

LIMITED DISTRIBUTION

ILION RESEARCH DIVISION
PROGRESS REPORT - HIGHLIGHTS
MAY 1983

Distribution List

<u>R. E. Fielitz</u>	D. S. Findlay
W. H. Coleman, II	J. C. Hutton
R. L. Hall	C. Lall
C. B. Workman	J. S. Martin
T. L. Capeletti	C. E. Ritchie
J. W. Bower	R. J. Sanzo
J. W. Brooks	R. L. Sassone

Remington Arms Company, Inc.

NEW PRODUCT DEVELOPMENT

(J. S. Martin)

Model 1100 Special Shotgun

(D. S. Findlay, T. P. Powers)

Research is in the process of acceptance testing for the LT-20 Specials. Eleven (11) Trial & Pilot guns are in endurance testing. Six (6) fore-ends have been tested to 5,000 rounds. Four (4) additional fore-ends are to be taken to 20,000 rounds. Of these, three (3) are at 10,000 rounds and one (1) is at 15,000 rounds. One (1) fore-end cracked at 3,250 rounds at the 10 o'clock position (detent at 6 o'clock).

Production has encountered problems with cracking of the 12 Ga. Special fore-ends and mismatch between parts of the two-piece butt plate. Research personnel are evaluating several fore-end design alternatives. Strain measurements indicate that an elastomer buffer will be required to consistently prevent cracking.

Model 870 Special Field Shotgun

(D. S. Findlay, F. H. Smith)

One (1) sample each of the 12 Ga. and LTWT-20 Specials have been completed for evaluation and have been approved by Marketing. Testing of five (5) 12 Ga. Specials and five (5) LTWT-20's has been completed to 5,000 rounds of Magnums with no problems. Drawings have been transmitted to the Plant.

Model 870 Restyle Shotgun

(D. S. Findlay; K. L. Calkins)

Five (5) prototype guns were assembled and evaluated by Marketing. Two (2) additional samples to further illustrate design options have been provided to Marketing for Consumer Research. A decision is needed from Marketing by June 15, 1983 to satisfy the schedule for 1985 announcement.

Model 111 Autoloading Shotgun

(D. S. Findlay, J. L. Kast)

The Model 111 is tentatively scheduled to replace the Model 1100 in 1987. Objectives include improved strength, lighter weight, and new styling features. One (1) prototype is in endurance test. Four (4) additional samples will be assembled for Design Verification testing pending results of the test on the first sample.

Model 7400 .223 Carbine

(R. S. Murphy, A. R. Eddy)

Preliminary design has been completed on a ten (10) shot magazine box for the Model 7400 .223 caliber carbine. Contact has been made with two (2) vendors on fabrication of prototype magazines. They have been supplied with model drawings and a Request for Quote on development parts. Ten (10) additional Model 7400 .223 carbines with the latest specifications will be assembled the week of May 23rd. Function testing on the four (4) shot has been held at approximately 5,000 rounds due to project priorities.

Bolt Action Rifle

(F. E. Martin)

Two (2) prototypes of the Model 700 *Lightweight* have been completed and reviewed by Research and Marketing. Thirty-six (36) prototypes of 30-06, 270, and 280 caliber are being fabricated for testing. Barreled actions will be completed by mid-June. However, stocks will not be completed until the end of August.

Model 1100/870 Slug Barrel Investigation (A. A. Hugick)

Preliminary design investigation of a reduced I.D. barrel configuration is in progress. Prototypes with the barrel mounted scope mount and various choke/bore designs are planned for testing in July.

CURRENT PRODUCT DEVELOPMENT

(J. W. Brooks)

Model Seven Lightweight Rifles

(D. E. Bullis)

Results of the sensitivity analysis indicate that controlled assembly of components for the steel trigger guard and floor plate may prevent premature opening of the floor plates on the 7mm-08 and .308 caliber rifles. Additional tests are needed to confirm this. If successful, the revised design could be released to Production by June 10.

To avoid costs associated with controlled assembly, the aluminum trigger guard and floor plate design is being developed as a replacement for the present design. Field cycle testing on eleven (11) guns has been completed and endurance tests are in progress. There have been no problems to date with those guns. Production of this design could be initiated in the first quarter of 1984.

Model 700 ADL Restyle

(P. Nasypany)

Trial and Pilot testing was completed with satisfactory results on production 222 Rem. caliber rifles with the stamped no-bind magazine follower.

Model 700 Classic in 250-3000 Savage Caliber (P. Nasypany)

Prototype rifles averaged less than 2.0 inches with Remington 100 grain, Win. 100 grain, and Win. 87 grain bullets. Function testing using the 22-250 caliber magazine spring was satisfactory.

Model XP100 in .223 and 7mm-08 Caliber (T. J. Plunkett)

Fiberglass stocks have been ordered for testing of the 308 caliber. Stocks should be in plant by June 6, 1983.

Four (4) XP100 prototypes in .223 caliber are being tested for accuracy. Results are incomplete. Five (5) more prototypes will be made and shot for accuracy verification. Testing to be completed by the end of June.

Model 870 Police Shotgun

(T. J. Plunkett)

Due to testing priorities and manpower, prototype barrels have not been shot for point-of-impact Design Verification. Testing is scheduled for completion by the end of May.

Model 870/1100 12 Ga. Waterfowl Shotgun (P. Nasypany)

Prototypes featuring birch wood with oil finish, parkerized metal finishes, and camouflage slings were shown to Marketing.

MATERIALS AND PROCESS DEVELOPMENT

(J. W. Bower)

Materials Programs

(C. Lall)

Injection Molding - Firearms

(B. Panagian, K. C. Rowlands)

Shrinkage alterations to the Model 700 magazine follower mold will be complete by June 8. A mold has been ordered for the common centerfire rear sight slide. Tooling quotes are pending for the common centerfire front sight ramp and the Model 7400 operating handle.

Injection Molding - Comercial

(B. Panagian, K. C. Rowlands,
M. J. Topolski)

The mold for the West Co. lyophilization stopper has been received ahead of schedule. Molding will begin during the last week of May.

Injection Molding - Metals

(M. J. Topolski, M. Tasovac)

Type 316L stainless steel parts with very good mechanical properties have been processed: An oxidation step used to improve corrosion resistance may be damaging the furnace heating elements. Further testing is in progress.

Injection Molding - Ceramics

(M. Tasovac)

The appropriation request is circulating in Bridgeport.

Three (3) alumina feedstocks have been molded into tooth implant blanks. They are being processed in Wilmington to determine compatibility with "bioglass".

Tungsten carbide parts processed in Wilmington and Ilion were unsatisfactory. Chemical analysis indicated carbon loss, leading to a very brittle eta-phase formation.

Testing and Certification of Magnetic Powder Metal Components

(C. Lall)

Several samples have been processed for optimum magnetic properties. These samples are awaiting coining and grinding, prior to testing.

Detailed layouts and descriptions of the toroid testing equipment are being prepared for a potential customer.

Development of a High Strength, Low Shrinkage Alloy

(C. Lall)

To overcome the need for coining due to warpage at sintering, a low shrinkage alloy is being developed. Samples have been pressed, in preparation for sintering.

Scanning Electron Microscope

(C. Lall, M. J. Topolski)

Engineering evaluation of equipment for this approved project are continuing. A report on initial assessments of potential vendor's equipment is circulating.

Process Development Programs

Cut Checkering Machine Development

(R. J. Balaski, A. M. Makowski,
E. R. Owens, B. Panagian)

Model Four checkering fixtures for the Bostomatic machine are progressing through the Model Shop and N/C Shop, with a June 1 anticipated completion date.

A purchase requisition will be issued for a CO.RE.MA.
Model ZZ-A-E CNC machine for checkering and bordering sanded wood.
Initial development work will focus on the Model Four fore-end.

Testing and Inspection

(J. A. Lawrence, A. M. Makowski,
B. Panagian)

A conceptual design has been completed for automatic gallery testing. A 22 caliber shooting butt will be installed in 72-1 to facilitate further evaluation.

The proposal for automatic inspection of discrete components has been reviewed with the Firearms Modernization Department. A followup meeting is scheduled to determine funding levels for EPL.

Coatings

(J. A. Lawrence, E. D. Rankins)

Life tests of uncoated and titanium nitride coated drills are being run in the N/C Shop. An evaluation of receiver action bar slot cutters has been completed by ETL and forwarded to PE&C for action.

Several firearms components await testing. These include chrome plated M/1100 barrels, M/700 barrels treated with Pyro-Dux, and a M/7400 barrel coated by Kolene.

Form-Rolling

(E. R. Owens)

Purchasing has received a signed non-disclosure agreement from Rol-Flo Engineering, Inc. Purchasing will now forward a proposed development contract for Rol-Flo's approval.

Four-Slide Process Development

(R. H. Smith)

Additional M/111 feed latches are being processed for testing and evaluation.

Industrial Engineering has been asked to update economics on eleven (11) parts currently made by H&P. Tooling orders will be requested pending favorable economics.

Synthetic Piston Seals

Sample 3M material has been received. It is in the Model Shop to be machined into piston seals. Sample Vespel material has been promised.