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REMINGTON ARMS COMPANY, INC.

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June 5,1989

TO: D. K. Albrecht
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File: Tech. Monthly Reports

FROM: W. H. Coleman, II

ILION R & D AND TECHNICAL
MONTHLY REPORTS
MAY 1989

Constructive suggestions, ideas and criticism are welcomed by all report contributors.

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06/02/89 PRODUCTION

CHARGE NO.	TITLE	EQUIPMENT DELIVERY	WORK SCHEDULE START	WORK SCHEDULE COMPLETE	REMARKS
	ALLEN DRILL PRESS 46-2			6/89	WILLIAMS
	ENGINEERING		3/2		
	MECHANICAL				
	ELECTRICAL				
	PLUMBING				
	AMMETERS FOR BLACK OXIDE HEATERS			6/89	WILLIAMS
	ENGINEERING		03/01	4/5	
	MECHANICAL				
	ELECTRICAL				ELECTRIC SHOP
	PLUMBING				
	ENGINEERING				
	MECHANICAL				
	ELECTRICAL				
	PLUMBING				
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	ENGINEERING				
	MECHANICAL				
	ELECTRICAL				
	PLUMBING				

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Ilion, New York
June 5,1989

TO: W. H. COLEMAN, II

FROM: L. B. BOSQUET/T. C. DOUGLAS

NEW PRODUCTS DEVELOPMENT MONTHLY REPORT - MAY

CURRENT PRODUCTS

EKSTROM-CARLSON CHECKERING MACHINE - Monteau/Hickey

The additional information needed from Ekstrom to enable Remington personnel to modify the PAL routines is now available. The special connector for interfacing the tape punch has been received from Allen Bradley and a cable is being prepared in the electric shop. As soon as this is ready, the PAL will be modified so that both the "A" and "B" sides of the machine can be run and full utilization realized. In anticipation of this, programs for both sides of the machine have been written for the SP-10MAG stock and fore-end.

A trip was made to Cad Cam Alliance to discuss further optimization of the software. A basic premise for accomplishing this has been established but needs to be tested. Additional samples are being prepared for submission to Cad Cam Alliance for quotation.

The air counterbalance system (E-TS-7530) has been redesigned and components have been ordered by the machine shop.

In order to address capacity concerns in the checkering area, a program is being investigated to remove all short stocks and fore-ends from the multi-head machines and put them on the Ekstrom-Carlson machine. This work is progressing nicely. It involves about seventeen NC programs and the associated tooling.

The fixturing for the Model 7400 and 7600 checkering is in design. The M/7400 fore-end program has been completed and the M/7600 program is being written. Programs for both stocks are being worked on.

REMINGTON BARREL FOR THE SNIPER WEAPON SYSTEM - Martin

Further testing of this barrel is planned using a 10 gun sample of GFM barrels and 10 Mike Rock barrels as controls. A third mandrel has been received which has 5 conventional lands and grooves versus the radiused configuration. This mandrel will be evaluated during this same test. The next step is to get the steel for the GFM barrels(if necessary), get GFM blanks manufactured, and then get GFM time to run them. Supply of M118 ammunition is also being evaluated. The steel has been ordered, with a tentative delivery date of 3Q89.

MULTI-HEAD CHECKERING SOFTWARE - Monteau/Hickey

A new program revision was received from American Bay Limited on May 30. It addresses several of the areas of concern pointed out in last months' report: INP, DRV, PLT and GST. It will be tried out in June.

Both the preventative maintenance and the repair programs are moving ahead. One of the multi-head machines has been rebuilt and another has had the PM completed.

An order has been issued to design and build a mount for the proposed electric drive motor. Success of the trial motor will result in a project being written for retrofitting all of the machines.

A revised project has been prepared and submitted for approval for the purchase of a "fileserver" which allows checkering programs to be stored in a central memory unit and downloaded to the multihead or Bostomatics on demand.

TOOL DESIGN - Monteau

The non-ammonia print machine was delivered and installed on May 12. This unit is on the plant on a three month rental basis with the option to buy at the end of the period. Its' performance over the rental period will be carefully watched to be sure that this machine meets the needs of the company.

M/11-87/1100 FORE-END - Powers

All further efforts will center around contour of the fore end and a "cold process" to install the reinforcement. The 40 prototype fore ends with nylon reinforcing patches (from Sile DeRobertis) have not arrived for testing. S & K personnel were notified of the acceptability of reducing the length of the finger groove. Our S & K personnel have notified us that they are working on a new cold process to adhere the fore end reinforcement, which could preclude the finger groove changes.

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ELVALOY RECOIL PAD - Powers

The prototype pads for design acceptance testing have arrived, been partially inspected, and shipped to S & K for processing. Jerry Helmer and I will be meeting with representatives of Rubber Industries on June 29th and 30th in Lexington, Mo. to discuss dimensional and processing problems with the pads. Recoil forces have to be shot with these prototypes in addition to obtaining Product Team approval.

M/11-87 GAS CYLINDER COLLAR - Powers

Redesign of this part, per vendor suggestions, is still pending.

REVISIONS TO H & P DIE AND STAMPING PARTS - Powers

Ed Owens, Tom Bauman, Hal Munson, I met with H & P during their visit in April. We reviewed the list of parts which we have agreed to resolve problems with. These parts are currently being worked on as fill-in jobs.

NEW PRODUCTS - 1988 CATALOG

PARKER - Murphy

The primary effort in the previous month was directed towards final gunsmithing the six design acceptance test guns. Highlights of last months activity are as follows:

- o A report on the barrel assembly x-ray inspection procedure has been included with the x-rays taken by Calumet Testing Lab. This procedure differs slightly from Fred Schmidt's and most probably will be used to inspect production braze joints. At the completion of testing, when the test barrels are re-xrayed we will be able to determine our path forward.

- o Tim McCormack has recommended that the Parker's be stocked by Larry DelGrego and Son here in Ilion since this work would further burden an already too busy Custom Shop. Without conveying this to Larry, I have requested his formal quotation on the work involved with disassembly, stocking, reassembly, etc., this gun.

  Stock blanks for the Parker will be sourced from Fajen and Fred Wenig of Fajen is producing two stocks and four fore-ends to be used as masters. Upon acceptance of these masters, Fajen can cut blanks for Mr. Heckert's Specials.

- o Design acceptance testing that was scheduled to be done by March 31 has started slowly. 3600 rounds have been fired to date and a meeting was held to determine our path forward. As a result of this meeting, testing was halted until I can correct the problems that we are experiencing.

- o The first draft of the Parker manual has been done and is being revised. Ron Smithson will begin the illustrations soon.

- o Mr. Heckert's first receiver has been sent to the engraver. This engraving will be absolutely first class and as such can not be rushed. Assembly of this gun will continue upon its return.

NEW PRODUCTS - 1989 CATALOG

SP-10 MAGNUM - Rowlands/Bauman/Lewis/Verdura/Murphy

Trial and Pilot testing of 30 guns started 5-5-89. Testing was halted with all of the guns at the 2000 round level when it became evident that performance and endurance life was not acceptable. Analysis indicated that out-of-spec slides were the prime contributors to the malfunction rate, and heavy action spring plungers were the major cause of part failures.

A verification test of four guns to 4000 rounds was then conducted with in-spec slides and light weight action spring plungers. Performance and endurance life of these four guns was acceptable.

An additional design acceptance test of 20 guns with all of the latest modification was started 5-19-89. To date, all of the guns are at the 2000 round level and some at the 3000 round level. Endurance life is acceptable, with very few part breakages. Performance of the majority of the guns is also acceptable, however three of the guns are still exhibiting high malfunction rates. An analysis to determine the cause is being conducted.

Vestshell has completed new mold tooling for bolt and carrier castings to replace the existing mold tooling that is nearing the end of its productive life. Some dimensions of the samples of both parts submitted for approval are out-of-spec and the tooling will have to be modified. When approved, these new castings will eliminate some machining operations that are currently being performed.

Vestshell has begun to submit substantial price increases on some of their investment castings. This has increased the price differential between investment castings and MIM parts to such an extent that we should again consider MIM parts as an alternative. The carrier is a prime example of a part that could function adequately with MIM mechanical properties and now provide an attractive cost saving. Vestshell 5/89 Quote: $7.52 each. MIM 5/87 Quote $3.34 each, tooling cost $15,000.

The trigger plate machining problems have been resolved and the full 12 part "A" and "B" loadings are running. The 32 piece "C" load program is also running. Approximately 1000 parts have been machined thru the FMS area. The cutter and fixture for machining the radius on the rear corners of the trigger plate have been received and will be set up in June.

The bi-weekly meeting has been changed to once a week and meets each Monday to track the flow of production parts.

SLUG GUN SYSTEM - D.Findlay/Lewis/Verdura

The scope mount base continues to be the critical path item in this project. The tooling vendor has had trouble with the heat treating of locators for the NC fixtures and has had to remake them several times due to warpage. This tooling is now due June 15. Daily contact is being made with the vendor as there are five pieces of tooling outstanding.

NC programs for the scope mount base and the cantilever have been written and are ready for debugging as soon as the last tooling items are available. Because these parts are scheduled to be run on the K&T machine, the debugging will be done on third shift so as not to interfere with SP-10MAG parts.

Stock and fore-end checkering patterns are available and have been tried out.

Delivery of the scope ring sets, on order with Tasco, has been delayed until the middle of June.

Ron Leacock met with Remington personnel on April 3rd to discuss the issue of providing greater freedom of motion in the location and clamping of the barrels in the new machine. An agreement was reached whereby Leacock will design and build a developmental fixture which will meet the agreed on criteria. This fixture will be retrofitted to the present machine and will be proved out prior to completing the design of the new machine. It is hoped that the current delivery date of October will not be adversely affected.

MODEL 700 AS BDL (ARYLON STOCK) - SMITH/VERDURA/LEWIS

As known the quality of workmanship on these stocks has been anything but acceptable over the past few months. In April both the supplier and his molder were on site to attempt to repair some of the stocks that were sent in and to sit down with us and discuss our current and future status of this project. Since then the supplier has decided to change molders in an attempt to improve quality of the product and working relationships between himself and Remington.

On May 25th. I met with Six Enterprises and his proposed new molder, Trico Plastics, in Azusa, Calif. Trico is currently molding stocks for Browning, both long stocks for their A-Bolt rifle and short stocks and fore-ends for their shotguns. Trico has both a mold shop and a tool and die building shop. They currently do work for General Dynamics and Burroughs Business Machines and are implementing SPC to satisfy the Government's specifications. Trico appears to be more willing and better able to satisfy our requirements for producing a quality stock than did Culpepper Plastics.

On May 30th. Lee Six traveled to Culpepper Plastics to pick-up his mold and transport it to Trico Plastics. Once the mold has reached Trico they will hang the mold in a machine and begin to set up and adjust their process, this will include help from the DuPont technical people, i.e. Dan Saunders. By mid-week of June 5th. Trico should be sampling the mold and sending Remington sample stocks. It was agreed between Trico and Six that Six Enterprises would do the secondary work of putting on the recoil pad, grip cap, and sling swivels for the initial production stocks until Trico could set up a process, build fixtures, etc.

I would suggest that at this time Remington should supply Six Enterprises with a complete set of gauges and specifications that he can use to supply us with a quality stock. As of this date the vendor has no written inspection procedures or gages to check these stocks to.

MARAGING STAINLESS STEEL CHOKE TUBES - Powers

Use of this material for all 12 Gauge applications, except the rifled tube, has been approved and the DCR's have been issued. The 10 Gauge tubes are now in test with the Trial and Pilot guns.

NEW PRODUCTS AND PROCESSES - 1990 AND BEYOND

NEW .22 AUTOLOADING RIFLE - Smith/Findlay,Sr./Findlay

A number of components have been redesigned and sent to the Model Shop for build, in the mean time the gun was shot again the week of May 22nd. It was found that we have some ejection problems, stove piping of spent cartridge, bolt overrides of last round in magazine, and fail to fire problems. High speed movies were taken to see when and why some of these malfunctions are occurring. Feeding of the round from the magazine, however, is not a problem.

A meeting is being set to show Marketing and the Sales Force the gun and to get their input on styling and function. This meeting will hopefully be held early in June.

Another meeting, with the material people from DuPont, is being set to finalize the material specifications for the receiver and housing.

Hopefully by mid-June we will be sending out prints and build orders to produce the 12 gun sample for second phase testing.

NEW CENTERFIRE AUTOLOADING RIFLE (NCAR) - Powers/Findlay Sr.

The design is in the cartridge-feeding layout phase (infancy). Three initial calibers (7mm REM MAG, 300 WIN MAG & .338 WIN MAG) are now proposed. Product specifications and estimated Development Schedule Timing/Costs have been developed. Layout designs for the striker system have also been considered.

NEW BOLT ACTION RIFLE - Bauman/Murphy

Little has been done on the NBAR in the previous month. Tom Bauman has been working exclusively on the SP-10 Mag. and my time has been spent with the Parker.

MODEL 700 CLASSIC .300 SAVAGE (1990) - Martin

Design Acceptance testing was successfully completed with Transmittal accomplished on March 20th.

NEW CONCEPT SHOTGUN - Powers

Ken, Earl, Terry and I discussed the future of this program. We decided that the weight equalized recoil test must be shot before making any decisions for the direction of the program. An estimate of gun weight made by Earl suggests the NCS will be about 8 - 8 1/2 pounds. A serious weight reduction effort might get it down to 7 3/4 pounds. Our modified KFC/NCS weighs about 9 1/2 pounds. This high weight contributed to the favorable recoil rating of the gun in recent testing. Our main concern is that a realistically weighted gun would have unacceptable recoil. If this is the case we will probably change the design of the action system from the current gas-assisted inertia to a pressure regulated gas system, possibly the transverse vent design which we were developing earlier. Additional reasons for this decision would be: perceived difficulty of barrel manufacture, complexity of assembly/disassembly, and high stress levels in the inertia spring. It is hoped to shoot the weight-equalized recoil test the third week in May.

MODEL 11-87 POLICE - Powers

The six prototypes were assembled in production and delivered to the test lab for orifice work-up and field testing. The guns were fired a total 900 rounds with only two malfunctions. These guns featured a prototype magazine spring which has less load and rate, making loading easier and reducing the force on shells when the gun is stored fully loaded. Four of these will be shipped to the FBI Academy by June 8 for their testing. This Non-Developmental Item features a combination of parts and finishes which we currently make, but not in this form. A new magazine extension bracket will be required if this becomes a production item. The prototype magazine spring will be transmitted for use in the current M/870 Police gun. If the FBI selects our offering for their use, we can expect other law enforcement agencies and some branches of the military to buy our product also.