

N/C

During the past 20 years there have been indicators telling us that eventually we would not be able to make a new product, new machinery at a profit satisfactory to Remington Management. As the years progressed this became more apparent. I might cite a few examples.

During the development of the M/11-48 shotgun there were some 9 different models made, the last and final of which was the only one tested to the 12,000 round endurance test. We based results of the test then on one gun to put the whole line in production, and during that following year made 5,000 design changes. This was proof indeed that statistically one gun certainly is not adequate for testing purposes.

We were lucky in that after development of the M/870 we produced three autoloading shotguns using the basic elements of the 870 for approximately 80% of the mechanism. And therefore were able to make approximately 50 to 100 models for test purposes. I think there were 135 models made for the Spts.-58 and I don't recall the number for the M/878, and something like 70 or 80 models made for the M/1100. These tests proved very satisfactory, results of which indicated that we had a satisfactory product.

You may know that a model costs between \$10,000-20,000 to manufacture, and if we had started with a new gun, such as in the M/1100, with all new machinery and no parts available in production, it would have cost us roughly about \$20,000 per model to test. This would have been out of the question. The Nylon 66 was another example. Prior to that the development of a rifle similar to the M/550

proved to be too costly. The Nylon 66 would have fallen into the same category with exception that after developing the dies we were able to make the major portion of the gun by molding the stocks, fore ends and receivers all in one piece. The only cost, then, for a new item, was the development of the small and sometimes minor parts that go into the gun. Therefore a statistical sample was justified and proved to be satisfactory.

What have we done in the bolt action line. After the development of the M/721 we progressed into the M/725, changed the styling somewhat, changed a little bit more drastically in the M/700. We have added the M/600 and XP-100, all on the same receiver, utilizing the same machinery, with some adjustments to that machinery. None of these items could be produced, brand new, and from scratch, at the present time, with new machinery and at a profit.

The latest design was the effort that was made to produce a line of rim fire rifles. And finally we had to tie in a line of center fire rifles and even effort was made in the line of a bolt action shotgun so that we could get enough parts spread out over enough machinery in enough combinations to make it pay, and we just squeezed through. To design 15 guns simultaneously is practically unheard of in the gun industry and I don't think has ever been accomplished before.

Now we have a new line of products which we think will be necessary to keep Remington on the march and ahead of its competitors for the next 10 years. All of these are brand new, from muzzle to butt. They will require brand new machinery. I can tell you now that we cannot produce these items at a profit on conventional

machinery and conventional methods. Therefore we are proposing a program here this morning which should be taken seriously as I'm sure it would allow us to proceed ahead into the new 10 year era in a profitable manner. That is the progression of automation into numerical control machines.

Oftentimes people ask "What is N/C?" Numerical control regulates the action of one or more machines by automatic interpretation of instructions expressed as numerals. What this means is that with a punched tape the holes of which are oriented so that it controls and tells the machine what to do thru an electronic mechanism so that the interpretation of its instructions are directed to the machine to make angles, distances, holes, etc..

What are the advantages that Numerical Control would provide for Remington?

- Direct and indirect labor costs will decline.
- Lower risk factor in producing new items.
- Decrease in cost.
- Competitive advantage.
- More realistic planning and scheduling.
- Higher quality and reliability.
- Reduced scrap.
- Reduced inspection time.
- Less tooling investment.
- Smaller inventories.
- Reduced paperwork.
- Reintegration of manufacturing functions.
- More flexibility in factory locations.
- Improved cash position.

What Numerical Control should not be expected to do:

1. There is no advantage if we have no need and cannot economically justify.
2. There is no advantage if we can justify but cannot adjust our thinking to fully exploit and utilize the potential.
3. Very disadvantageous to us if we have provable need and can justify, yet do not, but our competitor does.

What are some of the other implications? They would be impact on the organization, communication, personnel training, maintenance, computer science, and management time.

What are some of the manufacturing advantages in this extension of automation by N/C. We obtain more flexibility, accuracy, repeatability, increased productivity, high machine tool utilization, tool saving, and reduced lead time.

Here is our proposal. We propose that a Numerical Control Custom Shop be initiated wherein we would manufacture the Model 870, and 1100, in 28 and 410 Gauges, and also a M/32 Over & Under and the Parker. We have estimated to the best of our ability along with the valued assistance of our plant friends as to what the per cent return on investment might be for the 870 and 1100 in 28 and 410 only. We have made two estimates, one based on selling these guns at standard price, \$99.95 and \$154.95 respectively, and also on a \$20 increase to \$119.95 and \$174.95, respectively. We think the increase is justified because Mr. Simmons who makes conversions of 20 Ga. M/1100's into 28 & 410 gauges charges \$100 for his conversions.

In these estimates several assumptions were made; that the purchase of the receiver would be a M/742 blank, actually obtained from the plant after the roll marking operation. After the Numerical Control Custom Shop completed the manufacture of the receiver it would be returned to the plant for brazing, welding, finishing and coloring. We would also obtain M/11-48 - 28 & 410 Gauge barrels from the plant and ask them to also machine the gas cylinder on plant machines. Extra tooling, etc. was included in our estimate.

We would assume the plant would manufacture the fore end on plant machines for which tooling was included. All powder metal parts to be produced on present machine capacity time and tooling was considered. Finishing of parts; i.e. use of vibrator finishing, polishing, tumbling, etc. would be performed on plant equipment. Plant capacity to supply all add use parts such as pins, extractors, springs and followers would be included and they would perform all heat treat operations.

Other than that, the assembly, programming, maintenance, manufacture in general would be accomplished in the Custom Shop, with a total of 22 individuals.

This estimate also includes the building of a factory of one floor level with 7200 square feet of area, providing us with a 3,000 ft. machining area, 50 ton air conditioner, plumbing, unit heaters, wiring, and space allowed for normal facilities. To be an insulated Butler type building.

Results show ~~the~~ return on investment with the increased \$20 charge in selling price, of 16.6%, and with standard selling price, 12.3%. Project investment would be in the neighborhood of \$2,250,000.

It is conceivable then that with the complications of adding numerical control to the Remington production facilities, that to ease the burden, teach the people the required knowledge necessary to function with Numerical Control, it would be ideal to start with a small custom shop with space available to allow growth.

With
~~When~~ the new models which were discussed at the beginning ~~and~~ of our talk and designed for Numerical Control, and to be introduced into production facilities,

it would be expanded to the Numerical Control Custom Shop, and eventually a new factory, fully automated, with a nucleus of Numerical Control would be formed. This is our recommendation.

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