

To: Ken Soucy
From: Edward Ford
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Subject: January Monthly Report

CADD Software Study:

There are two Computer-Aided Design and Drafting (CADD) software packages currently in use at Remington - Computer Vision's CADDs 4X and Autodesk's AutoCAD v.12.0. The original study was to determine which of these packages could satisfactorily meet both R&D and ATO requirements in the hope of converging to one system. The study has expanded to include Parametric Technology's Pro/ENGINEER and Structural Dynamics Research Corporation's (SDRC) I-DEAS.

The M/700 Stainless Steel Stock was chosen as the benchmark. It consists of a data file containing laser digitized data defining the stock contour. Each company is to reverse engineer this part by creating surfaces from the digitized data. A copy of the benchmark was sent to Computer Vision and Parametric Technology. Parametric Technology presented their results during the January Technical Presentation held on January 19, 1993. Their system appears capable of fulfilling our design requirements, however, they did not follow the rules of the benchmark. Instead of using the digitized data to create surfaces they used the data to obtain dimensions which they used to create the stock from scratch. Computer Vision has chosen not to participate in the benchmark until additional information is obtained about the recently signed guideline contract between DuPont and Parametric Technology.

Autodesk and SDRC are scheduled to receive a copy of the benchmark in February.

M/320 Testing:

M/320 endurance testing began at the end of November and after 8700 rounds a crack appeared on gun #1036 in the radius between the breech face and the recoil lug clearance cut. Strain gages were mounted on gun #1028 in the radius and on the side of the frame just below this radius. Strain readings were recorded while closing the action, shoulder shooting with target ammunition, shoulder shooting with heavy nitro magnum ammunition, closing the action while in the test jack, jack shooting with target ammunition, and jack shooting with heavy nitro magnum ammunition. The data was input into Minitab and a statistical analysis performed. The analysis revealed two significant results. First, the material yields when a heavy nitro magnum shell is fired in the top barrel. Second, there is no significant difference between shoulder shooting and jack shooting. Therefore, future testing can be done with either setup.

Upon the recommendation of Fred Schmidt, the radius was flame hardened on four guns. Strain gages were mounted on gun #1054 in

the radius and on the side of the frame just below this radius. The same test was conducted and the data input into Minitab. It revealed that the material was still yielding when a heavy nitro magnum shell is fired in the top barrel.

Strain gages were mounted on the original cold rolled 4137R frame but after firing only one target round the gage broke. The frame was magnafluxed which showed a crack in the radius that was undetectable by eye.

David Findlay modeled the frame using Computer Vision's Stress lab and strain gages were mounted in fifteen locations on gun #1075. The same test was conducted and the results were used to verify the computer model constraints and loading conditions.

Model drawing was changed to increase the radius from 0.062" to 0.188" and to raise the recoil lug clearance cut by 0.100". The test lab is awaiting these changes to continue testing.