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FIREARMS RESEARCH DIVISION

PROGRESS REPORT - HIGHLIGHTS

APRIL 1981

Remington Arms Company, Inc.

NEW PRODUCT DEVELOPMENTXSG/XPG Shotguns ✓

Preliminary Design of the XSG autoloading shotgun will be completed as scheduled in July. Four Research model guns have been assembled ~~far~~ *AND ARE CURRENTLY BEING TESTED TO VERIFY DESIGN* ~~design verification testing~~. All four guns are 3" magnums featuring the A-3 locking system, a modified M/1100 gas system, square wire action spring forward around the magazine tube, and an average weight of 7 lb. 12 oz. (3.5 kilograms). Two skeet grade guns are also being fabricated. Work is *EIGHT MORE "XSG" MAGNUM MODEL GUNS WILL FOLLOW IN MID JUNE.* progressing on contingency designs for gas, locking, feeding, and fire control systems. In the most recent series of tests, a new gas system with forward vent holes has produced a closer relationship in bolt velocities for light and heavy loads than any system previously considered for XSG application.

Model drawings for the XPG pump action shotgun have been released to the Model Shop for prototype fabrication. Assembly is scheduled for July 1981.

Model 7400/7600 Centerfire Rifles

Research continues to work with Production to decrease Gallery reject and overall malfunction rates for these new generation rifles. Because approximately 70% of the rejects have been for magazine box related malfunctions, recent work has concentrated on assuring that boxes are fabricated to model drawings. The vendor (H&P Die Stamping) has extensively reworked tooling to produce dimensionally accurate boxes. Five hundred samples fabricated with the new tooling have been received for evaluation. However, since more than 200,000 boxes were in Plant inventory, Production has also developed gages to monitor box dimensions and has been actively evaluating methods to assure dimensional accuracy on boxes currently

in process. Focusing on the high volume 30-06 caliber rifles, preliminary tests with the vendor samples and the boxes adjusted to meet the new gages indicate a reduction in Gallery reject rate from approximately 25% to approximately 10 - 15%. Further evaluation and work on other malfunction sources is in progress.

Model Four Limited Edition

Research testing has confirmed excessive cracking of the rosewood fore-end tip. Due to cracking tendency, cost, and limited availability of the rosewood, Marketing has requested evaluation of a polished metal cap. Surface finish will be comparable to the receiver/barrel finish and two spacer options are being considered: 1) omit the spacer completely or 2) replace the white line spacer with a black spacer which would require no change in tooling.

Model 979 Seismic Gun

Bridgeport Purchasing has been requested to obtain quotes for machined components for the seismic gun. These will be used to order parts for guns for 1982 delivery.

Nine electric seismic guns were shipped to MAPCO on April 16th. This brings to twelve the total number of guns shipped so far in 1981. Ten of these guns also had interchangeable percussion breech blocks with the new Remington designed fire-on-closing mechanism. All future guns shipped in 1981 will have electric breech blocks only.

The possibility exists that some parts for the DESA and Hofmann guns might not be interchangeable. This will be verified when the first shipment of Hofmann guns is received. If correct, this will mean two different parts lists in the field service manual. It has also been determined that some parts which were recently

sent to MAPCO as spares require hand fitting for them to function correctly. All of these problems, which were not previously anticipated, make it apparent that the field service manual will have to be more extensive than originally contemplated. Completion of the first draft will be delayed accordingly.

Model 870 Competition Trap Shotgun

Production is experiencing some difficulty in copper brazing and heat treating the present fore-end tube assembly. They have furnished Research with new assemblies for testing. These assemblies were made with a higher carbon material and simpler brazing process.

Marketing indicates that initial reaction from the field has been generally good. However, there have been some complaints about misalignment between the vent rib and the receiver. Research is working with Marketing and Production to determine extent of the problem and to identify changes in design and/or process that may be required to eliminate the problem.

Bolt Action Carbine

Marketing has evaluated several alternative stocks and selected one for final design. Samples are being fabricated for 1) final testing of new actions, 2) measurements required to produce a master stock drawing, and 3) fabrication (by Fajan) of stocks for field test models. Product acceptance is scheduled for June 1981. However, meeting that schedule will be difficult and will require high priority on the remaining work.

Model 7 Bolt Action Rifle

Model drawings are being finalized on this new style bolt action rifle. The current plan is to offer this limited production rifle as a market test of new design and styling features.

CURRENT PRODUCT DEVELOPMENTModel 700 Bolt Lock and Fire Control

Work is continuing on the bolt lock on a low priority basis due to Marketing's decision not to implement the bolt lock into the M/700 product line. Twenty-five prototypes are being fabricated for use with the Bolt Action Carbine, but will be delayed pending a decision on desirability of including the bolt lock in the Carbine design.

Testing will continue on the new fire control.

Model 700 ADL/BDL Restyling

Marketing has requested styling changes be made to upgrade the ADL and BDL models for 1982.

Samples of the ADL and BDL models have been completed with the requested changes and furnished to Marketing for their evaluation.

Model 788 Safety

Due to concerns about styling, alternative safety button geometries were evaluated. The M/700 style button was selected as the preferred alternative design and revised cost estimates have been obtained. Use of the M/700 style button will result in a cost increase of \$0.32 per gun compared to the stamped button currently specified in the new safety design. No further work is planned pending approval of the button geometry.

Model 1100 Ducks Unlimited

Sample Commemorative model emblems from the new vendor are on order and scheduled for delivery by the end of April. When received, the samples will be fastened to receivers for endurance testing. Trial and Pilot quantities of the emblems are also due by the end of April. These guns are scheduled for Warehousing in July 1981.

Sample 3" Magnum 32" barrels for the Trade gun have been received and will be tested for point of impact by the end of April. Trade guns are scheduled for Warehousing in December 1981. However, the Plant is accelerating the schedule to permit Warehousing in July.

Model 1100 Link Breakage

Higher carbon steel parts have been received from the vendor. They have been processed and delivered to the Test Lab. Dry cycle testing is scheduled to begin the first week of May.

Model 870 Limited Edition

Model Requirements have been defined and Marketing has furnished 4 to 1 artwork for the receiver side panels. Cost estimates have been requested thru Purchasing for sample receivers to be etched by Newcut.

We are in the process of having parts made that will be required for a Research sample.

Model 552 Rimfire Rifle

Extractor and chamber dimensions are being evaluated on Model 552's to determine potential directions for redesign. Development of a permanently attached deflector shield is also being considered. A major action redesign effort would require approximately 2 to 3 years.

PROCESS DEVELOPMENTAuto-Drill Line

Plant personnel have assumed responsibility for operation of the system and Research personnel continue to work with them to maximize production rates and increase efficiency of the operation. Engineering drawings are being updated to reflect extensive changes in the electrical system and work is continuing on the smoke removal, oil filtration, and cut blank conveyor systems. Total capital cost is projected to be approximately \$1.1MM which is within $\pm 10\%$ of the Part II authorization. Operations costs associated with installation are projected to be approximately \$178M compared to the \$210M Part II estimate.

ASEA Manipulator

Repairs to the ASEA have been effected, and Trial and Pilot resumed. Completed samples should be available for review with Production by the end of the month. At that time, a program for turning the machine over to Production will be established.

Four Slide Machine

Runoff of the machine at the vendor's plant is scheduled for mid-May, with delivery to Ilion by June 1, 1981. The vendor is being contacted weekly in an effort to prevent further delays in this project.

Laser Welding

Additional components, made to ETL tolerance requirements, will be available for shipment to Wilmington by the end of the month. If laser welding of these parts is satisfactory, a review will have to be made of Production's ability to reproduce the tolerances.

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Cut Checkering Machine for Field Grade Guns

Based on a preliminary XSG analysis, the minimum capital investment savings to be derived from successful development of this machine is \$2 million. The CO.RE.MA. mechanical checkering machine has been installed and development work should begin in early May.

Machine Loading Robot System

The goal of this project is to effect a \$3 million annual cost savings through a 10% reduction in labor requirements. Included in the system will be a simple, probably non-servo, robot and a special storage facility. One system will be supplied for each machine, creating a non-synchronous transfer system utilizing the assets already in place.

Because of the large potential of this project, two engineers have now been assigned to it, with completion of the investigative phase expected by August.

Rollform Shotgun Firing Pins

An investigation has been started into the feasibility of using relatively new roll forming technology, which is an adaptation of thread rolling, to produce firing pins and other symmetrical parts. Preliminary economics indicates that a roll forming machine could be justified on the firing pin alone. A visit to a vendor's plant is being scheduled.

Stainless Steel M/700 - 7mm-08 Varmint

This project involves the manufacturing of receivers, barrels, and barrel brackets from 416 stainless steel. Receiver blanks have been fabricated in the Model Shop, and processing through the remainder of Production should begin by the end of April. Steel has been ordered for the barrel bracket, which will be fabricated in the N/C Shop. Steel is available from the Plant for barrels. These will be fabricated during the next run of Varmint barrels on the GFM.