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REMINGTON ARMS COMPANY, INC.

RESEARCH DEPARTMENT

HIGHLIGHTS

NOVEMBER 1983

DISTRIBUTION

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FIREARMS

Model 1100 Special Field Shotgun

The elastomer buffer fore-end design has been transmitted to the Plant and tooling and part fabrication for trial and pilot have been initiated. Production deliveries to the warehouse are scheduled to begin in March.

Model 870 Special Field Shotgun

Samples for Marketing evaluation and catalog pictures are complete. Trial and pilot samples for testing and evaluation have been started. Pending Research approval, initial warehouse deliveries will begin in February.

Model 700 Mountain Rifle

A drawing package has been sent to Process for estimating. A question has been raised with respect to Production's ability to checker the stock and alternate patterns are being developed. A total of 36 barreled actions have been built, and stocks are being made by the Custom Shop. Final Research accuracy and function testing will begin when these rifles have been completed.

Sportsman 74, Sportsman 76

The Sportsman 74 and 76 parts lists and drawing packages are complete and awaiting authorization for transmittal. Process Engineering will build all rifles for test and evaluation.

Injection Molding - Firearms Components

A value analysis of centerfire rifle magazine followers is complete. Results and recommendations have been published in a separate report.

Centerfire rear sight bases have been assembled to Model 700 rifles. Verification of point-of-impact will be done in the Research Test Lab.

Model 7400 operating handles have been molded.

Cut Checkering Machine Development

Research is assisting Production with the purchase of additional Bostomatic machines for the Model 870 Restyle program. A preliminary meeting with Bostomatic was held in

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Cut Checkering Machine Development - Cont'd

Ilion on November 21. Machines should be on order in early January to meet warehousing schedules.

Three-flute, carbide spiral cutters purchased from Ekstrom-Carlson should provide tool life superior to that experienced on the present 3-spindle machines. Plant Engineering is reviewing equipment for regrinding this design. In the meantime, they will be sent back to Ekstrom-Carlson for regrind.

The CO.RE.MA. fore-end machine is complete except for a lead screw, which CO.RE.MA. purchases. Machine runoff in Italy is expected in December.

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FIREARMS MODERNIZATION

Small Parts Flexible Manufacturing System

The \$1.4MM Research and Development project for a prototype system has been authorized.

Initial development will focus on the following critical areas:

- Machine Tool Specifications
- Robot Requirements and Specifications
- Machining Tests - Ilion Research and EDL
- Fixture Design

Wood Shop Modernization

Development of an overall Wood Shop Modernization Plan is progressing. In addition, several areas are currently under evaluation which may yield rapid investment paybacks:

- Wood Shop Material Handling

Current material handling methods are being evaluated for potential improvements. State-of-the-art systems were reviewed at the Autofact Show in Detroit, November 15 - 17. The economic stake is currently under evaluation.

- Press-Formed Stocks - Robot Load

A significant labor reduction can be realized by robot loading and unloading existing stock presses. This concept would include a vision system to help the robot locate the stocks on a storage truck. Economic and technical evaluations are currently in progress.

- Press-Formed Stocks - Die Production Improvements

Preliminary information has been sent to EDL to investigate alternative die manufacturing methods. The operation costs and flexibility of press-forming will improve if die production is less time consuming.

In addition, press-forming long stocks and fore-ends will become more feasible with reduced costs and increased die flexibility.

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Receiver Flexible Manufacturing System

Research is actively developing the "Basic Data" required for the commercial facility project. The initial areas being addressed include the following:

- Project Objectives Letter
- Proposed System Layout
- Functional Process Description

Additional machining tests are scheduled to begin December 1 at EDL and will focus on the following areas:

- Tool Life Evaluation
- CNC Tool Re grind Quality vs. New Tools
- Effect of Titanium-Nitride Tool Coatings

GFM Automation

The installation of the robot, mandrel assembly/stripping machine and system controller is complete. Modifications to the GFM machine and the automatic cut-off machine should be complete in December provided machinist and electrician manpower can be maintained on this equipment.

Automatic Flexible Sub-Assembly of Small Components

A \$750M Research and Development project to develop a prototype system has been authorized.

EDL is ordering a Unimation Puma 560 robot for this project with delivery expected by March, 1984. Development will begin on the design and fabrication of the assembly stations required for the five proposed components.

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AMMUNITION

New Unibody Process

An experimental run of 8 gauge has been completed through loading and test, and tool trim in on the Production body former for the three row trial and pilot run is in progress. At that time, the body former can run four quadrants in full production.

Release to Ship approvals have been obtained for 12 gauge 2-3/4" 1-1/2 ounce, 12 gauge 3" 1-7/8 ounce, and 20 gauge 2-3/4" 1 ounce "Premier" shotshells. Handloads have been confirmed at process limits for 20 gauge 2-7/8" 1-1/4 ounce "Premier". The experimental loading is scheduled for this month.

Steel Shot Shotshell Loads

The 12 gauge 3" 1-3/8 ounce steel shot handloads have been confirmed at the process limits. An experimental run has not been scheduled.

The 12 gauge 3" 1-1/4 ounce steel shot handload confirmation at the process limits has been delayed until December. An experimental run is scheduled for March, 1984.

12 Gauge 1-1/4 Ounce Rifled Slug

A new load has been developed for the heavier pellet weight 116H primer. This load successfully passed all accuracy and ballistic tests. Approximately 7,000 slugs have been swaged for an experimental run which will take place when a loader is available.

357 Remington Maximum

Samples of Production's trial and pilot run of the 180 grain product passed all Research acceptance tests. Tests of the 125 grain load continue to be satisfactory with WC 680 powder. Work on this program is being stopped due to allegations that Ruger and Dan Wesson may cease gun production.

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RESEARCH PERSONNELREMINGTON ROLL

	Actual <u>12/30/83</u>	Actual <u>11/30/83</u>	Forecast <u>12/31/83</u>
<u>Exempt</u>			
Ammunition Research	14	14	11
Firearms Research	37	34	34
Firearms Modernization	9	9	9
Other	<u>1</u>	<u>1</u>	<u>1</u>
<u>Total Exempt</u>	<u>61</u>	<u>58</u>	<u>55</u>
 <u>Nonexempt</u>			
Ammunition Research	12	12	12
Firearms Research	10	10	12
Firearms Modernization	1	1	1
ER&DD	1	1	1
Other	<u>1</u>	<u>1</u>	<u>1</u>
<u>Total Nonexempt</u>	<u>25</u>	<u>25</u>	<u>27</u>
 <u>Wage Roll</u>			
Firearms Research	18	17	19
Firearms Modernization	<u>1</u>	<u>1</u>	<u>2</u>
<u>Total Wage Roll</u>	<u>19</u>	<u>18</u>	<u>21</u>
 <u>Total Research Department</u>	<u>105</u>	<u>101</u>	<u>103</u>

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