

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
April 28, 1988

TO: W.H. COLEMAN, II

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

NEW PRODUCTS DEVELOPMENT MONTHLY REPORT - APRIL

CURRENT PRODUCTS

SYNTHETIC LONG STOCK - MODEL 700 RS - Smith

The vendor's proposed bedding block design has been accepted and he is currently building a mold to produce parts. Molded parts however, won't be available until sometime in May. In order to get a repair operation started sooner, an order has been placed with Choate for 1500 of the blocks which will be machined from solid stock. A temporary process will be set up at Ilion to effect the repair of roughly 3600 stocks currently on hold. This includes stock assemblies as well as finished product in the warehouse.

The 10% and 20% glass-filled Arylon has been shipped to Harding for sampling May 5th. Dan Saunders of DuPont will supervise the run. Dan will also be in May 4th to discuss where we stand with Lee Six and his use of Arylon. Randy and I spoke with Bill Coleman on April 20 about where we stood with using Lee as a supplier and Lee using Arylon as a stock material. Regardless of us buying stocks from Lee or not, I believe that Lee is going to switch from using Noryl to Arylon, which means we will not be "First" with Arylon. We decided that a way around this would be to order stocks from Lee Six, made of Arylon with his current 'BDL' configuration, for 1989 and still go ahead with development of this program which could be a phase-in in 1989 or a new product in 1990. This would give us first use of Arylon and still replace the Brown-Precision stock, and possibly the Choate stock, for 1989.

I will provide Dan Saunders with the test data on the Arylon stocks and let him report the findings to Lee Six.

We have received quotes from Six-Enterprises, American Plastics, and Harding Manufacturing. Randy Murphy is having Tom Andrews look at the economics. Their findings should be ready for the next Product Team meeting in May.

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SNIPER WEAPON SYSTEM - Snedeker

As the First Article Test program nears completion the Government has scheduled a meeting with Remington representatives on the 3rd of May 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 wishes to review at this meeting: (as quoted directly from the Government letter on this matter).

a. Trigger Pull - discuss Remington's progress on the new trigger pull gage and the ability to meet the requirement with the new gage set-up.

b. Failure to eject problem - discuss Remington's analysis of the ejection problem and rationale on corrective action taken.

c. Turned Reticle - one reticle turned approximately 30 deg. during the temperature extreme test and the Government needs an update on Leupolds's analysis.

d. Corrosion Resistance Requirement - some of the components, in particular the firing pin, are not completely corrosion resistant. Recommendation for correction action is required.

The following failures have been noted during First Article Testing and are considered minor. These failures will be treated as correct and proceed, but recommendations for corrective action are requested.

a. Interchangeability - one rifle had a long front trigger guard screw that prevented bolt from closing. One rifle had an external trigger adjustment screw that cross threaded.

b. Cleanliness and optical quality (on the scope)- Particles in excess of the requirement were found on the lens after targeting and accuracy.

c. Reattachment - front mounting bolt became loose (stripped) on one scope during temperature extreme test.

(End of Government concerns)

Remington wishes to discuss with the Government:

- Accelerated delivery issues.
- Endurance testing issues during production runs.
- First Article test requirements for Remington manufactured barrels.

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

A program is currently underway to redesign the fore end to eliminate a persistent cracking problem. Our personnel at S & K have proposed alterations to the fore-end. They are: remove the fiberglass reinforcing patch and corresponding undercut and stop the finger groove cut about two inches from the rear of the fore-end. 73 prototypes of this configuration have been made for testing which should begin on May 2nd.

FLEXIBLE SMALL PARTS ASSEMBLY - Baszczuk

The assembly machine fixture modification, designed by Technical to align both side plates in the fixture nest at the riveting station, was installed the first week in March. This has corrected the problem of mis-aligned side plates on assembled trigger housings and eliminated the need for 100% inspection and manual alignment of the housings by the machine operator.

Approximately 31,700 Model 700 trigger housings have been produced on the flexible assembly machine which was turned over to Production in December, 1987. Minor problems are still being encountered and are being identified and corrected as they occur. The process engineer assigned to the machine has not been available to help in the day-to-day trouble shooting due to his continued involvement in the TARP program.

MODEL 870 POLICE - Franz

Complaints have been received from two law enforcement agencies that their Model 870s stem occasionally during the high cyclic rates used in training (five shots in less than three seconds). These malfunctions do not occur at normal rates of fire. Two shotguns that were said to malfunction regularly were returned by the Idaho State Police. Both guns would stem on occasion. This was confirmed in high cyclic rate feeding tests using dummies. High speed movies showed that the carrier rebounds down after the feeding round hits the top of the barrel extension. The carrier eventually recovers due to the force exerted by the carrier dog follower spring. It was felt that a heavier spring would minimize this condition. The Model 11-87 carrier latch spring could be used as a direct replacement for the carrier dog follower spring and yield a gain of approximately two pounds in working force.

Due to fact that this has been an isolated complaint originating from a test of questionable value, it was determined by the Product Team to discontinue any further work in this area at this time. John Rogers will continue to monitor.

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BOSTOMATIC CHECKERING MACHINE - Monteau/Hickey

As reported last month, machine memory can be expanded to 4000 feet at a cost of \$3750. This would be accomplished by adding a 5 1/4" dual drive floppy disc unit and would be for the Bostomatic only.

Another option being investigated has the potential of being able to service the Bostomatic, the Co.Re.Ma. and the five multi-head machines. In practice, a checkering program would be written, put on a floppy disc and down-loaded to this unit. Once in memory, a program could be called up as needed, down-loaded to the individual machine and run. A rough estimate for this approach is in the neighborhood of \$10-12,000 but would provide faster, more trouble free change-over from pattern to pattern by eliminating the tape readers and their associated problems.

When all necessary information is available, an evaluation will be made and a path forward established.

EKSTROM-CARLSON CHECKERING MACHINE - Monteau/Hickey

Work continues to get this piece of equipment to the point where it can handle long stocks, short stocks and fore ends. A purchase order was issued to Synermation, Inc. on March 8 for completion of the "INSERT CHECKER". A rough draft of their proposal is expected the week of April 25 with completion still anticipated by the end of May.

A more economical cutter motor, designed to Remington specifications, has been placed on order with Air Turbine Technology. This motor has been designed to fit both the Bostomatic and the Ekstrom-Carlson equipment. Delivery is expected toward the end of June.

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 from Ekstrom-Carlson and information on commands has been requested from Allen Bradley. It may be necessary to have Ekstrom-Carlson make any required revisions as the machine has an obsolete controller and information is very difficult to obtain.

In anticipation of the need for additional checkering capacity in the future, information was requested from Ekstrom-Carlson on their new equipment. That information has been received and is being reviewed.

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MULTI-HEAD CHECKERING SOFTWARE - Monteau/Hickey

Two approaches are being taken to remove the multi-head checkering software from the GE 4020. The first is through a contract with Synermation, Inc. to provide software which is compatible with the Computervision CAD system. Synermation has not been successful to date.

The second is a contract with American Bay Limited to convert the software to run on the COMPAQ 386 personal designers. This approach is progressing very well. Five routines (required to run pistol grip patterns) have been completed and are functioning. Bob Turner was on the plant April 13 to make sure the completed routines would function on our equipment and to determine what changes were necessary to optimize them. Work is also underway on the fore-end routines (wrapped pattern) and on a tape punch routine. The net result of these two approaches remains the same - the elimination of service contracts on the GE 4020 amounting to \$40,000 annually.

TOOL DESIGN - Monteau

The first of two trigger pull adjustment machines designed to enable setting the trigger assemblies for the SWS to a tolerance of plus or minus four ounces has been completed and is undergoing tests. As of April 13 over 3,000 checks of trigger pull had been made and the data collected for analysis.

In order to take advantage of increased demand for RSS barrels and relieve a constraint, Production requested that additional brazing fixtures be designed and built. Two fixtures were designed, each of which will handle two barrels at a time. The first will braze rear sight bases and the second will take care of the front sight ramps. The design of both is complete and they have been released for build.

SMALL PARTS FMS - Baszczuk

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

A process to machine Model 11-87 and Model 870 breech bolts on the FMS is now approximately 90% complete. A review of the test NC program and tooling package needs to be completed. Assistance from the NC group is needed to finish this project and provide the prototype testing.

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

SP-10MAG:

Work is progressing very well on the programming and debugging of sub-routines for both the receiver and the trigger plate for the SP-10MAG. Single part fixturing for four set ups of the trigger plate are complete and are mounted on the CD machine. A CMM program has been written and verified for determining vendor accuracy on slide castings. Several castings have been inspected and the data turned over to the designers.

An aluminum fore-end former has been completed. This former will be used to produce the trial and pilot run of parts and if no further changes are necessary, it will then be used to make the permanent steel former.

SLUG GUN SYSTEM:

Twelve scope bases (brazed design) have been completed for the proposed Model 870/1100 slug gun system and turned over to D. Findlay. Work has been started on a quantity of bases designed for the projection weld process. Both will be evaluated in prototype testing.

SUPPORT TO PRODUCTION AND LEGAL:

In addition to project associated work and FMS programming and optimization, support is provided for the legal staff in preparing the company's defense in product liability cases and assistance is provided to various production areas. For example:

- o All SWS trigger housing spacers-rear are produced by the N/C Shop
- o A program has been written to inspect the SWS trigger housing spacer on the CMM. This is a 100% inspection.
- o A program has been written which provides production with a more accurate method of setting up the Model 700 rivetless extractor cuts by measuring them on the CMM.
- o A quantity of 1950 series sears were made for the legal staff to be used in defending liability cases involving pre-1950 trigger plate assemblies.

FMS MODELING - Findlay

Modeling is currently being done 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 May 20th 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.

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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 next six months.

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NEW PRODUCTS - 1988 CATALOG

PARKER - Murphy

The primary emphasis in the previous month was directed at resolving barrel assembly brazing: the critical path item of the Parker program. A meeting was held on April 5 involving Remington and DuPont metallurgists to determine the heat treatment necessary to obtain the required factor of safety. We agreed that a quenched and tempered barrel with a hardness of Rc 28 should result in a barrel with 130ksi yield strength with adequate ductility. To verify this, tensile and strength test samples are being made to test. A radiograph to inspect the braze joints was recommended in addition to a hardness test immediately following braze.

A "Brazing Summit" is scheduled for April 28 with Kolar in Racine. Representatives from Kolar, Remington, DuPont, Lucas-Milhaupt, Radyne, and Johnson Furnace are expected. The development of a brazing process for barrels is behind schedule and this meeting should serve to get this program back on track.

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.

MODEL 700 CLASSIC .35 WHELEN - Bosquet

Trial and pilot assembly and Gallery testing of this model will be completed by the end of April. At that time, the Test and Measurement Lab will select a sample for design verification testing. After successful completion of testing, a production sample will be selected and release for invoiced shipment will be requested.

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MODEL 700 MOUNTAIN RIFLE CALIBER ADDITIONS - Bosquet

Stocks are now available and they are being cut checkered with no apparent problems so far. Trial and pilot assembly should begin by the end of April and guns will be available for design verification testing in early May. The caliber additions are the short calibers; .308 Win., 243 Win. and 7mm-08 Rem. When the Test and Measurement Lab accepts the trial and pilot, release for invoiced shipment will be requested and a production sample will be selected.

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NEW PRODUCTS - 1989 CATALOG

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

The 12 gun test resumed the week of March 28th, after all the guns were modified to suit the new feeding system. In 1500 rounds of field testing, there have been no "fails to feed" malfunctions by any of the guns. The remaining problem being experienced by some of the guns is one of poor extraction and ejection. The cause has been identified and is being corrected.

A back-up design of a feeding and extraction system that will invalidate the Ithaca patents is nearing completion. One gun should be ready for testing the week of April 25th. Although it now appears that this new design will not be required, it might become useful as a "bargaining chip", if necessary.

Due to failures during testing, the slide extension assembly has been redesigned to provide a stronger braze joint. Redesigned samples are in the 12 gun test.

The second round of patterns have been shot and evaluated using Steel BB (1 3/4 oz) ammunition. These results contradict previous testing. An examination of the ammunition to check for consistency of pellet count revealed nothing wrong. An SP-10 with a set of choke tubes has been sent to Lonoke for ammunition and pattern evaluation. Lonoke will do their evaluations from a universal receiver to determine if the same inconsistencies are evident when the barrel is rigidly mounted.

Randy Murphy has been assigned as the leader of the SP-10 Magnum design review team.

Drop testing of the proposed package design will take place when guns are available from the twelve gun test.

Of the estimated 7500 hours of tool design required for this project, 80% have been completed and are being built. There are approximately 600 hours of design which have not been assigned to date. Plans have been made to contract the bulk of the remaining work with outside design firms.

All item masters and product structures have been submitted and are being verified as they are entered into the system. Work on process records is continuing.

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 the checkering operation have to be provided.

A purchase order was issued for a Milwaukee-Matic 1015 manufacturing center with a five pallet handling system on March 7. This machine will perform several cuts on the receiver, and will machine the barrel extension and gas piston lug. The acceptance run-off and delivery of this equipment is scheduled for July.

Plans are being formulated to change the trial and pilot meeting on this model form every other week to a weekly format. Details have not been finalized but the intent is to begin tracking all aspects of the project (raw materials, components, item masters, product structures, process records, etc.) to be sure that nothing is overlooked.

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. It is anticipated that the ammunition will be available early in the second quarter.

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

The Test & Measurement Lab report has been approved and distributed. The Product Team set the following specifications at the last meeting:

M/1100 12 ga. Steel Shot Barrel Specifications

-
- Gauge: 12
 - Barrel Rollmark: 2 3/4 and 3" Magnum Steel Only
 - Orifice: one .088 in.
 - One Choke Tube:
 - Name: Extra Long-Range Steel Shot
 - 80% patterns at 40 yds. (w/2 3/4" Mag. 2's)
 - constriction: same as current full tube
 - material: VascoMax 250 Maraging Steel
 - titanium nitride finish
 - Barrel Lengths: 26, 28 and 30 in..
 - Barrel Finish: Black Matte Finish

It was decided by the Product Team that an information hang tag will be attached to the barrel. A draft of the hang tag as well as barrel usage is being reviewed by the Litigation group. The etching of the titanium nitride coated tubes remains to be resolved. Samples are due back from the vendor by May 6th. It is anticipated that transmittal will take place by May 13th.

CONFIDENTIALTURKEY CHOKE TUBE - Powers

All pattern evaluation work has been completed. All data supports the previous testing which indicates that "Greater than Full" choke performance is not achievable in the standard bore configuration. Further development work on this program by the Iliion Technical Section has stopped.

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 Iliion Technical Section.

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 4000 rounds, using various ammunition types.

The initial testing of the cantilever scope mount system was very good. There were concerns that the cantilever mount would oscillate when fired, thereby interfering with quick follow-up shots. Strain gage measurements indicate that the mount does oscillate, but the oscillations cease well before the shooter can recover from the recoil of the gun. It was also determined that a synthetic buffering material placed under the rear of the cantilever, between the receiver and the cantilever dampens the oscillations approximately twice as fast as a free cantilever. The buffer also serves a secondary purpose of supporting the free end of the cantilever if downward pressure is placed on the cantilever. The MIM scope ring design will be altered to provide for better clamp coverage, and the ring positions on the cantilever mount have been altered to provide optimum eye relief adjustment to the shooter. Prototype parts reflecting these changes are being made in the Model Shop and it is anticipated that the next series of testing will start in early May.

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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.

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.

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 and work is under way revising and updating the process records to reflect the changes.

These improvements will be phased in in 1988 and cataloged in 1989.

MODEL 7400-4, 7600-5 CONSOLIDATION - Lewis/Verdura

Process records, item masters and product structures have been written and are ready to issue as soon as the corresponding information on the stock and fore-end is available.

The consolidation of these models will be phased in as scheduling permits in 1988 and will be included in the 1989 catalog.

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NEW PRODUCTS AND PROCESSES - 1990 AND BEYOND

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

This program will replace the present family of synthetic stock autoloaders, the N-66 and N-77. The current process is over 25 years old and uses special equipment and molds which are nearing the end of their useful life. 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.

D.S.Findlay Sr. was in on April 21 and April 22 to discuss the program and review the design. It was decided that we would progress with a graphite receiver and housing and look at both a wood and synthetic stock. This would leave an extruded aluminum receiver as an alternative design.

Parts that need to be designed are:

- spring guides
- springs
- sights

Parts that need redesign are:

- last shot hold open(l.s.h.o.)
- bolt (provide stop surface for l.s.h.o.)
- housing (provide clearance for l.s.h.o.)
- firing pin
- magazine box
- follower
- receiver (provide clearance for l.s.h.o.)

This design and redesign should be complete by May 6. At that time we can start detailing components and sending work to the model shop.

On May 4th, Bill Marks of DuPont will be in to look at the components to be made of synthetics and composites, and give us suggestions on material selection and contacts in composites.

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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SHOTGUN BARREL AUTOMATION - Baszczuk

The Pilger tests to produce sample cold form shotgun barrels with finished bore and chamber and partially finished outside contour has been delayed from April to the first part of July 1988. This delay is due to an extremely busy production schedule at the Sandvik Corporation in Arnprior, Ontario where the tests will be run. The quotes for new mandrel tooling and Pilger roll die alterations are also late. They are now expected around April first. This should allow sufficient time for fabrication without further delaying the tests.

Approximately 75 feet of both C-1035 and AISI 4130 ERW tubing is due. This is enough to produce about 50 barrels for evaluation from each material.

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.

Computer simulation data has been used to provide a guide for altering a KFC M/250 for conversion to gas-assisted recoil operation. The layout and detail drawings are completed and in the model shop for prototyping. These parts have been completed. The protoype inertia spring has been delivered by the vendor. Gun assembly and testing will begin the last week in April.

The high-speed movie equipment has been received and will be used for testing the modified KFC M/250.

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. Samples of a new recoil pad material from the EAR Co. have been received for evaluation.

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NEW BOLT ACTION RIFLE - Martin/Jackson

A meeting was held on the 4th and 5th of April with members from the Marketing group, Technical Section, and the FMS Process Engineering Section to define the path forward in regards to strength, styling, and manufacturability. The benchmark for strength will be the standard M/700 receiver.

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 crowned like the Mountain rifles and will have 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 August.

The trigger guard, magazine follower, magazine release, and magazine spring will be sent out for quotes in May.

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).

On April 12th through the 15th, D.C. Brennan was on site to reshoot the test with their shooter. Their shooter validated the Remington shooters, and again indicated no significant improvement in accuracy.

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.

ELECTRO-CHEMICAL RIFLING - Lewis

A Part II on this project has to be submitted. Quotes are needed from Cation Corporation and estimated testing costs are needed from the Test Lab.

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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. John Rogers is working on getting the current version of Mil Spec 3443.

One bayonet adapter design has been sent to the Model Shop for fabrication and an alternate design will be complete by the end of April. New sling swivel assemblies and a new 7-shot magazine tube spring have been released for build. A new recoil pad design has been detailed, but questions remain on appropriate material specifications.