RESEARCH DEPARTMENT

FIREARMS RESEARCH DIVISION
MONTHLY REPORT - JUNE 1980

HIGHLIGHTS

PROCESS DEVELOPMENT Page

- Four Slide Machine The four-slide machine has been ordered and will be ready for tooling August 1980.
  A wire E.D.M. has been selected and a purchase order is being prepared.
- Integral Ejectors Model 1100 - 12 Gauge Trial & Pilot barrels have been satisfactorily tested and are in full production.
- Rivetless Extractors Regular size rivetless extractors are currently being assembled in Model 700 - 7mm-08, Model XP-100 7mm BR, and Model 7400 - 7600 pilot run and production rifles.
- Auto-Drill Line It appears that the startups can be scheduled for late July. First will be the chip and filtration system and then the machining line.
- ASEA Manipulator Updated economics project a $70M per year savings at a 26% ROI. These figures include additional expenditures of $6500 for a Schaeritz LVDT receiver repositioning system.

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- Laser Welding Metallurgically sound welds of the Model 1100 1018 slide blocks were obtained by EDL. Welding tests of the Model 1100 powder metal and XSG 8620 slide blocks are in progress.
- Laser Wood Carving Artwork for the Model 1100 LT-20 Ducks Unlimited gun and other designs are ready for review.

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PROCESS DEVELOPMENT

Four-Slide Machine

This automatic manufacturing system for in-house production of precision formed stampings will enable Remington to develop an expertise in stamping manufacture in order to eliminate our total dependence on costly outside suppliers. Additional benefits will be improved quality and reduced new product lead times.

Support equipment will include a wire electrical discharge machine which will be used to manufacture four-slide tooling and prototype gun parts.

The Four-Slide machine has been ordered and will be shipped to the manufacturers tooling vendor in August 1980. A quotation has been requested for tooling to produce the Model 742-760 (Model 7400-7600) long magazine follower on this equipment.

A purchase order is being prepared for "Elox" electrical discharge machine. Delivery of this machine will be 12 to 16 weeks.

Some additional low cost support equipment with short delivery dates still remain to be selected.

Integral Ejectors

Currently the ejectors in the Model 1100 12 Ga. and 20 Ga. shotguns are spot welded to the barrel extension and machined to size. A process has been developed to form the ejector as an integral part of the barrel extension. Savings of over $60,000 per year can be realized by this procedure.

Three operations will be eliminated as well as the ejector pin and result in a more durable ejection system. Tooling to coin ejection surfaces into 12 Ga., 16 Ga. and standard 20 Ga. barrels has been developed and transmitted to Production.

Tooling modifications have been made to support the outside of the LT-20 barrel in order to reduce a "bulge" in the area of the ejector. This produced satisfactory results. Four prototype barrels have been sent to the Test Lab.

Rivetless Extractors

These new centerfire extractors in small, regular and magnum sizes will replace the troublesome riveted types. Part cost will be reduced, a number of bolt head operations eliminated, and gun reliability and ease of replacement will be improved.

All three extractor sizes have been extensively tested and approved for introduction in all centerfire rifles.

Drawings of extractors and bolt head modifications have been transmitted to Production.

Regular and magnum extractors require an anti-rotation projection in their respective bolt heads in order to prevent them from rotating out of position.

Tooling to coin the anti-rotation projections is being developed for all centerfire bolt heads in both right and left hand configurations. Tooling for Model 700 Reg.Cal. and Model 7400-7600 bolt heads is complete and in production.

Auto-Drill Line

The present method of preparing shotgun barrel blanks for the swaging machines is difficult to control and requires an unacceptably high degree of technical and engineering support. A process has been developed to replace it utilizing proven machining methods and completely automatic part handling.

It appears now that the startups can be scheduled for the latter part of July. First will be the chip and filtration systems and then the machining line. The electrical and plumbing work is progressing. By next week the area should be ready for the next phase of millwright work. The smoke system specifications should be finalized this week so it can be ordered.

There could be some degree of inadequacy of machine lubrication, as furnished, over extended operation. A detailed study is currently in progress to determine potential modifications.

Currently quoted drill head deliveries could leave us with short supply around the first of 1981. Negotiations with the supplier are in progress to improve the situation. An alternate type drill will also be investigated.

ASEA Manipulator

Rifle and shotgun receivers are rough and finish polished by a labor intensive hand process. ASEA, Inc., an industrial manipulator manufacturer, demonstrated the technical capability of automatically polishing Model 742 and Model 760 receivers utilizing their industrial robot. Updated economics project a $70M per year savings at a 26% ROI. These figures reflect the additional expenditure of $6500 for the Schaeirtz LVDT repositioning system to overcome the tolerance problem in receiver panel polishing. The vendor was visited to review the system design and timing. Delivery is anticipated in September 1980.

Laser Welding

Model 1100 and Model 870 shotgun slide blocks are currently being brazed to action bars or slide plates. The brazed joints are inherently unreliable and difficult to inspect without destructive testing. Scrap rates run as high as 20% in subsequent operations. A laser welding process was proposed to replace the troublesome brazing operation. The estimated gross savings are $30M per year at a 38% ROI.

Metallurgically sound welds of the 1018 slide blocks were obtained by ETL. Welding tests of the powder metal slide blocks and the 8620 slide blocks are in progress. Sample completion by ETL and subsequent functional testing at Ilion has been delayed until 6-30-80 due to laser start-up problems and vacation schedules.

Laser Wood Carving

Laser wood carvings offer improved aesthetics over the current pressed checkering method of stock and fore end decorating. Laser carving is comparable in detail to the traditional and expensive hand carving methods but at greatly reduced cost.

Marketing expressed interest in a laser engraved DU emblem for the LT-20 Ducks Unlimited Edition. Artwork is ready for review with the vendor.

Other designs were prepared to further investigate laser decorating potential. Artwork will be discussed with the vendor before an order for samples can be placed.