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### **M/710 Development Status**

To: D. Diaz, J. Mead

#### **Design**

Preliminary component designs have been completed for all components except for the bolt lock, bolt handle and bolt plug. Component level detailed drawings including the bolt lock will be completed and forwarded to Manufacturing by March 3rd. The bolt handle and bolt plug drawings are contingent on cosmetic approval, currently under evaluation.

To evaluate the mechanics of the action system, a prototype action was produced and assembled. The receiver insert is machined steel and the barrel represents only the rear six inches of the entire barrel. Due to a setup mistake by the vendor, the receiver had a thin wall condition at the front end where the barrel is pressed into the receiver. During assembly of the receiver and barrel, the receiver cracked through the thin wall region. With correct receivers, cracking should not occur, but it is an area that will be closely monitored throughout development. Once assembled, head space measurements indicated a deep chamber, approximately .010" over Remington Extreme Maximum specification. All other components assembled and functioned correctly. The firing pin system was fully representative of the design and tested for indents and fatigue. SAAMI recommended minimum indent depth is .017 inches, the current system is producing indent depths of .014 inches on average. With the head space issue, the quantitative value of indent may be incorrect, but the action will provide a baseline for relative effects of firing pin spring variations. Several firing pin springs with incremental increases in energy have been ordered. The firing pin system was also subjected to fatigue testing, via cyclic dry firing. The M/710 firing pin is a threaded assembly of three components, fatigue of the threaded unions were a concern. The action was subjected to 6000 dry firings without failure. It is only a sample of one, but the fact that no failures occurred is positive information.

Two iterations of the magazine box have been built, evaluated, and improved. A sample of the third iteration is expected by March 15. The optimization has been in the lower box area, to improve upward movement of the cartridges. No evaluation of the feeding aspects from the box to the chamber have been completed to date.

#### **Manufacturing**

Barrel process development is continuing and has been reported to be on schedule. The outside barrel contour has been discussed relative to cosmetic appearance. The desire is to have a forged barrel contour that closely matches the prototype barrel contour. Once the forging process has been optimized, samples of the barrel contour will be submitted for evaluation. Quotes have been received for the barrel heat treatment process development. Barrel samples for heat treatment development have been completed. Design and build of a barrel assembly fixture to press the barrel into the receiver is underway, with expected completion on schedule.

Upon receipt of component detailed drawings, (by March 3) lilon purchasing will be required to begin quoting of production vendors. Lead times for all components, including materials, for component manufacturing will need to be closely monitored. Expectations are that DAT components will be supplied by the production vendors. DAT is scheduled to begin on 6/28/99.

The Hanson Group has begun development of the molding tool for the receiver insert. Dimensionally correct parts are expected by April 30. Material for mold runoff, process development, and production of EET/DAT components has been ordered.

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## Marketing

Sample bolt plugs and bolt handles have been submitted for evaluation, along with the M/710 prototype. Upon determination of the desired geometry, detailed drawings will be completed and issued to Manufacturing.

## Summary

Overall the M/710 program is on schedule and progressing well, but the major obstacles are still ahead. The barrel processing and receiver insert molding are still unproven, as well as the overall function of the firearm. The next major milestone is EET, to begin May 3. The following is a list of action items as assigned during the Dec. 18, 1998 design review meeting.

Action Item	Responsible	Date Req'd	Date Completed
List of common parts to M/700	M. Keeney	1/4/98	12/23/98
Cap. required to produce short action	Rabbia/Keeney	3/99	12/23/98 (submitted options)
List of caliber unique parts	Keeney	1/4/99	12/23/98
Investigate barrel/receiver markings	Diaz/Hendley	3/99	
Redesign of bolt handle	Keeney/Bunting	3/99	2/19/99 (samples submitted)
Distribute schedule/spendout	Keeney/Santillo	2/4/99	2/4/99
Reoccurring capital expenditure	Rabbia	2/99	
Cosmetic review	All	1/15/99	1/14/99
Investigate pillar bedding	Keeney/Santillo	2/99	
Vendor involvement/quoting	Keeney/Santillo	10/99	
Accelerate schedule for 2000 intro	All	2/99	2/4/99
Incremental cost review	Rabbia	1/99	
Make vs. buy analysis	Rabbia	2/99	
Evaluate barrel capacity/plan	Rabbia	2/99	