

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

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✓ File: Tech. Monthly Reports

FROM: W. H. Coleman II

Ilion R & D and Technical

Monthly Reports

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

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Ilion, New York  
June 30, 1988

TO: W. H. COLEMAN, II  
FROM: L. B. BOSQUET/T. C. DOUGLAS

NEW PRODUCTS DEVELOPMENT MONTHLY REPORT - JUNE

CURRENT PRODUCTS

EKSTROM-CARLSON CHECKERING MACHINE - Monteau/Hickey

Work is progressing satisfactorily on the program to have Synermation complete the "INSERT CHECKER" routine which will provide the capability to program both fore-end and stock patterns. A sub-routine "EDIT EKSTROM" has been received in an initial release format for try-out. This has the "tool up" commands and is being tried out to determine what debugging may be necessary. Synermation's progress is being monitored thru weekly communication.

A more economical cutter motor, designed to Remington specifications and which will fit both the Bostomatic and the Ekstrom-Carlson equipment, has been successfully run off at the vendor's plant. These are constant torque- constant RPM motors which are expected to improve the quality and throughput of both machines. Delivery is expected to be about mid-July for the twenty motors which are on order. Adapter sleeves for the Bostomatic have been designed and need to be built. The motors will be installed in the Ekstrom-Carlson machine by the end of July and in the Bostomatic as soon as the adapter sleeves are available.

The need to access and revise the Programmable Application Logic (PAL) on the Allen Bradley 7320 controller has been addressed. A quotation has been received and it has been decided to contract Ekstrom-Carlson to make the changes as the machine uses an obsolete controller and it is nearly impossible to obtain the necessary programming manuals. A purchase requisition will be issued to cover this.

In anticipation of the need for additional checkering capacity in the future, a monetary requirement was included in the 1989 capital forecast. The availability of a sum of capital this year, coupled with the need, has moved this up in priority. Quotations have been solicited and a project will be ready for circulation and approval by the first of August.

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SNIPER WEAPON SYSTEM - Douglas

A meeting with Remington representatives was held on the 8th and 9th of June at Picatinny Arsenal in New Jersey to discuss the results of the testing to date and review their concerns and Remington's.

The following lists the items the Government reviewed at this meeting:

a. Trigger Pull - discussed Remington's progress on the new trigger pull gage and the ability to meet the requirement with the new gage set-up. Remington has submitted an amended test procedure for approval.

b. Reattachment - Scope reattachment testing by the Army indicated non-compliance with the specifications. Carl Fetty from Leupold Stevens flew to Picatinny arsenal for additional testing using the Leupold procedures. The scopes subsequently passed this testing.

c. Point of Aim Retention - Army testing was inadequate. They will run additional tests. Remington test data supplied on these same rifles indicate this to be a non-problem. The Army will amend the endurance testing procedure to only conduct this test at the 0-500 and the 4500-5000 round levels.

d. Cold weather testing - After being told that we had passed First Article Testing, we were subsequently told that additional testing they had done indicated that they were "concerned" and wanted to do more testing. Remington has been studying their data and conducting in-house testing that indicates that the fail to fire problems being experienced are almost certainly due to improper procedures. Remington has forwarded recommendations to the Army on how to run the testing and have sent two people from Remington to Aberdeen to instruct them on the use of these procedures. The testing is currently scheduled for July 5th and 6th. They will fire 200 rounds through each of three rifles.

The first mandrel for the Remington 5R, 11.25 inch twist GFM produced SWS barrels has been run, producing barrels with an undersize bore. The second mandrel has been received, but due to production constraints, it was not possible to run the sample lot of barrels this month. Arrangements have been made to run them on July 11.

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

Quotations from three vendors for a new design fore end support have been received and are being evaluated. This part is intended to replace our current fore end/barrel support and eliminate the need for the reinforcing patch in the fore end.

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BOSTOMATIC CHECKERING MACHINE - Monteau/Hickey/Inserra

Investigation into a means of providing additional memory for the Bostomatic checkering machine has been broadened in scope. One of the systems being looked into has the potential for providing faster, more trouble-free pattern change-over by being able to store all of the patterns for the Bostomatic, Co.Re.Ma. and the five multi-spindle machines. A potential vendor will be on the plant the week of July 11 to review our application and be sure that his system will do what we want it to do. He will then submit a quotation for a "turnkey" system. An economic evaluation will be made and a path forward will be determined.

To help increase the float capabilities of the cutter heads and reduce the amount of touch-up required, the nose piece and follower shoes have been redesigned and are being built. It is expected that they will be ready for try-out the latter part of July.

MULTI-HEAD CHECKERING SOFTWARE - Monteau/Hickey

American Bay Limited is making excellent progress in converting the GE 4020 software to run on our Compaq 386 PDs. Bob Turner has sent in a second disc which will be loaded and tried within the next couple of weeks. A known program will be trial loaded onto the disc to determine what debugging is necessary and where in the software the bugs are. If everything works correctly, the net result will be a tape for a pistol grip. Work is still underway on the routines required to program a fore-end.

Recent communication with Bob Turner has indicated that he will be spending full time on this project when he returns from vacation the end of this month.

TOOL DESIGN - Monteau

Investigation has been started into replacing the Bruning Model 870 blueprint print machine. The initial investigation has been centered around an ammonia-less system. This would eliminate the need for ammonia lines coming into the print room and the potential hazards involved. Quotes have been received on the Bruning PD-404 and PD-778. Arrangements are being made for a demonstration of the PD-778. As part of the investigation, the MSDS for the activator was requested and is being reviewed for possible use on the plant.

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SMALL PARTS FMS - Baszczuk

There has been little activity on this project the past several months due to more urgent priorities.

A process to machine Model 11-87 and Model 870 breech bolts on the FMS is being developed. A test program has been written by the NC group to determine whether or not the T10 machines can hold the required tolerance between the inside of the locking block slot and the bolt face using the "B" load fixture. 100 breech bolts will be cut and inspected. Completion is expected by July 1.

It may be necessary to review the feasibility of putting the breech bolts on the FMS due to increases in production schedules which will tend to make the set-ups long duration. This may be contrary to the best utilization of the equipment.

N/C SHOP - Sanzo/Rankins/Jones/Kozakowski

SLUG GUN SYSTEM:

Both brazed and projection welded scope base designs will be evaluated during prototype testing. To this end, 11 of the brazed design bases were completed on June 17 and an additional 14 will be done by the end of the month. Ten of the welded design have also been completed.

SUPPORT TO PRODUCTION:

In addition to project associated work and FMS programming and optimization, the NC area provides support to production. Four follower wheels B-87224-A and 42 B-87224-B were completed on June 10. These wheels are used on the copy lathes which produce stocks and fore-ends.

The NC area also programs and fabricates the initial aluminum stock and fore-end formers for new or revised products. A new Model Four stock former has been requested by production. It has been scheduled but has not been started yet.

Another area of support lies in the training field. A 10-12 week course in programming was completed recently. This course was taught as part of a program developed as a cooperative effort between the Tool Room and the Model Shop. This proved to be a learning experience for the instructor as well as the students and many ways for improving the content, presentation and timing of the course have been identified for the future.

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**FMS MODELING - Findlay**

Re-modeling is complete on the M/1100 LT-20 receiver for FMS production. This work and a detailed drawing will be turned over to the N/C and FMS groups by June 30th to begin process definition and N/C programming. Upon completion of the M/1100 LT-20, modeling of the M/870 LW receiver will begin.

**ASSISTANCE TO THE PLANT - Baszczuk**

The plant has requested the assistance of A.R.Baszczuk at the S&K facilities in Lexington, Missouri. He has been at S&K on two occasions recently to provide technical assistance in identifying and correcting problems which have caused the wood to become a major constraint to meeting company goals. It is expected that he will be at S&K for the balance of the year.

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NEW PRODUCTS - 1988 CATALOG

PARKER - Murphy

The primary emphasis in the previous quarter was directed at resolving barrel assembly brazing: the critical path item of the Parker program. Highlights of last months activity are as follows:

- o Previous furnace braze testing indicated that some loss of hardness from the desired Rc 28 may occur. The barrel strength calculations were reviewed and Rc 26 Parker barrels will have factors of safety over the chamber that are, at a minimum, equivalent to our LT-20. Therefore, Rc 26 min. barrels will be acceptable.
- o Lucas-Milhaupt was emphatic that their only involvement would be to supply brazing filler metal.
- o Thomas Banski was hired as a brazing consultant. He has given us direction on resolving furnace brazing questions as well as introducing a new dip brazing approach. Mr. Banski has identified AAA Industries, a brazing job shop near Chicago, that is knowledgeable in dip and belt furnace brazing.
- o John Hoppe of AAA Industries instrumented a welded barrel assembly with a thermocouple and developed a temperature profile. He then brazed a scrap barrel assembly and achieved an approximate 80% braze of the breech end. Looking at the assembly it appears that the brazing filler metal did not melt completely. He will rebraze the assembly this week for a longer time at temperature (along with a heat treated piece of barrel to test for hardness changes).
- o Kolar is pursuing furnace brazing with Harris Metals. Harris is located in Racine, is a division of Linberg Furnace, and has in-house x-ray inspection capability so they may be better equipped than AAA to handle production. The intent is for Harris (like AAA), to thermocouple instrument an assembly to obtain a temperature profile and then demonstrate the brazing of prototypes.

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- o Pete Cross and I have tentatively set up a process to dip braze an assembly in a salt bath. This alternative has been put on hold recognizing the disadvantages of this process as well as the progress being made furnace brazing.
- o Fred Schmidt will set up a meeting with Tocco and follow-up on induction brazing.
- o I have located our torch brazing equipment and modification to allow us to braze Parker prototype barrels can not be easily accomplished.

Other Business:

- o Kolar will submit a quotation for a brazing fixture.
- o Kolar will submit a quotation for a stock drill fixture.
- o I have sent an old Parker parts list to Kolar to update reflecting the new parts so we can assign part numbers.
- o Pete will begin manufacturing fore-end tips for the splinter fore-end (with 2 degree draft).
- o Pete will set-up existing lock bases and add a 2 degree draft.

A meeting was held with Process Engineering and the Custom Shop to formalize a procedure to transmit the Parker to the plant. Several questions were answered regarding the need for part numbers, drawing format, material and heat treatment recording, and Remington Standards as they relate to the Parker. Concerning the question of incoming component inspection, legal input is needed to help determine exactly what inspection is required. A meeting will be scheduled with legal to resolve this issue.

The first draft of the Parker owners manual has been done on the Technical Publishing System and has been reviewed. The benefits of this system are becoming apparent as the corrections and modifications are being made. The show Parker has been requested from Marketing and will be used for photos employed in making illustrations for this manual.



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MODEL 700 CLASSIC .35 WHELEN - Bosquet

This model has successfully passed design verification testing conducted by the Test and Measurement Lab. Report number 881681 has been issued attesting to the fact that the samples passed all three test criteria; visual appearance, accuracy and field function. The sample was judged to be acceptable on visual appearance; when the guns were shot for accuracy, the average group size was 1.77 inches (Maximum acceptable group size for this rifle is 3.5 inches) and the field function test was accepted.

A conditional release has been issued to the warehouse pending acceptance of the production sample and full release for invoiced shipment at the July Product Team Meeting.

MODEL 700 MOUNTAIN RIFLE CALIBER ADDITIONS - Bosquet

The Test and Measurement Lab has selected their sample in 7mm-08 caliber. It was decided that, because this was a new offering in the Mountain Rifle barrel configuration, design verification testing should also include the other calibers offered; the .243 and the .308. These are now available and the Test Lab will be selecting their sample from guns in the warehouse. Testing is expected to be done following the July shutdown week and a report issued. At that time a production sample will be selected and approval for invoiced shipment will be requested. The warehouse is being held pending the outcome of the testing.

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NEW PRODUCTS - 1989 CATALOG

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

The major portion of the twelve gun test is now complete. The consensus of the Test Lab personnel conducting the tests is that the gun now meets Remington's standards of safety, reliability and performance. The only tests remaining are a "crud" test of the fire control and a hot and cold environment test of gun and ammunition.

Two guns were strength tested at 55000 P.S.I. and failed in a manner similar to a M/1100. Analysis indicates that the barrel extension failed first. Additional strength tests will be conducted with barrel extensions manufactured from 4140 cold drawn instead of hot rolled steel.

All of the guns passed the SAMMI drop and jar-off tests. However, trigger modification were necessary because the guns did not meet the performance characteristics of the M/1100 fire control in one of the drop modes from 48 inches with the safety "off". The new design is a compromise between a balanced trigger and a balanced trigger assembly.

The SP-10 Mag. will be furnished with only a modified and full choke tube. These will provide nominal pattern densities of 65% and 75% at 40 yards with 1 3/4 ounce steel BB ammo. A new 10 Ga. tee-handle type choke tube wrench is being developed.

Lou Ferreira has been supplied with five guns for the packaging drop test. One gun has been sent to Wilmington for photographing for the 89 catalog. Research will provide Dick Dietz with four guns for an Alaskan field trip in September. Process Engineering will supply twenty guns for the November gun writers seminar.

The back-up design of a feeding and extraction system that will invalidate the Ithaca Patents has encountered some manufacturing problems and will not be ready for testing until mid-July.

The first meeting of the Design Review Team was held May 26. An overview of the review process was presented and the team members were shown the SP-10 Mag. cut-away gun and the improvements compared with the Ithaca Mag-10 were discussed. Sub teams were assigned to examine the firearm from a systems approach using a form of failure mode analysis and report back their findings.

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Drop testing of the proposed packaging has been scheduled for the week of July 11. Assuming that the tests are successful, the tray molder will be released to build tooling and samples will be available in approximately twelve weeks after finalizing the choke tube wrench design.

Of the estimated 7700 hours of tool design required for this project, 90% have been completed and are being built. All remaining design work has been contracted to outside design firms or assigned in-house.

Product structures have been entered into the MRP system and have been verified. Process records are being released as the tool design is completed.

Checkering patterns have been transmitted and are being programmed. Pending completion of the "INSERT CHECKER" routine for the Ekstrom-Carlson machine, the stock will be programmed on the Bostomatic. Locators for checkering the stock and fore-end have been designed and are being built.

The K&T five station NC machine was successfully run off at the vendor's facility on June 21-23. It will be located in the FMS area in building 60 and preparations are underway to have everything ready when the machine is delivered on July 6. A K&T technician will be on the plant to oversee the installation and start-up which is expected to take two weeks. Because the "turn-key" tooling won't be available until September, an interim method of producing parts for trial and pilot has been determined. Two cubes have been ordered and are due July 15. Three people will be attending programming school the week of June 20 and will write the programs for the interim processes.

The trial and pilot meeting has been restuctured and is being held on a weekly basis.

A request has been received to provide twenty guns for a writers seminar to be held November 9 thru 12. These guns should be assembled by the middle of October so that they can be field tested prior to the seminar. To accomplish this, the Model Shop and NC Shop will provide assistance in fabricating parts or assemblies for which the production tooling may not be available in time.

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MODEL 700 CLASSIC .300 WEATHERBY MAGNUM - Martin

The Model 700 Classic offering for 1989 will be the .300 Weatherby Magnum. This will be a synergistic offering from Firearms and Ammunition. Lonoke has provided Ilion with chamber drawings and reamers. Ilion will provide Lonoke with three pressure barrels and one complete firearm for their ammunition development. Ilion will have five more completed rifles awaiting shipment of pilot run ammunition for Design Acceptance Testing.

Proof loads have been developed by Ilion. Accuracy has been shot using Weatherby ammunition. The bullet weights of 150 grain and 180 grain tested 1.65 inches and 1.35 inches respectively. Remington ammunition is expected in late June.

Chamber tooling and gaging has been designed and placed on order from advance prints to assure their being available in time to run the trial and pilot.

MODEL 1100 MAGNUM RETROFIT BARREL/STEEL SHOT - Franz/Powers

The Test & Measurement Lab report has been approved and distributed. The design has been transmitted.

M/1100 12 ga. Steel Shot Barrel Specifications

Gauge: 12

Barrel Rollmark: 2 3/4 inch Magnum and 3 inch Magnum  
Steel Only

Orifice: one .088 in.

One Choke Tube:

- Name: Remington Long Range Steel
- 80% patterns at 40 yds. (w/2 3/4" Magnum 2's)
- constriction: same as current full tube
- material: VascoMax 250 Maraging Steel
- titanium nitride finish

Barrel Lengths: 26 and 30 in.

Barrel Finish: Standard polish Black Oxide finish.

The barrel hang tag has been reviewed by Marketing and the Litigation Support groups.

TURKEY CHOKE TUBE - Murphy

Kolar Arms will attempt to develop a Turkey choke tube. Any tube developed by Kolar will undergo final Design Review and Design Acceptance Testing by the Ilion Technical Section.

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MODEL 870 FUNCTIONAL IMPROVEMENTS - Lewis/Verdura

Twenty-five of the new Delrin ejector bases have been sent to Aberdeen Proving Ground for liquid compatability testing. This test must be passed on any future military contract for shotguns. No word has been received to date.

Process records and structures are complete and are on the system except for police versions which use the new ejector system. Police structures will not be activated until successful completion of trial and pilot.

SLUG GUN SYSTEM - D.Findlay

The objective of this program is to improve the accuracy of the Model 11-87 and Model 870 12 guage Deer Guns through the use of a barrel mounted scope system and a rifled choke tube. The goals of the program are to achieve five shot groups of three inches or less using Remington, Winchester and BRI Sabot slugs.

Twenty-one design acceptance choke tubes were received from the screw machine vendor on February 19th. These tubes, made from VascoMax 250 maraging steel, have been heat treated and sent to Cation Corporation for the addition of the rifling. Ten design acceptance samples have been received and have been sent to the Test Lab. Testing will determine group size for accuracy, turn out, and seizing potential in 2000 rounds, using various ammunition types. Testing is currently underw with no negative aspects so far. Testing should be complete in mid-July.

Design work has been finalized on the cantilever and scope mount base designs and fabrication has been initiated on two different scope mount designs. Work on a second scope mount design was begun since it appeared to be a less costly to manufacture than the initial NBAR based design. Quotes have been obtained on the NBAR based scope mount design from the MIM group and indicate that five months are required from initial transmittal to trial and pilot quantities. This time frame is identical for the second design currently being built although it should be more economical to produce. Leupold and Tasco have been contacted to see if anything currently in their product line will fit the cantilever mount design. Leupold has said no; Tasco is investigating. If the Tasco discussions are positive it is likely that the introduction time can be shortened. Testing on the damping characteristics of the cantilever mount have been completed and acceptable damping times of .1 seconds were obtained with a steel cantilever and neoprene rubber rear dampener. A sample gun was presented at the May Product Team meeting and was viewed very positively by the group.

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MODEL 700 SYNTHETIC ARYLON STOCK - Smith

The synthetic stock offering for 1989 will be made from Du Pont Arylon. This stock will replace the current stocks made from Rynite and the right hand fiberglass stocks from Brown Precision. The Arylon stocks will be made in Lee Six's current mold. The options will be as follows:

- BDL only
- long action
- short action
- magnum barrel channel
- varmint barrel channel

Lee Six's mold has been shipped to Culpepper Plastics Corp. in Clinton, Ark. The needed alterations and molding will be done there with an approved sample to be ready by Sept.1st.

I have received a copy of the quote from Six Enterprises and have issued the needed purchase requisition to Phip Harper in purchasing. This will allow him to start on the contract. There are some noted differences between this quote and previous verbal agreements:

- verbal quote was \$23.85/stock for 10,000 stocks over a 5 year period.
- written quote is \$24.85/stock for 10,000 stocks over a 2 year period.

Lee Six is requoting due to an error in quoting on a two-color grip cap versus the desired raised black on black cap.

Dan Saunders and George Cato will visit Culpepper on June 30th and run the mold with them to insure that Culpepper understands and adheres to the process. They will also rerun a sample lot of both 10% and 20% Arylon material.

This offering gives us first use of Arylon as a stock material and will replace the Brown Precision and Choate stocks for 1989, however the question of long range supply of synthetic stocks has not been answered and the determination of us developing a mold with a Mountain Rifle outside configuration also has not been answered.

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MODEL 870/1100 LIGHTWEIGHT RESTYLE PROGRAM - Lewis/Verdura

All specifications for these models have been reviewed and agreed on. The complete drawing package has been transmitted. The process records and item masters have been completed. The product structures are being worked on and are nearing completion.

At the June Product Team meeting it was decided to keep the specifications for 1989 the same as currently offered. They will remain the same until the fourth quarter of next year. All lightweights produced in the fourth quarter of 1989 will be to the restyle specifications and the guns will be carried in the 1990 catalog. Further work on this item has been put on hold at this time.

MODEL 7400-4, 7600-6 CONSOLIDATION - Lewis/Verdura

Process records, item masters and product structures have been written and are ready to issue.

The consolidation of these models has been deferred to 1990.

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NEW PRODUCTS AND PROCESSES - 1990 AND BEYOND

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

This program will complement the present family of .22 autoloaders, M/552, N-66, and N-77. The new autoloader will be designed around an existing barrel and magazine box to allow the remainder of the parts to be sourced with minimal machining and finishing operations required. The wood stock version of this gun must be price competitive with the Ruger 10-22.

Bill Marks, of DuPont, was in May 4 to discuss material selection on selected components. It was decided to look into the use of Graphite filled polymers for the receiver and housing. Bill will work with the Composites group at TSL on this and we will supply him with detailed drawings of these parts as soon as we have them.

The C.V. group has been detailing parts and issuing work to the Model Shop, a list follows:

operating handle	-	built
firing-pin	-	"
hold-open	-	"
spring guides	-	"
bolt spring	-	"
striker spring	-	"
sear	-	"
trigger		
striker		
mag-follower		
safety		

The only major component not yet complete is the stock. Tom Plunket is modeling and surfacing the straight laminated wood primary design. The low cost beaver-tail synthetic stock will be done after completion of the wood stock.

The Test Lab is doing bolt velocities, cycle times, and Pressure/Time curves on N/66's and N/77's. This data will be put in Scott Franz's newly developed "blow-back" computer simulation program to validate the program. Once validated, the computer simulation will be used to refine the operating parameters of the new rifle design.



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NEW CONCEPT SHOTGUN - Powers

The computer simulation model for the gas-assisted inertia operated shotgun has been completed and trial runs have been made to determine the system parameters required for optimum performance.

A preliminary layout for a gas-assisted inertia operating gun has been submitted by Dick Rego and Earl Seppala.

Initial testing of the KFC prototype gas-assisted recoil gun has begun. This prototype is currently operating with all loads from standard target to 2 3/4" steel to 3" Magnum. Much more testing is planned, including bolt velocity measurements and extensive high speed movies. Digitizing of preliminary high speed movies is complete. The results of this testing will aid in verification and refinement of our computer simulation.

Recoil reduction efforts will center on recoil pad material/design and possibly using some type of "hydraulic" damping unit in the stock. A M/11-87 was sent to "The Shooter's Emporium" for retrofitting a hydraulic recoil reduction device. We have received the gun with the modification. It looks good. Samples of recoil pad materials from the EAR Co. have been received for evaluation. We also met with people from DuPont (IPD & FPD) who will supply us with some material for evaluation. Preliminary recoil force measurements on both the EAR and DuPont materials is complete. Additional samples of the DuPont material is forthcoming. Mike Branger of IPD will be conducting measurements of pad materials within the next six weeks.

MILITARY SPECIFICATION M/870 SHOTGUN - Findlay

This program is intended to enable the M/870 pump shotgun to meet Mil Spec 3443, which will allow Remington to bid on any future U.S. Government contracts. The most current version of Mil Spec 3443 has been received and is being reviewed. A meeting is scheduled for July 12th to discuss the new specifications.

Parts for this bayonet adapter and heat shield equipped firearm are being received from the model shop to try two different bayonet adapter designs. A sample of each design should be ready for weight testing in early July.

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NEW BOLT ACTION RIFLE - Martin/Jackson

The receiver design will be a standard M/700 receiver with secondary cuts required for the bolt lock and possibly minor cosmetic changes in non-critical areas. We will continue to investigate providing the gun with rings and bases versus the previous integral receiver mounting.

The barrel will be a Custom Shop contour with a Mountain rifle crown. Upgraded iron sights as provided on Custom models.

The magazine box will have a detachable bottom that will conceal any gaps or mismatch between the box, trigger guard, and/or the stock. First prototypes of the new design are due in late August.

The trigger guard, magazine follower, magazine release, and magazine spring have been sent out for quotes.

Testing of a patented new technology rifle barrel is currently underway in a joint program between Remington and D.C.Brennan Firearms, Inc. The Brennan technology claims a 25% increase in accuracy with reduced recoil. However, test results to date show no significant improvement over our current design (at the 95% confidence level). A test is being set up to reshoot the rifles using standard Sportsman 78 stocks with fore end bedding pressure. The results of these tests will determine if it is warranted to continue with this program. This testing is planned for mid-July.

ELECTRO-CHEMICAL RIFLING - Lewis

An updated quote has been received from Cation Corporation. As soon as the estimated testing costs are available from the Test Lab, an updated economic evaluation will be done and a Part II to the project submitted.