

SECRET  
FIREARMS RESEARCH DIVISION

PROGRESS REPORT - HIGHLIGHTS

FEBRUARY 1981

*Remington Arms Company, Inc.*

## NEW PRODUCT DEVELOPMENT

### XSG/XPG Shotguns

The present XSG design features an action spring forward around the magazine tube, a modified barrel contour for reduced weight, and an improved (smoother action) locking system. Four (4) prototypes are being fabricated for field testing to prove out the design. Assembly is scheduled for completion by mid-March. Work is continuing on a variety of contingency designs for the feeding, gas, locking, and fire control systems. In laboratory tests, two more square wire action springs are exhibiting good closing velocities after 3,750 and 6,573 2-3/4" magnum rounds, respectively. Design work on the XPG (pump action) feed system has been initiated.

### Model 7400/7600 Centerfire Rifles

Phase 1 (Data Gathering) of the M/7400/7600 Task Force program is essentially complete and Phase 2 (Data Analysis) is in progress. Review of gallery rejects by malfunction type is complete and a computer program is being written to provide weekly update charts on status of malfunctions. Parts for the 100 piece correlation study are 95% complete and nearing final assembly.

One of the problems which has been identified is in the final heading area. Critical gage dimensions have been determined, new fixtures are being designed, and a new heading machine has been installed. Initial results look encouraging.

A follow up Research Warehouse Quality Audit is in progress to compare performance of M/7400's to M/742's. Five guns each of M/7400, M/4

M/742 ADL and M/742 BDL have been obtained from the warehouse.

Preliminary results indicate that the new models compare favorably with the previous line.

#### Model Four Limited Edition

Research is working with Process Engineering on the best way to attach and finish the rosewood tip to the fore-end. Samples of rosewood received from the vendor seem to be free of cracks and color is better than expected. Sample fore-ends with rosewood tips will be fabricated and tested by mid-April. All drawings and parts lists are now complete and will be transmitted upon completion of the rosewood tests.

#### Model 979 Seismic Gun

Barrel damage has been traced to squib loads which cause blockage in the barrel and excessive pressure when the subsequent round is fired. To date, three (3) guns have been returned for barrel replacement. Recently developed inspection procedures have enabled gun operators to detect three (3) additional plugged bores, thus preventing barrel damage.

Twenty-five (25) percussion breech blocks, with fire-on-closing sear mechanisms, have been shipped to MAPCO.

A schedule has been developed for the next ten (10) seismic guns. These guns will be ready for shipment by the end of March.

#### Model 870 Competition Trap Shotgun

During fabrication of Trial and Pilot components, the Plant experienced a problem with alignment of the barrel and receiver assemblies. A check

on dimensions specified on the engineering drawings confirmed that extremes in tolerances could cause the observed interference. When the gas cylinder diameter was reduced by 0.010", parts would assemble without any difficulty. Two (2) guns with the reduced diameter gas cylinders were evaluated against a gun without the modification. Results of the evaluation were as follows:

1. No appreciable change in piston velocities.
2. No detectable change in gas leakage past the gas cylinder.
3. Comparable shoulder force measurements.

The gas cylinder drawing has been modified to reflect the reduced cylinder diameter and transmitted to Production.

#### Bolt Action Carbines

Work on this rifle has been suspended pending agreement by Marketing and Research on model requirements.

#### CURRENT PRODUCT DEVELOPMENT

##### M/700 Bolt Lock and Fire Control

Five (5) prototype bolt locks and fire controls are in test. The test schedule has been delayed due to priorities on the XSG program, but should be completed by mid-March.

A re-evaluation on cost of the bolt handle and plunger is in progress.

##### M/788 Safety

All model drawings have been transmitted to the Plant. Production has ordered a sample of 2,000 springs and plungers for a Pilot run with safety levers modified to include the 100° cone angle.

#### Model 1100 Ducks Unlimited

Josten, the vendor selected to make the emblem for the commemorative model, furnished us with a test sample. Shooting tests were satisfactory. However, Josten now states there may be a problem in holding dimensions. They will modify our print to indicate dimensions they can hold and return it to Research by the end of February. Due to the limited time available prior to production of these guns, Purchasing is keeping a close contact with Josten and has contacted a back up vendor.

#### Model 1100 Link Breakage

Samples of the present production parts have been shot peened and turned over to the Test Lab. Sample parts fabricated from a high carbon steel are scheduled to be delivered the week of March 9th.

#### Rivetless Extractor

All tooling and drawings for the anti-rotation projections are complete and have been transmitted to Production. No further reports will be issued.

#### PROCESS DEVELOPMENT

##### Auto-Drill Line

Research is continuing to assist Production in troubleshooting start up problems and in operator training. Pilot operation on a two shift basis has been initiated. When a full two shift operation is achieved, production rates will be more than sufficient to satisfy feed rates required for GFM machines. Plant personnel are scheduled to assume responsibility for operation of the Auto-Drill Line in mid-April.

#### ASEA Manipulator

Experimental polishing of the top and bottom radii has been interrupted due to internal problems with the wrist movement of the manipulator. Repairs are in progress.

Experimental polishing of receiver side panels indicates that forces above the rated load of the manipulator may be required to obtain a suitable finish. Revisions to the gripper design, which may reduce the force level, are being investigated.

#### Four Slide Machine

Because of machinery overcrowding at the tooling vendor's plant, shipment of the Four-Slide Machine to the tooling vendor has been rescheduled for March 16th. Similarly, receipt of the machinery and tooling at Ilion has been delayed until April.

#### Laser Welding

DuPont ETL and Remington personnel are investigating the possibility of laser welding XSG slide blocks to action bars. Initial samples welded by ETL were tested and found to be unsatisfactory, breaking in less than 100 cycles. Additional components have been supplied to ETL.

#### One-Piece Model 700 Bolt Assembly

The production of a one-piece Model 700 bolt assembly is being investigated as a cost reduction item. Two separate approaches are being studied. One starts from bar stock and utilizes standard machining techniques. The second method begins with a forging which includes not only the bolt head and bolt body, but also the bolt handle all in one piece.

Torlon Piston Seal

A revised gas seal has been proposed for the Model 1100, using a Torlon seal and a stainless steel heat shield. Preliminary testing was terminated after 14,000 rounds when the seal failed. Molded parts are scheduled for delivery by the first of June. Tests to date have been conducted with seals machined from extruded rod.