Sportsman M/710 Bolt Action Rifle

Design Concept
Review I

Sportsman Model 710
Concept Review Agenda

- Review Program Objectives, Design Goals, Status and Schedule ---------- Danny Diaz
- Review Two piece Stock Concept---------- Derek Watkins
- Review One piece Stock Concept---------- Derel Watkins
- Collect and Record Input ---------- Team
- Review Conclusions ---------- Danny Diaz

Sportsman M/710
Program Objectives

- Design and Manufacture a low end bolt action rifle with the highest possible profit margin.
- Enter the market in year 2000.
- Sound aesthetics
- Performance equal to or exceeding competitors similar offerings.
  - ✓ Savage 111, Marlin MR-7, and Winchester 70

Sportsman M/710
Marketing Specifications

- Bolt action - short & long action (including magnums)
- Standard barrels lengths (22" - 24")
- Synthetic stock with recoil pad & swivel studs
- Wood stock added in the future based on investment & stock cost
- Floor-plate or detachable box magazine (lowest cost)
- Reasonable bolt action grade trigger (comparable to competitive products)
- Inexpensive metal finish (uniform without turn rings)
- Inexpensive adjustable sights as option
- Accepts after-market scope bases (bases not included with gun)
- MSP $229 (non-magnum synthetic)
- NSP $188 (non-magnum synthetic)
- Target Margin 45% (non-magnum synthetic)
- Target manufacturing cost $103 (non-magnum synthetic)

Sportsman M/710
Design Alternatives

- Modify current line (i.e. M/700)
  - ✓ Pro's
    - → as a company we have a large expertise base
    - → large number of parts
    - → known and accepted performance characteristics
  - ✓ Con's
    - → limited design changes
    - → limited changes to current processes
    - → tolerances sensitive

Sportsman M/710
Design Alternatives

- New design
  - ✓ Pro's
    - → design for ease of manufacture
    - → reduction in component number and complexity
    - → designed for possible use new state-of-art processes
    - → incorporate tolerance insensitive design of components
    - → drop out firecontrol
  - ✓ Con's
    - → new unknown design; new firecontrol; cast receiver
    - → lack of expertise with possible new processes
    - → new stock design

Sportsman M/710
Design Objective

- ✓ design a high margin quality centerfire rifle family.
- ✓ simple innovative design
  - → user friendly
  - → reliable, robust, and durable design
- ✓ easy to manufacture, eliminate costly process
- ✓ designed to accept new cost effective state-of-art process
  - → high speed machining, forging, semi-solid forming, and new assembly technologies
- ✓ share a common backbone of parts.
- ✓ performance bench mark - M/700

Sportsman M/710 Design Path

✓ Design Concepts

→Two piece stock

- *synthetic two piece stock*
- *investment Cast Receiver*
- *unidameter Bolt*
- *synthetic trigger guard/housing*
- *Clamped barrel*

→One piece stock

- *Synthetic or wood*
- *Extruded Tube Receiver*
- *conventional trigger housing*
- *threaded barrel*
- *metal clip*

Sportsman M/710; Two Piece Stock
Investment Cast Receiver

- *Investment Cast Receiver*
  - *near shape*

Sportsman M/710; Two Piece Stock
Unidameter Bolt

- *Unidameter Bolt*
  - *Elimination of the broaching operation*
  - *Bolt handle & bolt body*
  - *Field Strippable*

Sportsman M/710; Two Piece Stock Safety & Trigger Guard

- *Synthetic trigger guard/housing*
  - *– modular*
- *Safety*
- *Tang - three (3) positions*

Sportsman M/710; Two Piece Stock Barrel

- *Barrel*
  - *Clampable*
  - *Barrel bolt locking system*
  - *3 lugs*
  - *Three ring of steal*
  - *5R riffling*

Sportsman M/710; Two Piece Stock FireControl & Magazine

- *Fire Control*
  - *Linkage system*
  - *Tolerance insensitive*
  - *Lock Time < 4ms*
  - *Minimum cocking forces*
- *Magazine*
  - *Synthetic clip*

Sportsman M/710 Two Piece Stock

- Two piece stock ()

Sportsman M/710; One Piece Stock - Extruded Tube Receiver

→Extruded Tube Receiver

– *eliminate bolt key broaching*

Sportsman M/710
One Piece Stock - Threaded barrel

→threaded barrel

Sportsman M/710
One Piece Stock

- Stock ()

Sportsman M/710 Development Schedule

❐ **Project Definition**	**September 2, 1997**
✓ **Process Investigation**	**September 3, 1997**
✓ **Concept Design Phase**	**October 17, 1997**
→ **Concept Program Review 1**	**February 20, 1998**
❐ Preliminary Design Phase	March 3, 1998
❐ Initial Prototype Evaluation Phase	June 6, 1998
❐ Design Phase	August 5, 1998
❐ Engineering Evaluation Testing	November 5, 1998
❐ Final Design	May 14, 1999
❐ Design Acceptance Test	August 27, 1999
❐ Design Transmittal	October 8, 1999

Sportsman M/710
Action Items

- Phase II of the process investigation.
- Competitive analysis
- Build ten (10) 4X4 firecontrol for EET
- Engineering Evaluation Test for 4X4
- Concept design Configuration analysis
- Concept design bolt locking system FEA
- Concept Design Review I
- Complete modeling of concept design
- 710 Firecontrol Initial evaluation (3 units)