, Jeffrey A.		Starks, Gerry
Martin, Fred E.		Truax, Irving E.
Martin, James S., Jr.		Williams, Clifford
Murphy, Randall S.		Williams, Donald
Plunkett, Thomas J.		
Powers, Thomas P.		
Rankins, Edwin D.		
Rowlands, Kenneth C.		
Sanzo, Robert J.		
Saunders, Eugene L.		
Snedeker, James R.		

Total Firearms Personnel - 53

AMMUNITION

Exempt <u>4</u>	Non/Exempt <u>2</u>	Wage Roll <u>2</u>
Cole, Wm., T.	Conant, Paul	Dunn, Timothy
des Jardins, C.F.	Thomas, Dennis	Selan, Jerry
McDonald, Alexander D.		
Smith, Floyd H.		

Total Ammunition Personnel - 9

* ESD Engineer - James Ronkainen (Firearms)

REMINGTON PERSONNEL

Remington Roll

Actual
9/30/85

Exempt

Ammunition Research	4
Firearms Research	24
Firearms Modernization	7
Administration	<u>1</u>
Total Exempt	36

Non/Exempt

Ammunition Research	2
Firearms Research	12
Firearms Modernization	2
Administration	<u>1</u>
Total Non/Exempt	17

Wage Roll

Ammunition Research	2
Firearms Research	<u>17</u>
Total Wage Roll	19

Total Research	72
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