7.6

cc: R. E. Fielitz
H. K. Boyle
J. W. Bower
W. H. Coleman
R. H. Collins

LIMITED DISTRIBUTION

REMINGTON ARMS COMPANY, INC.

FIREARMS PROCESS RESEARCH DIVISION

THIRD QUARTERLY REPORT

SEPTEMBER 1984

CBW
9/28/84

HIGHLIGHTS

HIGHLIGHTS

BARBER - PRESALE R 0116836

RECEIVER FLEXIBLE MANUFACTURING SYSTEM

Several alternatives to provide improved economics for the Receiver FMS are being developed by Remington and the Engineering Department.

- o A less automated commercial system using four spindle Snyder machines.
- o A Cincinnati Milacron "turnkey" FMS using standard single spindle CNC machining centers serviced by an Automatic Guided Vehicle System and their standard software.
- o A Cincinnati Milacron FMS with functions similar to the Snyder system requiring both standard and custom software.
- o A semi-automated Receiver machining area using standard stand alone single spindle CNC machining centers and manual material handling.

An evaluation of all these alternatives will be made and recommendations presented to management in early October. Current plans are to finalize the commercial project strategy, obtain a CAC from BM&I in 1Q'85 and commercial project authorization in 2Q'85.

The Snyder four spindle machine acceptance tests in Detroit have again been delayed and are now expected to begin in early November. Known items remaining to be completed include;

- o Installation and testing of the redesigned workstation tailstock.
- o Final alignment of the four machine spindles.
- o Tuning of the X and Y axis (controls may be undersize)
- o Purchase and install additional heaters and a second chiller unit to meet operating requirements.
- o Increase coolant piping and/or pump size to meet operating specifications.

FLEXIBLE SMALL PARTS ASSEMBLY SYSTEM

Only spring roll pins (as M/1100 carrier release pins) remain to be tested at Ilion. Design Change Requests have been submitted or approved for several other small part changes that will support automated assembly techniques.

Work has begun at Ilion on spatial and structural requirements for the system. Layouts will be prepared shortly for plant approval of the system location. A steel frame floor may be required to add rigidity to the present flooring. ESD Mechanical Consultants will be contacted regarding vibration isolation requirements for the system.

EDL is continuing fabrication of the workstations and detailed design of the manual feed system. They are on schedule for a 1Q'85 delivery.

AUTOMATE RECEIVER BROACH

Basic data describing the current process is being collected and reviewed. In addition, alternate processes for the broaching operation are being considered.

SERIAL NUMBER RECORDING SYSTEM

A system run-off was conducted at Computer Identics September 10 - 12. The new SNRS met or exceeded specifications in all tests. SNRS equipment was shipped on September 20 and is expected to arrive in Ilion week of September 24.

Installation of wiring and conduit has been completed. All lines are in place and ready for connection to the new equipment.

The first training sessions have been completed. Both supervision and wage roll employees who will operate and maintain the SNRS were given an overview of the system. Additional training sessions are being planned which will cover the operation and maintenance of specific areas of the system.

Equipment installation is expected to begin in mid October with full operation to begin towards the end of November. The schedule has slipped due to completion delays at Computer Identics and revised time estimates for software installation and system start-up.

SMALL PARTS FMS

Bill Corcoran, EDL designer, visited the Plant on Monday and Tuesday September 17 and 18 to discuss small parts fixturing. Bill will be designing multiple part tombstone fixturing for small parts.

The purchase of a CNC machining center for small parts process development is being delayed pending outcome of the receiver system investigation on the single vs. four spindle machining center concept.

GFM AUTOMATION

Trial and Pilot operations continue on the automated system. The system has not yet been accepted by production due to a problem with the barrel blank rack feeding mechanism. Presently, barrel blanks are gravity fed down a ramp to a point where the blank is positioned for the robot for pick up. Due to the nature of the design, the blanks tend to rub against the guides which cause the blanks to back-up if one blank gets stuck. An operator has to walk over to the ramp and jar the stuck blank loose and restart the system back into its automatic mode. This troublesome design is presently being investigated for solutions to eliminate this back-up condition.

WOOD FINISHING AUTOMATION

Testing of the DeVilbiss rotary atomizers which will replace our current Graco guns is progressing as production schedules allow. Tests were conducted which prove the atomizer quality is superior to the Graco guns. Spray room operators indicate they are saving 50 to 60% in finish material.

ELECTROSTATIC SPRAY LINE

An additional electrostatic spray line is not economically feasible despite potential burdening of 90% in its first year of installation. Efficiency improvements proposed for the current spray line are not expected to increase the return significantly above 11.1% for the new line.

BIRCH FINISHING

No further birch finishing tests will be done due to the poor economics for an additional electrostatic spray line. The current line is too highly burdened to include the stain and seal coats for birch parts.

Short and long stocks were stained successfully with the rotary bells. The pigment stain color cannot be matched to the current dye stain, so further color development would be

necessary if the project ever becomes economically feasible. Conductivity testing determined that an additional flow coat was needed between stain and seal coats.

Seal and topcoat lacquer tests on short stocks produced good parts at low turbine speeds. Fore-ends were also topcoated with good results. Curable varnish was also tested as a more durable alternative to lacquer topcoats, but the initial results were poor due to the low viscosity of the finish.

RADCURE 84 CONFERENCE

C. R. Thorsland attended the Radcure 84 conference in Atlanta, September 10-13. The purpose of attending the conference was to further evaluate the potential of using ultra violet cured finishes on gun stocks. The advantage U.V. offers is fast curing. The price of the finishes is higher than conventional finishes, and at this time the selection is limited. Until the industry has adequately addressed the existing problems such as safety (toxicity of finishes), adhesion and weatherability, it would be ill advised for Remington to actively pursue U.V. coatings.

AUTOMATIC LONG STOCK SANDING

Gebruder-Hau is filing for bankruptcy in Germany. Hau-Welco, the U.S. distributor for Gebruder-Hau, is still interested in testing their concept for automatic long stock sanding with Welco buffing and grinding equipment. The business situation will delay the testing program for an unspecified period of time.

AUTOMATED FORE END SANDING

Firearms Process Research has been investigating the feasibility of automating fore end sanding. Gebruder Hau, of West Germany had indicated that they felt the job could be accomplished with two rotary indexing machines at an estimated cost of $750M. High spot economics indicated a potential ROI of 20% and testing was to be conducted in Germany for a $6M charge. The project has been delayed due to Gebruder Hau filing for bankruptcy.

Other methods of sanding have been evaluated including robotics, but have not been economically attractive. The project is currently under review to determine if further investigation will continue.

HEIAN ROUTER

The Heian machine has been running production with no signs of the turret arcing problems experienced earlier. Spare parts are on order from Japan. Cross referenced drawings for the turret assemblies have been received and are being reviewed to determine what additional spare parts will be ordered. Drawings for the X and Y drive units are expected.

CUT CHECKERING DEVELOPMENT

Due to the changes in projected volumes of the Model 870 restyle, its been decided to tool-up the Bostomatic and CO RE MA checkering machines for the model 4 & 6 stock and fore-end respectively.

The high velocity vacuum system has been shipped and is expected by the first week in October. Both machines will be ready and the tests should begin a few days after.

Preliminary software has been developed which enables the CO RE MA (fore-end machine) to cut diagonally as opposed to the zig zag technique used on the machine as purchased. The diagonal cut will reduce tooling cost and increase pattern flexiblilty. The spindle change (from Biax/Germany to Air Turbine/ American) on the CO RE MA has been completed.