

# *Sportsman M/710 Bolt Action Rifle*

## Design Concept Review I



# *Sportsman Model 710*

## *Concept Review Agenda*

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- ❑ 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*

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- ❑ 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*

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- ☐ 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*

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### □ 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*

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### □ 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*

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- ✓ 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*

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## ✓ 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*

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- *Investment Cast Receiver*  
– *near shape*

# *Sportsman M/710; Two Piece Stock*

## *Unidameter Bolt*

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- *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*

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

# *Sportsman M/710; Two Piece Stock FireControl & Magazine*

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- *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*

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- Extruded Tube Receiver
  - *eliminate bolt key broaching*

*Sportsman M/710*

*One Piece Stock - Threaded barrel*

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→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)