

LIMITED DISTRIBUTION

REMINGTON ARMS COMPANY, INC.

RESEARCH DEPARTMENT

HIGHLIGHTS REPORT

JANUARY 1983

DISTRIBUTION

| | |
|------------------|------------------|
| J.P. McAndrews | C.A. Riley |
| E.F. Barrett | D.M. Condon |
| E. . Hooton, Jr. | W.H. Coleman, II |
| G.L. Ehrens | R.L. Hall |
| R.A. Partnoy | P.S. Hebert |
| C.T. Wagner | C.B. Workman |

NOTE: Please destroy this report when
it has served your needs.

FIREARMS

Model 1100 Special Shotguns

Model drawings have been transmitted to Production for the Model 1100 Special Field shotguns, except for the 20 ga. stock and the two piece butt plate designs that will be completed in February. Thirty-five (35) sample guns for use by Market field force personnel will be assembled by mid-February.

Model 870 Special Shotguns

Samples of the Model 870 Special Field Shotgun are being assembled for review by Marketing. Design specifications are 75% complete and drawings are being prepared for preliminary economic analysis. Sample guns and design specifications will be completed by mid-February.

Model 7400/7600 Center Fire Rifles

Priority has been placed on completion of the Model 7400, 223 caliber rifle design for mid-1983 introduction. Model requirements include an aluminum receiver, four (4) shot magazine box, low lustre metal and wood finishes, 18½" barrel, and no checkering, grip cap, or white line spacers. A sample will be prepared for review at the February Operations Committee meeting. Preliminary drawings have been provided to Production for economic evaluation. If approved, complete drawings will be available for transmittal in February.

Model 870 Police Shotgun

Four (4) prototype slide and carrier assemblies featuring revisions required to eliminate the jammed shell malfunction were provided to Marketing for use at a January Police Ordnance Show in Los Angeles. Revisions include addition of a shell stop latch to the bottom of the slide and provision of additional clearance between the carrier and the slide. Results of live round tests in the laboratory and in the field indicate that these revisions should eliminate the jammed shell malfunction.

Injection Molding Metal and Ceramic Components

The first commercial order has been received. The West Company, Phoenixville, Pa., has placed an order for injection molded hobb forms to be made from Fe-2% Ni. West presently has this part made as an aluminum die casting.

Initial samples of M/7400 magazine followers have been molded, processed through sintering and are being evaluated. The mold for M/700 rear sight bases is proceeding on schedule at Wilmington shops, with a March completion expected.

Research Department

-1-

January 1983

Laser Applications

ETL has submitted a final report on the laser processing of gun components with the conclusions that:

- laser welding of shotgun slide block - action bar assemblies using a CO₂ laser, with strength comparable to conventional brazed assemblies, is feasible at rapid welding rates.
- localized transformation hardening to produce wear surfaces in steel components is feasible.
- initial results of laser welded free-machining steels using a double pass showed potential for improved weld integrity.

Updated economics will be requested. Additional testing in Ilion will be required.

FIREARMS MODERNIZATION

Receiver Flexible Manufacturing System

Machining tests of M/870 receivers were conducted in Wilmington Shops to prove out fixture and work holding concepts, tooling, cutting cycle and machine monitoring techniques.

Preliminary results indicate:

- Fixture mandrel and clamping concepts tested favorably.
- Part holding techniques need additional development/redesign for production use.
- Most of the tooling performed satisfactorily
- Current cutting cycle is approximately twice that required for production.

Wood Finishing Automation

The DeVilbiss rotary atomizers were installed on the electrostatic sprayline on 1/17/83. Preliminary tests resulted in approximately a 50% reduction in finish usage. Further trial and pilot production will be necessary to obtain optimum results for finish savings and quality. Future work will focus on development of a top coat electrostatic finishing process to replace the current hand spraying operations.

Research Department

-2-

January 1983

Stock Process Machines - Auto Loading

Robot loading was determined to be the most technically feasible solution for auto loading the short stock process machines. EDL is investigating the selection of an optimum robot. Work is underway to develop an area layout which will be used to determine the scope of work and re-evaluate the project economics.

AMMUNITION

"Premier" Shotshell

All trial and pilot product from Lonoke (PR12-6, PR20-6, PR12HF-7½, PR12F-7½, and PR20F-7½) and Bridgeport's SP12SMAG-2 "Nitro Magnum" passed lot acceptance tests.

Acceptable ballistics at all temperatures in hand loads have been established for the 12 gauge 3" 1-7/8 oz. "Premier" load. Patterns meet Federal's Premium".

12 Gauge 1 Ounce Target Load

The effect of increasing the velocity, from 1145 fps to 1180 (equalling competition), on gun function is being evaluated. Tests to date indicate that the ballistics characteristics of the powders used by both Remington and Winchester are similar and therefore reliability of gun function should be similar.

Wad Improvement Program

Production molded RTL wads using USI linear LDPE were hand loaded as 1 oz.-1180 fps target loads using RTL wads molded with Union Carbide LLDPE as a control. The USI material gave equivalent performance and is substantially lower in cost.

A load fit study was performed using the proposed low cost component wad in a variety of field loads. Preliminary results indicate this wad could directly replace seven present wad configurations. Ballistic testing has not been conducted.

Shotshell Primer Basics

An experimental run of shotshell primers was made using domed primer cups, quarter hard anvils and both 1024 and fuelless mixtures. Excessive flattening of the primers was encountered at tamp and foil. Contoured primer backing plates may be required and will be evaluated prior to the trial and pilot run. Pellet weight was slightly high with the fuelless mixture indicating that a slightly thinner charging plate is required for production. Both factory and trade primers were produced and will be tested.

Research Department

-3-

January 1983

ABC Primer

Experimental tooling for a four flash hole version of the ABC battery cup is being designed to increase flash hole area and reduce primer failures.

357 Rem. Max.

Nine thousand rounds of proof loads were shipped to Ruger this month following a 150°F heat soak. An oven fire destroyed 11,500 rounds and precluded any further heat soaking until safe operations of other ovens are confirmed. Lonoke is currently loading additional proof loads.

Extended Range Center Fire

A prototype bullet grooving unit was installed on a center fire duplex loader. Experimental runs of 30-06 and 308 Win. were made using 165 gr. Sierra PSPBT bullets without damaging the soft point of the bullets. Preliminary ballistics testing showed an accuracy of 0.6" for the 308 Win. and 1.1" for the 30-06 when loaded with HRP 85 powder. Accuracy is comparable to Federal Premium. Other calibers will be run after the unit has been installed on a different loader.

ER&D FIELD GROUP

Shotshell Body Forming

Repair work on the Bridgeport body forming equipment is essentially complete and the equipment is back in operation.

The system is presently tooled with 12 gauge on two quadrants. We plan to phase in 8 gauge and 20 gauge on the remaining two quadrants. After this is complete, ER&D will focus on completing the project scope of work, which includes documentation, manuals, and training of plant personnel.

During the shutdown period, solutions to the heatset corrosion and component transfer problems were implemented. Alternative solutions are being developed as backup in the event that the current fixes prove to be unsatisfactory.

Center Fire Modernization

Work continues on the following prototype machines:

- Bullet Assembly - Machine is tooled and ready for extensive testing.
- Jacket Draw - In routine production use.

Research Department

-4-

January 1983

Center Fire Modernization - Cont'd

- Header - Undergoing extensive evaluation prior to trial & pilot.
- Turret Trim/Headturn - Ready for trial & pilot
- Anneal/Taper/Anneal - Equipment checkout to begin January 31, 1983.
- Loader - Awaiting installation

Progressive Shell Draw Development

Development of 30-06 tooling and the computer model to aid in tooling design is complete.

A run of .357 magnum shells were made and sent to Lonoke for plant evaluation. Shell dimensions were good, including wall variation.

The remaining work is to supply large sample lots of both shells for more extensive plant testing.

Research Department

-5-

January 1983

RESEARCH PERSONNEL

REMINGTON ROLL

| | <u>Actual</u> <u>12-31-82</u> | <u>Actual</u> <u>1-31-83</u> | <u>Forecast</u> <u>12-31-83</u> |
|--------------------------------------|----------------------------------|---------------------------------|------------------------------------|
| <u>Exempt</u> | | | |
| Ammunition Research | 16 | 16 | 16 |
| Firearms Research | 38 | 38 | 40 |
| Firearms Modernization | 7 | 7 | 9 |
| Other | <u>1</u> | <u>1</u> | <u>1</u> |
| Total Exempt | 62 | 62 | 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 | 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> | 109 | 109 | 113 |

Research Department

i

January 1983