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REMINGTON ARMS COMPANY, INC.

RESEARCH DEPARTMENT

HIGHLIGHTS REPORT

FEBRUARY 1983

DISTRIBUTION

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## FIREARMS

### Model 1100 Special Field Shotgun

The Model 1100 20 gauge Special Field stock will be complete by March 15. Research will then have completed all necessary models and transmittals to satisfy the needs of Production and Marketing for both 12 and 20 gauge.

### Model 870 Special Field Shotgun

One model gun has been completed for evaluation. Model drawings for cost evaluation will be ready by the end of March.

### Model 870 Riot Shotgun

Model drawings have been turned over to Process Engineering for cost evaluation. One gun has been endurance tested to 9,600 rounds and is still functioning satisfactorily. Twelve (12) guns have been field tested a total of 116 rounds each intentionally tripping each shell to simulate the jam condition. There were no jam related malfunctions.

Future testing will include a three (3) gun endurance test to at least 10,000 rounds each. Every 1,000 rounds, a 25-round test of the jam condition will be tried.

### Model 7400 .223 Caliber Carbine

Four (4) prototype Model 7400's in .223 caliber were completed for Marketing evaluation. Twenty (20) guns are now being assembled for design verification testing.

Engineering drawings have been provided to Production for economic evaluation. If approved, complete drawings are available to transmit.

### Bolt Action Rifle

A new bolt action rifle to replace the Model 700 Classic is being developed. It will be designated the Model 700 Lightweight. Design specifications have been reviewed and a model will be available by April 1.

Work is continuing on the new generation replacement for the Model 700 BDL. A prototype with octagonal receiver will be completed in April.

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### Parker Shotgun

Arrangements are proceeding to complete one (1) VH Grade 12 gauge Parker. Research is working to accelerate the completion date to May 1983.

### Model Seven Lightweight

- 308 Caliber

Production has encountered premature releasing of floor plate covers. An investigation into the cause is being made.

- Aluminum Floor Plate and Trigger Guard Assembly

Three (3) engineering samples have passed preliminary tests. ten (10) more assemblies will be ready for extended testing in March.

- 222 Caliber No-Bind Stamped Followers

Prototype followers gave a 2% malfunction rate in shoulder shooting. A larger quantity has been received for extended testing with new design magazine springs to eliminate stem malfunctions.

- 223 Caliber for 1984 Introduction

Ten (10) rifles are ready for Test Lab function and accuracy testing.

### Injection Molding Metal and Ceramic Components

The Model 700 magazine follower mold has been altered to reduce warpage in the sintered part. Additional samples are being processed.

Samples of Parmatech, Witec, and Remington 316L, which include an oxidation step, indicate that corrosion resistance is somewhat better than earlier runs.

### Wear Resistant P/M Alloys

Chrysler has requested a wear resistant material for an insert in an automobile application. 410 stainless steel powder has been modified with additions of Mo, Ni, P and C. Samples have been completed for Chrysler evaluation.

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## FIREARMS MODERNIZATION

### Automatic Assembly of Small Parts

The following assemblies have been selected for inclusion in the initial system; shotgun breech bolt, common trigger, M/700-7 trigger housing, and shotgun carrier. An estimate of the required investment and the preliminary economics is being prepared.

### Small Parts - Flexible Manufacturing System

EDL, has begun the design of the prototype breech bolt fixturing. Two fixtures will be fabricated by mid-April for use in machining and material handling tests.

### Serial Number Recording System - Phase II

The Phase II project has been approved. Plant Engineering has assigned work orders to the project and a purchase requisition has been written.

### Receiver Flexible Manufacturing System

Preliminary development of the machining system is complete, and current activities are focused on preparation of the prototype project. This project will include the purchase, installation and demonstration of all critical technology required for a production facility. To expedite this project for an early April authorization, Business Services is coordinating the project preparation with Marketing and Finance Department assistance. Project deliverables have been completed and presented to the Engineering Department for both the prototype and production facility. The CCE for the prototype facility and the VGA for the production facility are being prepared. Upon agreement of the investment figures, project economics can be prepared by Remington.

### GFM Automation

Detailed design is continuing according to schedule. One result of the design effort has been changes to the control system which are expected to result in an estimated total savings of \$11,000. In addition, these changes will benefit project timing and installation since some subsystems will now be wired, programmed and debugged in advance of the overall system startup.

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Installation is planned for early fall with a full system in operation by the end of the year.

#### Wood Finishing Automation

Quality problems discovered in the initial testing of the DeVilbiss atomizers have forced production to use the old Graco spray guns. Du Pont and DeVilbiss engineers have been contacted to obtain input for a solution and a rigid systematic testing program has been developed. Testing will begin in early March to correct the DeVilbiss quality deficiencies.

#### Ultra Violet Finishing

Testing of U.V. finishes continued at IST in Alabama with Lilly (finish suppliers) representatives present. Tests were run to determine the feasibility of using the process for repairs on pressed stocks and as a spray on fill process for raw wood. Samples looked promising for both applications but problem areas still exist and need further evaluation before Remington can adopt this process.

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## AMMUNITION

### New Unibody Shotshell Process

20 gauge tooling was trimmed in prior to the present machine shutdown and product was successfully run through the production body former. 12 gauge large volume tooling has been inspected.

The semiworks body former has been down for repairs due to a bent shaft and damaged hub, delaying development of the .410 bore and 10 gauge bodies. It is expected to be reassembled and operational by March 1.

### "Premier" Shotshell

Experimental machine loaded 12 gauge 3" 1-7/8 oz. using the 117 primer with 1.34 grains of "fuelless mix" produced acceptable ballistics at all temperatures. At +150°F in excess headspace, oversize chamber gun, partial primer backouts were evident, however, there were no leaks or dropped primers.

Product hand loaded with 1.13 grains of 1024 mix gave essentially comparable ballistics.

### Wad Improvement Program

Based on positive test results with the proposed low-cost component wad, in both Remington and competitive bodies, an economic comparison with the RXP12 has been requested. Samples have been supplied to Marketing for their test purposes. Also, Research will determine if the present production mold frames can be adapted to incorporate the new tooling.

### Shotshell Primer Basics

An experimental run of domed primer cups with contoured primer backing plates was run. Five thousand 1024 mixture primers and 20,000 fuelless mixture primers were sent to Lonoke for machine priming and loading in target loads. Extensive laboratory and field testing is planned.

Testing of fuelless mixture in steel shot loads indicates that it is slightly better than 1024 mixture in unburned powder testing at room temperature and -20°F.

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#### ABC Primer

Drawings for experimental tooling to produce a four flash hole ABC battery cup have been sent to Purchasing for tool fabrication. The effect of increased flash hole area on battery cup failures during firing will be evaluated.

#### Extended Range Center Fire Ammunition

The prototype bullet grooving unit is being installed on #5 duplex loader in preparation for an experimental run of 6mm Rem. and 243 Win. cartridges in early March. Tooling has produced a slight bulge (.0004") on either side of the cannellure and the bullets will not pass the maximum diameter gauge. Revised tooling is being fabricated.

#### Progressive Shell Draw Development

Development of 30-06 tooling is complete. The computer model to aid tooling design is also complete.

Additional work needs to be done on .357 magnum tooling. Lonoke has redesigned the shell to add more metal in the wall area for added strength. The progressive tooling is being modified to the new component design.

RESEARCH PERSONNEL

REMINGTON ROLL

	<u>Actual</u> <u>1-31-83</u>	<u>Actual</u> <u>2-28-83</u>	<u>Forecast</u> <u>12-31-83</u>
<u>Exempt</u>			
Ammunition Research	16	17	16
Firearms Research	38	39	40
Firearms Modernization	7	7	9
Other	<u>1</u>	<u>1</u>	<u>1</u>
Total Exempt	62	64	66
<u>Nonexempt</u>			
Ammunition Research	12	12	12
Firearms Research	11	11	11
Firearms Modernization	1	1	1
ER&D	1	1	1
Other	<u>1</u>	<u>1</u>	<u>1</u>
Total Nonexempt	26	26	26
<u>Wage Roll</u>			
Firearms Research	19	19	19
Firearms Modernization	<u>2</u>	<u>2</u>	<u>2</u>
Total Wage Roll	21	21	21
 <u>TOTAL RESEARCH DEPARTMENT</u>	 <u>109</u>	 <u>111</u>	 <u>113</u>

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