TO: J. W BOWER

FROM: T.C. DOUGLAS

SUBJ: MONTHLY REPORT - DEC 1985

12/19/85

M/1100 Functional Improvements

12 GA

The computer simulation of the M/1100 gas system was studied for possible refinements to enhance 1oz performance. Decreasing the initial volume and utilization of the standard M/1100 inertia sleeve has resulted in improved 1oz performance in several test guns. The valve seat for the diameter was decreased from .125 in to .100 in to keep the pressure vent spring from opening. These changes also increase the bolt velocity when firing 3" magnums. Eight guns are being built with these modifications. When the new guns are built, the orifices will be worked up to ensure reliable 1oz performance and to minimize 3" magnum velocities. They will then go through a 4000 rd endurance test. This test will also include alternative concepts to improve the endurance life of the piston, piston seal, and carrier latch. Plans are to start the test the week of Jan 6th.

20 GA

Bolt velocity testing on the M/1100 20 GA utilizing a magnum barrel with a second orifice hole on a field action indicates that the 28" and 26" barrels give enough bolt velocity to function reliably with skeet loads. Test results:

MAGNUM BBL W/(2) .070 ORIFICES — TERMINAL BOLT VELOCITY (FT/SEC)

| | STEEL LOAD | 2¾" STEEL LOAD | 3" MAGNUM - #1 |
|---|---|---|---|
| FIELD ACTION 28" BBL | 176 | 272 | 371 |
| MAGNUM ACTION 28" BBL | 156 | 262 | 369 |
| FIELD ACTION 26" BBL | 143 | 246 | 350 |
| MAGNUM ACTION 26" BBL | 125 | 233 | 339 |
| FIELD ACTION 21" BBL | 122 | 808 | 304 |
| MAGNUM ACTION 21" BBL | 127 | 193 | 296 |

The next step will be a 10 gun endurance test to determine if there are any endurance problems at these bolt velocities. The guns will be field actions with magnum barrels altered to field gun orifices.

M/870 Functional Improvements

Analysis of the design verification test yields the following:

- No parts breakages associated with functional improvements.
- Perceived opening and closing forces during shoulder shooting were significantly less than our current production gun.
- The ejection malfunction rate from the field portion of the test was .13% for the improved guns and .11% for the control guns.

- Feed and intercept latches did not come unstaked during the test.

- The M/1100 "tight coil" firing pin retract spring performed as well as the current M/870 firing pin retract spring.

- No problems associated with the M/1100 Special Field-Type magazine cap detent system.

- Blow-up testing (chamber burst) of new receivers with the dove-tail cut for the new ejector equal to our current design.
- All program goals were met.

The parts lists and drawing packages for the functional improvements were transmitted to Production on December 5th.

XP-100 .223 Caliber addition - Mid '86 introduction

Six XP-100's were sent to a writer's seminar in the Texas area where they were well received. Grace Raw from the Marketing dept. indicated that one magazine will be a front page story on the .223 XP-100. A custom shop version in .35 REM was also well received.

M/700 .338 WIN MAG caliber addition - 1987 introduction

Design acceptance testing of the .338 win mag caliber is complete. The parts list and drawing package are ready for transmittal to Production.

M/7400 Functional Improvements - 1989 Introduction

A historical analysis of the M/7400 has been started to determine what improvements are necessary. Our goal is to complete this analysis by Feb, 1986.

M/1100/870 20 GA. CHOKE TUBES

Increasing the wall thickness of a M/1100 20 ga bbl for choke tubes and carrying this extra wall thickness rearward until it intercepts our current barrel contour causes no interference with our current fore-end barrel groove. To allow retrofittability to guns already in the field requires either a reverse-tapered barrel or a barrel sacrificed on the end to accommodate the choke tube. Samples of both designs are being built for testing and Customer Service approval. This is not a problem on the M/870.

Pattern testing on the choke tubes show that we have a good IMP/CYL choke tube, but that the Full and Mod tubes need more work. Both the full and the mod tubes shot light patterns, however the full patterns were lighter than the mod. pattern. More mod and full tubes are being fabricated for additional testing.