

880711 NBAR Strength
880691 NBAR Strength
881272 NBAR Strength

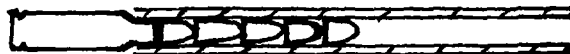
RESEARCH TEST & MEASUREMENT LAB WORK REQUEST

☒ Developmental ☐ Design Acceptance ☐ Pre-Pilot ☐ Pilot ☐ Production Acceptance	<u>AREA OF TESTING</u> <table> <tr> <td>☐ Safety Related</td> <td>☐ Litigation</td> </tr> <tr> <td>☐ Competitive Evaluation</td> <td>☐ Warehouse Audit</td> </tr> <tr> <td>☒ New Design</td> <td>☐ Cost Reduction</td> </tr> <tr> <td>☐ Design Change</td> <td>State </td> </tr> <tr> <td>☐ Plant Assistance</td> <td>Other </td> </tr> </table>		☐ Safety Related	☐ Litigation	☐ Competitive Evaluation	☐ Warehouse Audit	☒ New Design	☐ Cost Reduction	☐ Design Change	State	☐ Plant Assistance	Other
☐ Safety Related	☐ Litigation											
☐ Competitive Evaluation	☐ Warehouse Audit											
☒ New Design	☐ Cost Reduction											
☐ Design Change	State											
☐ Plant Assistance	Other											
<u>FIREARM STAT'S</u> MODEL: <u>NBAR</u> CAL or GAGE: <u>.30-06</u> BARREL TYPE: <u>STD.</u> PROOFED: YES ☐ NO ☒	<u>REPORT REQ'D.</u> FORMAL ☐ TEST RESULTS ONLY ☒	DATE REQUESTED: <u>3-11-88</u> DATE NEEDED BY: <u>3-28-88</u> REQUESTED BY: <u>R. Jackson</u> WORK ORDER NO: <u>481153</u>										

<u>TEST TYPE</u>			
☒ Strength Test ☐ Function Test ☒ Accuracy Test	☐ Ammunition Test ☐ Environmental Test ☐ Customer Complaint	☐ Dry Cycle Test ☐ Measurements ☐ Endurance Test	☐ Photo/Video ☐ Other

EXPLAIN IN DETAIL THE REASON FOR THIS TEST:

- ① PROOF TEST ALL 10 GUNS.
- ② HIGH PRESSURE INTENTIONAL ABUSE TEST ON ONE (1) RIFLE
 - MAX. LOAD OF 4198 POWDER + 220 GRAIN BULLET
 - PLUG BORE W/ FOUR 220 GRAIN BULLETS SUCH THAT BULLET IN CHAMBERED ROUND JUST TOUCHES THE PLUG BULLETS



- ③ SHOOT THREE 5-SHOT GROUPS IN EACH OF REMAINING RIFLES USING REMINGTON 180 GRAIN BRONZE POINT

-GUNS REQUIRED:

NOTE: NO firearms or parts will be tested in the Lab unless they are accompanied by a Work Request, and both are delivered to the Lab by the designer or engineer. All Work Requests are to be filled out in detail. No Exceptions.

DATE COMPLETED: 17 March 88
 TEST COMPLETED BY: CS
 REPORT DATE:

SUMMARY OF INTENTIONAL GUN ABUSE TEST

DATA

By C. Stephens

Date 17 March 88

FIREARM:

Make Remington

Model NBAR

Grade _____

Gauge 30-06

Serial Number XC0502

Origin _____

Test Number Assigned 880711

Comments Barrel plugged with 4 220gr. bullets
so that high pressure round touches.

HISTORY:

Condition New

Previous Rounds Fired -

Headspace at Test -

Test Date 17 March 88

ABUSIVE

LOAD USED:

Powder Type 4198

Powder Weight 50gr.

Case Make and Type REM

Total Bullet Weight 220gr. SP

Total Shot Weight _____

Estimated Pressure + 750 K

ADDITIONAL
COMMENTS:

Broke Stock, Bolt handle broke off, Receiver
cracked bottom left front, fragmented front
right & top of receiver. Right side shroud
gone.

REMINGTON ARMS COMPANY, INC.
Ilion Research Division

SUMMARY OF INTENTIONAL GUN ABUSE TEST

DATA

By C. Stephens

Date 18 March 88

FIREARM:

Make Remington

Model NRAR

Grade _____ Gauge 30-06 Serial Number XC 0503

Origin _____

Test Number Assigned 880711

Comments Barrel Plugged with 4 220gr. bullets

so that high pressure rounds touches last bullet.
Std. 700 Bolt Installed

HISTORY:

Condition _____

Previous Rounds Fired —

Headspace at Test —

Test Date 18 March 88

ABUSIVE

LOAD USED:

Powder Type 4198

Powder Weight 50gr.

Case Make and Type Rem

Total Bullet Weight 220

Total Shot Weight —

Estimated Pressure 750K +

ADDITIONAL
COMMENTS:

Broke Stock. Split Barrel approx. 8" long from
chamber forward. Fragmented barrel lug &
from of receiver. Bolt shroud completely gone.
Broke trigger plate assembly.

REMINGTON ARMS COMPANY, INC.
Illion Research Division

SUMMARY OF INTENTIONAL GUN ABUSE TEST

DATA

By C. Stephens

Date 22 March 88

FIREARM:

Make Remington

Model NRAR

Grade _____ Gauge 30-06 Serial Number XC 0498

Origin _____

Test Number Assigned 880711

Comments Barrel plugged with (4) 220gr bullets so
that high pressure round touches last bullet.

HISTORY:

Condition New

Previous Rounds Fired -

Headspace at Test -

Test Date 22 March 88

ABUSIVE

LOAD USED:

Powder Type 4198

Powder Weight 50gr

Case Make and Type Rem

Total Bullet Weight 220gr. SP

Total Shot Weight _____

Estimated Pressure 750 K

ADDITIONAL
COMMENTS:

Broke Stock. Fragmented Right side &
Front of Receiver. Broke trigger
assembly. Broke handle off bolt. Approx.
1/2 of bolt shroud missing.

REMINGTON ARMS COMPANY, INC.
Illion Research Division

SUMMARY OF INTENTIONAL GUN ABUSE TEST

DATA

By C. Stephens

Date 25 March 88

FIREARM: Make Remington Model NBAR
Grade _____ Gauge 30-06 Serial Number XC0500
Origin _____
Test Number Assigned 880711
Comments Barrel plugged with 4 220gr. bullets so
that high pressure round touches last round.

HISTORY: Condition New
Previous Rounds Fired —
Headspace at Test —
Test Date 25 March 88

ABUSIVE Powder Type 4198
LOAD USED: Powder Weight 50
Case Make and Type Rem.
Total Bullet Weight 220gr. SP
Total Shot Weight _____
Estimated Pressure 750K
700 Bolt Used

ADDITIONAL
COMMENTS: Broke Stock, Split barrel (Approx 7in).
Fragmented front of Receiver & bolt shroud.

TEST AND MEASUREMENT LAB TEST RESULTS

REQUESTER: R. H. Jackson TESTER: C. Stephens DATE: 3/30/88
REPORT NO.: 880891 WORK ORDER NO.: 481153
WRITTEN BY: C. Stephens
TEST TYPE: Test Results

FIREARM STAT'S : MODEL: NBAR CAL or GAUGE: 30-06
BARREL TYPE: _____ PROOFED: YES X NO _____

REASON FOR TEST :

To determine the strength of the NBAR

EQUIPMENT REQUIRED : 4 Rifles with modifications, 2 M700 with NBAR bolts, 1 NBAR with modified barrel hub diameter and one NBAR with raised rib scope mount. Handloading room, Iron lung and personnel.

TEST PROCEDURE : All four barrels were plugged with 4 220 gr. bullets so that the high pressure round would touch the last bullet. Handloads were loaded using data obtained from previous high pressure workups. All rifles were shot in the iron lung located in the measurement lab.

TEST RESULTS : The two M700 rifles held together with the only visible damage being to the stock and the bolt shroud on B6328311 showing damage. The rifle with the raised rib scope mount also held together with the stock showing the only damage. The rifle with the modified hub diameter showed excessive damage to the receiver.

Report No. 880891

RESEARCH TEST & MEASUREMENT LAB WORK REQUEST

☒ Developmental ☐ Design Acceptance ☐ Pre-Pilot ☐ Pilot ☐ Production Acceptance	AREA OF TESTING: ☐ Safety Related ☐ Litigation ☐ Competitive Evaluation ☐ Warehouse Audit ☒ New Design ☐ Cost Reduction ☐ Design Change Scale _____ ☐ Plant Assistance ☐ Other _____	
FIREARM STAT'S MODEL: <u>NBAR</u> CAL. or GAGE: <u>.30-06</u> BARREL TYPE: <u>STD.</u> PROOFED: YES ☐ NO ☐	REPORT REQ'D. FORMAL ☐ TEST RESULTS ONLY ☒	DATE REQUESTED: <u>3-29-88</u> DATE NEEDED BY: <u>3-31-88</u> REQUESTED BY: <u>R.A. JACKSON</u> WORK ORDER NO: <u>481153</u>

TEST TYPE			
☒ Strength Test ☐ Function Test ☐ Accuracy Test	☐ Ammunition Test ☐ Environmental Test ☐ Customer Complaint	☐ Dry Cycle Test ☐ Measurements ☐ Endurance Test	☐ Photo/Video ☐ Other _____

EXPLAIN IN DETAIL THE REASON FOR THIS TEST:

DO HIGH PRESSURE INTENTIONAL ABUSE TEST ON 4 RIFLES:

- * TWO m/100 WITH NBAR BOLTS (B6328311 and B6695575)
- * ONE NBAR WITH MODIFIED BARREL HUB DIA. (XC 0505)
- * ONE NBAR WITH RAISED RIB SCOPE MOUNTING (XC 0431)

FOR EACH OF THESE FOUR RIFLES:

→ MAX. LOAD OF 4198 POWDER + 220 GRAIN BULLET

→ PLUG BORE WITH FOUR 220 GRAIN BULLETS SUCH THAT BULLET IN CHAMBERED ROUND JUST TOUCHES THE PLUG BULLETS

-GUNS REQUIRED:



NOTE: NO firearms or parts will be tested in the Labs unless they are accompanied by a Work Request, and both are delivered to the Labs by the designer or engineer. All Work Requests are to be filled out in detail. No Exceptions.

DATE COMPLETED: 4-5-88

TEST COMPLETED BY: CS.

REPORT DATE: _____

Report No. 881272

RESEARCH TEST & MEASUREMENT LAB WORK REQUEST

☒ Developmental ☐ Design Acceptance ☐ Pre-Pilot ☐ Pilot ☐ Production Acceptance	<u>AREA OF TESTING</u> <table> <tr> <td>☐ Safety Related</td> <td>☐ Litigation</td> </tr> <tr> <td>☐ Competitive Evaluation</td> <td>☐ Warehouse Audit</td> </tr> <tr> <td>☒ New Design</td> <td>☐ Cost Reduction</td> </tr> <tr> <td>☐ Design Change</td> <td>State </td> </tr> <tr> <td>☐ Plant Assistance</td> <td>Other </td> </tr> </table>		☐ Safety Related	☐ Litigation	☐ Competitive Evaluation	☐ Warehouse Audit	☒ New Design	☐ Cost Reduction	☐ Design Change	State	☐ Plant Assistance	Other
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☐ Competitive Evaluation	☐ Warehouse Audit											
☒ New Design	☐ Cost Reduction											
☐ Design Change	State											
☐ Plant Assistance	Other											
<u>FIREARM STAT'S</u> MODEL: <u>New Barrington Rifle</u> CAL or GAGE: <u>30-06/300 Win</u> BARREL TYPE: <u>Sports/MAG</u> PROOFED: YES ☐ NO ☐	<u>REPORT REQ'D.</u> FORMAL ☐ TEST RESULTS ONLY ☒	DATE REQUESTED: <u>5-6-88</u> DATE NEEDED BY: REQUESTED BY: <u>F. Martin</u> WORK ORDER NO: <u>481153</u>										

<u>TEST TYPE</u>			
☒ Strength Test ☐ Function Test ☐ Accuracy Test	☐ Ammunition Test ☐ Environmental Test ☐ Customer Complaint	☐ Dry Cycle Test ☐ Measurements ☐ Endurance Test	☐ Photo/Video ☐ Other

EXPLAIN IN DETAIL THE REASON FOR THIS TEST:

Step 1 - Ultimate Strength Test - 4 Guns Supplied
 PROOF ALL GUNS INITIALLY

Step 2 - Load Ammo And Plug Bores 1100 GRs TOTAL
 Bullet Wgt. - 5 220 GR Bullets 4In
 Bore

-GUNS REQUIRED:

NOTE: NO firearms or parts will be tested in the Labs unless they are accompanied by a Work Request, and both are delivered to the Labs by the designer or engineer. All Work Requests are to be filled out in detail. No Exceptions.

DATE COMPLETED: 5-11-88
 TEST COMPLETED BY: CS
 REPORT DATE: 5-11-88

TEST AND MEASUREMENT LAB TEST RESULTS

REQUESTER: F. Martin TESTER: C. Stephens DATE: 5/11/88
REPORT NO.: 88127A WORK ORDER NO.: 481159
WRITTEN BY: C. Stephens
TEST TYPE: Test Results

FIREARM STAT'S : MODEL: NBAR CAL or GAUGE: 30-06
BARREL TYPE: Custom Shop PROOFED: YES X NO

REASON FOR TEST

To test the ultimate strength of the custom shop barrel contour in .30-06 & .300 Win. Mag.

EQUIPMENT REQUIRED : 2 NBAR in 30-06 & 300 Win Mag. calibers.
Measurement lab, iron lung, handloading room, loading dies,
loading materials, personnel.

TEST PROCEDURE : High pressure rounds were loaded for each calibre using data from previous tests. The rifles were then taken to the measurement lab and shot in the iron lung. The test was witnessed by F. Martin and T. Douglas.

TEST RESULTS : Both calibers performed in the normal M700 pattern. There were no visible cracks or bulges to the barrel or receiver. The bolts locked up and the stocks cracked.

REMINGTON ARMS COMPANY, INC.
Ilion Research Division

SUMMARY OF INTENTIONAL GUN ABUSE TEST

DATA

By C. Stephens

Date 5-11-88

FIREARM: Make Remington Model 700/NBAR
Grade _____ Gauge 30-06 Serial Number B6890899
Origin Custom Shop
Test Number Assigned 881272
Comments Custom Shop Barrel contour. Bbl. plugged
with 5 220gr. bullets H.P. round touches last bullet.

HISTORY: Condition New
Previous Rounds Fired 0
Headspace at Test -
Test Date 5-11-88

ABUSIVE Powder Type 4198
LOAD USED: Powder Weight 50gr
Case Make and Type Rem
Total Bullet Weight 220gr
Total Shot Weight _____
Estimated Pressure 750K⁺

ADDITIONAL
COMMENTS: Cracked stock, Locked up Bolt.

REMINGTON ARMS COMPANY, INC.
Ilion Research Division

SUMMARY OF INTENTIONAL GUN ABUSE TEST

DATA

By C. Stephens

Date 5-11-88

FIREARM:

Make Remington Model 700/NRAR

Grade _____ Gauge 300 Win Mag Serial Number C6209172

Origin Custom Shop

Test Number Assigned 881272

Comments Custom Shop Barrel contour. Bbl.

plugged with 5 220gr. bullets. H.P. round touches last bullet

HISTORY:

Condition New

Previous Rounds Fired 0

Headspace at Test -

Test Date 5-11-88

ABUSIVE

LOAD USED:

Powder Type 4198

Powder Weight 70gr

Case Make and Type Rem.

Total Bullet Weight 220

Total Shot Weight -

Estimated Pressure 750kt

ADDITIONAL
COMMENTS:

Cracked Stock, Locked up Bolt, Bolt Handle
fell off.

REMINGTON ARMS COMPANY, INC.
Illon Research Division

SUMMARY OF INTENTIONAL GUN ABUSE TEST

DATA

By C. Stephens

Date 5-11-88

FIREARM: Make Remington Model 700/NBAR
Grade - Gauge 300 Win Mag Serial Number C6209185
Origin Custom Shop
Test Number Assigned 881272
Comments Custom Shop Barrel contour. Bbl. plugged
with 5 220gr. bullets, H.P. round touches last bullet

HISTORY: Condition New
Previous Rounds Fired 0
Headspace at Test -
Test Date 5-11-88

ABUSIVE Powder Type 4198
LOAD USED: Powder Weight 70gr.
Case Make and Type Rem.
Total Bullet Weight 220gr.
Total Shot Weight -
Estimated Pressure 750K

ADDITIONAL
COMMENTS: Cracked Stock, Locked up Bolt.

REMINGTON ARMS COMPANY, INC.
Illion Research Division

SUMMARY OF INTENTIONAL GUN ABUSE TEST

DATA

By C. Stephens

Date 5-11-88

FIREARM:

Make Remington

Model 700/NBAR

Grade _____ Gauge 30-06 Serial Number C6209186

Origin Custom Shop

Test Number Assigned 881272

Comments Custom Shop Barrel contour. Bbl. plugged with
5 220gr. bullets, H.P. round touches last bullet

HISTORY:

Condition New

Previous Rounds Fired 0

Headspace at Test -

Test Date 5-11-88

ABUSIVE

LOAD USED:

Powder Type 4198

Powder Weight 50gr.

Case Make and Type Rem.

Total Bullet Weight 220gr.

Total Shot Weight _____

Estimated Pressure 750K +

ADDITIONAL
COMMENTS:

Cracked stock. Locked up bolt.

MODEL 700

17 CAL.

BARREL - LIFE
EVALUATION

PREVIOUS ROUNDS 1800	DATE <u>10-9-81</u>	MODEL <u>700</u>	Cal <u>17</u>	GUN NO. <u>26257382</u>	Total Rds. Fired _____	Total Malfunctions _____	Rate _____
	Description of Test <u>Endurance</u>				SPARKLESS BIC		

AMMUNITION	Shooter	No. of Rounds	MALFUNCTIONS										REMARKS									
			Firing	Extraction	Ejection	Trapped shell	Don't Lock up	Don't Lock Open	High	Low	Right	Shell Stems Mag		Bolt Overrides	Bolt Catches	Follower	Shell Jumps Mag	Action Blinds	Don't Blow Back	Follower Blinds	Breakages	Adjustments
1900	AL 20	20																				
	AL 20	20																				
	AL 20	20																				
	AL 20	20																				
	AL 20	20																				
2000	HS 20	20																				
	HS 20	20																				
	HS 20	20																				
	HS 20	20																				
	HS 20	20																				

PREVIOUS ROUNDS 1500	DATE 10-12-81		MODEL 700	Cal 17	GUN NO. B6091870	Total Rds. Fired		Total Malfunctions		Rate														
	Description of Test					ENDURANCE 0RD.																		
AMMUNITION	Shooter	No. of Rounds	MALFUNCTIONS										REMARKS											
			Firing	Extraction	Ejection	Trapped shell	Don't Lock up	Don't Lock open	Stem Chamber			Shell Stems Mag		Bolt Override	Bolt Catches	Follower	Shell Jumps Mag	Action Blinds	Don't Blow Back	Follower Blinds	Breakages	Adjustments		
	JB	200K																						
	JB	200K																						
	JB	200K																						
1600	JB	200K																						
	JB	200K																						
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	JB	200K																						
1700	JB	200K																						
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	JB	200K																						
	JB	200K																						
	JB	200K																						
1800	JB	200K																						
	JB	200K																						
	JB	200K																						
	JB	200K																						
1900	JB	200K																						

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PREVIOUS ROUNDS	DATE 10-9-81		MODEL 700	CAL 17	GUN NO. B6291862	Total Rds. Fired		Total Malfunctions		Rate		
	Description of Test		ENDURANCE		000							
AMMUNITION	Shooter	No. of Rounds	Firing	Extraction	Ejection	Trapped Shell	Don't Lock Up	Don't Lock Open	MALFUNCTIONS			REMARKS
									High	Low	Right	
1500	JB	20	OK									
	JB	20	OK									
	JB	20	OK									
	JB	20	OK									
	JB	20	OK									
	JB	20	OK									
	JB	20	OK									
	JB	20	OK									
	JB	20	OK									
	JB	20	OK									
1600	JB	20	OK									
	JB	20	OK									
	JB	20	OK									
	JB	20	OK									
	JB	20	OK									
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1700	JB	20	OK									
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	JB	20	OK									
1800	JB	20	OK									
	JB	20	OK									
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	JB	20	OK									
	JB	20	OK									
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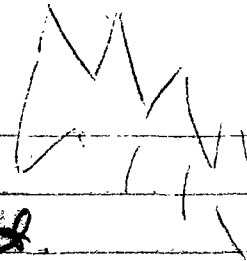
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PREVIOUS ROUNDS	DATE 16-8-82		MODEL 700	CAL 17	GUN NO. B6256994	Total Rds. Fired	Total Malfunctions	Rate	REMARKS														
	Description of Test		Endurance		STAINLESS		SBC																
1500	MALFUNCTIONS																						
AMMUNITION	Shooter	No. of Rounds	Firing	Extraction	Ejection	Trapped shell	Don't Lock up	Don't Lock Open	Stem Chamber	High	Low	Right	Shell stems Mag	Bolt overrides	Bolt catches	Follower	Shell jumps Mag	Action Blinds	Don't Blow Back	Follower Blinds	Breakages	Adjustments	
	AL 20																						
	AL 20																						
	AL 20																						
	AL 20																						
1600	AL 20																						
	AL 20																						
	AL 20																						
	AL 20																						
	AL 20																						
	AL 20																						
1700	AL 20																						
	AL 20																						
	AL 20																						
	AL 20																						
	AL 20																						
1800	AL 20																						

X

PREVIOUS ROUNDS		DATE	MODEL	GUN NO.	Total Rds. Fired	Total Malfunctions	Rate
1800		10-9-87	700	B6256984			
		Description of Test	STAINLESS	BBC			
AMMUNITION		No. of Rounds	Firing	Extraction	Ejection	Trapped Shell	Don't Lock Up
			Don't Lock Open	High	Low	Right	Shell Stems Mag
			Bolt Override	Bolt Catches	Follower	Shell Jumps Mag	Action Blinds
			Don't Blow Back	Follower Blinds	Breakages	Adjustments	REMARKS
1900		M 20					
		M 20					
		M 20					
		M 20					
		M 20					
		M 20					
		M 20					
		M 20					
		M 20					
2000		M 20					

Date June 14, 1982



Status Report - Format

Objective

Mode of Testing

Status as of Date

Expected Test Completion Date

Notable Results
Significant Results

- ① - What are we trying to learn
- ② - How are we approaching it
- ③ - Where are we
- ④ - When will we finish
- ⑤ - Any significant results/no fan.

⑦ RWP - [Signature]

⑧ ADL [Signature]



CONFIDENTIAL-SUBJECT TO PROTECTIVE ORDER
KINZER V. REMINGTON

R2538701

8-24-81
H. STAGG

MODEL 700 17 CAL. BARREL LIFE EVALUATION

	ROUND LEVEL	ORDINANCE STEEL					AVERAGE GROUP SIZE	STAINLESS STEEL					AVERAGE GROUP SIZE
		B6291870	B6292216	B6292788	B6293660	B6291862		B6257982	B6256994	B6257672	A6861854	H6862062	
①	0-ROUNDS-AS RECD AVERAGE GROUP SIZE 3X5 SHOT GRP. VERTICAL HORIZONTAL	1.59"	1.09"	.69	.81"	.89"	1.01"	1.83"	1.20"	.84"	1.12"	1.10"	1.22"
		.66	.60	.54	.74	.58	.68	.96	.67	.73	1.15	.81	.86
		1.57	.97	.57	.57	.81	.85	1.81	1.17	.57	1.47	.73	.95
②	500-ROUNDS AVERAGE GROUP SIZE 3X5 SHOT GRP. VERTICAL HORIZONTAL	.84"	1.18"	.94"	1.06"	.76"	.96"	2.13"	1.31"	.91"	1.00"	.90"	1.25"
		.82	.57	.74	.75	.47	.70	2.00	.98	.67	.64	.80	1.00
		.57	1.07	.86	.88	.69	.75	1.15	1.09	.74	.83	.57	.94
③	1000-ROUNDS AVERAGE GROUP SIZE 3X5 SHOT GRP. VERTICAL HORIZONTAL	1.36"	1.00"	.93"	1.83"	1.55"	1.33"	1.95"	2.41"	2.78"	.88	2.60"	2.13"
		.89	.64	.76	1.27	1.27	.97	1.32	2.33	2.13	.74	2.05	1.71
		1.27	.87	.68	1.26	1.11	1.03	1.71	1.59	2.36	.77	2.14	1.71
④	1500-ROUNDS AVERAGE GROUP SIZE 3X5 SHOT GRP. VERTICAL HORIZONTAL	.88"	1.19"	1.52"	1.92"	1.16"	1.33"	2.61"	2.63"	2.29"	2.67"	2.51"	2.54"
		.59	.57	1.47	1.54	.77	.98	2.05	2.81	1.92	2.17	2.05	2.10
		.67	1.13	.96	1.16	1.03	.97	1.79	1.72	1.53	1.53	2.20	1.75
⑤	2000-ROUNDS AVERAGE GROUP SIZE 3X5 SHOT GRP. VERTICAL HORIZONTAL	1.09	1.10	.83	.96"	1.16	1.03	2.10	2.37	3.36"	2.49"	1.37	2.34
		.49	.75	.66	.63	.81	.67	1.15	1.27	1.95	1.66	.78	1.36
		1.07	.87	.77	.87	.96	.91	1.87	2.23	2.75	2.21	1.15	2.04
	NOTE #1 500 ROUND ENDURANCE CONDUCTED BETWEEN ACCURACY INTERVALS COOL EVERY 200 RDS. CLEAN BORE EVERY 1000 RDS.												
	NOTE #2 GUN # F16862009 STAINLESS BARREL PUMPED FROM 1450' 1500' 1600' 1700' 6" CENTRIC UNACCEPTABLE 1100' KIN. W.T. SIGNAT.												

8-24-81
H. STAGG

MODEL 700 17 CAL. BARREL LIFE EVALUATION

ROUND LEVEL	ORDINANCE STEEL					AVERAGE GROUP SIZE	STAINLESS STEEL					AVERAGE GROUP SIZE
	B6291870	B6292216	B6292788	B6293660	B6291862		B6257382	B6256994	B6257672	A6861854	A6862062	
① 0-ROUNDS-AS RECD AVERAGE GROUP SIZE 3X5 SHOT GRP. VERTICAL HORIZONTAL	1.59" .66 1.57	1.07" .40 .97	.69 .54 .57	.81" .74 .59	.89" .58 .81	1.01" .62 .85	1.83" .96 1.81	1.20" .67 1.17	.84" .73 .57	1.12" 1.15 1.47	1.10" .81 1.73	1.22" .86 1.95
② 500-ROUNDS AVERAGE GROUP SIZE 3X5 SHOT GPS. VERTICAL HORIZONTAL	.84" .82 .59	1.18" .57 1.07	.94" .74 1.06	1.06" .75 1.08	.76" .47 .69	.96" .70 .75	2.13" 2.00 1.45	1.31" .92 1.09	.91" .67 1.74	1.00" .64 1.33	.90" .80 1.57	1.25" 1.00 1.94
③ 1000-ROUNDS AVERAGE GROUP SIZE 3X5 SHOT GPS. VERTICAL HORIZONTAL	1.36" .89 1.87	1.00" .64 1.87	.93" .76 1.68	1.83" 1.27 1.26	1.55" 1.21 1.11	1.33" .97 1.03	1.99" 1.32 1.71	2.41" 2.33 1.59	2.78" 2.13 2.36	1.88 1.74 1.77	2.60" 2.05 2.14	2.13" 1.71 1.71
④ 1500-ROUNDS AVERAGE GROUP SIZE 3X5 SHOT GPS. VERTICAL HORIZONTAL	.88" .59 1.67	1.19" .57 1.13	1.52" 1.44 1.96	1.92" 1.54 1.16	1.16" .77 1.03	1.35" .98 1.99	2.61" 2.05 1.79	2.63" 2.81 2.72	2.29" 1.92 1.53	2.67" 2.17 1.53	2.57" 2.06 2.20	1.54" 2.10 1.95
⑤ 2000-ROUNDS AVERAGE GROUP SIZE 3X5 SHOT GPS. VERTICAL HORIZONTAL	1.09 .49 1.07	1.10 .75 1.87	.85 .46 1.77	.96" .63 1.81	1.16 .81 1.96	1.03 .67 1.91	2.10 1.15 1.87	2.37 1.27 2.23	3.36" 1.95 2.76	2.49" 1.66 2.21	1.37 .73 1.15	2.34 1.36 2.04
NOTE #1 500 ROUND ENDURANCE CONDUCTED BETWEEN ACCURACY INTERVALS COOLENERS RECORDS CLEAN BORE EVERY 1000 ROUNDS												
NOTE #2 GUN # A16862059 STAINLESS 800, PUMPED ACTION 1451. BORE 17 6.1" CENTRIC LIAISON 1844 11446111 #77 STINKIT												

8-24-81
H-STAGG

MODEL 700 17 CAL. BARREL LIFE EVALUATION

ROUND LEVEL	ORDINANCE STEEL				STAINLESS STEEL				AVERAGE GROUP SIZE	AVERAGE GROUP SIZE
	84291870	84292216	84292788	84293660	86257308	86256994	86257172	86258062		
① 0-ROUNDS AS REC'D AVERAGE GROUP SIZE 3X5 SHOT G.P.S. VERTICAL HORIZONTAL	159"	107"	69"	81"	103"	120"	84"	110"	122"	122"
② 500-ROUNDS AVERAGE GROUP SIZE 3X5 SHOT G.P.S. VERTICAL HORIZONTAL	84"	118"	94"	106"	213"	131"	91"	90"	125"	125"
③ 1000-ROUNDS AVERAGE GROUP SIZE 3X5 SHOT G.P.S. VERTICAL HORIZONTAL	136"	100"	93"	103"	199"	241"	278"	260"	213"	213"
④ 1500-ROUNDS AVERAGE GROUP SIZE 3X5 SHOT G.P.S. VERTICAL HORIZONTAL	88"	119"	152"	192"	241"	263"	289"	251"	154"	154"
⑤ 2000-ROUNDS AVERAGE GROUP SIZE 3X5 SHOT G.P.S. VERTICAL HORIZONTAL	109"	110"	83"	96"	240"	237"	336"	137"	234"	234"
NOTE #1 500 ROUND ENDURANCE CONDUCTED BETWEEN ACCURACY INTERVALS COOL DOWN PERIODS CLEAN BORE EVERY 100 ROUNDS										
NOTE #2 GUN # F188009 STAINLESS BARREL PULLED FOR TEST, GROUP NO C10 CLEANING, UNACCEPTABLE 1146 KINZ V 1977 SINKY										

PREVIOUS ROUNDS 1500	DATE 10-8-81		MODEL 700	Cal 17	GUN NO. A686202L	Total Rds. Fired		Total Malfunctions		Rate													
	Description of Test		Endurance		SPINLESS		BRL																
AMMUNITION	Shooter	No. of Rounds	MALFUNCTIONS										REMARKS										
			Firing	Extraction	Ejection	Trapped shell	Don't Lock Up	Don't Lock Open	High	Low	Right	Shell Stems Mag		Bolt Overrides	Bolt Catches	Follower	Shell Jumps Mag	Action Blinds	Don't Blow Back	Follower Blinds	Breakages	Adjustments	
100	AL 20	20																					
	AL 20	20																					
	AL 20	20																					
	AL 20	20																					
	AL 20	20																					
	AL 20	20																					
	AL 20	20																					
	AL 20	20																					
	AL 20	20																					
	AL 20	20																					
200	AL 20	20																					
	AL 20	20																					
	AL 20	20																					
	AL 20	20																					
300	AL 20	20																					
	AL 20	20																					

PREVIOUS ROUNDS 1800		DATE 10 8 81		MODEL 700		CAL 17		GUN NO. AC 86 2028	
AMMUNITION		Description of Test		Caldwell		Hankin 860		Total Rds. Fired	
		Rate				Total Malfunctions			
		Shooter		No. of Rounds		MALFUNCTIONS		REMARKS	
		Firing		Extraction		Ejection		Trapped Shell	
		Don't Lock Up		Don't Lock Open		High		Stem Chamber	
		Low		Right		Shell Stems Mag		Bolt Override	
		Bolt Catches Follower		Shell Jumps Mag		Action Binds		Don't Blow Back	
		Follower Binds		Breakages		Adjustments			
1900		AC 20		AC 20		AC 20		AC 20	
		AC 20		AC 20		AC 20		AC 20	
		AC 20		AC 20		AC 20		AC 20	
2005		AC 20		AC 20		AC 20		AC 20	

[illegible]

[illegible]

PREVIOUS ROUNDS	AMMUNITION	Shooter	No. of Rounds	MALFUNCTIONS												REMARKS							
				Firing	Extraction	Ejection	Trapped shell	Don't Lock Up	Don't Lock Open	High	Low	Right	Shell Stems Mag	Bolt Overrides	Bolt Catches		Follower	Shell Jumps Mag	Action Blinds	Don't Blow Back	Follower Blinds	Breakages	Adjustments
1500		AL 20																					
		AL 20																					
		AL 20																					
		AL 20																					
		AL 20																					
		AL 20																					
		AL 20																					
		AL 20																					
		AL 20																					
		AL 20																					
1600		AL 20																					
		AL 20																					
		AL 20																					
		AL 20																					
		AL 20																					
1700		AL 20																					
		AL 20																					
		AL 20																					
		AL 20																					
		AL 20																					
1800		AL 20																					
		AL 20																					
		AL 20																					
		AL 20																					
		AL 20																					

GUN NO. B6257382
 Total Rds. Fired _____
 Total Malfunctions _____
 Rate _____

DATE 10-9-81 MODEL 700 Cal 17
 Description of Test Endurance STAINLESS BBL.

MODEL 700 17 CAL. BARREL LIFE EVALUATION

7-1-80
HISTASH

ORDINANCE			STAINLESS		
0-ROUNDS					
3X5 SHOT GPs.			GUN# B6291870		
GP#1	SIZE	1.0		1.40	
	HOR.	1.0		1.38	
	VERT.	.44		.88	
GP#2	SIZE	1.84		1.40	
	HOR.	1.80		1.40	
	VERT.	.80		.72	
GP#3	SIZE	1.92		2.70	
	HOR.	1.90		2.66	
	VERT.	.74		1.28	
500 ROUNDS					
ORDINANCE			STAINLESS		
3X5 SHOT GPs.					
GP#1	SIZE	1.12		.94	
	HOR.	.50		.92	
	VERT.	1.12		.72	
GP#2	SIZE	1.40		3.12	
	HOR.	1.38		1.72	
	VERT.	.34		3.10	
GP#3	SIZE	1.0		2.34	
	HOR.	.90		1.72	
	VERT.	1.0		2.18	

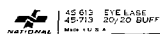
ORDINANCE			STAINLESS		
1000 ROUNDS					
3X5 SHOT GPs.			GUN# B6291870		
GP#1	SIZE	1.86		2.48	
	HOR.	1.84		2.12	
	VERT.	1.34		1.80	
GP#2	SIZE	.98		2.34	
	HOR.	.86		2.12	
	VERT.	.56		1.34	
GP#3	SIZE	1.20		1.14	
	HOR.	1.12		.90	
	VERT.	.78		.82	
1500 ROUNDS					
ORDINANCE			STAINLESS		
3X5 SHOT GPs.					
GP#1	SIZE	.90		1.58	
	HOR.	.88		1.58	
	VERT.	.22		1.22	
GP#2	SIZE	1.08		2.22	
	HOR.	.86		.84	
	VERT.	.92		2.60	
GP#3	SIZE	.66		3.52	
	HOR.	.26		2.84	
	VERT.	.84		2.32	

MODEL 700 17 CAL. BARREL LIFE EVALUATION

8-24-81
H. STAGG

ROUND LEVEL	1	2	3	4	5
	B6291870	B6292216	B6292788	B6293660	B6291862
① 0-ROUNDS-AS RECD					
AVERAGE GROUP SIZE	1.59"	1.07"	.69	.81"	.89"
3X5 SHOT GRP.					
VERTICAL	.66	.60	.54	.74	.58
HORIZONTAL	1.57	.97	.37	.59	.81
② 500-ROUNDS					
AVERAGE GROUP SIZE	.84"	1.18"	.94"	1.06"	.76"
3X5 SHOT GRP.					
VERTICAL	.82	.57	.74	.75	.47
HORIZONTAL	.59	1.07	.86	.88	.69
③ 1000-ROUNDS					
AVERAGE GROUP SIZE	1.36"	1.00"	.93"	1.83"	1.55"
3X5 SHOT GRP.					
VERTICAL	.89	.64	.76	1.27	1.27
HORIZONTAL	1.84	.87	.68	1.26	1.11
④ 1500-ROUNDS					
AVERAGE GROUP SIZE	.88"	1.19"	1.52"	1.92"	1.16"
3X5 SHOT GRP.					
VERTICAL	.59	.57	1.41	1.54	.77
HORIZONTAL	.67	1.13	.96	1.16	1.03
⑤ 2000-ROUNDS					
AVERAGE GROUP SIZE	1.09	1.10	.83"	.96"	1.16
3X5 SHOT GRP.					
VERTICAL	.49	.75	.66	.63	.81
HORIZONTAL	1.07	.87	.77	.87	.96
NOTE #1					
500 ROUND ENDURANCE CONDUCTED					
BETWEEN ACCURACY INTERVALS					
COOL EVERY 20 RDS					
CLEAN BORE EVERY 100 RDS					

AVERAGE GROUP SIZE	8	9	10	11	12	AVERAGE GROUP SIZE
	B6257382	B6256994	B6257672	A6861854	A6862062	
① 0-ROUNDS-AS RECD						
AVERAGE GROUP SIZE	1.01"	1.83"	1.20"	.84"	1.12"	1.10"
3X5 SHOT GRP.						
VERTICAL	.62	.96	.67	.73	1.15	.81
HORIZONTAL	.85	1.81	1.17	.57	.47	.73
② 500-ROUNDS						
AVERAGE GROUP SIZE	.96"	2.13"	1.31"	.91"	1.00"	.90"
3X5 SHOT GRP.						
VERTICAL	.70	2.00	.90	.67	.64	.80
HORIZONTAL	.75	1.45	1.09	.74	.83	.57
③ 1000-ROUNDS						
AVERAGE GROUP SIZE	1.33"	1.99"	2.41"	2.78"	2.88	2.60"
3X5 SHOT GRP.						
VERTICAL	.97	1.32	2.33	2.13	.74	2.05
HORIZONTAL	1.03	1.71	1.59	2.36	.77	2.14
④ 1500-ROUNDS						
AVERAGE GROUP SIZE	1.33"	2.61"	2.63"	2.29"	2.67"	2.51"
3X5 SHOT GRP.						
VERTICAL	.98	2.05	2.21	1.92	2.17	2.05
HORIZONTAL	.99	1.79	1.72	1.58	1.53	2.20
⑤ 2000-ROUNDS						
AVERAGE GROUP SIZE	1.03	2.10	2.37	3.36"	2.49"	1.37
3X5 SHOT GRP.						
VERTICAL	.67	1.15	1.27	1.95	1.66	.78
HORIZONTAL	.91	1.87	2.23	2.75	2.21	1.15
NOTE #2						
GUN# A6862009 STAINLESS BBL						
PULLED FROM TEST. BORE NOT						
CONCENTRIC, UNACCEPTABLE						
ACCURACY AT START						

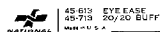


MODEL 700 17.CAL. BARREL LIFE EVALUATION

7-1-81
H. STAGG

		1	2	3	4	5
		ORDINANCE		STAINLESS		
		0-ROUNDS				
3X5 SHOT GPS.		GUN#	B6291862	GUN#	A6862062	
GP #1	SIZE	70		140		
	HOR.	68		130		
	VERT.	50		92		
GP #2	SIZE	84				
	HOR.	68				
	VERT.	56				
GP #3	SIZE	114				
	HOR.	108				
	VERT.	62				
		500-ROUNDS				
3X5 SHOT GPS.		ORDINANCE		STAINLESS		
GP #1	SIZE	70		98		
	HOR.	66		54		
	VERT.	60		90		
GP #2	SIZE	64		96		
	HOR.	50		66		
	VERT.	56		76		
GP #3	SIZE	94		76		
	HOR.	92		50		
	VERT.	24		74		

		6	7	8	9	10	11	12	13
		ORDINANCE		STAINLESS					
		1000 ROUNDS							
3X5 SHOT GPS.		GUN#	B6291862	GUN#	A6862062				
GP #1	SIZE	142				248			
	HOR.	136				218			
	VERT.	122				244			
GP #2	SIZE	132				242			
	HOR.	132				194			
	VERT.	86				148			
GP #3	SIZE	172				290			
	HOR.	66				230			
	VERT.	172				242			
		1500 ROUNDS							
3X5 SHOT GPS.		ORDINANCE		STAINLESS					
GP #1	SIZE	150				256			
	HOR.	148				252			
	VERT.	108				210			
GP #2	SIZE	76				186			
	HOR.	40				176			
	VERT.	72				178			
GP #3	SIZE	122				310			
	HOR.	120				246			
	VERT.	52				194			



MODEL 700 17 CAL. BARREL LIFE EVALUATION

7-1-81
H. STAGG

		1	2	3	4	5
		ORDINANCE		STAINLESS		
		0-ROUNDS				
3X5 SHOT GPS.		GUN #	6293660	A6861854		
GP#1	SIZE	7H		1.28		
	HOR.	44		1.20		
	VERT.	68		.34		
GP#2	SIZE	80		1.08		
	HOR.	52		1.04		
	VERT.	66		.74		
GP#3	SIZE	88		1.20		
	HOR.	80		1.20		
	VERT.	88		.32		
		500 ROUNDS				
3X5 SHOT GPS.		ORDINANCE		STAINLESS		
GP#1	SIZE	116		1.48		
	HOR.	112		1.46		
	VERT.	44		.52		
GP#2	SIZE	80		.60		
	HOR.	80		.46		
	VERT.	62		.52		
GP#3	SIZE	122		.92		
	HOR.	72		.56		
	VERT.	120		.88		

		6	7	8	9	10	11	12	13
		ORDINANCE		STAINLESS					
		1000 ROUNDS							
3X5 SHOT GPS.		GUN #	86293640	A6861854					
GP#1	SIZE	210		1.48					
	HOR.	1.96		.46					
	VERT.	.96		.20					
GP#2	SIZE	1.98		.60					
	HOR.	1.22		.48					
	VERT.	1.60		.58					
GP#3	SIZE	1.40		1.56					
	HOR.	.60		1.38					
	VERT.	1.26		1.44					
		1500 ROUNDS							
3X5 SHOT GPS.		ORDINANCE		STAINLESS					
GP#1	SIZE	252		2.38					
	HOR.	1.18		2.20					
	VERT.	2.22		.94					
GP#2	SIZE	1.38		3.62					
	HOR.	.46		1.60					
	VERT.	1.38		3.60					
GP#3	SIZE	1.86		2.02					
	HOR.	1.84		.78					
	VERT.	1.02		1.96					

MODEL 700 17 CAL BR REL LIFE EVALUATION

7-1-81
HSTAGG

		ORDINANCE		STAINLESS	
		O-ROUNDS			
3X5 SHOT GPS.		GUN#	B-6292216	B6256994	
GP#1	SIZE	1.26		1.40	
	HOR.	1.24		1.38	
	VERT.	.44		.66	
GP#2	SIZE	.70		.84	
	HOR.	.64		.82	
	VERT.	.68		.58	
GP#3	SIZE	1.26		1.36	
	HOR.	1.02		1.30	
	VERT.	.68		.78	
		500 ROUNDS			
3X5 SHOT GPS.		ORDINANCE		STAINLESS	
		GUN#			
GP#1	SIZE	.92		1.58	
	HOR.	.82		1.30	
	VERT.	.62		1.14	
GP#2	SIZE	1.50		1.26	
	HOR.	1.48		1.12	
	VERT.	.36		.78	
GP#3	SIZE	1.12		1.10	
	HOR.	.92		.86	
	VERT.	.74		.78	

		ORDINANCE		STAINLESS	
		1000 ROUNDS			
3X5 SHOT GPS.		GUN#	B6292216	B6256994	
GP#1	SIZE	.72		1.38	
	HOR.	.72		1.08	
	VERT.	.28		1.28	
GP#2	SIZE	1.30		2.54	
	HOR.	.90		1.46	
	VERT.	1.30		2.50	
GP#3	SIZE	.98		3.32	
	HOR.	.98		2.22	
	VERT.	.34		3.22	
		1500 ROUNDS			
3X5 SHOT GPS.		ORDINANCE		STAINLESS	
		GUN#			
GP#1	SIZE	1.40		2.42	
	HOR.	1.34		1.50	
	VERT.	.44		1.86	
GP#2	SIZE	.88		2.26	
	HOR.	.80		1.04	
	VERT.	.64		2.14	
GP#3	SIZE	1.28		3.22	
	HOR.	1.24		2.62	
	VERT.	.64		2.62	



MODEL-700 17.CAL. BARREL LIFE EVALUATION

7-1-81
H. STAGG

ORDINANCE			STAINLESS		
0-ROUNDS			1000 ROUNDS		
3X5 SHOT GPS.			3X5 SHOT GPS.		
GUN# B6292788			GUN# B6257672		
GP#1	SIZE	.30	GP#1	SIZE	.76
	HOR.	.24		HOR.	.50
	VERT.	.30		VERT.	.74
GP#2	SIZE	.70	GP#2	SIZE	.52
	HOR.	.68		HOR.	.30
	VERT.	.48		VERT.	.44
GP#3	SIZE	.98	GP#3	SIZE	1.24
	HOR.	.72		HOR.	.92
	VERT.	.94		VERT.	1.02
3X5 SHOT GPS.			3X5 SHOT GPS.		
500 ROUNDS			1500 ROUNDS		
ORDINANCE			STAINLESS		
GP#1	SIZE	1.32	GP#1	SIZE	.58
	HOR.	1.16		HOR.	.38
	VERT.	.78		VERT.	.56
GP#2	SIZE	.74	GP#2	SIZE	.62
	HOR.	.70		HOR.	.44
	VERT.	.74		VERT.	.60
GP#3	SIZE	.76	GP#3	SIZE	1.52
	HOR.	.72		HOR.	1.50
	VERT.	.70		VERT.	.86

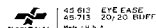
ORDINANCE			STAINLESS		
1000 ROUNDS			1500 ROUNDS		
3X5 SHOT GPS.			3X5 SHOT GPS.		
GUN# B6292788			GUN# B6257672		
GP#1	SIZE	1.22	GP#1	SIZE	2.34
	HOR.	.56		HOR.	2.24
	VERT.	1.18		VERT.	1.56
GP#2	SIZE	.76	GP#2	SIZE	2.96
	HOR.	.74		HOR.	2.0
	VERT.	.46		VERT.	2.38
GP#3	SIZE	.80	GP#3	SIZE	3.04
	HOR.	.74		HOR.	2.84
	VERT.	.64		VERT.	2.44
3X5 SHOT GPS.			3X5 SHOT GPS.		
ORDINANCE			STAINLESS		
GP#1	SIZE	1.38	GP#1	SIZE	2.20
	HOR.	.74		HOR.	2.10
	VERT.	1.38		VERT.	1.28
GP#2	SIZE	1.70	GP#2	SIZE	2.46
	HOR.	1.30		HOR.	2.18
	VERT.	1.38		VERT.	2.42
GP#3	SIZE	1.48	GP#3	SIZE	2.20
	HOR.	.86		HOR.	1.40
	VERT.	1.48		VERT.	2.06

MODEL 700 17 CAL BARREL LIFE EVALUATION

7-1-81
H. STAGG

ORDINANCE		
2000 ROUNDS		
GUN # B6292788		
3X5 SHOT GPS.		
GP#1	SIZE	82
	HOR.	68
	VERT.	78
GP#2	SIZE	94
	HOR.	90
	VERT.	48
GP#3	SIZE	74
	HOR.	74
	VERT.	70
3X5 SHOT GPS.		
GUN # B6293660		
GP#1	SIZE	108
	HOR.	106
	VERT.	76
GP#2	SIZE	84
	HOR.	82
	VERT.	32
GP#3	SIZE	96
	HOR.	72
	VERT.	82

STAINLESS		
2000 ROUNDS		
GUN # B6257672		
3X5 SHOT GPS.		
GP#1	SIZE	326
	HOR.	234
	VERT.	236
GP#2	SIZE	380
	HOR.	290
	VERT.	270
GP#3	SIZE	302
	HOR.	300
	VERT.	278
GUN # A6861854		
GP#1	SIZE	174
	HOR.	168
	VERT.	148
GP#2	SIZE	282
	HOR.	276
	VERT.	142
GP#3	SIZE	292
	HOR.	230
	VERT.	208

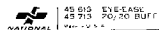


MODEL 700 17 CAL. BARREL LIFE EVALUATION

10/22/81
H. STAGG

ORDINANCE			2000 ROUNDS		
GUN # B6291870					
3X5 SHOT GPS.					
GP#1	SIZE	98			
	HOR.	96			
	VERT.	64			
GP#2	SIZE	88			
	HOR.	86			
	VERT.	26			
GP#3	SIZE	140			
	HOR.	140			
	VERT.	56			
3X5 SHOT GPS.			GUN# B6292216		
GP#1	SIZE	128			
	HOR.	108			
	VERT.	78			
GP#2	SIZE	132			
	HOR.	114			
	VERT.	82			
GP#3	SIZE	72			
	HOR.	40			
	VERT.	64			

STAINLESS			2000 ROUNDS		
GUN# B6257382					
3X5 SHOT GPS.					
GP#1	SIZE	202			
	HOR.	166			
	VERT.	168			
GP#2	SIZE	138			
	HOR.	138			
	VERT.	72			
GP#3	SIZE	292			
	HOR.	256			
	VERT.	104			
GUN# B6256994					
GP#1	SIZE	216			
	HOR.	192			
	VERT.	96			
GP#2	SIZE	298			
	HOR.	296			
	VERT.	172			
GP#3	SIZE	198			
	HOR.	180			
	VERT.	112			



MODEL 700 17 CAL. BARREL LIFE EVALUATION

				1	2	3	4	5
					ORDINANCE			
					2000 ROUNDS			
					GUN# B6291862			
					3X5 SHOT GPS			
1								
2		GP#1	SIZE		1.28			
3			HOR.		1.10			
4			VERT.		1.12			
5								
6								
7		GP#2	SIZE		1.66			
8			HOR.		1.46			
9			VERT.		.80			
10								
11								
12		GP#3	SIZE		.54			
13			HOR.		.32			
14			VERT.		.52			
15								
16								
17								
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38								
39								
40								

6	7	8	9	10	11	12	13
STAINLESS							
2000 ROUNDS							
GUN# A6862062							
3X5 SHOT GPS.							
GP#1	SIZE	1.30					
	HOR.	1.28					
	VERT.	.94					
GP#2	SIZE	1.92					
	HOR.	1.90					
	VERT.	.52					
GP#3	SIZE	.88					
	HOR.	.28					
	VERT.	.88					

Model 700 ~~3006~~ 17CAL. ORD. STEEL.

12-80

~~No Room Based Evaluation~~

Measurement Data Sheet.

DATE: 6-23-81

ROUND LEVEL: 1000 } Gun # B6293660

Headspace: - - - - -

Visual Inspection: tearing/fouling (bore scope)

a. Throat area: THROAT SHOWS EROSION
AND FOULING.

b. 8"-10" from muzzle:

Bore & Groove Meas.	Air + plug gages.	6" increments
Bore	12"	muzzle
Bore - .1691	.1685	.1686
Groove - .1731	.1716	.1720

Accuracy: 100yd. bench rest 10x scope.

3 x 5 shot groups measd. center to center

Ammo: Rem. 170 gr. P.S.P. - C.L.

Group #1	Group #2	Group #3
Size - 210	Size - 198	Size - 140 Avg - 1826
Hor. - 196	Hor. - 122	Hor. - 60 1.26
Vert. - 96	Vert. - 160	Vert. - 126 1.27

Cool between groups and shoot warmer
shot prior to group.

Model 700 ~~30.06 cal.~~ 17 CAL. ORD STEEL.

12-50

~~No Rem-Barnet Evaluation~~

~~f. #2~~

Measurement Data Sheet.

DATE: 6-30-81 - - -

ROUND LEVEL: - 1500 - - - -

} Gun # - B6293660. - - -

Headspace: - - - - -

Visual Inspection: tearing/fouling (bore scope)

a. Throat area: - THROAT AREA ERODED.

BURNT OR SCORCHED APPEARANCE

b 8"-10" from muzzle:

Bore & Groove Meas.		Air + plug gages.		6" increments
Bore	6"	12"	18"	muzzle
Bore.-	.1693	.1689	.1686	.1687
Groove.	.1729	.1721	.1718	.1720

Accuracy: 100 yd. bench rest 10x scope.

3 x 5 shot groups measd. Center to center

Ammo: Rem. 170 gr. P.S.P. - C.L.

Group #1

Size - 252

Hor. - 118

Vert - 222

Group #2

Size - 138

Hor - 46

Vert. 138

Group #3

Size - 186 Avg. 1.92

Hor. - 184 1.16

Vert. - 102 1.54

Cool between groups and shoot warmer shot prior to group.

Model 700 ~~30.06~~ ent. 17 CAL. ORD STEEL
No Ream Barrel Evaluation
Measurement Data Sheet.

12-80

f. 42

DATE: 7-27-81. - - -

ROUND LEVEL: 2000 - - - - } Gun # B6293660. - - -

Headspace: - - - - -

Visual Inspection: tearing / fouling (bore scope)

a. Throat area:

THROAT SHOWS EXCESSIVE EROSION

b. 8"-10" from muzzle:

Bore & Groove Meas.	Air + plug gages.	6" increments
Breach 6" 12" 18" muzzle		
Bore - .1695 .1690 .1685 .1685 .1687		
Groove - .1731 .1720 .1717 .1721 .1721.		

Accuracy: 100yd. bench rest 10x scope.

3 x 5 shot groups measd. Center to center

Ammo: Rem. 190 gr. P.S.P. - C.L.

Group #1	Group #2	Group #3
Size - <u>1.08</u>	Size - .84	Size - .96 Avg. .96
Hor. - <u>1.06</u>	Hor. - .82	Hor. - .72 .87
Vert - .76	Vert. .32	Vert. - .82 .63

Cool between groups and shoot warmer
shot prior to group.

Model 700 ~~30.06 cal~~ 17 CAL. ORD STEEL

12-80

~~Measurement Data Sheet~~

Measurement Data Sheet.

DATE: 5-22-81 - - - -

ROUND LEVEL: - 0 - - - - - } Gun # B6291870 - - -

Headspace: - - - - -

Visual Inspection: tearing/fouling (bore scope)

a. Throat area: FOUR(4) LANDS EXTEND BACK INTO THROAT

b. 8"-10" from muzzle:

Bore & Groove Meas.	Air + plug gages.	6" increments
Breach 6" 12" 18" muzzle		
Bore - .1691 .1688 .1687 .1685 .1686		
Groove - .1724 .1723 .1721 .1721 .1721		

Accuracy: 100yd. bench rest 10x scope.

3 x 5 shot groups measd. Center to center

Ammo: Rem. 190 gr. P.S.P. - C.L.

Group #1	Group #2	Group #3
Size - 1/2	Size - 1/84	Size - 1/92 Avg 1/586
Hor. - 1/2	Hor. - 1/80	Hor. - 1/90 1/57
Vert. - 1/4	Vert. - .80	Vert. - .74 .66

Cool between groups and shoot warmer shot prior to group.

2ND ACCURACY TEST

Model 700 ~~30.06~~ CAL. 17 CAL. BRD. STEEL

12-80

~~No Rem. Band Evaluation~~

f. H. J.

Measurement Data Sheet.

DATE: 6-11-81 - - - -

ROUND LEVEL: 500 - - - - } Gun # B6291870 - - - -

Headspace: - - - - -

Visual Inspection: tearing / fouling (bore scope)

a. Throat area: THREE (3) LANDS EXTEND BACK -
THROAT EROSION APPEARING.

b. 8"-10" from muzzle:

Bore & Groove Meas.		Air & plug gages.		6" increments
Bore	6"	12"	18"	muzzle
Bore - .1689	.1687	.1684	.1685	.1686
Groove - .1723	.1722	.1720	.1720	.1720

Accuracy: 100 yd. bench rest 10x scope.

3 x 5 shot groups nearid. Center to center

Ammo: Rem. 170 gr P.S.P. - C.L.

Group #1

Group #2

Group #3

Size - 1/12

Size - 1/40

Size - 1/2 Avg - .84

Hor. - .50

Hor. - .38

Hor. - .90 .59

Vert - 1.12

Vert. .34

Vert. - 1/2 .82

Cool between groups and shoot warmer shot prior to group.

Model 700 ~~30.06 cal.~~ .17 CAL. .ORD STEEL 12-80~~No. 7000 30.06 cal. Evaluation~~
Measurement Data Sheet.

DATE: 6-23-81 - - -

ROUND LEVEL: -1000 - - - - } Gun # B 629 1870 - - -

Headspace: - - - - -

Visual Inspection: tearing/fouling (bore scope)

a. Throat area: THROAT SHOWS EROSION-

b. 8"-10" from muzzle:

Bore & Groove Meas.	Air + plug gages.	6" increments
Breach 6"	12"	18" muzzle
L.e. - .1692	.1688	.1683
Groove .1726	.1721	.1715
		.1718
		.1720

Accuracy: 100yd. bench rest 10x scope.

3 x 5 shot groups measd. Center to center

Ammo: Rem. 170 gr. P.S.P. - C.L.

Group #1

Size - 1.86Hor. - 1.84Vert. - 1.34

Group #2

Size - .98

Hor. - .86

Vert. .56

Group #3

Size - 1.20 Avg. 1.346Hor. - 1.12 1.27

Vert. - .78 .89

Cool between groups and shoot warmer shot prior to group.

Model 700 ~~30.06 cal.~~ 17 CAL. BRD. STEEL. 12-80
No Ream Barrel Evaluation
Measurement Data Sheet. *f. H. J.*

DATE: 7-27-81
ROUND LEVEL: 1500 } Gun # B 6291870
Headspace: -----
Visual Inspection: tearing/fouling (bore scope)
a. Throat area:
THROAT SHOWS EXCESSIVE EROSION
b. 8"-10" from muzzle:

Bore & Groove Meas.		Air + plug gages.	6" increments
Breach	6"	12"	18" muzzle
Bore-.1695	.1687	.1682	.1682 .1686
Groove-.1729	.1721	.1716	.1719 .1720

Accuracy: 100yd. bench rest 10x scope.
3x5 shot groups measd. Center to center
Ammo: Rem. 180 gr. P.S.P.-C.L.

Group #1	Group #2	Group #3
Size - .90	Size - 1.08	Size - .66 AVG-.88
Hor. - .88	Hor. - .86	Hor. - .26 .67
Vert. - .22	Vert. - .92	Vert. - .64 .59

Cool between groups and shoot warmer
shot prior to group.

Model 700 ~~30.06~~ ent. .17 CAL. ORD. STEEL.

12-80

~~No Rem Barret Evaluation~~

Measurement Data Sheet.

DATE: 5-22-81

ROUND LEVEL: 0 } Gun # B-6293660

Headspace: - - - - -

Visual Inspection: tearing/fouling (bore scope)

a. Throat area: ^{TWO} LANDS EXTEND BACK INTO THROAT.

b. 8"-10" from muzzle:

Bore & Groove Meas.	Air & plug gages.	6" increments
Bore 6"	12" 18"	muzzle
Bore - .1690	.1688	.1686
Groove .1725	.1720	.1722

Accuracy: 100yd. bench rest 10x scope.

3 x 5 shot groups meas'd. Center to center

Ammo: Rem. 180 gr. P.S.P. - C.L.

Group #1	Group #2	Group #3
Size - .74	Size - .80	Size - .88 Avg. .806
Hor. - .44	Hor. - .52	Hor. - .80 .59
Vert. - .68	Vert. - .66	Vert. - .88 .74

Cool between groups and shoot warmer shot prior to group.

2ND ACCURACY TEST

Model 700 ~~30.06~~ .17 CAL. ORD. STEEL

12-80

~~No Room for Evaluation~~

Measurement Data Sheet.

DATE: 6-11-81 - - - -

ROUND LEVEL: 500 - - - - } Gun # B6293660 - - -

Headspace: - - - - -

Visual Inspection: tearing / fouling (bore scope)

a. Throat area: FOUR (4) LANDS EXTEND BACK INTO THROAT
THROAT EROSION -

b. 8"-10" from muzzle:

Bore & Groove Meas.	Air + plug gages.			6" increments
Breach	6"	12"	18"	muzzle
Bore - .1691	.1688	.1685	.1686	.1686
Groove .1728	.1721	.1719	.1719	.1720

Accuracy: 100yd. bench rest 10x scope.

3 x 5 shot groups measd. Center to center

Ammo: Rem. 190 gr. P.S.P. - C.L.

Group #1

Size - 1/16

Hor. - 1/12

Vert - 44

Group #2

Size - .80

Hor - .80

Vert. .62

Group #3

Size - 1/22 AUG 1986

Hor. - .72 .88

Vert. - 1/20 .75

Cool between groups and shoot warmer
shot prior to group.

Model 700 ~~30.06 cal.~~ .17 CAL. ORD. STEEL.
~~No Room Based Evaluation~~
Measurement Data Sheet.

12-80
J. H. J.

DATE: 5-22-81 - - -

ROUND LEVEL: - 0 - - - - - } Gun # B6292216 - - -

Headspace: - - - - -

Visual Inspection: tearing/fouling (bore scope)

a. Throat area: THREE (3) LAND EXTEND INTO THROAT.

b. 8"-10" from muzzle:

Bore & Groove Meas.		Air + plug gages.		6" increments
Breach	6"	12"	18"	muzzle
Bore -	.1693	.1689	.1688	.1686
Groove -	.1722	.1720	.1720	.1720

Accuracy: 100yd. bench rest 10x scope.

3 x 5 shot groups measd. Center to center

Ammo: Rem. 170 gr. P.S.P. - C.L.

Group #1

Size - 1.26

Hor. - 1.24

Vert. - .44

Group #2

Size - .78

Hor. - .64

Vert. - .68

Group #3

Size - 1.26 Avg. 1.066

Hor. - 1.03 .97

Vert. - .68 .60

Cool between groups and shoot warmer
(shot prior to group.

2ND ACCURACY TEST.

Model 700 ~~30.06 cal.~~ .17 CAL. ORD. STEEL
~~No Room Barrel Evaluation~~
 Measurement Data Sheet.

12-80
 J. H. J.

DATE: 6-11-81
 ROUND LEVEL: 500 } Gun # B6292216
 Headspace: -----
 Visual Inspection: tearing / fouling (bore scope)
 a. Throat area:
 VERY HEAVY THROAT EROSION
 b. 8"-10" from muzzle:

Bore & Groove Meas.	Air & plug gages.	6" increments
Breach 6"	12"	18" muzzle
Bore - .1693	.1683	.1682
Groove - .1726	.1721	.1719
	.1685	.1686
	.1719	.1719

Accuracy: 100yd. bench rest 10x scope.
 3 x 5 shot groups measd. Center to center
 Ammo: Rem. 190 gr. P.S.P. - C.L.

Group #1	Group #2	Group #3
Size - .92	Size - 1.50	Size - 1.12 Avg: 1.28
Hor. - .82	Hor. - 1.48	Hor. - .92 1.07
Vert. - .62	Vert. - .36	Vert. - .74 .57

Cool between groups and shoot warmer
 shot prior to group.

Model 700 ~~2001~~ 17 CAL. ORD STEEL

12-80

~~Remington-Union Evaluation~~
Measurement Data Sheet.

J. H. J.

DATE: 6-23-81

ROUND LEVEL: 1000 } Gun # B-6292216

Headspace: - - - - -

Visual Inspection: tearing/fouling (bore scope)

a. Throat area: FOULING IN THROAT

THROAT ERODED.

b. 8"-10" from muzzle:

Bore & Groove Meas.	Air & plug gages.	6" increments
Breach 6"	12"	18" muzzle
Bore - .1691	.1683	.1685
Groove .1726	.1716	.1719

Accuracy: 100yd. bench rest 10x scope.

3 x 5 shot groups measd. center to center

Ammo: Rem. 190 gr. P.S.P. - C.L.

Group #1	Group #2	Group #3
Size - .72	Size - 1.30	Size - .98 Avg 1.2
Hor. - .72	Hor. - .90	Hor. - .98 .87
Vert. - .28	Vert. - 1.20	Vert. - .34 .64

Cool between groups and shoot warmer shot prior to group.

Model 700 ~~30.06 cal~~ 17 CAL. .ORD STEEL
No Rem Barrel Evaluation
Measurement Data Sheet.

12-80

f. H. J.

DATE: 7-27-81 - - -

ROUND LEVEL: 1500 - - - - - } Gun # B6292216 - - -

Headspace: - - - - -

Visual Inspection: tearing/fouling (bore scope)

a. Throat area: DARK OR BURNED AREA.

THROAT ERODED.

b. 8"-10" from muzzle:

Bore & Groove Meas.	Air + plug gages.	6" increments
Breach 6" 12" 18" muzzle		
Bore - .1694 .1690	.1686 .1684	.1686
Groove - .1729 .1722	.1715 .1719	.1719.

Accuracy: 100yd. bench rest 10x scope.

3 x 5 shot groups measd. Center to center

Ammo: Rem. 170 gr. P.S.P. - C.L.

Group #1	Group #2	Group #3
Size - .40	Size - .88	Size - 1.22 Avg - 1.86
Hor. - .34	Hor. - .80	Hor. - 1.24 1.13
Vert. - .44	Vert. - .64	Vert. - .64 .57

Cool between groups and shoot warmer
shot prior to group.

Model 700 ~~30.06~~ 17CAL. ORD, STEEL.

12-80

~~No Room Barrels Evaluation~~

Measurement Data Sheet.

DATE: 5-22-81 - - -

ROUND LEVEL: 0 - - - - - } Gun # B6291862 - - -

Headspace: - - - - -

Visual Inspection: tearing/fouling (bore scope)

a. Throat area: THREE (3) LANDS EXTEND BACK INTO THROAT

b. 8"-10" from muzzle:

Bore & Groove Meas.	Air & plug gages.	6" increments
Borech 6"	12"	18" muzzle
Bore - .1693	.1688	.1685
Groove - .1721	.1719	.1720

Accuracy: 100yd. bench rest 10x scope.

3 x 5 shot groups measd. Center to center

Ammo: Rem. 190 gr. P.S.P. - C.L.

Group #1	Group #2	Group #3
Size - .70	Size - .84	Size - 1.14 Aug. 893
Hor. - .68	Hor. - .68	Hor. - 1.08 .81
Vert. - .50	Vert. - .56	Vert. - .62 .56

Cool between groups and shoot warmer shot prior to group.

2ND ACCURACY TEST

Model 700 ~~30.06 cal.~~ .17 CAL DRD STEEL

12-80

f.42g

Measurement Data Sheet.

DATE: 6-16-81 - - -

ROUND LEVEL: 500 - - - - - } Gun # B6291862 - - -

Headspace: - - - - -

Visual Inspection: tearing/fouling (bore scope)

a. Throat area: THREE (3) LANDS EXTEND BACK.

THROAT EROSION - APPEARING.

b. 8"-10" from muzzle:

Bore & Groove Meas.	Air + plug gages.	6" increments
Bore - 6"	12" 18"	muzzle
Bore - .1692 .1689	.1686 .1685	.1686
Groove - .1724 .1721	.1719 .1729	.1729.

Accuracy: 100yd. bench rest 10x scope.

3 x 5 shot groups measd. Center to center

Ammo: Rem. 180 gr. P.S.P. - C.L.

Group #1

Size - .70

Hor. - .66

Vert. - .60

Group #2

Size - .64

Hor. - .50

Vert. - .56

Group #3

Size - .94 Avg. .76

Hor. - .92 .69

Vert. - .24 .47

Cool between groups and shoot warmer shot prior to group.

Model 700 ~~30.06 cal.~~ 17 CAL. ORD. STEEL

12-80

~~No Room Barrel Evaluation~~

Measurement Data Sheet.

DATE: 6-23-81 - - -

ROUND LEVEL: 1000 - - - - - } Gun # B 6291862 - - -

Headspace: - - - - -

Visual Inspection: tearing / fowling (bore scope)

a. Throat area: THROAT AREA VERY ERODED.
AND BURNT-

b. 8"-10" from muzzle:

Bore & Groove Meas.	Air + plug gages.	6" increments
Breach 6"	12"	18" muzzle
Bore - .1693	.1688	.1683
Groove - .1728	.1722	.1719
		.1719
		.1720

Accuracy: 100yd. bench rest 10x scope.

3 x 5 shot groups measd. Center to center

Ammo: Rem. 190 gr. P.S.P. - C.L.

Group #1

Size - 1/42

Hor. - 1/36

Vert. - 1/22

Group #2

Size - 1/52

Hor. - 1/32

Vert. .86

Group #3

Size - 1/72 Avg. 1/553

Hor. - .66 1.11

Vert. - 1/72 1.27

Cool between groups and shoot warmer
shot prior to group.

Model 700 ~~30.06.17 CAL.~~ .07 CAL. ORD STEEL
No Ream Barrel Evaluation
Measurement Data Sheet.

12-80

f. H. J.

DATE: 7-27-81

ROUND LEVEL: 1500 } Gun # B6291862

Headspace: - - - - -

Visual Inspection: tearing/fouling (bore scope)

a. Throat area:

THROAT SHOWS EXCESSIVE EROSION

b. 8"-10" from muzzle:

Bore & Groove Meas.		Air + plug gages.		6" increments
Breach	6"	12"	18"	muzzle
Bore -	.1694	.1692	.1684	.1687
Groove -	.1729	.1721	.1717	.1719

Accuracy: 100yd. bench rest 10x scope.

3 x 5 shot groups measd. Center to center

Ammo: Rem. 190 gr. P.S.P. - C.L.

Group #1

Size - 150

Hor. - 148

Vert. - 108

Group #2

Size - 76

Hor. - 40

Vert. - 72

Group #3

Size - 122 AUG. 116

Hor. - 120 103

Vert. - 52 77

Cool between groups and shoot warmer
shot prior to group.

Model 700 ~~30.06 cal.~~ .17 CAL. ORD. STEEL

12-80

~~No Rem Remet Evaluation~~

J. H. J.

Measurement Data Sheet.

DATE: 5-22-81 - - - -

ROUND LEVEL: - 0 - - - - - } Gun # B-6292288 - - - -

Headspace: - - - - -

Visual Inspection: tearing/fouling (bore scope)

a. Throat area: THREE (3) LANDS EXTEND INTO THROAT AREA.

b. 8"-10" from muzzle:

Bore & Groove Meas.	Air + plug gages.	6" increments
Breach 6" 12" 18" muzzle		
Bore - .1691 .1684	.1687 .1687	.1687
Groove - .1722 .1721	.1720 .1720	.1720

Accuracy: 100yd. bench rest 10x scope.

3 x 5 shot groups measd. Center to center

Ammo: Rem. 170 gr. P.S.P. - C.L.

Group #1	Group #2	Group #3
Size - .30	Size - .70	Size - .98 Avg. .69
Hor. - .24	Hor. - .68	Hor. - .72 .54
Vert. - .30	Vert. - .48	Vert. - .94 .57

Cool between groups and shoot warmer shot prior to group.

2ND ACCURACY TEST

Model 700 ~~30.06~~ .17 CAL. ORD. STEEL 12-80
~~No Rem. Bench Evaluation~~
 Measurement Data Sheet.

DATE: 6-11-81 - - - -
 Round LEVEL: 500 - - - - } Gun # B6292788 - - -
 Headspace: - - - - -
 Visual Inspection: tearing/fouling (bore scope)
 a. Throat area: FOUR (4) LANDS EXTEND BACK.
 THROAT EROSION -
 b 8"-10" from muzzle:

Bore & Groove Meas.		Air & plug gages.		6" increments
Bore-	6"	12"	18"	muzzle
Bore- .1690	.1688	.1685	.1684	.1685
Groove .1725	.1722	.1719	.1720	.1720

Accuracy: 100yd. bench rest 10x scope.
 3 x 5 shot groups measd. Center to center
 Ammo: Rem. 170 gr. P.S.P. - C.L.

Group #1	Group #2	Group #3
Size - <u>1/32</u>	Size - .74	Size - .76 Avg - .94
Hor. - <u>1/16</u>	Hor - 70	Hor. - .72 .86
Vert - .78	Vert. .74	Vert. - .70 .74

Cool between groups and shoot warmer
 shot prior to group.

3RD ACCURACY TEST

Model 700 ~~30.06~~ 17 CAL. ORD. STEEL
~~No Team Band Evaluation~~
 Measurement Data Sheet.

12-80

J. H. J.

DATE: 6-23-81. - - -

ROUND LEVEL: -1000 - - - - } Gun # - B6292788. - - -

Headspace: - - - - -

Visual Inspection: tearing/fouling (bore scope)

a. Throat area: THROAT SHOWS EROSION AND FOULING.

b. 8"-10" from muzzle:

Bore & Groove Meas.	Air + plug gages.	6" increments
Breach 6"	12"	15" muzzle
bore - .1691	.1688	.1682
Groove - .1730	.1721	.1716
		.1718
		.1720

Accuracy: 100yd. bench rest 10x scope.

3 x 5 shot groups nearid. Center to center

Ammo: Rem. 180 gr. P.S.P. - C.L.

Group #1	Group #2	Group #3
Size - /22	Size - .76	Size - .80 Avg - .926
Hor. - .56	Hor. - .74	Hor. - .74 .68
Vert. - /18	Vert. .46	Vert. - .64 .76

Cool between groups and shoot warmer
 shot prior to group.

Model 700 ~~30-06~~ 17CAL. ORD STEEL

12-80

No Ream Barrel Evaluation

f. H. J.

Measurement Data Sheet.

DATE: 6-30-81 - - -

ROUND LEVEL: 1500 - - - - - } Gun # B6292788 - - -

Headspace: - - - - -

Visual Inspection: tearing/fouling (bore scope)

a. Throat area: THROAT AREA - ERODED -

THROAT APPEARS - BURNT - OR SCORCHED

b 8"-10" from muzzle:

Bore & Groove Meas.	Air & plug gages.	6" increments
Bore 6" 12" 18" muzzle		
Bore - .1693 .1688 .1685 .1683 .1687		
Groove .1730 .1722 .1719 .1721 .1720		

Accuracy: 100yd. bench rest 10x scope.

3 x 5 shot groups nearid. Center to center

Ammo: Rem. 190 gr. P.S.P. - C.L.

Group #1

Size - 1.38

Hor. - .74

Vert - 1.38

Group #2

Size - 1.20

Hor - 1.30

Vert. 1.38

Group #3

Size - 1.48 Avg - 1.52

Hor. - .86 .96

Vert. - 1.48 1.41

Cool between groups and shoot warmer shot prior to group.

Model 700 ~~30-06~~ 17 CAL. ORD STEEL

12-80

~~No Rem Barrel Evaluation~~

~~f. H. J.~~

Measurement Data Sheet.

DATE: 1-27-81 - - -

ROUND LEVEL: 2000 - - - } Gun # B6292788. - -

Headspace: - - - - -

Visual Inspection: tearing/fouling (bore scope)

a. Throat area:

THROAT SHOWS EXCESSIVE EROSION

b. 8"-10" from muzzle:

Bore & Groove Meas.	Air & plug gages.	6" increments
Breach 6" 12" 18" muzzle		
Bore - .1697 .1689 .1684 .1686 .1686		
Groove - .1729 .1720 .1717 .1719 .1720		

Accuracy: 100yd. bench rest 10x scope.

3 x 5 shot groups measd. Center to center

Ammo: Rem. 170 gr. P.S.P. - C.L.

Group #1

Size - .82

Hor. - .68

Vert - .78

Group #2

Size - .94

Hor - .90

Vert - .48

Group #3

Size - .74 AVG - .833

Hor. - .74 .77

Vert - .70 .66

Cool between groups and shoot warmer shot prior to group.

Model 700 ~~30.06 cal~~ 17CAL. ORD. STEEL.

12-80

~~No Rem Barrel Evaluation~~

~~f. H. J.~~

Measurement Data Sheet.

DATE: 10-22-81

ROUND LEVEL: 2000 } Gun # B6291862

Headspace: - - - - -

Visual Inspection: tearing / fowling (bore scope)

a. Throat area: THROAT SHOWS EROSION
STRESS LIKE MARKS, IN THROAT

b 8"-10" from muzzle:

Bore & Groove Meas.	Air & plug gages.	6" increments
Breach 6"	12"	18" muzzle
Bore - .1702 .1691	.1687	.1688 .1686
Groove .1731 .1724	.1720	.1720 .1719

Accuracy: 100yd. bench rest 10x scope.

3 x 5 shot groups, meas'd. Center to center

Ammo: Rem. 25GE. POWER-LOKT. H.R. LOSTD
~~170 gr. P.S.P. - C.H.~~

Group #1	Group #2	Group #3
Size - 128	Size - 166	Size - .54 AVG- 1.16
Hor. - 110	Hor. - 146	Hor. - .32 .96
Vert. - 142	Vert. - .80	Vert. - .52 .81

Cool between groups and shoot warmer
shot prior to group.

Model 700 ~~30-06 cal.~~ 17 CAL. ORD. STEEL.

12-80

~~No Rem. Barrel Evaluation~~

f. H. J.

Measurement Data Sheet.

DATE: 10-22-81 - - -

ROUND LEVEL: 2000 - - - } Gun # B629 1870 - - -

Headspace: - - - - -

Visual Inspection: tearing/fouling (bore scope)

a. Throat area: THROAT SHOWS EROSION AND BURNT.
STRESS LIKE MARKS.

b 8"-10" from muzzle:

Bore & Groove Meas.	Air + plug gages.	6" increments
Breach 6"	12" 18"	muzzle
Bore - .1697 .1689	.1686 .1687	.1686
Groove .1730 .1721	.1717 .1720	.1719

Accuracy: 100 yd. bench rest 10x scope.

3 x 5 shot groups ^{meas'd. Center to center}
Ammo: Rem. ~~30-06~~ 35 GR. POWER-LOKT. NP. 202TD.

Group #1	Group #2	Group #3
Size - .98	Size - .88	Size - 1.40 AVG-1.086
Hor. - .96	Hor. - .86	Hor. - 1.40 1.09
Vert. - .64	Vert. - .26	Vert. - .56 .49

Cool between groups and shoot warmer shot prior to group.

Model 700 ~~30-06~~ cal. 17 CAL. BRD. STEEL.
~~No Rem Barrel Evaluation~~
Measurement Data Sheet.

12-80
J.H.

DATE: 10-22-81 ---
Round Level: 2000 --- } Gun # B6292216 ---
Headspace: ---
Visual Inspection: tearing / fouling (bore scope)
a. Throat area: THROAT SHOWS EROSION.
STRESS LIKE MARKS - IN THROAT
BURNT APPEARANCE.
b. 8-10" from muzzle:

Bore & Groove Meas.		Air + plug gages.		6" increments
Bore	6"	12"	18"	muzzle
Bore -	.1697	.1689	.1685	.1684
Groove -	.1732	.1723	.1719	.1716

Accuracy: 100yd. bench rest 10x scope.
3 x 5 shot groups measured. Center to center
Ammo: Rem. 25 GR. POWER-LOK[®] H.P. 190 gr P.S. P.C.H. 102TD.

Group #1	Group #2	Group #3
Size - 1.28	Size - 1.32	Size - .72 1.10
Hor. - 1.08	Hor. - 1.14	Hor. - .40 .87
Vert. - .78	Vert. - .82	Vert. - .64 .75

Cool between groups and shoot warmer
shot prior to group.

Model 700 ~~30.06 cal.~~ .17 CAL. STAINLESS STEEL 12-80
~~No Rem. Barrel Evaluation~~ f.d.g.
 Measurement Data Sheet.

DATE: 6-11-81 - - - -

ROUND LEVEL: - 500 - - - - - } Gun # B6257672 - - -

Headspace: - - - - -

Visual Inspection: tearing/fouling (bore scope)

a. Throat area: THREE (3) LANDS EXTEND BACK INTO THROAT. THROAT APPEARS TO BE RERTY-OR SCORCHED

b. 8"-10" from muzzle:

Bore & Groove Meas.		Air + plug gages.		6" increments
Borech	6"	12"	18"	muzzle
Bore - .1689	.1687	.1686	.1685	.1683
Groove - .1721	.1720	.1719	.1719	.1719

Accuracy: 100yd. bench rest 10x scope.

3 x 5 shot groups measd. Center to center

Ammo: Rem. 170 gr. P.S.P. - C.L.

Group #1	Group #2	Group #3
Size - .58	Size - .62	Size - .52 Avg. .906
Hor. - .28	Hor. - .44	Hor. - .50 .74
Vert. - .56	Vert. - .60	Vert. - .86 .67

Cool between groups and shoot warmer shot prior to group.

3RD ACCURACY TEST

Model 700 ~~30.06 cal~~ .17 CAL. STAINLESS STEEL. 12-80~~No Range Band Evaluation~~

f. H. J.

Measurement Data Sheet.

DATE: 6-23-81 - - -

ROUND LEVEL: -1000 - - - } Gun # B-6252672 - - -

Headspace: - - - - -

Visual Inspection: tearing/fouling (bore scope)

a. Throat area: THREE (3) LANDS EXTEND BACK INTO THROAT
THROAT SHOWS EROSION- BURNT AND SCORCHED APPEARANCE

b. 8"-10" from muzzle:

Bore & Groove Meas.		Air + plug gages.		6" increments
Breach	6"	12"	18"	muzzle
Bore - .1692	.1687	.1686	.1685	.1683
Groove - .1725	.1719	.1719	.1719	.1719

Accuracy: 100 yd. bench rest 10x scope.

3 x 5 shot groups measd. Center to center

Ammo: Rem. 190 gr. P.S.P. - C.H.

Group #1

Size - 2³⁴Hor. - 2³⁴Vert - 1⁵⁶

Group #2

Size - 2⁹⁶Hor - 2⁰Vert. 2³²

Group #3

Size - 3⁰⁴ AVG 2⁷⁸Hor. - 2⁸⁴ 2³⁶Vert. - 2⁴⁴ 2¹³Cool between groups and shoot warmer
shot prior to group.

Model 700 ~~30.06 cal.~~ 17. CAL, ST. STEEL

12-80

~~No Rem. Barrel Evaluation~~

J. H. J.

Measurement Data Sheet.

DATE: 6-30-81

ROUND LEVEL: 1500 } Gun # B 6257672

Headspace: - - - - -

Visual Inspection: tearing / fouling (bore scope)

a. Throat area: THROAT SADDLES SLIGHT EROSION
AND FOULING.

b. 8"-10" from muzzle:

Bore & Groove Meas.		Air + plug gages.		6" increments
Breach	6"	12"	18"	muzzle
Bore -	.1693	.1688	.1685	.1684
Groove -	.1722	.1719	.1718	.1719

Accuracy: 100yd. bench rest 10x scope.

3 x 5 shot groups measd. center to center

Ammo: Rem. 190 gr. P.S.P. - C.L.

Group #1	Group #2	Group #3
Size - 220	Size - 246	Size - 220 Avg. 2286
Hor. - 210	Hor. - 218	Hor. - 140 189
Vert. - 128	Vert. - 242	Vert. - 206 192

Cool between groups and shoot warmer
shot prior to group.

Model 700 ~~30-06 cal.~~ 17 CAL. STAINLESS

12-80

No Ream Barrel Evaluation

f. H.

Measurement Data Sheet.

DATE: 7-27-81 - - -

ROUND LEVEL: 2000 - - - - - Gun # B-6257672 - - -

Headspace: - - - - -

Visual Inspection: tearing / fouling (bore scope)

a. Throat area: DARK OR BURNT AREA
SLIGHT EROSION

b. 8"-10" from muzzle:

Bore & Groove Meas.	Air plug gages.	6" increments		
Breach	6"	12"	18"	muzzle
Bore - .1696	.1687	.1685	.1684	.1685
Groove - .1730	.1718	.1717	.1717	.1719

Accuracy: 100 yd. bench rest 10x scope.

3 x 5 shot groups meas'd. Center to center

Ammo: Rem. 180 gr. P.S.P. - C.L.

Group #1

Size - 3.26

Hor. - 2.34

Vert - 2.36

Group #2

Size - 3.80

Hor - 2.20

Vert - 2.20

Group #3

Size - 3.02 Avg - 3.36

Hor. - 3.2 2.75

Vert - .78 1.95

Cool between groups and shoot warmer
shot prior to group.

Model 700 ~~3006~~ 17 CAL. STAINLESS STEEL 12-80
~~No 200 3006 17 CAL. STAINLESS STEEL 12-80~~ f. H. J.
Measurement Data Sheet.

DATE: 5-22-81

ROUND LEVEL: 0 } Gun # B6257382

Headspace: - - - - -

Visual Inspection: tearing / fouling (bore scope)

a. Throat area: TWO (2) LANDS EXTEND BACK INTO THROAT.

b. 8"-10" from muzzle:

Bore & Groove Meas.		Air + plug gages.		6" increments
Breach	6"	12"	18"	muzzle
Bore - .1692	.1687	.1687	.1686	.1685
Groove - .1723	.1722	.1719	.1719	.1719

Accuracy: 100yd. bench rest 10x scope.

3 x 5 shot groups measd. Center to center

Ammo: Rem. 190 gr. P.S.P. - C.L.

Group #1

Size - 1/40

Hor. - 1/38

Vert - .88

Group #2

Size - 1/40

Hor - 1/40

Vert. .72

Group #3

Size - 200 Aug-1833

Hor. - 266 181

Vert. - 128 .96

Cool between groups and shoot warmer shot prior to group.

2ND ACCURACY FIRING.

Model 700 ~~30.06 cal.~~ .17 CAL. STAINLESS STEEL

12-80

~~No Rem. Bench Evaluation~~

J.H.

Measurement Data Sheet.

DATE: 6-11-81 - - - -

ROUND LEVEL: 500 - - - - - } Gun # B6257382 - - -

Headspace: - - - - -

Visual Inspection: tearing/fouling (bore scope)

a. Throat area: THREE (3) LANDS EXTEND BACK INTO THROAT - FOULING APPEARS AT START OF LANDS

b 8"-10" from muzzle:

Bore & Groove Meas.		Air + plug gages.		6" increments
Breach	6"	12"	18"	muzzle
Bore -	.1692	.1689	.1686	.1685
Groove -	.1724	.1721	.1719	.1719

Accuracy: 100yd. bench rest 10x scope.

3 x 5 shot groups measd. Center to center

Ammo: Rem. 180 gr. P.S.P. - C.L.

Group #1	Group #2	Group #3
Size - .94	Size - 3 1/2	Size - 2 3/4 AUG. 2 1/33
Hor. - .92	Hor. - 1 1/2	Hor. - 1 1/2 1.45
Vert. - .72	Vert. - 3 1/10	Vert. - 2 1/8 2.0

DONT GROUP.

Cool between groups and shoot warmer shot prior to group.

3RD ACCURACY TEST

Model 700 ~~30-06 cal.~~ 17 CAL. STAINLESS STEEL 12-80
~~No Room Barrel Evaluation~~ f.H.
 Measurement Data Sheet.

DATE: 6-23-81

ROUND LEVEL: 1000 --- } Gun # R6257382 ---

Headspace: ---

Visual Inspection: tearing/fouling (bore scope)

a. Throat area: TWO (2) LANDS EXTEND BACK INTO THROAT. THROAT SCORCHED OR BURNED - SLIGHT EROSION

b. 8"-10" from muzzle:

Bore & Groove Meas.	Air & plug gages.	6" increments
Breech 6"	12"	18" muzzle
Bore - .1692	.1688	.1687
Groove - .1728	.1721	.1720
		.1719

Accuracy: 100yd. bench rest 10x scope.

3 x 5 shot groups nearid. Center to center

Ammo: Rem. 190 gr. P.S.P. - C.L.

Group #1	Group #2	Group #3
Size - 2 4/8	Size - 2 3/4	Size - 1 1/4 Avg - 1.986
Hor. - 2 1/2	Hor. - 2 1/2	Hor. - .90 1.71
Vert. - 1 8/10	Vert. - 1 3/4	Vert. - .82 1.32

Cool between groups and shoot warmer shot prior to group.

Model 700 ~~30.06~~ cal. 17 CAL. STAINLESS
 No Ream Barrel Evaluation
 Measurement Data Sheet.

12-80
 J.H.

DATE: 7-21-81
 ROUND LEVEL: 1500 } Gun # B6257382
 Headspace: -----

Visual Inspection: tearing/fouling (bore scope)

a. Throat area: THROAT IS VERY DARK OR BURNT.
 CAN NOT VISUAL FURTHER-

b 8"-10" from muzzle:

	Bore & Groove Meas.		Air + plug gages.		6" increments
	Breach	6"	12"	18"	muzzle
Bore.-	.1692	.1689	.1686	.1686	.1685
Groove.-	.1731	.1720	.1719	.1719	.1718

Accuracy: 100yd. bench rest 10x scope.

3 x 5 shot groups measd. Center to center

Ammo: Rem. 180 gr. P.S.P. - C.L.

Group #1	Group #2	Group #3
Size - <u>158</u>	Size - <u>272</u>	Size - <u>352</u> Avg. <u>2606</u>
Hor. - <u>158</u>	Hor. - <u>94</u>	Hor. - <u>284</u> 1.79
Vert. - <u>122</u>	Vert. - <u>260</u>	Vert. - <u>232</u> 2.05

Cool between groups and shoot warmer
 shot prior to group.

Model 700 ~~30.06 cal.~~ 17 CAL. STAINLESS STEEL. 12-80
~~No Rem. Barrel Extension~~ f.42g
Measurement Data Sheet.

DATE: 5-22-81 - - -

ROUND LEVEL: 0 - - - - - } Gun # B 625699-4 - - -

Headspace: - - - - -

Visual Inspection: tearing/fouling (bore scope)

a. Throat area: TWO (2) LANDS EXTEND BACK INTO THROAT.

b. 8"-10" from muzzle:

Bore & Groove Meas.		Air + plug gages.		6" increments
Breach	6"	12"	18"	muzzle
Bore - .1691	.1686	.1685	.1685	.1684
Groove - .1721	.1721	.1719	.1719	.1719

Accuracy: 100yd. bench rest 10x scope.

3 x 5 shot groups meas'd. Center to center

Ammo: Rem. 170 gr. P.S.P. - C.L.

Group #1	Group #2	Group #3
Size - <u>1.40</u>	Size - .84	Size - <u>1.36</u> Avg - <u>1.20</u>
Hor. - <u>1.38</u>	Hor. - .82	Hor. - <u>1.30</u> ^{1.17}
Vert. - .66	Vert. - .58	Vert. - .78 ^{.67}

Cool between groups and shoot warmer shot prior to group.

2ND ACCURACY FIRING.

Model 700 ~~30-06~~ cal. 17 CAL. STAINLESS STEEL.

12-80

~~No Rem Barrel Evaluation~~

J.H.

Measurement Data Sheet.

DATE: 6-11-81 - - - -

ROUND LEVEL: 500 - - - - } Gun # B6256994 - - -

Headspace: - - - - -

Visual Inspection: tearing/fouling (bore scope)

a. Throat area: THREE (3) LANDS EXTEND BACK INTO THROAT AREA. SOME FOUING- THROAT AREA DARK. SCORCHED.

b 8"-10" from muzzle:

Bore & Groove Meas.		Air + plug gages.		6" increments
Breach	6"	12"	18"	muzzle
Bore -	.1690	.1687	.1686	.1685
Groove -	.1721	.1720	.1719	.1718

Accuracy: 100yd. bench rest 10x scope.

3 x 5 shot groups measd. Center to center

Ammo: Rem. 170 gr. P.S.P. - C.L.

Group #1	Group #2	Group #3
Size - 1/58	Size - 1/26	Size - 1/10 Avg - 1.313
Hor. - 1/30	Hor. - 1/12	Hor. - .86 1.09
Vert. - V-1/14	Vert. .78	Vert. - .78 .90

Cool between groups and shoot warmer shot prior to group.

3RD ACCURACY TEST.

Model 700 ~~30.06 cal.~~ 17 CAL. STAINLESS STEEL

12-80

~~Remington-Union Metallic Cartridge Co.~~

J. H. J.

Measurement Data Sheet.

DATE: 6-23-81 - - -

ROUND LEVEL: 1000 - - - - Gun # B6256994 - - -

Headspace: - - - - -

Visual Inspection: tearing/fouling (bore scope)

a. Throat area: TWO (2) LANDS EXTEND BACK INTO THROAT.
THROAT SHOWS EROSION. BURNED OR SCORCHED APPEARANCE

b. 8"-10" from muzzle:

Bore & Groove Meas.		Air + plug gages.		6" increments
Breach	6"	12"	18"	muzzle
Bore -	.1692	.1686	.1685	.1684
Groove -	.1727	.1719	.1719	.1719

Accuracy: 100 yd. bench rest 10x scope.

3 x 5 shot groups meas'd. Center to center

Ammo: Rem. 190 gr. P.S.P. - C.L.

Group #1	Group #2	Group #3
Size - <u>138</u>	Size - <u>254</u>	Size - <u>322</u> Avg - <u>2413</u>
Hor. - <u>108</u>	Hor. - <u>146</u>	Hor. - <u>222</u> 1.59
Vert. - <u>128</u>	Vert. - <u>250</u>	Vert. - <u>322</u> 2.33

Cool between groups and shoot warmer shot prior to group.

Model 700 ~~30-06 cal.~~ 17CAL. STAINLESS
No Ream Barrel Evaluation
Measurement Data Sheet.

12-80
J. H. J.

DATE: 7-27-81 - - -

ROUND LEVEL: 1500 - - - - - } Gun # B6256994 - - -

Headspace: - - - - -

Visual Inspection: tearing/fouling (bore scope)

a. Throat area: THROAT SHOWS - DARK OR BURNT.

SLIGHT EROSION -

b. 8"-10" from muzzle:

Bore & Groove Meas.	Air + plug gages.	6" increments
Breach 6" 12" 18" muzzle		
Bore - .1694 .1686 .1685 .1686 .1683		
Groove .1729 .1718 .1718 .1719 .1718		

Accuracy: 100yd. bench rest 10x scope.

3 x 5 shot groups measd. Center to center

Ammo: Rem. 170 gr. P.S.P. - C.L.

Group #1	Group #2	Group #3
Size - 242	Size - 226	Size - 322 Avg. 2633
Hor. - 150	Hor. - 104	Hor. - 262 1.72
Vert. - 16	Vert. - 214	Vert. - 262 2.21

Cool between groups and shoot warmer
shot prior to group.

Model 700 ~~30-06~~ cal. 17 CAL. STAINLESS STEEL

12-80

~~No Rem. Bench Evaluation~~

f. H. J.

Measurement Data Sheet.

DATE: 5-22-81 - - - -

ROUND LEVEL: 0 - - - - - } Gun # A 6861854 - - - -

Headspace: - - - - -

Visual Inspection: tearing / fouling (bore scope)

a. Throat area: THREE (3) LANDS EXTEND BACK INTO THROAT

b. 8"-10" from muzzle:

Bore & Groove Meas.		Air + plug gages.		6" increments
Bore	6"	12"	18"	muzzle
<u>Bore</u> .1625	.1686	.1684	.1684	.1683
<u>Groove</u> .1720	.1720	.1719	.1719	.1718

Accuracy: 100yd. bench rest 10x scope.

3 x 5 shot groups meas'd. Center to center

Ammo: Rem. 170 gr. P.S.P. - C.L.

Group #1

Size - 122

Hor. - 120

Vert. - .34

Group #2

Size - 102

Hor. - 154

Vert. - .74

Group #3

Size - 120 Avg - 116

Hor. - 120 ^{1.15}

Vert. - .32 ^{.47}

Cool between groups and shoot warmer
shot prior to group.

Model 700 ~~30.06~~ cal. 17 CAL. STAINLESS STEEL 12-80
~~#1 Rem. Bench Evaluation~~ f.d.g.
 Measurement Data Sheet.

DATE: 6-11-81 ---
 ROUND LEVEL: --- } Gun # A6861854 ---
 Headspace: ---
 Visual Inspection: tearing / fouling (bore scope)
 a. Throat area: TWO (2) LAND EXTEND BACK INTO THE PORT.
 NO TEARING OR FOULING.
 b. 8"-10" from muzzle:

Bore & Groove Meas.	Air + plug gages.	6" increments
Breach 6" 12" 18" muzzle		
Bore - .1684 .1684 .1683 .1682 .1680		
Groove - .1720 .1721 .1720 .1720 .1719		

Accuracy: 100yd. bench rest 10x scope.
 3 x 5 shot groups measd. Center to center
 Ammo: Rem. 190 gr. P.S.P. - C.L.

Group #1	Group #2	Group #3
Size - 1/48	Size - 60	Size - .92 AVG - 1/2
Hor. - 1/46	Hor. - 46	Hor. - .56 .83
Vert. - .52	Vert. - .52	Vert. - .88 .64

Cool between groups and shoot warmer shot prior to group.

3RD ACCURACY TEST

Model 700 ~~30-06~~ ~~ent.~~ .17 CAL. STAINLESS STEEL 12-80

~~No Room Barrel Evaluation~~
Measurement Data Sheet.

f. H. J.

DATE: 6-23-81 - - -

ROUND LEVEL: 1000 - - - - - } Gun # A6861854 - - -

Headspace: - - - - -

Visual Inspection: tearing / fouling (bore scope)

a. Throat area: THROAT- SHOWS SLIGHT EROSION.
THROAT IS VERY DIRTY- APPEARS SCORCHED-OR BURNT

b. 8"-10" from muzzle:

Bore & Groove Meas.	Air + plug gages.	6" increments
Breach 6"	12"	18" muzzle
Bore- .1690 .1684	.1682 .1680	.1682
Groove- .1722 .1720	.1719 .1719	.1719

Accuracy: 100yd. bench rest 10x scope.

3 x 5 shot groups meas'd. Center to center

Ammo: Rem. 190 gr. P.S.P. - C.L.

Group #1	Group #2	Group #3
Size - .48	Size - .60	Size - 1.56 Avg-.88
Hor. - .46	Hor - 48	Hor. - 1.38 .77
Vert -.20	Vert-.58	Vert.- 1.44 .74

Cool between groups and shoot warmer shot prior to group.

Model 700 ~~30.06 cal.~~ 17 CAL. ST. STEEL

12-80

~~No Rem Barrel Evaluation~~

~~f.42~~

Measurement Data Sheet.

DATE: 6-30-81 - - -

ROUND LEVEL: 1500 - - - - - } Gun # A6861854 - - -

Headspace: - - - - -

Visual Inspection: tearing/fouling (bore scope)

a. Throat area: THROAT SHOWS SLIGHT EROSION AND
FOULING, AREA

b. 8"-10" from muzzle:

Bore & Groove Meas.	Air & plug gages.		6" increments	
Breach	6"	12"	18"	muzzle
Bore - .1689	.1685	.1682	.1682	.1682
Groove - .1722	.1718	.1717	.1718	.1719

Accuracy: 100 yd. bench rest 10x scope.

3 x 5 shot groups meas'd. Center to center

Ammo: Rem. 170 gr. P.S.P. - C.L.

Group #1	Group #2	Group #3
Size - <u>2.38</u>	Size - <u>3.62</u>	Size - <u>2.02</u> Avg. <u>2.673</u>
Hor. - <u>2.20</u>	Hor. - <u>1.60</u>	Hor. - <u>.78</u> 1.53
Vert. - <u>.94</u>	Vert. - <u>3.60</u>	Vert. - <u>1.96</u> 2.17

Cool between groups and shoot warmer
shot prior to group.

rifle did experience
key-hole during accuracy.

Model 700 ~~30-06 cal.~~ 17. CAL STAINLESS.

12-80

No Rem Barrel Evaluation

f.42g

Measurement Data Sheet.

DATE: 7-27-81 - - -

ROUND LEVEL: - 2000 - - - - { Gun # A6861854 - - -

Headspace: - - - - -

Visual Inspection: tearing/fouling (bore scope)

a. Throat area: THROAT SHOWS DARK AREAS.
BURN SPOTS - SLIGHT EROSION

b. 8"-10" from muzzle:

Bore & Groove Meas.	Air + plug gages.	6" increments
Breach 6" 12" 18" muzzle		
Bore - .1696 .1685 .1681 .1682 .1683		
Groove - .1724 .1718 .1718 .1719 .1720		

Accuracy: 100yd. bench rest 10x scope.

3 x 5 shot groups noaid. Center to center

Ammo: Rem. 190 gr. P.S.P. - C.L.

Group #1

Size - 174

Hor. - 168

Vert - 148

Group #2

Size - 212

Hor - 276

Vert - 142

Group #3

Size - 292

Hor. - 220

Vert - 208

Avg - 2493

2.21

166

Cool between groups and shoot warmer
shot prior to group.

Model 700 ~~30.06~~ cal. 17 CAL. STAINLESS STEEL. 12-80

~~the Remington~~

Measurement Data Sheet.

DATE: 5-22-81 - - - -

ROUND LEVEL: 0 - - - - - } Gun # A6862062. - - -

Headspace: - - - - -

Visual Inspection: tearing/fouling (bore scope)

a. Throat area: ONE (1) LAND EXTENDS BACK INTO THROAT
OTHER LANDS VARY IN LENGTH

b. 8"-10" from muzzle:

Bore & Groove Meas.	Air + plug gages.	6" increments
Breach 6" 12" 18" muzzle		
Bore - .1689 .1689 .1687 .1686 .1685		
Groove - .1721 .1720 .1719 .1718 .1719		

Accuracy: 100yd. bench rest 10x scope.

3 x 5 shot groups meas'd. Center to center

Ammo: Rem. 170 gr. P.S.P. - C.L.

Group #1

Size - 1/40

Hor. - 1/30

Vert - .92

Group #2

Size - .72

Hor - .60

Vert. .72

Group #3

Size - 1/20 Avg. 1/10

Hor. - 1/12 81

Vert. - .54 73

Cool between groups and shoot warmer
shot prior to group.

Model 700 ~~30.06 cal.~~ .17 CAL. REM STAINLESS STEEL 12-80
~~No Rem Barrel Evaluation~~ *f. H. J.*
 Measurement Data Sheet.

DATE: 6-16-81 - - -

ROUND LEVEL: - 500 - - - - } Gun # - A6862062 - -

Headspace: - - - - -

Visual Inspection: tearing / fouling (bore scope)

a. Throat area: TWO (2) LANDS EXTEND BACK INTO THROAT - NO TEARING OR FOULING.

b. 8"-10" from muzzle:

Bore & Groove Meas.	Air + plug gages.			6" increments
Breach 6"	12"	18"	muzzle	
Bore - .1691	.1689	.1687	.1686	.1685
Groove - .1722	.1720	.1719	.1718	.1719

Accuracy: 100yd. bench rest 10x scope.

3 x 5 shot groups meas'd. Center to center

Ammo: Rem. 190 gr. P.S.P. - C.L.

Group #1	Group #2	Group #3
Size - .98	Size - .96	Size - .76 Avg - .90
Hor. - .54	Hor. - .66	Hor. - .50 .57
Vert. - .90	Vert. - .76	Vert. - .74 .80

Cool between groups and shoot warmer shot prior to group.

Model 700 ~~2200~~ .17 CAL STAINLESS STEEL 12-80

~~No Range Band Evaluation~~

J.H.

Measurement Data Sheet.

DATE: 5-22-81

ROUND LEVEL: 0 } Gun # B-625767.2

Headspace:

Visual Inspection: tearing/fouling (bore scope)

a. Throat area: FOUR (4) LANDS-EXTEND BACK INTO THROAT AREA.

b. 8-10" from muzzle:

Bore & Groove Meas.		Air + plug gages.		6" increments
Breach	6"	12"	18"	muzzle
Bore - .1690	.1686	.1685	.1683	.1680
Groove - .1720	.1719	.1718	.1718	.1717

Accuracy: 100yd. bench rest 10x scope.

3 x 5 shot groups measd. Center to center

Ammo: Rem. 190 gr. P.S.P. - C.L.

Group #1

Size - 1"

Hor. - .5"

Vert. - .7"

Group #2

Size - .5"

Hor. - .30"

Vert. - .5"

Group #3

Size - 1.5" Avg. .854"

Hor. - .72" .59"

Vert. - 1.0" .72"

Cool between groups and shoot warmer shot prior to group.

3RD Accuracy Test

Model 700 ~~30.06 cal.~~ 17 CAL. STAINLESS STEEL 12-80~~The Rem. Arms & Ammunition~~

J. H. J.

Measurement Data Sheet.

DATE: 6-23-81 - - -ROUND LEVEL: 1000 - - - - } Gun # A6862062 - - -

Headspace: - - - - -

Visual Inspection: tearing / fouling (bore scope)

a. Throat area: SLIGHT EROSION -

THROAT AREA - SCORCHED - VERY DIRTY -

b 8"-10" from muzzle:

Bore & Groove Meas.	Air + plug gages.			6" increments
Breach	6"	12"	18"	muzzle
Bore - .1693	.1690	.1687	.1686	.1686
Groove - .1723	.1721	.1720	.1719	.1719

Accuracy: 100yd. bench rest 10x scope.

3 x 5 shot groups measd. Center to center

Ammo: Rem. 190 gr. P.S.P. - C.L.

Group #1	Group #2	Group #3
Size - <u>248</u>	Size - <u>242</u>	Size - <u>232</u> <u>AVG-240</u>
Hor. - <u>218</u>	Hor. - <u>194</u>	Hor. - <u>220</u> <u>214</u>
Vert. - <u>244</u>	Vert. - <u>148</u>	Vert. - <u>222</u> <u>205</u>

Cool between groups and shoot warmer shot prior to group.

Model 700 ~~30.06 cal.~~ 17. CAL. STAINLESS
No Rem Barrel Evaluation
Measurement Data Sheet.

12-80
J.H.

DATE: 7-27-81 --

ROUND LEVEL: 1500 -- -- -- -- } Gun # A6862062 -- --

Headspace: -- -- -- --

Visual Inspection: tearing/fouling (bore scope)

a. Throat area: BURN AREAS - SLIGHT REARER
RINGS - SLIGHT EROSION.

b. 8"-10" from muzzle:

Bore & Groove Meas.		Air + plug gages.		6" increments
Breach	6"	12"	18"	muzzle
Bore - .1692	.1690	.1696	.1696	.1696
Groove - .1727	.1720	.1719	.1718	.1719

Accuracy: 100 yd. bench rest 10x scope.

3 x 5 shot groups measd. Center to center

Ammo: Rem. 170 gr. P.S.P. - C.L.

Group #1	Group #2	Group #3
Size - 2 ⁵⁶	Size - 1 ⁸⁶	Size - 3 ⁴² Avg - 2 ⁵⁰⁶
Hor. - 2 ⁵²	Hor. - 1 ⁷⁶	Hor. - 2 ⁴⁶ 2.25
Vert. - 2 ⁰	Vert. - 1 ⁷⁸	Vert. - 1 ⁹⁴ 1.91

Cool between groups and shoot warmer
shot prior to group.

Model 700 ~~3006~~ .17 CAL. STAINLESS STEEL

12-80

~~No Room Barrel Evaluation~~

J. H. J.

Measurement Data Sheet.

DATE: 5-22-81 - - -

ROUNDS LEVEL: - - - - - } Gun # A6862009 - - -

Headspace: - - - - -

Visual Inspection: tearing/fouling (bore scope)

a. Throat area: NO TEARING OR FOULING
LANDS DO NOT EXTEND BACK INTO THROAT

b 8"-10" from muzzle:
BORE NOT CONCENTRIC.

Bore & Groove Meas.	Air + plug gages.	6" increments		
Breach	6"	12"	18"	muzzle
bore. .1688	.1688	.1685	.1684	.1682
groove. .1721	.1721	.1721	.1721	.1719

Accuracy: 100yd. bench rest 10x scope.
3 x 5 shot groups meas'd. Center to center
Ammo: Rem. 170 gr. P.S.P. - C.H.

Group #1	Group #2	Group #3
Size -	Size -	Size -
Hor. -	Hor. -	Hor. -
Vert. -	Vert. -	Vert. -

Cool between groups and shoot warmer
shot prior to group.

THIS SHEET NOT INCLUDED IN REPORT

Model 700 ~~30.06 cal~~ 17 CAL. STAINLESS STEEL

12-80

~~No Rem Barrel Evaluation~~

J. H. J.

Measurement Data Sheet.

DATE: 10-22-81

ROUND LEVEL: 2000 } Gun # B6257382

Headspace: -----

Visual Inspection: tearing/fouling (bore scope)

a. Throat area: THROAT SHOWS EROSION

THROAT SHOWS A BURNT APPEARANCE

b 8-10" from muzzle:

Bore & Groove Meas.	Air & plug gages.	6" increments
Breach 6"	12"	muzzle
Bore - .1698	.1687	.1686
Groove .1726	.1718	.1720

Accuracy: 100 yd. bench rest 10x scope.

3 x 5 shot groups aimed. Center to center

Ammo: Rem. 170 gr P S P - C. M. 25 GR. POWER-LOKT HP 102TD

Group #1	Group #2	Group #3
Size - 2.02	Size - 1.38	Size - 2.22 Avg 2.106
Hor. - 1.66	Hor. - 1.30	Hor. - 2.56 1.87
Vert. - 1.60	Vert. - .72	Vert. - 1.04 1.15

Cool between groups and shoot warmer shot prior to group.

Model 700 ~~30.06 cal. 17 CAL. STAINLESS STEEL~~
~~No Rem Barrel Evaluation~~
Measurement Data Sheet.

12-80

f. H. g.

DATE: 10-22-81

ROUND LEVEL: 2000

} Gun # B625 6994

Headspace: - - - - -

Visual Inspection: tearing/fouling (bore scope)

a. Throat area: THROAT SHOWS EROSION
THROAT - IS A BURNT APPEARANCE

b. 8"-10" from muzzle:

Bore & Groove Meas.	Air + plug gages.	6" increments
Breach 6"	12"	muzzle
Bore .1701	.1685	.1685
Groove .1729	.1717	.1717

Accuracy: 100yd. bench rest 10x scope.

3 x 5 shot groups measd. Center to center

Ammo: Rem. ~~25GR-POWER-LOKT. HP. LOTTD.~~
~~170 gr. P.S.P.-CL.~~

Group #1	Group #2	Group #3
Size - 2.16	Size - 2.98	Size - 1.98 Avg. 2.366
Hor. - 1.92	Hor. - 2.96	Hor. - 1.80 2.23
Vert. - .96	Vert. - 1.72	Vert. - 1.12 1.27

Cool between groups and shoot warmer
shot prior to group.

Model 700 ~~30.06 cal.~~ 17 CAL. STAINLESS STEEL

12-80

~~No Rem Barrel Evaluation~~

J. H. J.

Measurement Data Sheet.

DATE: 10-22-81 - - -

ROUND LEVEL: 2000 - - - - - } Gun # A6862062 - - -

Headspace: - - - - -

Visual Inspection: tearing/fouling (bore scope)

a. Throat area: THROAT EROSION APPEARING
THROAT HAS A BURNT APPEARANCE

b. 8"-10" from muzzle:

Bore & Groove Meas.		Air + plug gages.		6" increments
Bore	6"	12"	18"	muzzle
Bore -	.1703	.1690	.1687	.1686
Groove -	.1728	.1719	.1718	.1717

Accuracy: 100yd. bench rest 10x scope.

3 x 5 shot groups measd. Center to center

Ammo: Rem. ~~256R POWER-LOKT H.P. 202TD.~~
~~190 gr 257-Sub.~~

Group #1	Group #2	Group #3
Size - 1.30	Size - 1.92	Size - .88 AVG - 1.366
Hor. - 1.28	Hor. - 1.90	Hor. - 28 1.15
Vert. - .94	Vert. - .55	Vert. - .88 .78

Cool between groups and shoot warmer
shot prior to group.

1134K

Q44445

SPRING ANALYSIS OUTPUT
7 Mar 1985

09:35:08

For:
ROUND MUSIC WIRE WITH SQUARED ENDS

OUTSIDE DIAMETER..... .188+/- .008
WIRE DIAMETER..... .031+/- .0004
HOLE DIAMETER..... .195
PIN DIAMETER..... 0.000
TOTAL TURNS..... 16.5
ACTIVE TURNS..... 14.5
FREE LENGTH..... 1.062+/- .030
SOLID HEIGHT..... .542+/- .007
WAHL CORRECTGION FACTOR... 1.31
SPRING RATE..... 23.66
DIA. CHANGE FL to SH..... .0017
MEAN DIAMETER..... .157
SPRING INDEX..... 5.06

STRESS AND LOAD: .075
LOAD AT .830in..... 5.489
EXPECTED LOAD VARIATION... 5.05 TO 5.93 5.49
STRESS AT .830in..... 96196.5
LOAD AT .565in..... 11.758
EXPECTED LOAD VARIATION... 10.82 TO 12.70 11.76
STRESS AT .565in..... 206076.1
FORCE TO SOLID..... 12.29
STATIC STRESS AT SOLID.... 215405.5
TOTAL STRESS AT SOLID.... 215405.5
ENERGY..... 2.29
TENSILE STRENGTH..... 324402.3
DESIGN STRESS AS 62%..... 201129.4
TOTAL STRESS AS
PERCENT OF TENSILE STRESS. 66.4

MAKE SPRINGS TO
INFORMATION HIGH-LITED

W00# C-5003-3141

MATE (2)

Notification
Change
Date

SPRING ANALYSIS OUTPUT
7 Mar 1985

09:35:00

Good

For:
ROUND MUSIC WIRE WITH SQUARED ENDS

OUTSIDE DIAMETER..... .188+/- .008
WIRE DIAMETER..... .031+/- .0004
HOLE DIAMETER..... .195 -
PIN DIAMETER..... 0.000
TOTAL TURNS..... 16.5
ACTIVE TURNS..... 14.5
FREE LENGTH.. 1.062+/- .030
SOLID HEIGHT..... .542+/- .007
WAHL CORRECTION FACTOR... 1.31
SPRING RATE.....23.66
DIA. CHANGE FL to SH..... .0017
MEAN DIAMETER..... .157
SPRING INDEX..... 5.06

STRESS AND LOAD:
LOAD AT ~~0.000~~ in. ~~0.075~~..... ~~14~~
EXPECTED LOAD VARIATION... 5.05 TO 5.93
STRESS AT .030 in..... 96196.5
LOAD AT ~~0.000~~ in. ~~0.075~~..... ~~14~~ 30
EXPECTED LOAD VARIATION... 10.82 TO 12.70
STRESS AT .565 in..... 206076.1
FORCE TO SOLID..... 12.29
STATIC STRESS AT SOLID.... 215405.5
TOTAL STRESS AT SOLID.... 215405.5
ENERGY..... 2.29
TENSILE STRENGTH..... 324402.3
DESIGN STRESS AS 62%..... 201129.4
TOTAL STRESS AS
PERCENT OF TENSILE STRESS. 66.4

Length

TRIG EXTERNAL

ROUND SPRING DESIGN INPUTS

Please Fill Out the Following:

- 1 (A) Type of wire
(1) Music wire (ASTM-A228)
(2) Stainless Steel (ASTM-A313)
(3) Hard Drawn (ASTM-A227)
(4) Oil Tempered (ASTM-A229)
- 4 (B) Type of spring ends
(1) Plain ends (total coils = active coils)
(2) Plain and ground ends (total coils = active coils + 1.)
(3) Squared ends (total coils = active coils + 2.)
(4) Squared and ground ends (total coils = active coils + 1)
- .380 in. (C) Hole diameter (if applicable)
- .004 in. (D) Free length of clearance between hole diameter and OD of spring (if applicable)
- NA in. (E) Pin diameter (if applicable)
- NA in. (F) Min. free length clearance between pin diameter and ID of spring (if applicable)
- 14 lb. (G) P1 (lbs. of force at L1) 20
- .620 in. (H) L1 (maximum length of spring while in part)
- .19 lb. (I) P2 (lbs. of force at L2) 30
- .600 in. (J) L2 (minimum length of spring while in part)
- 65 % (K) Indicate maximum stress as a function of tensile strength
- (L) Indicate whether this stress is to be taken at solid stress or at L2 (Static Application only)
- in/sec. (M) Activating mass velocity (Dynamic Application only)
- (N) Indicate whether or not a drawing is to be made
- -----

SPRING ANALYSIS OUTPUT
25 Mar 1985

10:44:28

For:
ROUND MUSIC WIRE WITH SQUARED AND GROUND ENDS

OUTSIDE DIAMETER..... .377+/- .020
WIPE DIAMETER..... .047+/- .0004
HOLE DIAMETER..... .380
PIN DIAMETER..... 0.000
TOTAL TURNS..... 2.8
ACTIVE TURNS..... .8
FREE LENGTH..... .676+/- .030
SOLID HEIGHT..... .131+/- .001
WAHL CORRECTGION FACTOR... 1.21
SPRING RATE.....**.** 250

DIA. CHANGE FL to SH..... .1598
MEAN DIAMETER..... .330
SPRING INDEX..... 7.02

STRESS AND LOAD:
LOAD AT .620in..... 14.000
EXPECTED LOAD VARIATION... 11.90 TO 16.10
STRESS AT .620in..... 137355.0
LOAD AT .600in..... 19.000
EXPECTED LOAD VARIATION... 16.15 TO 21.85
STRESS AT .600in..... 186410.4
FORCE TO SOLID..... 136.33
STATIC STRESS AT SOLID....1337505.2
TOTAL STRESS AT SOLID....1337505.2
ENERGY... .. .33

TENSILE STRENGTH..... 304264.0
DESIGN STRESS AS 65%..... 197771.6
TOTAL STRESS AS
PERCENT OF TENSILE STRESS.439.6

SPRING ANALYSIS OUTPUT
25 Mar 1985

15:00:58

For:

SQUARE HARD DRAWN WIRE WITH SQUARED AND GROUND ENDS

OUTSIDE DIAMETER..... .377+/- .020
WIPE DIAMETER..... .045+/- .0004
HOLE DIAMETER..... .380
PIN DIAMETER..... 0.000
TOTAL TURNS..... 2.2
ACTIVE TURNS..... .2
FREE LENGTH..... .620+/- .030
SOLID HEIGHT..... .100+/- .001
WAHL CORRECTGION FACTOR... 1.24
SPRING RATE.....**.* 700

DIA. CHANGE FL to SH..... 1.5727
MEAN DIAMETER..... .332
SPRING INDEX..... 7.38

STRESS AND LOAD:

LOAD AT .620in..... 0.000
EXPECTED LOAD VARIATION... 0.00 TO 0.00
STRESS AT .620in..... 0.0
LOAD AT .600in..... 14.000
EXPECTED LOAD VARIATION... 11.90 TO 16.10
STRESS AT .600in..... 155989.4
FORCE TO SOLID..... 363.75
STATIC STRESS AT SOLID....4052954.7
TOTAL STRESS AT SOLID....4052954.7
ENERGY..... .14
TENSILE STRENGTH..... 252358.3
DESIGN STRESS AS 62%..... 156462.2
TOTAL STRESS AS
PERCENT OF TENSILE STRESS.**.* 1606.03163597

ING SPRING
EXTERNAL

ROUND SPRING DESIGN INPUTS

Please Fill Out the Following:

1 (A) Type of wire

- (1) Music wire (ASTM-A228) -
- (2) Stainless Steel (ASTM-A313) -
- (3) Hard Drawn (ASTM-A227) -
- (4) Oil Tempered (ASTM-A229) -

4 (B) Type of spring ends

- (1) Plain ends (total coils = active coils)
- (2) Plain and ground ends (total coils = active coils + 1.)
- (3) Squared ends (total coils = active coils + 2.)
- (4) Squared and ground ends (total coils = active coils +

.375 .312^{±.005} in. (C) Hole diameter (if applicable)

.004 in. (D) Free length of clearance between hole diameter and OD of spring (if applicable)

.17 in. (E) Pin diameter (if applicable)

.17 in. (F) Min. free length clearance between pin diameter and ID of spring (if applicable)

14 lb. (G) P1 (lbs. of force at L1)

.483
~~.483~~ in. (H) L1 (maximum length of spring while in part)

19 lb. (I) P2 (lbs. of force at L2)

.468 in. (J) L2 (minimum length of spring while in part)

6.5 % (K) Indicate maximum stress as a function of tensile strength

(L) Indicate whether this stress is to be taken at solid stress or at L2 (Static Application only)

in/sec. (M) Activating mass velocity (Dynamic Application only)

(N) Indicate whether or not a drawing is to be made

TRIG SPRING
INTERNAL

ROUND SPRING DESIGN INPUTS

Please Fill Out the Following:

1 (A) Type of wire

- (1) Music wire (ASTM-A228)
- (2) Stainless Steel (ASTM-A313)
- (3) Hard Drawn (ASTM-A227)
- (4) Oil Tempered (ASTM-A229)

4 (B) Type of spring ends

- (1) Plain ends (total coils = active coils)
- (2) Plain and ground ends (total coils = active coils + 1.)
- (3) Squared ends (total coils = active coils + 2.)
- (4) Squared and ground ends (total coils = active coils +

.195 in. (C) Hole diameter (if applicable)

.004 in. (D) Free length of clearance between hole diameter and OD of spring (if applicable)

.117 in. (E) Pin diameter (if applicable)

.117 in. (F) Min. free length clearance between pin diameter and ID of spring (if applicable)

20 lb. (G) P1 (lbs. of force at L1)

.875 in. (H) L1 (maximum length of spring while in part)

30 lb. (I) P2 (lbs. of force at L2)

.635 in. (J) L2 (minimum length of spring while in part)

65 % (K) Indicate maximum stress as a function of tensile strength

 (L) Indicate whether this stress is to be taken at solid stress or at L2 (Static Application only)

 in/sec. (M) Activating mass velocity (Dynamic Application only)

 (N) Indicate whether or not a drawing is to be made

SPRING ANALYSIS OUTPUT
19 Mar 1985

13:47:25

For:
FOUND MUSIC WIRE WITH SQUARED AND GROUND ENDS

OUTSIDE DIAMETER..... .210+- .008
WIPE DIAMETER..... .042+- .0004
HOLE DIAMETER..... .218
PIN DIAMETER..... 0.000
TOTAL TURNS..... 15.0
ACTIVE TURNS..... 13.0
FREE LENGTH..... 1.085+- .030
SOLID HEIGHT..... .630+- .006
WAHL CORRECTGION FACTOR... 1.40
SPRING RATE.....72.57
DIA. CHANGE FL to SH..... .0018
MEAN DIAMETER..... .168
SPRING INDEX..... 4.00

STRESS AND LOAD:

LOAD AT .875in..... 15.239
EXPECTED LOAD VARIATION... 14.02 TO 16.46
STRESS AT .875in..... 123522.0
LOAD AT .635in..... 32.655
EXPECTED LOAD VARIATION... 30.04 TO 35.27
STRESS AT .635in..... 264690.1
FORCE TO SOLID..... 33.02
STATIC STRESS AT SOLID.... 267631.1
TOTAL STRESS AT SOLID.... 267631.1
ENERGY..... 5.75
TENSILE STRENGTH..... 309580.2
DESIGN STRESS AS 62%..... 191939.7
TOTAL STRESS AS
PERCENT OF TENSILE STRESS. 86.4

SPRING ANALYSIS OUTPUT
21 Mar 1985

12:54:59

For:

ROUND MUSIC WIRE WITH SQUARED AND GROUND ENDS

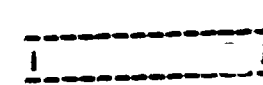
OUTSIDE DIAMETER..... .300+/- .010
WIPE DIAMETER..... .044+/- .0004
HOLE DIAMETER..... .303
PIN DIAMETER..... 0.000
TOTAL TURNS..... 2.5
ACTIVE TURNS..... .5
FREE LENGTH..... .500+/- .015
SOLID HEIGHT..... .112+/- .001
WAHL CORRECTION FACTOR... 1.26
SPRING RATE.....**.* 600

DIA. CHANGE FL to SH..... .2204
MEAN DIAMETER..... .256
SPRING INDEX..... 5.82

STRESS AND LOAD:

LOAD AT .483in..... 10.000
EXPECTED LOAD VARIATION... 8.50 TO 11.50
STRESS AT .483in..... 96530.0
LOAD AT .468in..... 19.000
EXPECTED LOAD VARIATION... 16.15 TO 21.85
STRESS AT .468in..... 183407.0
FORCE TO SOLID..... 232.87
STATIC STRESS AT SOLID....2247891.3
TOTAL STRESS AT SOLID....2247891.3
ENERGY..... .22
TENSILE STRENGTH..... 307370.3
DESIGN STRESS AS 62%..... 190569.6
TOTAL STRESS AS
PERCENT OF TENSILE STRESS.731.3

Handwritten:
2.5 TURNS
= 1.25 INCHES



SPRING ANALYSIS OUTPUT
21 Mar 1985

12:41:35

For:
FOUND MUSIC WIRE WITH SQUAPED AND GROUND ENDS

OUTSIDE DIAMETER..... .304+/- .010
WIRE DIAMETER..... .044+/- .0004
HOLE DIAMETER..... .307
PIN DIAMETER..... 0.000
TOTAL TURNS..... 2.9
ACTIVE TURNS..... .9
FREE LENGTH..... .525+/- .030
SOLID HEIGHT..... .128+/- .001
WAHL CORRECTION FACTOR... 1.26
SPRING RATE.....**.** 333.333333333

DIA. CHANGE FL to SH..... .0803
MEAN DIAMETER..... .260
SPRING INDEX..... 5.91

STRESS AND LOAD:
LOAD AT .483in..... 14.000
EMBEDDED LOAD VARIATION... 11.90 TO 16.10
AT .483in..... 136763.0
.468in..... 19.000
LOAD VARIATION... 16.15 TO 21.85
.468in..... 185606.9
FORCE TO SOLID..... 132.18
STATIC STRESS AT SOLID....1291223.7
TOTAL STRESS AT SOLID....1291223.7
ENERGY..... .25
TENSILE STRENGTH..... 307370.3
DESIGN STRESS AS 62%..... 190569.6
TOTAL STRESS AS
PERCENT OF TENSILE STRESS.420.1

SPRING ANALYSIS OUTPUT
19 Mar 1985

13:45:51

For:
ROUND MUSIC WIPE WITH SQUARED AND GROUND ENDS

OUTSIDE DIAMETER..... .210+- .008
WIPE DIAMETER..... .042+- .0004
HOLE DIAMETER..... .218 -
PIN DIAMETER..... 0.000
TOTAL TURNS..... 15.0
ACTIVE TURNS..... 13.0
FREE LENGTH..... 1.085+- .030
SOLID HEIGHT..... .630+- .006
WAHL CORRECTION FACTOR... 1.40
SPRING RATE.....72.57
DIA. CHANGE FL to SH..... .0018
MEAN DIAMETER..... .168
SPRING INDEX..... 4.00

STRESS AND LOAD:

LOAD AT .875in..... 15.239
EXPECTED LOAD VARIATION... 14.02 TO 16.46
STRESS AT .875in..... 123522.0
LOAD AT .635in..... 32.655
EXPECTED LOAD VARIATION... 30.04 TO 35.27
STRESS AT .635in..... 264690.1
FORCE TO SOLID..... 33.02
STATIC STRESS AT SOLID.... 267631.1
TOTAL STRESS AT SOLID..... 267631.1
ENERGY..... 5.75
TENSILE STRENGTH..... 309580.2
DESIGN STRESS AS 62%..... 191939.7
TOTAL STRESS AS
PERCENT OF TENSILE STRESS. 86.4

Stress
Reference
1450° F
20 min
OK

mm

mm

mm

ROUND SPRING DESIGN INPUTS

EXPERIMENTAL
SEAR SPRING
w/M-70 RATES
APPROX.

Please Fill Out the Following:

- 1 (A) Type of wire
(1) Music wire (ASTM-A228)
(2) Stainless Steel (ASTM-A313)
(3) Hard Drawn (ASTM-A227)
(4) Oil Tempered (ASTM-A229)
- 3 (B) Type of spring ends
(1) Plain ends (total coils = active coils)
(2) Plain and ground ends (total coils = active coils + 1.)
(3) Squared ends (total coils = active coils + 2.)
(4) Squared and ground ends (total coils = active coils + 2)
- .280 in. (C) Hole diameter (if applicable)
- .010 in. (D) Free length of clearance between hole diameter and OD of spring (if applicable)
- .14 in. (E) Pin diameter (if applicable)
- .14 in. (F) Min. free length clearance between pin diameter and ID of spring (if applicable)
- 10.4 lb. (G) P1 (lbs. of force at L1)
- .375 in. (H) L1 (maximum length of spring while in part)
- 12.8 lb. (I) P2 (lbs. of force at L2)
- .340 in. (J) L2 (minimum length of spring while in part)
- 65 % (K) Indicate maximum stress as a function of tensile strength
- Sec. 2 (L) Indicate whether this stress is to be taken at solid stress or at L2 (Static Application only)
- in/sec. (M) Activating mass velocity (Dynamic Application only)
- (N) Indicate whether or not a drawing is to be made

SPRING ANALYSIS OUTPUT
27 Mar 1985

09:46:55

For:

ROUND MUSIC WIRE WITH SQUARED ENDS

OUTSIDE DIAMETER..... .217+/- .008
WIRE DIAMETER..... .034+/- .0004
HOLE DIAMETER..... .220
PIN DIAMETER..... 0.000
TOTAL TURNS..... 6.6
ACTIVE TURNS..... 4.6
FREE LENGTH..... .527+/- .030
SOLID HEIGHT..... .257+/- .003
WAHL CORRECTION FACTOR... 1.29
SPRING RATE.....68.57
DIA. CHANGE FL to SH..... .0032
MEAN DIAMETER..... .183
SPRING INDEX..... 5.38

STRESS AND LOAD:

LOAD AT .375in..... 10.400
EXPECTED LOAD VARIATION... 9.36 TO 11.44
STRESS AT .375in..... 158499.2
LOAD AT .340in..... 12.800
EXPECTED LOAD VARIATION... 11.52 TO 14.08
STRESS AT .340in..... 195076.0
FORCE TO SOLID..... 18.46
STATIC STRESS AT SOLID.... 281376.6
TOTAL STRESS AT SOLID.... 281376.6
ENERGY..... .41
TENSILE STRENGTH..... 319820.2
DESIGN STRESS AS 62%..... 198288.5
TOTAL STRESS AS
PERCENT OF TENSILE STRESS. 88.0

1-----

SPRING ANALYSIS OUTPUT
27 Mar 1985

09146155

For:
ROUND MUSIC WIRE WITH SQUARED ENDS

OUTSIDE DIAMETER..... .217+/- .000
WIRE DIAMETER..... .034+/- .0004
HOLE DIAMETER..... .220
PIN DIAMETER..... 0.000
TOTAL TURNS..... 6.6
ACTIVE TURNS..... 4.6
FREE LENGTH..... .527+/- .030
SOLID HEIGHT..... .257+/- .003
WAHL CORRECTGION FACTOR... 1.29
SPRING RATE.....68.57
DIA. CHANGE FL to SH..... .0032
MEAN DIAMETER..... .183
SPRING INDEX..... 5.38

STRESS AND LOAD:

LOAD AT .375in..... 10.400
EXPECTED LOAD VARIATION... 9.36 TO 11.44
STRESS AT .375in..... 158499.2
LOAD AT .340in..... 12.800
EXPECTED LOAD VARIATION... 11.52 TO 14.08
STRESS AT .340in..... 195076.0
FORCE TO SOLID..... 18.46
STATIC STRESS AT SOLID.... 281376.6
TOTAL STRESS AT SOLID..... 281376.6
ENERGY..... .41
TENSILE STRENGTH..... 319820.2
DESIGN STRESS AS 62%..... 198288.5
TOTAL STRESS AS
PERCENT OF TENSILE STRESS. 88.8

MAKE SPRING: To
Info High-Lite
W0# C500? - 314

MAKE - 4

ROUND SPRING DESIGN INPUTS

Please Fill Out the Following:

- _____ (A) Type of wire
(1) Music wire (ASTM-A228)
(2) Stainless Steel (ASTM-A313)
(3) Hard Drawn (ASTM-A227)
(4) Oil Tempered (ASTM-A229)
- _____ (B) Type of spring ends
(1) Plain ends (total coils = active coils)
(2) Plain and ground ends (total coils = active coils + 1.)
(3) Squared ends (total coils = active coils + 2.)
(4) Squared and ground ends (total coils = active coils + 2)
- _____ in. (C) Hole diameter (if applicable)
- _____ in. (D) Free length of clearance between hole diameter and OD of spring
(if applicable)
- _____ in. (E) Pin diameter (if applicable)
- _____ in. (F) Min. free length clearance between pin diameter and ID of
spring (if applicable)
- _____ lb. (G) P1 (lbs. of force at L1)
- _____ in. (H) L1 (maximum length of spring while in part)
- _____ lb. (I) P2 (lbs. of force at L2)
- _____ in. (J) L2 (minimum length of spring while in part)
- _____ % (K) Indicate maximum stress as a function of tensile strength
- _____ (L) Indicate whether this stress is to be taken at solid stress or
at L2 (Static Application only)
- _____ in/sec. (M) Activating mass velocity (Dynamic Application only)
- _____ (N) Indicate whether or not a drawing is to be made

294

New Bolt Action

Sear Spring - 6"-7"

.035 Deflection

Spring Load +10%

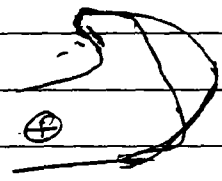
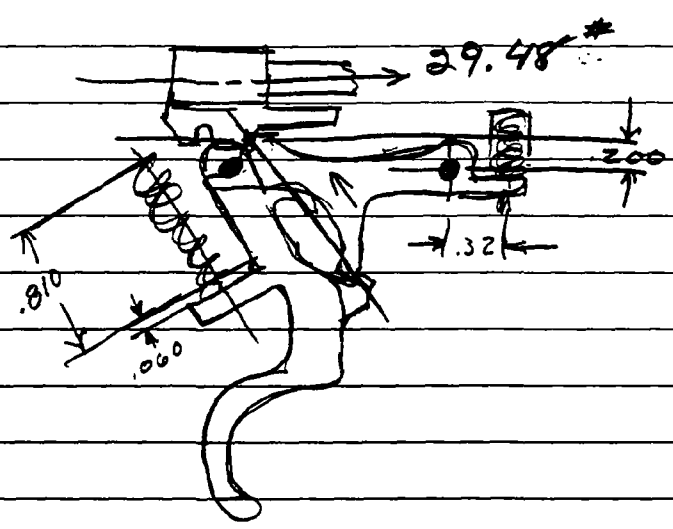
.220 Dia Hole

.375 Working Length

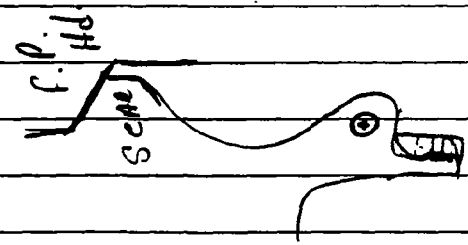
Max Load 2.68

+ 10% 2.68

29.48



Design



3	.075	.810
	3	.225
	<u> </u>	<u> </u>
	.225	.585

REMINGTON ARMS COMPANY, INC.

ENGINEERING DEPARTMENT

DUPLICATE

COMPUTATION SHEET

SHEET NO

TITLE OF PROJ

M. 700 Long Action Semi Auto

PROJ NO

SUBJECT

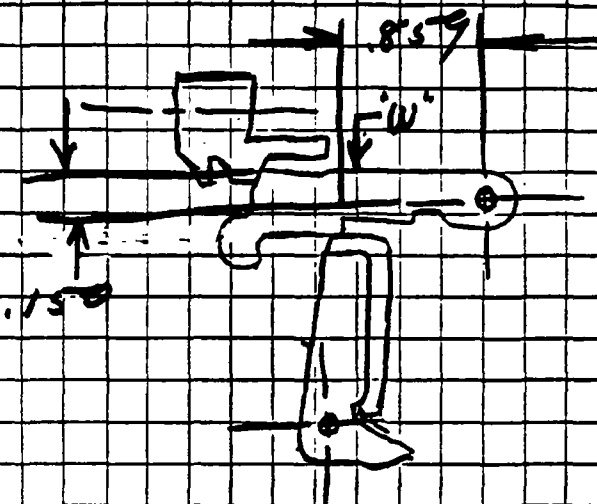
COMPUTER

Martini

WORKS

DATE

30 April 1975



Spring Load Abs 10%
29.48 max

$$29.48(.150) = 4.422 \text{ in lb}$$

$$8.59(W) = 4.422 \text{ in lb}$$

$$W = 5.14784 \text{ lb. max}$$

REMINGTON ARMS COMPANY, INC.

ENGINEERING DEPARTMENT



COMPUTATION SHEET

SHEET NO

TITLE OF PROJ M-700 Short Action Sear Tool PROJ NO

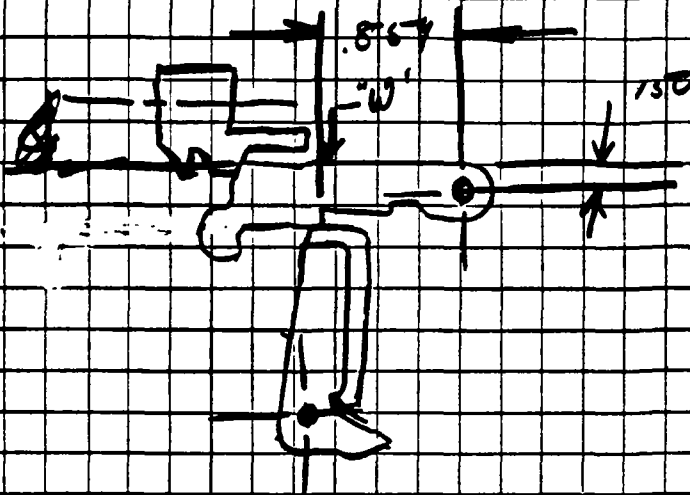
SUBJECT

COMPUTER

Hart

WORKS

DATE 30 April 19 75



Spring Tool Plus 10%
25.5057 max

$$25.51 (.150) = 3.8265 \text{ in lbs}$$

$$.859 (W) = 3.8265 \text{ in lbs}$$

$$W = 4.45459 \text{ lb max.}$$

Hold
For
Kerlin

ROUND SPRING DESIGN INPUTS

Please Fill Out the Following:

- 1 (A) Type of wire
(1) Music wire (ASTM-A228)
(2) Stainless Steel (ASTM-A313)
(3) Hard Drawn (ASTM-A227)
(4) Oil Tempered (ASTM-A229)
- 4 (B) Type of spring ends
(1) Plain ends (total coils = active coils)
(2) Plain and ground ends (total coils = active coils + 1.)
(3) Squared ends (total coils = active coils + 2.)
(4) Squared and ground ends (total coils = active coils + 2)
- .220 in. (C) Hole diameter (if applicable)
- .005 in. (D) Free length of clearance between hole diameter and OD of spring (if applicable)
- N.A. in. (E) Pin diameter (if applicable)
- N.A. in. (F) Min. free length clearance between pin diameter and ID of spring (if applicable)
- 6 lb. (G) P1 (lbs. of force at L1)
- .452 in. (H) L1 (maximum length of spring while in part)
- 8 lb. (I) P2 (lbs. of force at L2)
- .400 in. (J) L2 (minimum length of spring while in part)
- 65 % (K) Indicate maximum stress as a function of tensile strength
- Static (L) Indicate whether this stress is to be taken at solid stress or at L2 (Static Application only)
- in/sec. (M) Activating mass velocity (Dynamic Application only)
- (N) Indicate whether or not a drawing is to be made

Trigger Spring

OLD SPRING

ROUND SPRING DESIGN INPUTS

Please Fill Out the Following:

1 (A) Type of wire

- (1) Music wire (ASTM-A228)
- (2) Stainless Steel (ASTM-A313)
- (3) Hard Drawn (ASTM-A227)
- (4) Oil Tempered (ASTM-A229)

4 (B) Type of spring ends

- (1) Plain ends (total coils = active coils)
- (2) Plain and ground ends (total coils = active coils + 1.)
- (3) Squared ends (total coils = active coils + 2.)
- (4) Squared and ground ends (total coils = active coils + 2.)

.250 in. (C) Hole diameter (if applicable)

11 H. in. (D) Free length of clearance between hole diameter and OD of spring (if applicable)

.180 in. (E) Pin diameter (if applicable)

11 H in. (F) Min. free length clearance between pin diameter and ID of spring (if applicable)

3 lb. (G) P1 (lbs. of force at L1)

.610 in. (H) L1 (maximum length of spring while in part)

6 lb. (I) P2 (lbs. of force at L2)

.535 in. (J) L2 (minimum length of spring while in part)

65 % (K) Indicate maximum stress as a function of tensile strength

Solid (L) Indicate whether this stress is to be taken at solid stress or at L2 (Static Application only)

in/sec. (M) Activating mass velocity (Dynamic Application only)

 (N) Indicate whether or not a drawing is to be made

SPRING ANALYSIS OUTPUT
26 Apr 1984

16:17:34

For:
ROUND MUSIC WIRE WITH SQUARED AND GROUND ENDS

OUTSIDE DIAMETER..... .247+/- .010
WIRE DIAMETER..... .032+/- .0004
HOLE DIAMETER..... .250
PIN DIAMETER..... .180
TOTAL TURNS..... 12.0
ACTIVE TURNS..... 10.0
FREE LENGTH..... 1.035+/- .030
SOLID HEIGHT..... .384+/- .005
WAHL CORRECTION FACTOR... 1.22
SPRING RATE..... 15.17
DIA. CHANGE FL to SH..... .0031
MEAN DIAMETER..... .215
SPRING INDEX..... 6.72

TRIGGER SPRING

STRESS AND LOAD:
LOAD AT .810in..... 3.413
EXPECTED LOAD VARIATION... 3.14 TO 3.69
STRESS AT .810in..... 69713.6
LOAD AT .585in..... 6.825
EXPECTED LOAD VARIATION... 6.28 TO 7.37
STRESS AT .585in..... 139427.1
FORCE TO SOLID..... 9.87
STATIC STRESS AT SOLID.... 201704.5
TOTAL STRESS AT SOLID.... 201704.5
ENERGY..... 1.15
TENSILE STRENGTH..... 322820.1
DESIGN STRESS AS 65%..... 209833.0
TOTAL STRESS AS
PERCENT OF TENSILE STRESS. 62.5

SPRING ANALYSIS OUTPUT
26 Apr 1984

16:17:08

For:

ROUND MUSIC WIRE WITH SQUARED AND GROUND ENDS

OUTSIDE DIAMETER..... .247+/- .010
WIPE DIAMETER..... .030+/- .0004
HOLE DIAMETER..... .250
PIN DIAMETER..... .180
TOTAL TURNS..... 12.0
ACTIVE TURNS..... 10.0
FREE LENGTH..... 1.035+/- .030
SOLID HEIGHT..... .360+/- .005
WAHL CORRECTGION FACTOR... 1.21
SPRING RATE.....11.39
DIA. CHANGE FL to SH..... .0032
MEAN DIAMETER..... .217
SPRING INDEX..... 7.23

STRESS AND LOAD:

LOAD AT .810in..... 2.564
EXPECTED LOAD VARIATION... 2.36 TO 2.77
STRESS AT .810in..... 63247.5
LOAD AT .585in..... 5.128
EXPECTED LOAD VARIATION... 4.72 TO 5.54
STRESS AT .585in..... 126495.0
FORCE TO SOLID..... 7.69
STATIC STRESS AT SOLID.... 189742.4
TOTAL STRESS AT SOLID.... 189742.4
ENERGY..... .87
TENSILE STRENGTH..... 326044.5
DESIGN STRESS AS 65%..... 211928.9
TOTAL STRESS AS
PERCENT OF TENSILE STRESS. 58.2

SPRING ANALYSIS OUTPUT
26 Apr 1984

16:19:05

For:

ROUND MUSIC WIRE WITH SQUARED AND GROUND ENDS

OUTSIDE DIAMETER..... .240+/- .010
WIPE DIAMETER..... .032+/- .0004
HOLE DIAMETER..... .250
PIN DIAMETER..... .180
TOTAL TURNS..... 14.0
ACTIVE TURNS..... 12.0
FREE LENGTH..... 1.035+/- .030
SOLID HEIGHT..... .448+/- .006
WAHL CORRECTGION FACTOR... 1.23
SPRING RATE.....13.96
DIA. CHANGE FL to SH..... .0021
MEAN DIAMETER..... .208
SPRING INDEX..... 6.50

STRESS AND LOAD:

LOAD AT .810in..... 3.141
EXPECTED LOAD VARIATION... 2.89 TO 3.39
STRESS AT .810in..... 62491.8
LOAD AT .585in..... 6.281
EXPECTED LOAD VARIATION... 5.78 TO 6.78
STRESS AT .585in..... 124983.6
FORCE TO SOLID..... 8.19
STATIC STRESS AT SOLID.... 163034.2
TOTAL STRESS AT SOLID.... 163034.2
ENERGY..... 1.06
TENSILE STRENGTH..... 322820.1
DESIGN STRESS AS 65%..... 209833.0
TOTAL STRESS AS
PERCENT OF TENSILE STRESS. 50.5

SPRING ANALYSIS OUTPUT
26 Apr 1984

16:18:23

For:
ROUND MUSIC WIRE WITH SQUARED AND GROUND ENDS

OUTSIDE DIAMETER..... .247+/- .010
WIRE DIAMETER..... .032+/- .0004
HOLE DIAMETER..... .250
PIN DIAMETER..... .180
TOTAL TURNS..... 14.0
ACTIVE TURNS..... 12.0
FREE LENGTH..... 1.035+/- .030
SOLID HEIGHT..... .448+/- .006
WAHL CORRECTION FACTOR... 1.22
SPRING RATE.....12.64
DIA. CHANGE FL to SH..... .0020
MEAN DIAMETER..... .215
SPRING INDEX..... 6.72

STRESS AND LOAD:

LOAD AT .810in..... 2.844
EXPECTED LOAD VARIATION... 2.62 TO 3.07
STRESS AT .810in..... 58094.6
LOAD AT .585in..... 5.688
EXPECTED LOAD VARIATION... 5.23 TO 6.14
STRESS AT .585in..... 116189.3
FORCE TO SOLID..... 7.42
STATIC STRESS AT SOLID.... 151562.4
TOTAL STRESS AT SOLID.... 151562.4
ENERGY..... .96
TENSILE STRENGTH..... 322820.1
DESIGN STRESS AS 65%..... 209833.0
TOTAL STRESS AS
PERCENT OF TENSILE STRESS. 46.9

SPRING ANALYSIS OUTPUT
26 Apr 1984

16:17:34

For:
ROUND MUSIC WIRE WITH SQUARED AND GROUND ENDS

OUTSIDE DIAMETER..... .247+/- .010
WIRE DIAMETER..... .032+/- .0004
HOLE DIAMETER..... .250
PIN DIAMETER..... .180
TOTAL TURNS..... 12.0
ACTIVE TURNS..... 10.0
FREE LENGTH..... 1.035+/- .030
SOLID HEIGHT..... .384+/- .005
WAHL CORRECTGION FACTOR... 1.22
SPRING RATE..... 15.17
DIA. CHANGE FL to SH..... .0031
MEAN DIAMETER..... .215
SPRING INDEX..... 6.72

STRESS AND LOAD:
LOAD AT .810in..... 3.413
EXPECTED LOAD VARIATION... 3.14 TO 3.69
STRESS AT .810in..... 69713.6
LOAD AT .585in..... 6.825
EXPECTED LOAD VARIATION... 6.28 TO 7.37
STRESS AT .585in..... 139427.1
FORCE TO SOLID..... 9.87
STATIC STRESS AT SOLID.... 201704.5
TOTAL STRESS AT SOLID.... 201704.5
ENERGY..... 1.15
TENSILE STRENGTH..... 322820.1
DESIGN STRESS AS 65%..... 209833.0
TOTAL STRESS AS
PERCENT OF TENSILE STRESS. 62.5

TRIGGER SPRING

F. MARTIN

MAKE - Z

W.O. C-5003-314-4

.152 - 1 1/2 -

Bolt Stop Spring
Lock

ROUND SPRING DESIGN INPUTS

Please Fill Out the Following:

- 1 (A) Type of wire
(1) Music wire (ASTM-A228)
(2) Stainless Steel (ASTM-A313)
(3) Hard Drawn (ASTM-A227)
(4) Oil Tempered (ASTM-A229)
- 4 (B) Type of spring ends
(1) Plain ends (total coils = active coils)
(2) Plain and ground ends (total coils = active coils + 1.)
(3) Squared ends (total coils = active coils + 2.)
(4) Squared and ground ends (total coils = active coils +)
- .097 in. (C) Hole diameter (if applicable)
- NA in. (D) Free length of clearance between hole diameter and OD of spring (if applicable)
- NA in. (E) Pin diameter (if applicable)
- NA in. (F) Min. free length clearance between pin diameter and ID of spring (if applicable)
- 2 lb. (G) P1 (lbs. of force at L1)
- .290 in. (H) L1 (maximum length of spring while in part)
- 4 lb. (I) P2 (lbs. of force at L2)
- .230 in. (J) L2 (minimum length of spring while in part)
- 6.5 % (K) Indicate maximum stress as a function of tensile strength
- Static (L) Indicate whether this stress is to be taken at solid stress or at L2 (Static Application only)
- NA in/sec. (M) Activating mass velocity (Dynamic Application only)
- NA (N) Indicate whether or not a drawing is to be made

SPRING ANALYSIS OUTPUT
19 Oct 1984

10:13:19

For:
ROUND MUSIC WIRE WITH SQUARED AND GROUND ENDS

OUTSIDE DIAMETER..... .093+/- .004
-WIRE DIAMETER..... .018+/- .0003
HOLE DIAMETER..... .097
PIN DIAMETER..... 0.000
-TOTAL TURNS..... 12.0
-ACTIVE TURNS..... 10.0
FREE LENGTH..... .350+/- .015
-SOLID HEIGHT..... .216+/- .004
-WAHL CORRECTGION FACTOR... 1.38
-SPRING RATE.....35.77
DIA. CHANGE FL to SH..... .0006
MEAN DIAMETER..... .075
-SPRING INDEX..... 4.17

STRESS AND LOAD:
LOAD AT .290in..... 2.146
EXPECTED LOAD VARIATION... 1.97 TO 2.32
STRESS AT .290in..... 97302.5
LOAD AT .230in..... 4.292
EXPECTED LOAD VARIATION... 3.95 TO 4.64
STRESS AT .230in..... 194605.0
-FORCE TO SOLID..... 4.79
-STATIC STRESS AT SOLID.... 217308.9
TOTAL STRESS AT SOLID..... 217308.9
ENERGY..... .19
TENSILE STRENGTH..... 352729.4
DESIGN STRESS AS 62%..... 218692.2
TOTAL STRESS AS
PERCENT OF TENSILE STRESS. 61.6

BOULDER LOCK CAM SPRING

ROUND SPRING DESIGN INPUTS

Please Fill Out the Following:

1 (A) Type of wire

- (1) Music wire (ASTM-A228)
- (2) Stainless Steel (ASTM-A313)
- (3) Hard Drawn (ASTM-A227)
- (4) Oil Tempered (ASTM-A229)

1 (B) Type of spring ends

- (1) Plain ends (total coils = active coils)
- (2) Plain and ground ends (total coils = active coils + 1.)
- (3) Squared ends (total coils = active coils + 2.)
- (4) Squared and ground ends (total coils = active coils +

N.A. in. (C) Hole diameter (if applicable)

N.A. in. (D) Free length of clearance between hole diameter and OD of spring (if applicable)

.220 in. (E) Pin diameter (if applicable)

.005 in. (F) Min. free length clearance between pin diameter and ID of spring (if applicable)

.5 lb. (G) P1 (lbs. of force at L1)

.075 in. (H) L1 (maximum length of spring while in part)

1 lb. (I) P2 (lbs. of force at L2)

.060 in. (J) L2 (minimum length of spring while in part)

65 % (K) Indicate maximum stress as a function of tensile strength

Solid (L) Indicate whether this stress is to be taken at solid stress or at L2 (Static Application only)

N.A. in/sec. (M) Activating mass velocity (Dynamic Application only)

N.A. (N) Indicate whether or not a drawing is to be made

SPRING ANALYSIS OUTPUT
19 Oct 1984

12:53:32

For:

ROUND MUSIC WIRE WITH PLAIN ENDS

OUTSIDE DIAMETER..... .247+/- .015
WIPE DIAMETER..... .018+/- .0003
HOLE DIAMETER..... .250
PIN DIAMETER..... .220
TOTAL TURNS..... 2.0
ACTIVE TURNS..... 2.0
FREE LENGTH..... .300+/- .015
SOLID HEIGHT..... .054+/- .001
WAHL CORRECTGION FACTOR... 1.11
SPRING RATE..... 6.28
DIA. CHANGE FL to SH..... .0078
MEAN DIAMETER..... .229
SPRING INDEX..... 12.72

STRESS AND LOAD:

LOAD AT .075in..... 1.414
EXPECTED LOAD VARIATION... 1.20 TO 1.63
STRESS AT .075in..... 157228.9
LOAD AT .060in..... 1.508
EXPECTED LOAD VARIATION... 1.20 TO 1.73
STRESS AT .060in..... 167710.8
FORCE TO SOLID..... 1.55
STATIC STRESS AT SOLID.... 171903.6
TOTAL STRESS AT SOLID.... 171903.6
ENERGY..... .02
TENSILE STRENGTH..... 352729.4
DESIGN STRESS AS 62%..... 218692.2
TOTAL STRESS AS
PERCENT OF TENSILE STRESS. 48.7

SPRING ANALYSIS OUTPUT
19 Oct 1984

12:59:23

For:
POUND MUSIC WIRE WITH PLAIN ENDS

OUTSIDE DIAMETER..... .247+/- .015
WIPE DIAMETER..... .018+/- .0003
HOLE DIAMETER..... .250
PIN DIAMETER..... .220
TOTAL TURNS..... 1.5
ACTIVE TURNS..... 1.5
FREE LENGTH..... .175+/- .015
SOLID HEIGHT..... .045+/- .001
WAHL CORRECTION FACTOR... 1.11
SPRING RATE..... 8.38
DIA. CHANGE FL to SH..... .0041
MEAN DIAMETER..... .229
SPRING INDEX..... 12.72

STRESS AND LOAD:
LOAD AT .075in..... .838
EXPECTED LOAD VARIATION... .71 TO .96
STRESS AT .075in..... 93172.7
LOAD AT .060in..... .963
EXPECTED LOAD VARIATION... .82 TO 1.11
STRESS AT .060in..... 107148.6
FORCE TO SOLID..... 1.09
STATIC STRESS AT SOLID.... 121124.5
TOTAL STRESS AT SOLID.... 121124.5
ENERGY..... .01
TENSILE STRENGTH..... 352729.4
DESIGN STRESS AS 62%..... 218692.2
TOTAL STRESS AS
PERCENT OF TENSILE STRESS. 34.3

|

SPRING ANALYSIS OUTPUT
19 Oct 1984

12:42:18

For:
FOUND MUSIC WIRE WITH PLAIN ENDS

OUTSIDE DIAMETER..... .247+/- .015
WIRE DIAMETER..... .014+/- .0003
HOLE DIAMETER..... .250
PIN DIAMETER..... .220
TOTAL TURNS..... 2.0
ACTIVE TURNS..... 2.0
FREE LENGTH..... .500+/- .030
SOLID HEIGHT..... .042+/- .001
WAHL CORRECTION FACTOR... 1.08
SPRING RATE..... 2.18
DIA. CHANGE FL to SH..... .0242
MEAN DIAMETER..... .233
SPRING INDEX..... 16.64

STRESS AND LOAD:

LOAD AT .075in..... .928
EXPECTED LOAD VARIATION... .79 TO 1.07
STRESS AT .075in..... 217626.6
LOAD AT .060in..... .960
EXPECTED LOAD VARIATION... .82 TO 1.10
STRESS AT .060in..... 225307.6
FORCE TO SOLID..... 1.00
STATIC STRESS AT SOLID.... 234524.7
TOTAL STRESS AT SOLID.... 234524.7
ENERGY..... .01
TENSILE STRENGTH..... 366648.5
DESIGN STRESS AS 62%..... 227322.1
TOTAL STRESS AS
PERCENT OF TENSILE STRESS. 64.0

1000

DATE											
SHEET OF	2	Dotted line (- - - -) indicates same part number.									
DWG NO.		PART NUMBER				Short Action	Varmint	Long Action	LH		
		PART NUMBERS									
		BARREL									
		17 Rem 24" (Blank									
		222 24" "									
		22-250 24" "									
		223 24" "									
		243 22" "									
		6mm 22" "									
		308 22" "									
		270 22" "									
		30-06 22" Blank									
		7mm Rem Mag 22" "									
		270 LH 22" "									
		30-06 LH 22" "									
		7mm Rem Mag LH 22" Blank									
		222 Varmint 24" Blank									
		22-250 " 24" "									
		223 " 24" "									
		243 " 24" "									
		308 " 24" "									
		7mm-08 " 24" "									
<u>SKE-376A</u>		RECEIVER (Marking)									
		17 Rem. 222 223									
		6mm 22-250 308 7mm-08									
		243									
		270 30-06 7mm Rem Mag									
		270 LH 30-06 LH 7mm Rem Mag LH									
		(LH Marking)									
		BOLT ASSEMBLY									
		17 Rem 222 223									
		22-250 243 6mm 308 7mm-08									
		270 30-06									
		7mm Rem Mag									
		270 LH 30-06 LH									
		7mm Rem Mag LH									
		BOLT BODY ASSEMBLY									
		17 Rem 222 223									
		22-250 243 6mm 308 7mm-08									
		270 30-06									

DATE					Short Action	Varmint	Long Action	LH
SHEET OF	3	Dotted line (- - - -) indicates same part number						
DWG NO	PART NUMBER				Short Action	Varmint	Long Action	LH
				7mm Rem Mag.				
				BOLT BODY ASSEMBLY (cont'd.)				
				270 LH 30-06 LH				
				7mm Rem Mag LH				
				Bolt Body Short Action				
				Long Action				
A-18483				Bolt Body Brazing Slug	• 18483	—	—	—
SKD-376				Bolt Head (Blank SKD-376)	•			
				17 Rem 222 223				
				22-250 243 6mm 308 7mm-08				
				270 30-06				
				7mm Rem Mag				
				270 LH 30-06 LH				
				7mm Rem Mag LH				
A 18738				Bolt Pin	• 18738	—	—	—
A-17011				Ejector Washer	• 17011			
SKD-3778				Bolt Handle (Blank	•			
				Bolt Handle LH (Blank	•			
C-20185				Bolt Handle Brazing Shim	• 20186	—	—	—
A-17017				Ejector (Blank A-13974)	• 17017	—	—	—
A-17676				Ejector Pin (Blank A-91802)	• 17676	—	—	—
A-17019				Ejector Spring	• 17019	—	—	—
				Extractor				
SKD-3765				17 Rem 222 223 (Blank SKD-3766)	•			
"				22-250 243 6mm 308 7mm-08	•			
				(Blank SKD-3767)				
"				270 30-06 (Blank SKD-3767)	•			
"				7mm Rem Mag (Blank SKD-3768)	•			
				FIRING PIN ASSEMBLY SHORT ACTION				
				LONG ACTION				
SKD-2941				Bolt Plug (Blank	•			
C-100330				Firing Pin Short Action (Blank)	• 100330	—		
"				Long Action (C-100335)	•		100331	
				Firing Pin Cross Pin				
				Firing Pin Head				
				Main Spring Short Action, Long Action				
C-91335				WASHER Long Action	• 91335	—	—	—
SKD-3758				Bolt Stop	•			
C-24475				Bolt Stop Pin	•			
				Bolt Stop Spring				

Model Shop Parts

9-17-84

Drawings Needed

- Bolt Body
- Bolt Plug
- Firing Pin Head
- D Bolt Stop Spring
- D Magazine Box
- D " Bottom
- D " Follower
- D " Spring
- D Trigger Guard
- D Magazine Latch
- D Latch Pin
- D Latch Spring

RANDY

Marked Prints

- Barrel - Kevin
- ~~Bolt Head - S.R.P.~~
- Firing Pin Cross Pin
- D Trigger - Revise

- D Bolt Lock Spring - Same As Bolt Stop Spring
- B Safety Lever - Revised - To Finocay For Change
- D " Link - Drawing
- D " Detent - ★ Drawing Done
- D Safety Retaining ~~Spring~~ - Wave Washer (Behind Cam)
- D Sear Spring - Done, Need Drawing
- D Trigger Spring - Revised?
- D Trigger Adjusting Screw - Revised - Done

These drawings or marked prints must be done by October 19. This leaves 5 weeks of Model Shop build time and 1 week of assembly time for Fred.

The "D" before the part name means that design

=====

is required. I will be doing the magazine box and trigger guard design and drawings. Fred will handle the rest of the design. Kevin, Ray, Skip and others will be doing all of Fred's drawing work.

Model Shop Parts	Design	Drawings	Model Print	Number Needed	In Shop	Complete
Barrel (hub, rough chamber, crown)	C			10		
Receiver (in Model Shop, time consuming)	C	C		6	•	
Bolt Assembly (have 5 long + 4 short with new bolt head, current body + handle)	C					
Bolt Handle	C	C		10	•	
Bolt Body	C			10		
Bolt Head	C			10		
Extractor (in Model Shop, have 6)	C	C		10	•	
Firing Pin Assembly						
Bolt Plug	C			10		
Firing Pin	C	C		10		
Firing Pin Cross Pin	C			10		
Firing Pin Head	C			10		
Bolt Stop	C	C		10		
Bolt Stop Spring				10		
Magazine Box				10		
" Bottom				10		
" Follower				10		
" Spring				10		

Model Shop Parts	Design	Drawing	Marked Print	Number Needed	In Shop	Comments
Trigger Guard				10		
Magazine Latch				10		
Latch Spring				10		
Latch Pin				10		
Stock Assembly						
Stock (makers needs updating can shape stocks)				10		
Fore-end Tip				10		
Grip Cap				10		
Recoil Pad				10		
Billet - Add Use M. R.	C	C		10		4
Washer " " "	C	C		10		4
Plug " " "	C	C		10		
Safety Assembly						
Bolt Lock	C	C		10		•
Bolt Lock Spring				10		
Cam	C	C		10		•
Plunger	C	C		10		•
Plunger Pin	C	C		10		•
Safety Lever			MARKED PRINT TO DATE	10		
Safety Link				10		
Safety Detent				10		
Safety Roller	C	C		10		•
Safety Retaining Ring				10		
- Sear	C	C		10		2
Sear Spring						

Model Shop Parts

R2538815

Items Complete
Contingency #2

Full Round Receiver

- Thicker recoil lug
- Standard scope mounts
- M/700 anti-bind bolt
- Front lock system
- Short and long action
- Fire control with
 - Blocked trigger
 - Blocked sear
 - Independent bolt lock
 - Skeletonized housing
 - Tamper proof (Jam screws)

M/7 LWT Contoured Barrel

- Target crown
- Iron sights
- Chrome moly barrel

Feed System

- Commercial version
- Detachable box

New Bolt

- M/700 extractor
- Smooth bolt handle
- Reduced lock time
 - Easy lift
 - LWT firing pin

New Stock

- Straight grip walnut (Classic)
- Standard butt and grip cap
- Standard sling swivels

1-31-83

Items Complete
Contingency #1

Round Bottom Octagonal

- Thicker recoil lug
- Std. scope mounts
- M/700 anti-bind bolt
- Front lock system
- Short and long action
- Fire control (Same as Contingency #2)

M/XCF LWT Contour Barrel

- High gloss w/o removing forge marks
- Target crown
- Chrome moly barrel
- Drilled and tapped - no sights

New Bolt

- New extractor
- Restyled bolt handle
- Reduced lock time - easy lift
- - LWT firing pin
- Restyled bolt plug
- Separate bolt lock

1-31-83

Items Complete
Preferred Design

Flat Bottom Octagonal Receiver

- Integral recoil lug
- Integral scope mount
- Front lock system
- Anti bind (M/700 style)
- Short and long action
- Fire control (Same as Contingency #2)

M/XCF LWT Contour Barrel

- High gloss w/o removing forge marks
- Target crown
- Chrome moly barrel
- Clean barrel

Feed System

- Rotary detachable magazine
- Unload bolt open
- No bolt drag

New Bolt

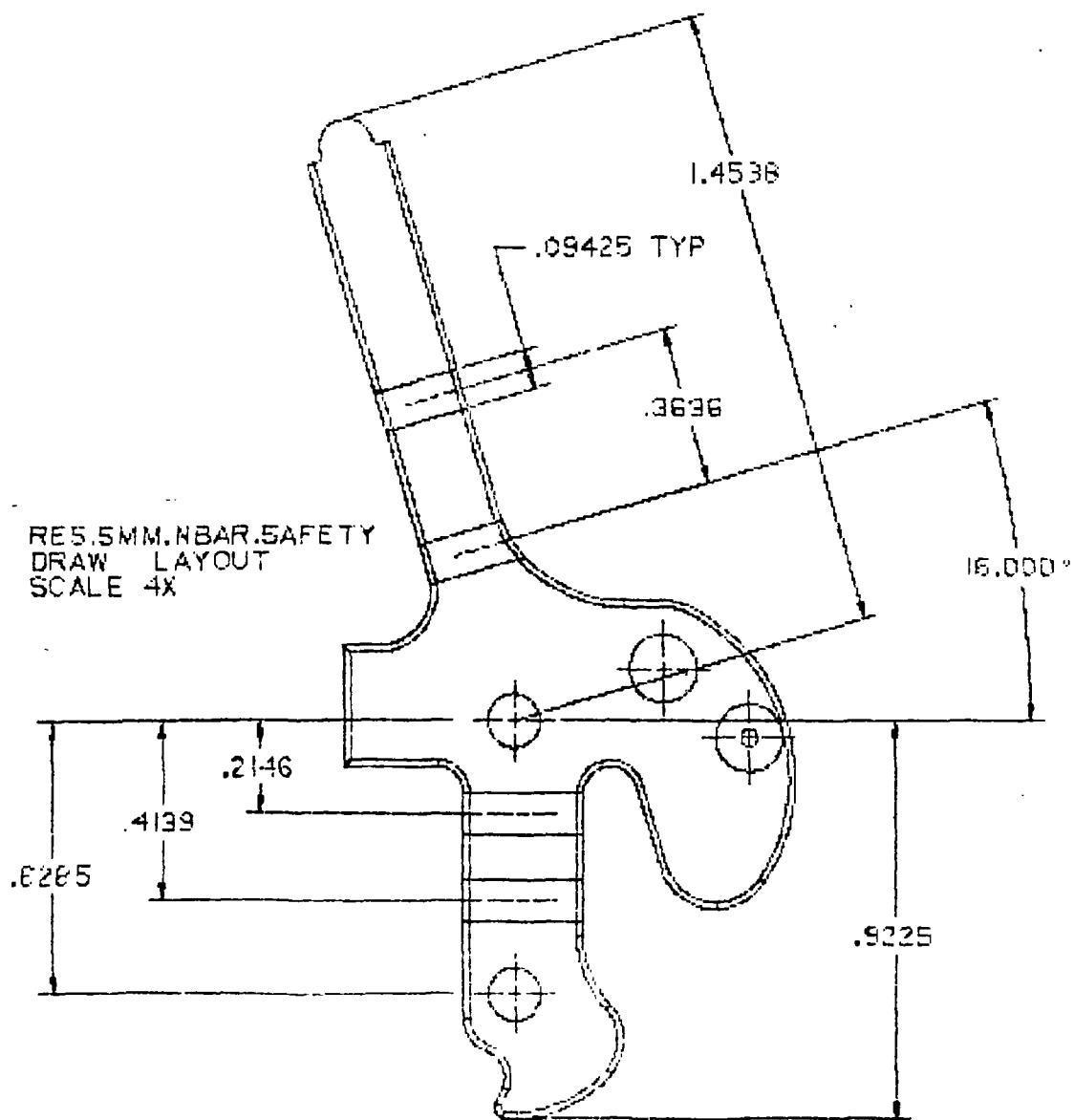
- New extractor
- Restyle bolt handle
- Reduced lock time - easy lift
- LWT firing pin
- Restyled bolt plug
- Separate bolt lock

Stock

- Walnut - Bob Emmons
- Recessed sling swivel
- Cast of toe out
- Skeleton butt plate and grip cap
- Epoxy bedd
- Medium gloss
- Schnabel fore-end

1-31-83

NBAR SCHEDULES



fred

10.9.85

- bolt assembly cuts → add to drawing, ready for Model Shop
- bolt plug to Model Shop
- bolt lock → add detail cuts, to model shop
- bolt lock spring drawing
- request quote for F-40 x $\frac{1}{8}$ " cap screws
" " " flister head screws
- bolt stop spring design
- order Browning A-Bolt by 10-10
- follow stocks in Model Shop
- when safeties are ready - assemble current 70 safety buttons
- check drawing package

Date: NBAR

Sheet 1 Dotted line (----)
of indicates same part number

DWG. NO.	PART NAME
-------------	-----------

PART NUMBERS

BARREL ASSEMBLY COMPLETE

17 Rem.
222
22-250
223
243
6 mm
308
25-06
270
30-06
7mm Mag
300 Win Mag
338 Win Mag
22-250 LH
243 LH
270 LH
30-06 LH
7mm Mag LH
222 Varmint
22-250 Varmint
223 Varmint
243 Varmint
6 mm Varmint
308 Varmint

BARREL ASSEMBLY

17 Rem
222
22-250

Date: NBAR

Sheet 2 Dotted line (----)
of indicates same part number

DWG. NO.	PART NAME
-------------	-----------

PART NUMBERS

223
243
6mm
308
25-06
270
30-06
7mm Mag.
300 Win Mag
338 Win Mag
22-250 LH
243 LH
270 LH
30-06 LH
7mm Mag LH
222 Varmint
22-250 Varmint
223 Varmint
243 Varmint
6mm Varmint
308 Varmint

BARREL

17 Rem 24"
222 24"
22-250 24" (LH also)
223 24"
243 22" (LH also)
6mm 22"
308 22"
25-06 24"
270 22" (LH also)
30-06 22" (LH also)
7mm Mag. 24" (LH also)

Date: **NBAR**

Sheet 3 Dotted line (----)
of indicates same part number

DWG. PART NAME
NO.

PART NUMBERS

300 Win Mag 24"
338 Win Mag 24"
222 Varmint 24"
22-250 Varmint 24"
223 Varmint 24"
243 Varmint 24"
6mm Varmint 24"
308 Varmint 24"

RECEIVER

17 Rem., 222, 223
243
22-250, 6mm, 308
25-06, 270, 30-06
7mm Mag. 300, 338
22-250 LH
243 LH
270, 30-06, 7mm Mag LH

Bolt Assembly

17 Rem., 222, 223
22-250, 243, 6mm, 308
25-06, 270, 30-06
7mm Mag. 300 Mag, 338 Mag
22-250, 243 LH
270, 30-06 LH
7mm Mag LH

Bolt Body Assembly

17 Rem., 222, 223
22-250, 243, 6mm, 308
25-06, 270, 30-06
7mm Mag. 300 Mag, 338 Mag
22-250, 243 LH
270, 30-06 LH
7mm Mag LH

Date: NBAR

Sheet 4 of Dotted line (----) indicates same part number

DWG. NO. PART NAME

PART NUMBERS

Bolt Body
Short Action
Long Action

Bolt Body Brazing Slug
Bolt Head
17 Rem., 222, 223
22-250, 243, 6mm, 308
25-06, 270, 30-06
7mm Mag. 300 Mag, 338 Mag
22-250 243 LH
270, 30-06 LH
7mm Mag LH

Bolt Pin
Ejector Washer
Bolt Handle
Bolt Handle LH
Bolt Handle Brazing Shim

← Bolt Plug
Ejector
Ejector Pin
Ejector Spring
Extractor
17 Rem., 222, 223
22-250, 243, 6mm, 308
25-06, 270, 30-06
7mm Mag. 300 Mag, 338 Mag

Firing Pin Assembly
Short Action
Long Action

Bolt Plug Washer
Firing Pin
Short Action
Long Action

Bolt Plug

Lock

Lock Bolt Detent

Lock Bolt Detent Spring

Lock Bolt Plug Pin

Date: NBAR

Sheet 5 Dotted line (----)
of indicates same part number

DWG. NO.	PART NAME
-------------	-----------

PART NUMBERS

Firing Pin Cross Pin
Firing Pin Head
Mainspring
 Short Action
 Long Action

Bolt Stop
Bolt Stop Pin
Bolt Stop Spring
~~Bolt Stop Spring LH~~

Front Guard Screw

Magazine Assembly
 17 Rem., 222, 223
 22-250, 243, 6mm, 308
 25-06, 270, 30-06
 7mm Mag. 300 Mag, 338 Mag

Magazine Sub-Assembly
 17 Rem., 222, 223
 22-250, 243, 6mm, 308
 25-06, 270, 30-06
 7mm Mag. 300 Mag, 338 Mag

Magazine
 17 Rem., 222, 223
 22-250, 243, 6mm, 308
 25-06, 270, 30-06
 7mm Mag. 300 Mag, 338 Mag

Magazine Bottom
 17 Rem., 222, 223
 22-250, 243, 6mm, 308
 25-06, 270, 30-06
 7mm Mag. 300 Mag, 338 Mag

Magazine Follower
 17 Rem., 222, 223
 22-250, 243, 6mm, 308
 25-06, 270, 30-06
 7mm Mag. 300 Mag, 338 Mag

Date: NBAR

Sheet 6 Dotted line (----)
of indicates same part number

DWG. NO.	PART NAME
-------------	-----------

PART NUMBERS

Magazine Spacer	
17 Rem, 222, 223	
Magazine Spring	
17 Rem., 222, 223	
22-250, 243, 6mm, 308	
25-06, 270, 30-06	
7mm Mag. 300 Mag, 338 Mag	
Magazine Latch	
Magazine Latch Screw	
Magazine Release	
Magazine Release Pivot	
Rear Guard Screw	
Sear Pin	
Stock Assembly	
Short Action	
Long Action	
Magnum	
Short Action LH	
Long Action LH	
Magnum LH	
Short Action Varmint	
Fore-end Tip	
Grip Cap	
Recoil Pad	
Recoil Pad Screw	
Stock	
Short Action	
Long Action	
Magnum	
Short Action LH	
Long Action LH	
Magnum LH	
Short Action Varmint	

Date: NBAR

Sheet 7 Dotted line (----)
of indicates same part number

DWG. PART NAME
NO.

PART NUMBERS

Stock Reinforcement Rivet
Stock Reinforcement Plug (2)
Stock Reinforcement Washer

Scope Mount Assembly (2)
Scope Mount
Scope Mount Clamp
Scope Mount Nut
Scope Mount Ring
Scope Mount Screws

Swivel Assembly (2)
Swivel Screw (2)

TRIGGER ASSEMBLY
TRIGGER ASSEMBLY, LH

~~Bolt Lock~~
~~Bolt Lock LH~~
~~Bolt Lock Plunger~~
~~Bolt Lock Plunger Pin~~
~~Bolt Lock Spring~~
Bolt Stop Release
Bolt Stop Release LH

Safety Assembly
Safety Assembly LH
Safety
Safety LH
Safety Button
Safety Detent Ball
Safety Detent Spring
Safety Detent Spring LH
Safety Pivot Pin
Safety Snap Washer
Sear Safety Cam
Sear Spring

Date: NBAR

Sheet 8 Dotted line (----)
of indicates same part number

DWG. NO.	PART NAME
-------------	-----------

PART NUMBERS

	Trigger
	Trigger Block Plunger
	Trigger Block Plunger Spring
	Trigger Housing Assembly
	Trigger Housing Assembly LH
	Trigger Housing Rivet (4)
	Trigger Housing Spacer, Front
	Trigger Housing Spacer, Rear
	Trigger Side Plate, Right
	Trigger Side Plate, Right, LH
	Trigger Side Plate, Left
	Trigger Side Plate, Left, LH
	Trigger Pivot Pin
	Trigger Pull Adjustment Lever
	Trigger Pull Adjustment Lever Insert
	Trigger Pull Adjustment Lever Pin
	Trigger Pull Adjustment Screw
	Trigger Pull Adjustment Spring
	Trigger Spring
	Trigger Guard

Date: **NBAR**

Sheet 2 (Dotted line (----))
of indicates same part number

DWG. **PART NAME**
NO.

PART NUMBERS

	223					
	243					
	6mm					
	308					
	25-06					
	270					
	30-06					
	7mm Mag.					
	300 Win Mag					
	338 Win Mag					
	22-250 LH					
	243 LH					
	270 LH					
	30-06 LH					
	7mm Mag LH					
	222 Varmint					
	22-250 Varmint					
	223 Varmint					
	243 Varmint					
	6mm Varmint					
	308 Varmint					
	BARREL					
	17 Rem 24"					
	222 24"					
	22-250 24" (LH also)					
	223 24"					
	243 22" (LH also)					
	6mm 22"					
	308 22"					
	25-06 24"					
	270 22" (LH also)					
	30-06 22" (LH also)					
	7mm Mag. 24" (LH also)					

Ilion Research Division

Date: NBAR

Sheet 3 (Dotted line (----))
of indicates same part number

DWG. PART NAME
NO.

PART NUMBERS

300 Win Mag 24"
338 Win Mag 24"
222 Varmint 24"
22-250 Varmint 24"
223 Varmint 24"
243 Varmint 24"
6mm Varmint 24"
308 Varmint 24"

SKD-3764

RECEIVER

17 Rem., 222, 223
243
22-250, 6mm, 308
25-06, 270, 30-06
7mm Mag. 300, 338
22-250 LH
243 LH
270, 30-06, 7mm Mag LH

SKD-3803

Bolt Assembly

17 Rem., 222, 223
22-250, 243, 6mm, 308
25-06, 270, 30-06
7mm Mag. 300 Mag, 338 Mag
22-250, 243 LH
270, 30-06 LH
7mm Mag LH

C-EXP-1114

Bolt Body Assembly

17 Rem., 222, 223
22-250, 243, 6mm, 308
25-06, 270, 30-06
7mm Mag. 300 Mag, 338 Mag
22-250, 243 LH
270, 30-06 LH
7mm Mag LH

Date: NBAR

Sheet 1 (Dotted line (---))
of indicates same part number

DWG. PART NAME
NO.

PART NUMBERS

BARREL ASSEMBLY COMPLETE					
17 Rem.					
222					
22-250					
223					
243					
6 mm					
308					
25-06					
270					
30-06					
7mm Mag					
300 Win Mag					
338 Win Mag					
22-250 LH					
243 LH					
270 LH					
30-06 LH					
7mm MAG LH					
222 Varmint					
22-250 Varmint					
223 Varmint					
243 Varmint					
6 mm Varmint					
308 Varmint					
BARREL ASSEMBLY					
17 Rem					
222					
22-250					

Date: **NBAR**

Sheet 4 (Dotted line (---))
of indicates same part number

DWG. **PART NAME**
NO.

PART NUMBERS

SKC-3794	Bolt Body Short Action Long Action					
SKD-3766	Bolt Body Brazing Slug Bolt Head 17 Rem., 222, 223 22-250, 243, 6mm, 308 25-06, 270, 30-06 7mm Mag. 300 Mag, 338 Mag 22-250 243 LH 270, 30-06 LH 7mm Mag LH	SKD 3781				
B-18758	— Bolt Pin Ejector Washer					
SKD-3778	— Bolt Handle Bolt Handle LH					
SKD 2941	Bolt Handle Brazing Shim Ejector Plug Ejector Pin Ejector Spring Extractor 17 Rem., 222, 223 22-250, 243, 6mm, 308 25-06, 270, 30-06 7mm Mag. 300 Mag, 338 Mag					
	Firing Pin Assembly Short Action Long Action					
B-91335 SKC-3797	Bolt Plug Washer Firing Pin Short Action Long Action	C-100335				

Date: NBAR

Sheet 5 (Dotted line (----))
of indicates same part number

DWG. PART NAME
NO.

PART NUMBERS

A-EXP-1412	Firing Pin Cross Pin					
C-EXP-1264	Firing Pin Head (Blau) C-EXP-1436					
	Mainspring					
	Short Action					
	Long Action					
	Bolt Stop					
	Bolt Stop Pin					
	Bolt Stop Spring					
	Bolt Stop Spring LH					
C-22035	Front Guard Screw					
D-EXP-1405	Magazine					
	17 Rem., 222, 223					
	22-250, 243, 6mm, 308					
	25-06, 270, 30-06					
	7mm Mag. 300 Mag, 338 Mag					
B-EXP-1436	Magazine Sub-Assembly					
C-EXP-1352	Magazine Bottom					
	17 Rem., 222, 223					
	22-250, 243, 6mm, 308					
	25-06, 270, 30-06					
	7mm Mag. 300 Mag, 338 Mag					
D-EXP-1391	Magazine Follower					
	17 Rem., 222, 223					
	22-250, 243, 6mm, 308					
	25-06, 270, 30-06					
	7mm Mag. 300 Mag, 338 Mag					
B-EXP-1386	Magazine Latch					
	Magazine Latch Screw					

Date: NBAR

Sheet 6 (Dotted line (---))
of indicates same part number

DWG. PART NAME
NO.

PART NUMBERS

B-EXP-367	Magazine Release					
	Magazine Release Pivot					
	Magazine Spacer					
	17 Rem, 222, 223					
B-EXP-1014	Magazine Spring					
	17 Rem., 222, 223					
	22-250, 243, 6mm, 308					
	25-06, 270, 30-06					
	7mm Mag. 300 Mag, 338 Mag					
	Rear Guard Screw					
	Rear Pin					
	Stock Assembly					
	Short Action					
	Long Action					
	Magnum					
	Short Action LH					
	Long Action LH					
	Magnum LH					
	Short Action Varmint					
SLC-380	Fore-end Tip					
O-92762	Grip Cap					
	Recoil Pad					
	Recoil Pad Reinforcement					
	Recoil Pad Screw					
	Stock					
	Short Action					
	Long Action					
	Magnum					
	Short Action LH					
	Long Action LH					
	Magnum LH					
	Short Action Varmint					

Date: **NBAR**

Sheet 7 (Dotted line (----)
of indicates same part number

DWG. PART NAME
NO.

PART NUMBERS

	Stock Reinforcement River					
	Stock Reinforcement Plug (2)					
	Stock Reinforcement Washer					
SKC-3806	Scrap Mount Assembly (2)					
B-EXP-1414	Scope Mount — Blank (SKD-3805)					
B-EXP-1416	Scope Mount Clamp					
SKC-3807	Scope Mount Nut (Blank B-EXP-1415)					
A-EXP-1413	Scope Mount Ring					
	Scope Mount Screws					
	Swivel Assembly (2)					
	Swivel Screw (2)					
B-EXP-1434	TRIGGER ASSEMBLY					
	TRIGGER ASSEMBLY, LH					
C-EXP-1449	Bolt Lock					
	Bolt Lock LH					
	Bolt Lock Spring					
	Bolt Lock Release <i>Hunger</i>					
	Bolt Lock Release Pin					
	Bolt Stop Release					
	Bolt Stop Release LH					
	Safety Assembly					
	Safety Assembly LH					
	Safety					
	Safety LH					
	Safety Button					
	Safety Detent Ball					
	Safety Detent Spring					
	Safety Detent Spring LH					
	Safety Pivot Pin					
	Safety Snap Washer					
	Sear Safety Cam					
	Sear Spring					

Date: **NBAR**

Sheet 9 (Dotted line (----)
of indicates same part number

DWG. **PART NAME**
NO.

PART NUMBERS

SKB-3633	Trigger					
	Trigger Block Plunger					
SKA-3632	Trigger Block Plunger Spring					
	Trigger Guard					
C-EXP-1435	Trigger Housing Assembly					
	Trigger Housing Assembly LH					
	Trigger Housing Rivet (4)					
	Trigger Housing Spacer, Front					
C-EXP-1421	Trigger Housing Spacer, Rear					
	- Trigger Side Plate, Right <i>Blow</i>	C-EXP-1420				
	Trigger Side Plate, Right, LH					
C-EXP-1424	Trigger Side Plate, Left	C-EXP-1423				
	Trigger Side Plate, Left, LH					
	Trigger Pivot Pin					
C-EXP-1437	Trigger Pull Adjustment Lever					
B-EXP-1438	Trigger Pull Adjustment Lever Pin					
	Trigger Pull Adjustment Screw					
A-EXP-1411	Trigger Pull Adjustment Spring					
A-EXP-1410	Trigger Spring					
E-EXP-1350	Trigger Guard					

5-20-85 Discovered bolt lock model is wrong.
WEDM parts to date and Model Shop bending
time down the tubes. Model must be updated.
(Dwg correct. - CV model wrong)

5-20-85 Pressure vent work hit Model Shop yesterday.
All NBAR work stopped as per Curry.

Complete Model Shop Part Listing					4/3
Weight of	30-06				20
	Barrel (Through Custom Shop)				10
	Receiver				4
	Bolt Body Assembly	5	(5 Production)		20
	Bolt Plug	20			40
	Extractor	20			100
	Firing Pin	4			
	Firing Pin Cross Pin	1/2			
4/3	Firing Pin Head	20			
x	Magazine Bottom	10			
	Magazine Follower	8			
	Magazine Latch	10			
	Magazine Latch Screw	1			
	Magazine Release	2			
	Stock	10			
4/6	Scope Mount Clamp	1			
4/6	Scope Mount Nut	2			
	Scope Mount	1			Trigger Plunger
4/4	Bolt Lock	5	WEDM	5	
x	Bolt Lock Plunger	4			
	Safety	5	WEDM	5	
4/3	Safety Button	3			
4/10 wk	Sear	5	WEDM	5	
	Trigger	5	WEDM	5	
4/8	Trigger Block Plunger	1			
x	Trigger Block Plunger Spring	1	Complete		8 hrs
4/3	Trigger Housing Assembly	1			
4/3	Trigger Housing Spacer, Rear	2	WEDM	2	

x	Trigger Side Plate, Right	3	WASH	3
x	Trigger Side Plate, Left	3	WASH	3
4/10	Trigger Pull Adjustment Lever	5		
3/1	Trigger Pull Adj. Lever Insert	3	Complete	15 hrs
5/3	Trigger Pull Adj. Screw	3		
	Trigger Pull Adj. Spring	1		
	Trigger Spring	1		
	Trigger Guard	15	WASH	10
				38

180 days

90

270 days total

$$\begin{array}{r}
 65 \text{ days} \\
 4 \overline{) 270} \\
 \underline{24} \\
 30 \\
 36 \text{ days} \\
 4 \overline{) 144} \\
 \underline{12} \\
 24 \\
 \underline{24} \\
 0
 \end{array}
 \qquad
 \begin{array}{r}
 13 \text{ weeks} \\
 5 \overline{) 65} \\
 \underline{5} \\
 15
 \end{array}$$

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

Remington
*PETERS*
xc: J.W. Bower
W.M. Curry
F.E. Martin
R.J. Sanzo
F.H. Smith
J.R. Snedeker**"CONFINE YOUR LETTER TO ONE SUBJECT ONLY"**Ilion, New York
May 31, 1985TO: W.L. TOMEK
FROM: R.S. MURPHY ✓**NBAR PROGRAM TIMING**

The following schedule has been developed for the NBAR that is realistic and will certainly be able to be completed on time. Please review this schedule and try to anticipate your involvement. If there are any questions please see me so that we can keep the number of surprises to a minimum.

Fabricate 10 Prototypes	(10 Weeks)	Aug.	12
Assemble	(2 Weeks)	Aug.	26
Developmental Test	(5 Weeks)	Sept.	30
Redesign	(2 Weeks)	Oct.	14
Drawing Package to Process for Economics		Oct.	14
Fabricate 30 Prototypes	(15 Weeks)	Feb.	10
Design Acceptance Test	(6 Weeks)	Mar.	22
Formal Economics Transmit		Mar.	29

RSM:js

RSM

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

Remington



PETERS

xc: Jim Snedeker
Warren Tomek

"CONFINE YOUR LETTER TO ONE SUBJECT ONLY" _____

May 22, 1985

TO: Terry Douglas
Dave FindlayRandy Murphy
Ken Rowlands

FROM: Jim Bower

Design Verification Tests

All design verification tests must include function testing from the shoulder. Jack testing is a viable alternative for early development testing, and is the only practical means of endurance testing. However, no design should be transmitted to Production without first verifying it by actual shoulder shooting.

JWB:sps

Trigger Assembly	
Trigger Assembly LH	
Bolt Stop	Bolt Stop Spring
Bolt Stop LH	
Safety Assembly	
Safety Assembly LH	
Safety	
Safety LH	
Safety Button	
Safety Detent Ball	B-23220
Safety Detent Spring	B-15368
Safety Detent Spring LH	B-92546
Safety Pivot Pin	B-17043
Safety Snap Washer	A-17044
Sear Safety Cam	
Sear Spring	A-17047
Trigger	
Trigger Block Plunger	
Trigger Block Plunger Spring	
Trigger Housing Assembly	
Trigger Housing Assembly LH	
Trigger Housing Rivet (4)	A-14632
Trigger Housing Spacer, Front	B-14630
Trigger Housing Spacer, Rear	
Trigger Side Plate, Right	
Trigger Side Plate, Right LH	
Trigger Side Plate, Left	
Trigger Side Plate, Left LH	

Trigger Pin

C-24475

Trigger Pull Adjustment Lever

Trigger Pull Adjustment Lever Pin

Trigger Pull Adjustment Screw

Trigger Pull Adjustment Spring

Trigger Spring

Bolt Lock

Bolt Lock, LH

Bolt Lock Spring

Bolt Lock Release

Bolt Lock Release Pin

Trigger Assembly	
Trigger Assembly LH	
Bolt Stop	Bolt Stop Spring
Bolt Stop LH	
Safety Assembly	
Safety Assembly LH	
Safety	
Safety LH	
Safety Button	
Safety Detent Ball	B-23220
Safety Detent Spring	B-15368
Safety Detent Spring LH	B-92546
Safety Pivot Pin	B-17043
Safety Snap Washer	A-17044
Sear Safety Cam	
Sear Spring	A-17047
Trigger	
Trigger Block Plunger	
Trigger Block Plunger Spring	
Trigger Housing Assembly	
Trigger Housing Assembly LH	
Trigger Housing Rivet (4)	A-14632
Trigger Housing Spacer, front	B-14630
Trigger Housing Spacer, rear	
Trigger Side Plate, Right	
Trigger Side Plate, Right LH	
Trigger Side Plate, Left	
Trigger Side Plate, Left LH	

Trigger Pin

C 24475

Trigger Pull Adjustment Lever

Trigger Pull Adjustment Lever Pin

Trigger Pull Adjustment Screw

Trigger Pull Adjustment Spring

Trigger Spring

Bolt Lock

Bolt Lock, LH

Bolt Lock Spring

Bolt Lock Release

Bolt Lock Release Pin

Firecontrol (complete w/safety and bolt lock)

Feeding Assembly
Bolt Lock

Bolt Assembly

Magazine Assembly

Barrel Assembly

NBAR PARTS LIST

Barrel Assembly Complete

New Drawings →

1 of
Dove's Group

17 Rem

222

22-250

223

243

6 mm

308

25-06

270

30-06 7mm Mag

300 Win. Mag.

338 Win. Mag.

22-250 LH

243 LH

270 LH

30-06 LH

7mm Mag LH

222 Varmint

22-250 Varmint

223 Varmint

243 Varmint

6 mm Varmint

308 Varmint

- Barrel Assembly New Drawings

17 Rem

222

22-250

223

243

6mm

308

25-06

270

30-06 7mm Mag

300 Win Mag

338 Win Mag

22-250 LH

243 LH

270 LH

30-06 LH

7mm Mag LH

222 Varmint

22-250 Varmint

223 Varmint

243 Varmint

6mm Varmint

308 Varmint

• • Barrel

17 Rem 24"

222 24"

22-250 24" (LH Also)

223 24"

243 22" (LH Also)

6 mm 22"

308 22"

25-06 24"

270 22" (LH Also)

30-06 22" (LH Also)

7mm Mag 24" (LH Also)

300 Win Mag 24"

338 Win Mag 24"

222 Varmint 24"

22-250 Varmint 24"

223 Varmint 24"

243 Varmint 24"

6mm Varmint 24"

308 Varmint 24"

• • Receiver New Drawing → Skip SAE-3764

17 Rem, 222, 223

243

22-250, 6mm 308

25-06, 270, 30-06,

7mm Mag, 300, 338

22-250 LH

243 LH

270, 30-06, 7mm Mag LH

• Bolt Assembly SKD-3803 Done

17 Rem, 222, 223

22-250, 243, 6mm, 308

25-06, 270, 30-06

7mm Mag, 300 Mag, 338 Mag

22-250, 243 LH

270, 30-06 LH

7mm Mag LH

• • Bolt Body Assembly C-EXP-1114
C-EXP-1114

17 Rem, 222, 223

22-250, 243, 6mm, 308

25-06, 270, 30-06

7mm Mag, 300 Mag, 338 Mag

22-250, 243 LH

270, 30-06 LH

7mm Mag LH

- 5.1
- • Bolt Body SKC-3794
 - Short Action
 - Long Action
 - • Bolt Body Brazing Slug A-18493
 - • Bolt Head (BLANK SKD-3781) SKD-3766
 - 17 Rem, 222, 223
 - 22-250, 243, 6mm, 308
 - 25-06, 270, 30-06
 - 7mm Mag, 300 Mag, 338 Mag
 - 22-250, 243 LH
 - 270, 30-06 LH
 - 7mm Mag LH
 - • • Bolt Pin A-18758
 - • • Ejector Washer B-17011
 - • Bolt Handle SKD-3778
 - • Bolt Handle LH
 - • Bolt Handle Brazing Shim C-20195
 - Ejector A-17017
 - Ejector Pin A-17676
 - Ejector Spring A-17019
 - Extractor
 - 17 Rem, 222, 223
 - 22-250, 243, 6mm, 308
 - 25-06, 270, 30-06
 - 7mm Mag, 300 Mag, 338 Mag

Bolt Plug SKD-2941 6 of

Firing Pin Assembly New

Short Action

Long Action

~~Bolt Plug~~

• Firing Pin

SKC-3797
(BLANK C-100335)

Short Action

Long Action

• Firing Pin Cross Pin

A-EXP-1412
BLANK C-EXP-1346
C-EXP-124A

• Firing Pin Head

• Main Spring

Short Action

A-17058

Long Action

Washer

B-91335

A-17029

Bolt Stop

B-17013

Bolt Stop Pin

C-24475

Bolt Stop Spring

B-15224

Bolt Stop Spring LH

B-90554

Front Guard Screw

C-22035

Magazine

D-EXP-1405

17 Rem, 227, 223

22-250, 243, 6mm, 308

25-06, 270, 30-06,

7mm Mag, 300 Mag, 338 Mag

Magazine Bottom

New

17 Rem, 222, 223

22-250, 243, 6mm, 308

25-06, 270, 30-06

C-EXP-1352

Magazine Follower

DEXP-1391

17 Rem, 222, 223

22-250, 243, 6mm, 308

25-06, 270, 30-06

7mm Mag, 300 Mag, 338 Mag

Magazine Spacer

New

B-EXP-1386

Magazine Latch

17 Rem, 222, 223

Magazine Latch Screw

Magazine Spring B-EXP-1014

B-EXP-1387

Magazine Release

17 Rem, 222, 223

Magazine Release Pivot

22-250, 243, 6mm, 308

22-250, 243, 6mm, 308

25-06, 270, 30-06

7mm Mag, 300 Mag, 338 Mag

Rear Guard Screw

2

Sear Pin

C-24475

Stock Assembly

New

Short Action

Long Action

Magnum

Short Action LH

Long Action LH

Magnum LH

Short Action Varmint

- Fore-end Tip

- Grip Cap

- Recoil Pad

D-92762

- Recoil Pad Reinforcement

- Recoil Pad Screws

C-25410

- Stock New

Short Action

Long Action

Magnum

Short Action LH

Long Action LH

Magnum LH

Short Action Varmint

- Stock Reinforcement Rivet B-9284

- Stock Reinforcement Plug (2) B-9285

- Stock Reinforcement Washer B-9284

Scope Mount Assembly (2)

- Scope Mount SKA-3806

- Scope Mount Clamp B-EXP-1414

- Scope Mount Nut B-EXP-1415

- Scope Mount Ring B-EXP-1416

- Scope Mount Screws C-EXP-1419

- Scope Mount Screws A-EXP-141

- Bolt Lock Plunger SKC-3776

- Bolt Lock Pin SKA-3777

- Bolt Stop Release C-15478

- Bolt Stop Release LH C-90555

- Safety Assembly
- Safety Assembly LH
- • Safety
- • Safety LH
- • Safety Button
- Safety Detent Ball B-23220
- Safety Detent Spring B-15368
- Safety Detent Spring LH B-92546
- Safety Pivot Pin B-17043
- Safety Snap Washer A-17044
- Sear Safety Cam
- Sear Spring A-17047
- Trigger
- Trigger Block Plunger
- Trigger Block Plunger Spring
- Trigger Housing Assembly ~~Trigger Guard~~
- Trigger Housing Assembly LH
- • Trigger Housing Rivet (4) A-14632
- • Trigger Housing Spacer, Front
- • Trigger Housing Spacer, Rear
- • Trigger Side Plate, Right
- • Trigger Side Plate, Right, LH
- • Trigger Side Plate, Left
- • Trigger Side Plate, Left, LH
- Trigger Pivot Pin C-24475
- Trigger Pull Adjustment Lever
- Trigger Pull Adjustment Lever Pin
- Trigger Pull Adjustment Screw

10 of

- Trigger Pull Adjustment Spring
- Trigger Spring

TRIGGER GUARD E-EXP-1350

Schedule

Barrel - 30-06

Get 10 hubbed + threaded barrels from production

Receiver

Complete Design

Marked-up Prints

Purchase Stock

Machine Blanks

Broach on Production

Complete Machining in Model Shop

Heat Treat

Assembly to Barrel (Custom Shop)

Chambering

Strategy / Assumptions

Developmental Testing to be done in 3006 only

Design Complete

Marked-up Prints Complete

Work Request in to Model Shop

Parts Complete

Assembly

Developmental Testing

Redesign Complete

Work Request in to Model Shop

Design Acceptance Test

Assemble Drawing Package

Formal Economics

Transmittal

Complete Parts From Production

Ejector
Ejector Pin
Ejector Spring
Mainspring
Bolt Stop
Bolt Stop Pin
Bolt Stop Spring
Sear Pin
Recoil Rod + Screws
Bolt Stop Release
Safety Detent Ball
Safety Detent Spring
Safety Pivot Pin
Safety Snap Washer
Trigger Pivot Pin

Incomplete Parts

Barrel
Bolt Body
Bolt Head
Firing Pin
Firing Pin Cross Pin
Trigger Side Plate, Rt.
Trigger Side Plate, Lt.

DATE																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
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DATE									
SHEET OF	2 3	Dotted line (- - - -) indicates same part number.							
DWG. NO.		PART NUMBER							
		PART NUMBERS							
		Firing Pin Assembly							
SKD-2941		Bolt Plug							
		Firing Pin (BLANK)							
		Firing Pin Cross Pin							
C-EXP-1264		Firing Pin Head (BLANK C-EXP-1346)							
A-17058		Mainspring							
B-91335		Washer							
SKC-3773		Bolt Lock							
SKC-3772		Bolt Lock Cam							
SKA-3792		Bolt Lock Cam Spring (SKA-3800 ALT)							
SKC-3776		Bolt Lock Plunger							
SKC-3777		Bolt Lock Plunger Pin							
SKA-3791		Bolt Lock Spring							
SKC-3758		Bolt Stop							
C-24475		Bolt Stop Pin							
SKA-3791		Bolt Stop Spring							
C-22035		Front Guard Screw (BLANK C-28810)							
C-EXP-1351		Magazine							
C-EXP-1352		Magazine Bottom							
C-EXP-1353		Magazine Follower							
C-EXP-1355		Magazine Latch							
		Magazine Latch Screw							
B-EXP-1354		Magazine Release							
A-17044		Magazine Release Retainer							
		Magazine Spring							
A-21255		Rear Guard Screw (BLANK A-91909)							
SKB-3728		Safety Detent Spring							
SKB-3779		Safety Lever							
		Safety Link							
		SAFETY ROTOR SPRING							
SKC-3775		Safety Rotor							

C.V.

NBAR Timing

Fabricate 10 Prototypes	(10 weeks)	Aug 12	
Assemble	(2 weeks)	Aug 26	
Test (Developmental)	(5 weeks)	Sept 30	
Redesign	(2 weeks)	Oct 14	
Fabricate 30	(15 weeks)	Feb 10	- Economics Out
Design Accept Test	(6 weeks)	Mar 22	Economics Back
Transmit		March 29	

Trigger Assembly

Wine Parts

Side Plates, left & rt.

Start 5/22

End date

4

5/28

Trigger

7

4/5

Sear

5

4/2

Bolt Lock

5

6/19

Safety

5

6/26

Spacer Rear

2

4/28

28 days (best time)

Days Shop Parts

5 Bolt Lock Plunger

3 Safety Button

1 Trigger Block Plunger

2 Plunger Spring

1 Housing Assembly

5 Adj. Lever

3 Adj. Screw

1 Adj. Spring

1 Trigger Spring

3 Adj. Pinset

25 days (Best Time)

July 1 - best time, shop parts

1 man 25 days

July 3 best time, wine parts

1 man 28 days

⁸
 79 days
 Stock 10 days
 Transport 15 days
 25 days
 129
 64 days contingency 14 days contingency
 193 days 42 days ~ 9 weeks
 28 days wire time (Ray)

48 ~ 30 days = 10 weeks
 $4 \sqrt[3]{73}$
 $\frac{16}{33}$
 1 hr/day or 4 hrs
 x 45 days
 20 hrs ~ 2 1/2 days

$\frac{10}{45}$
 August 12
 30 days, cut time to 7 wks.

Test (5 weeks)	Sept 16	
Redesign	Oct 11	
Manufacture (30)	Jan 20	Economics Out
Design Accept Test	Mar 1	Economics Back
Transmit	Mar 15	

To Model Shop Yet

- ✓ Firing Pin (long) 4 ~~days~~
- ✓ Firing Pin Head 4 wks
- Magazine follower 8 days
- ✓ Mag latch 2 wks
- ✓ Mag Release 8 hrs / 3 2 days

Bolt Plug

- ✓ Scope Mount Nut 2 days

- ✓ Bolt Assembly

Trigger Guard

talk about:

Stocks

Receivers

- ✓ Scope Mount Clamp 1 day

NBAR

Schedule (Transmit 1Q 86)

rites needed for competitive review?

report outlining deficiencies of wood stocks, fiberglass stock
how can Dupont help

ports list

letter to Griffiths, position vs. Sauer patent

NCS

letter to Goe Spring

Dual Oritone Report

Safety System Review

Weight Review

Dashpot progress report

MISC

trip report

appraisal forms

Frank Klein reply

Firing Pin Assembly

Reduced Number (4-6)

Firing Pin	4 days
Firing Pin Head	20 days
Cross Pin	1 hr.

Magazine Box Assembly (Long Action)

Box ?

Bottom	10 days
Followers	8 days
Catch	10 days
Release	2 days

Stock Assembly

Stocks from Production	6/7
Inletted in Model Shop	6/21
Sand + Finish on Production	7/19

Misc.

Bolt Plug	20 days
Scope Mount Nut	2 days
Scope Mount Box (Top)	1 day
Scope Mount Clamp	1 day

Scope Mount Assembly

Re-spray Mold 3 weeks

Mold Parts 1 week

Process 3 weeks

Secondary Machine 4 days

NBAR - SCORE MOUNT TESTING (REVISED) 5/20					
5/3	5/10	5/17	5/24	5/31	6/7
MAKE SPENT MOLD (INJECTION MOLD)					6/21
MOLD PARTS					6/21
SECONDARY MACHINE PARTS					
RUN FULL RANGE RECEIVERS IN PRODUCTION					
MILL INTEGRAL SCORE MOUNT CUTS IN RECEIVERS					
2 POLISH COLOR & TREAT TREAT RECEIVERS					
ASSEMBLE COMPONENTS IN GUNS					
PURCHASE & DELIVERY OF RUGER WHIPS FOR TEST					
SHOOT ACCURACY SHOOT 200 RDS. RETEST FOR ACCURACY (NBAR vs. RUGER)					

NIBAR - FIRING PIN & EXTRACTOR TESTING (RESERVED) 5/20 4/21 4/28

5/3 5/10 5/17 5/24 5/31 6/7

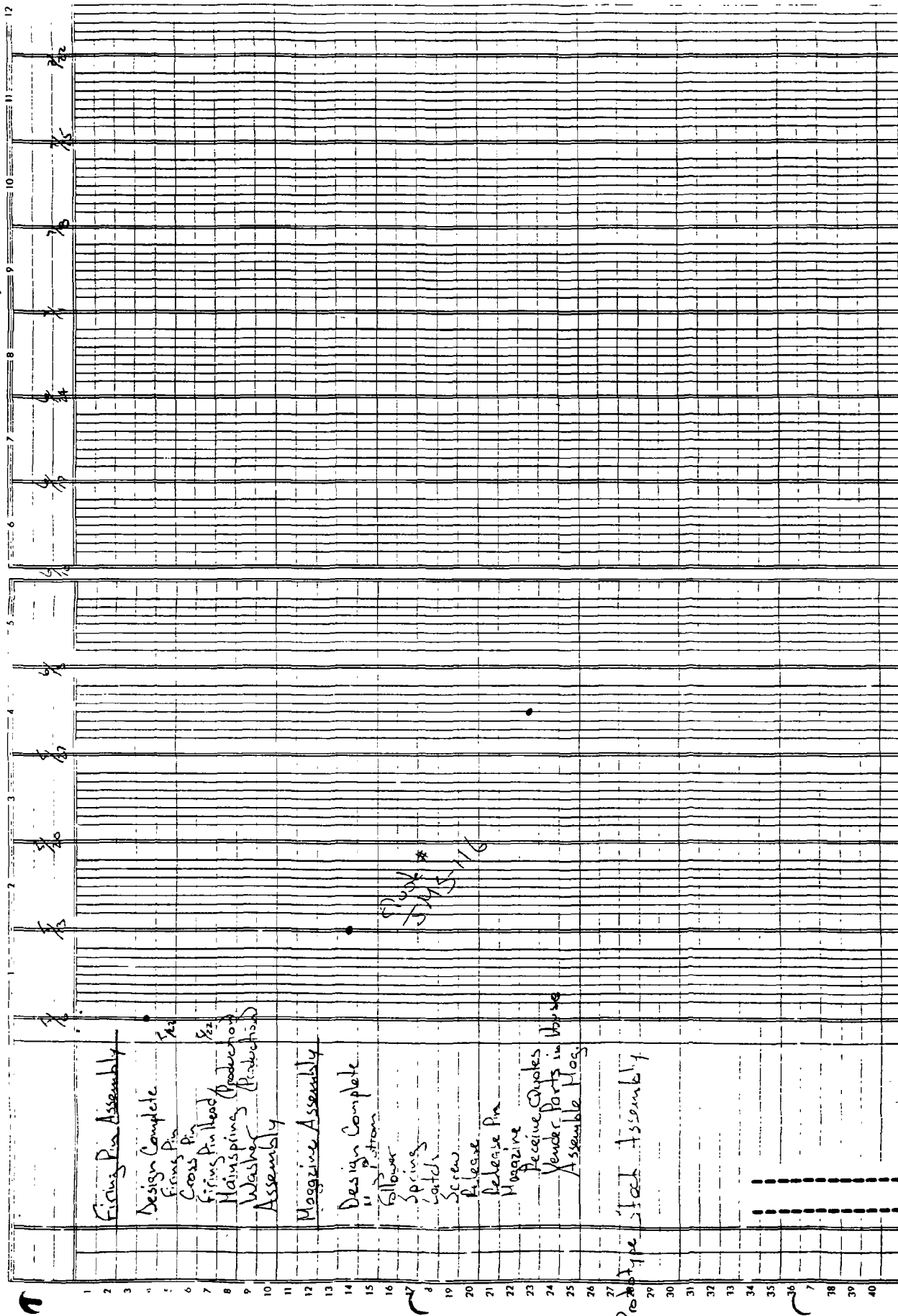
BUY-G NIBAR
30-06 CAL.
CONVERT-3 TO NIBAR

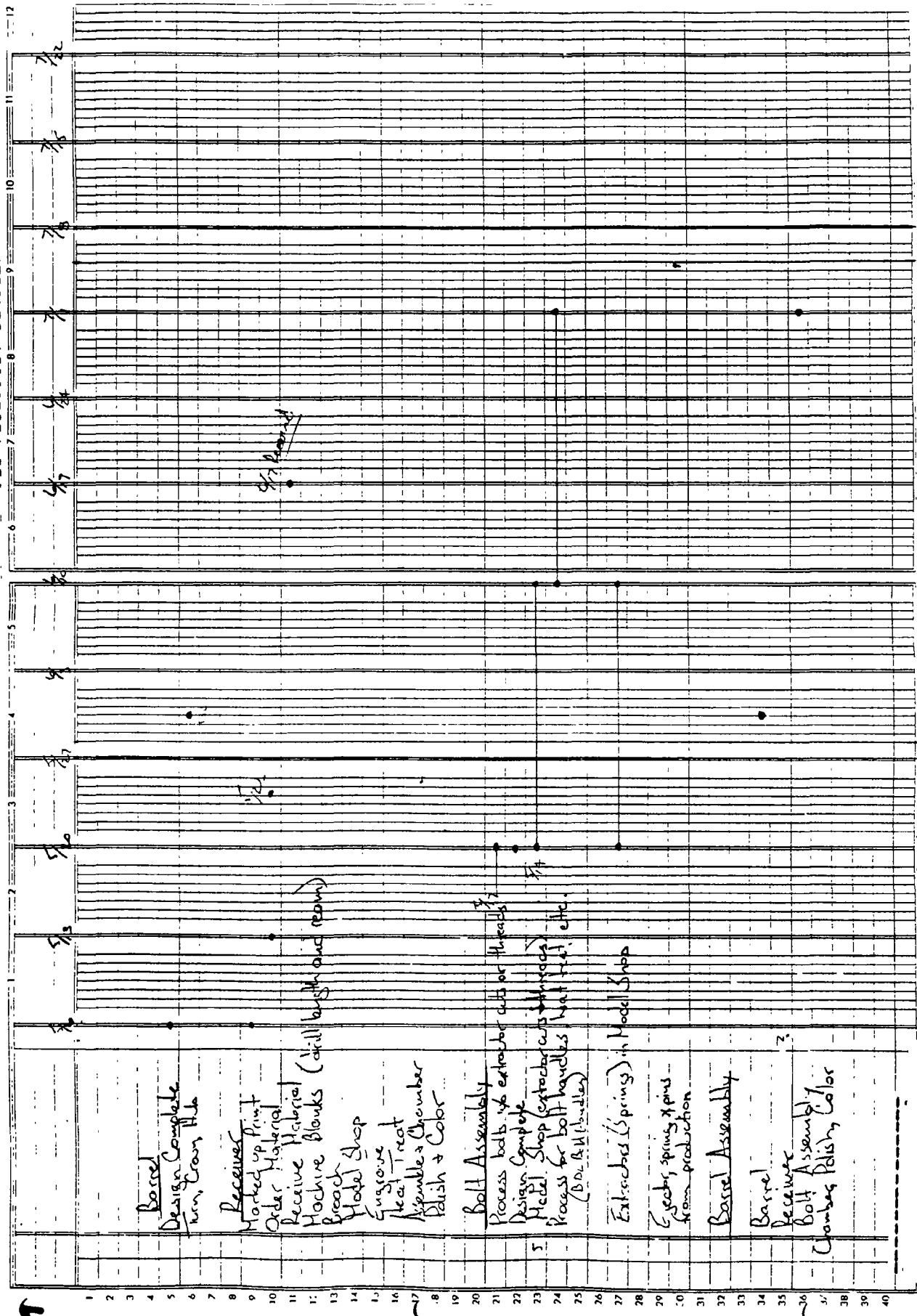
LINE FIRE, LOAD/
UNLOAD, FIRING
PIN DRY CYCLE
(7500 DRY CYCLES
1500 RDS.)

DRY CYCLE
EXTRACTOR (10000
CYCLES)

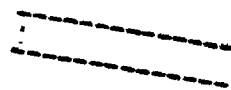
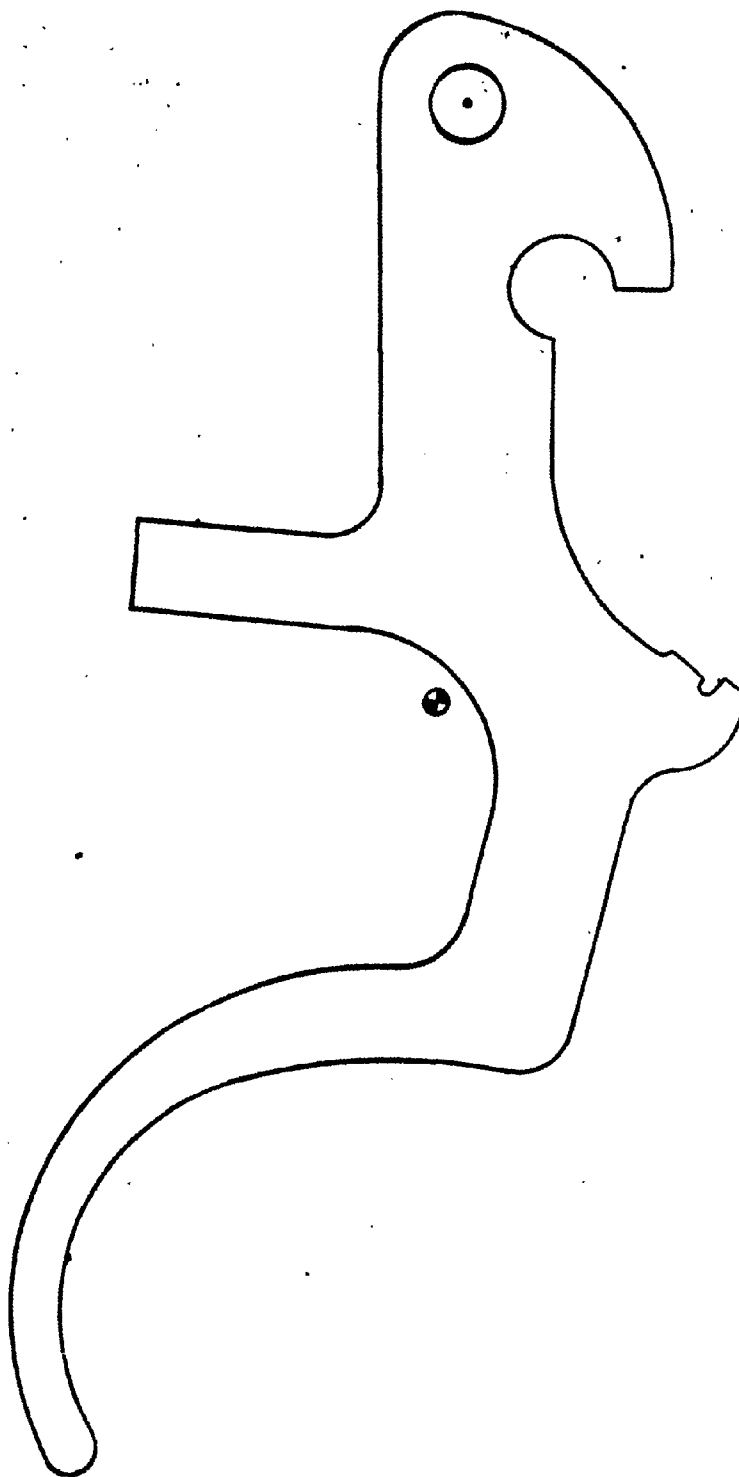
LINE FIRE TO
3000 RDS.
(NIBAR EX-NIBAR)

	1	2	3	4	5	6	7	8	9	10	11	12
1	Scope Mount Assembly											
2	Design Complete											
3	Photo Type Super Alloy Parts											
4	Tap Nut Thread Clamp 11x											
5	Remount Hold (Ring)											
6	Trigger Assembly											
7	Design Complete											
8	Bolt Lock											
9	Bolt Lock Plunger											
10	Bolt Lock Release Pin											
11	Safety Assembly											
12	Safety Button											
13	Safety Detent Ball											
14	Safety Detent Spring											
15	Safety Pin 1 Pin											
16	Safety Snap Washer											
17	Safety Cam											
18	Seal Spring											
19	Trigger											
20	Trigger Block Plunger											
21	Trigger Block Plunger Spr											
22	Trigger Housing Assy											
23	Pin											
24	Spacer, Front											
25	Spacer, Rear											
26	Side Plate, Left											
27	Side Plate, Right											
28	Trigger Pin											
29	Trigger Pin Adj. Lower											
30	Trigger Pin Adj. Lower Pin											
31	Trigger Pin Adj. Spring											
32	Trigger Pin Adj. Spring											
33	Trigger Pin Adj. Spring											
34	Trigger Pin Adj. Spring											
35	Trigger Pin Adj. Spring											
36	Trigger Pin Adj. Spring											
37	Trigger Pin Adj. Spring											
38	Trigger Pin Adj. Spring											
39	Trigger Pin Adj. Spring											
40	Trigger Pin Adj. Spring											





NBAR Force
Analysis



Trigger

$$\begin{aligned} R &= 3 \\ F_1 &= 2 \\ F_2 &= 8 \\ F_3 &= 8 \end{aligned}$$

.614 oz at 1.010

Jars off at 8"

$$E = mgh = wh = \frac{.614 \text{ oz} (8") (11 \text{ lb})}{16 \text{ oz}} = .307 \text{ in lbs}$$

$$E = wh = .307$$

$$w = \frac{.307}{30"} = .010 \text{ lb} = .164 \text{ oz}$$

$$\frac{.164}{.614} = 26\% \text{ of current}$$

REMINGTON ARMS COMPANY, INC.

ENGINEERING DEPARTMENT



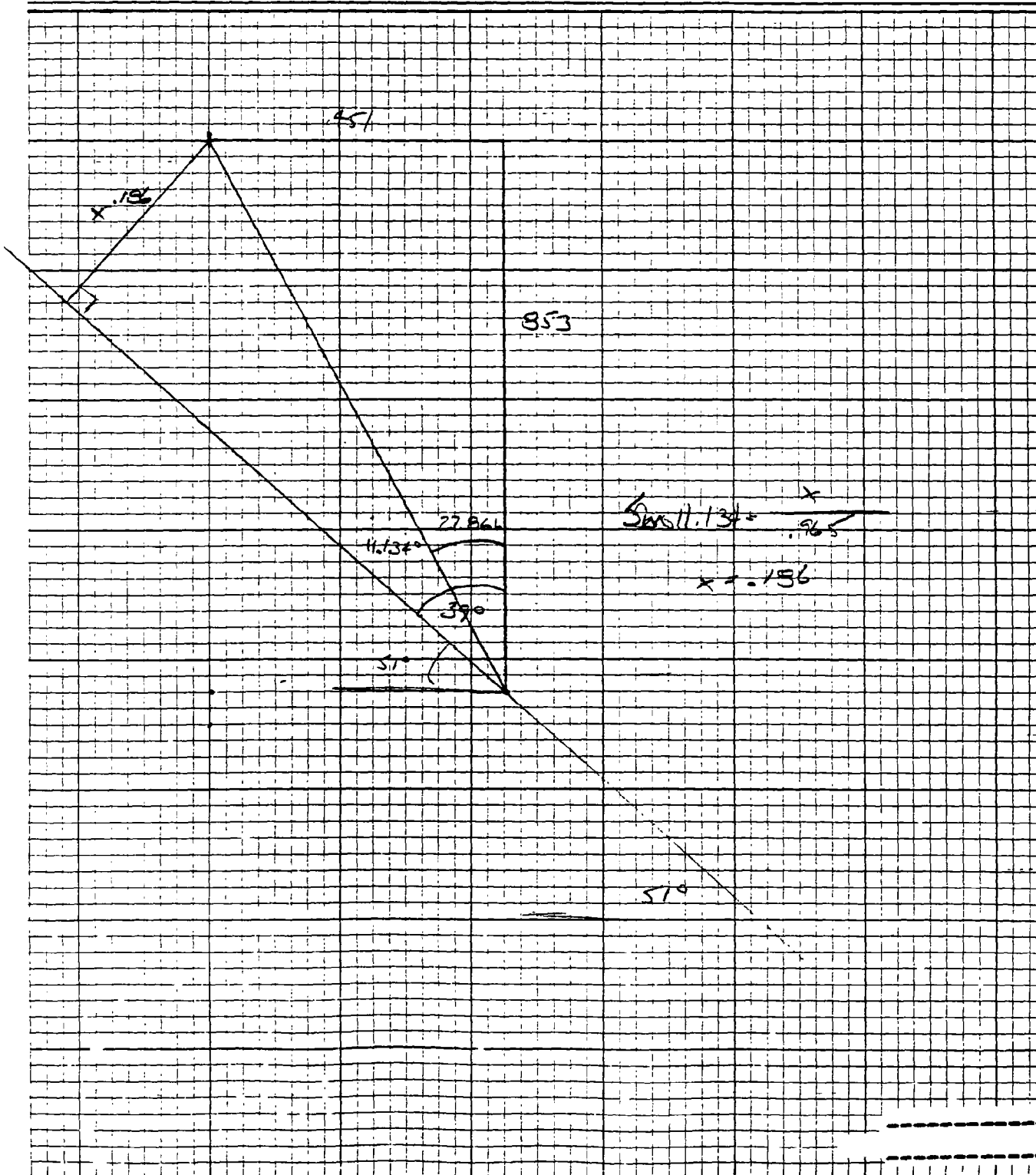
COMPUTATION SHEET

SHEET NO. _____

TITLE OF PROJ. _____ PROJ. NO. _____

SUBJECT _____ WORKS _____

COMPUTER _____ DATE _____ 19__



Sear

$$F_{FP} = 22.279$$

$$F_{SS} = 1.703$$

ΣH_0

$$.403(22.279) = .320(1.703) + F_{T1} \left(\frac{10}{1120} \right)$$

$$F_{T1} = 7.53 \quad \text{Present Design}$$

$$8.978 = .545 + 10 F_{T1}$$

$$F_{T1} = .843 \quad 10^{\#} \text{ Sear spring}$$

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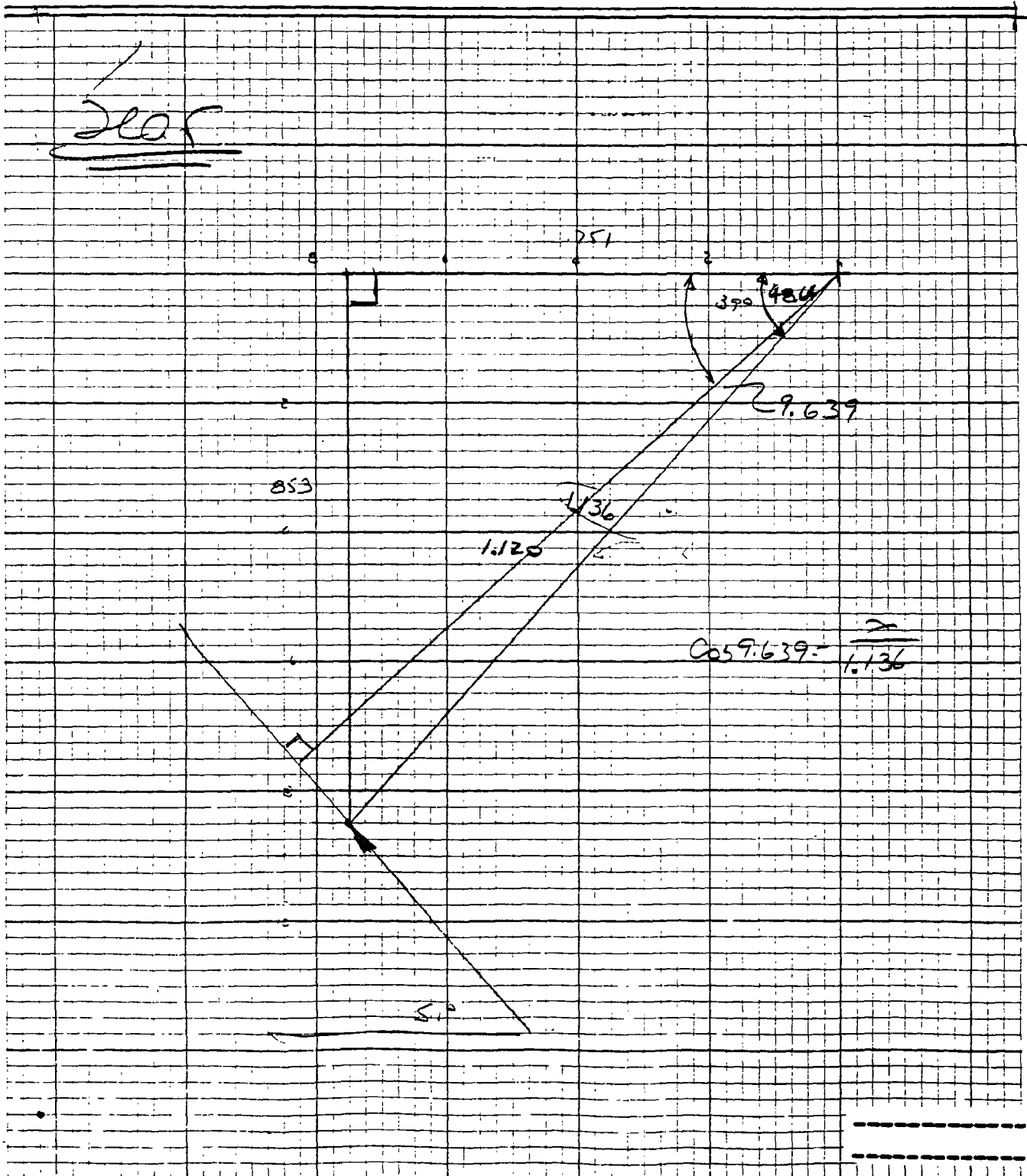
ENGINEERING DEPARTMENT  COMPUTATION SHEET

SHEET NO. _____

TITLE OF PROJ. _____ PROJ NO. _____

SUBJECT _____ WORKS _____

COMPUTER _____ DATE _____ 19. _____



Sear

$$W = .032$$

$$F_{SS} = 1.703$$

$$F_{TP} = 22.279$$

$$\sum M_c = 0$$

$$W(.564) + F_{TP}(.403) - F_{T_1}(1.102) - F_{SS}(.320) = 0$$

$$.564(.032) + 22.279(.403) - 1.102 F_{T_1} - 1.703(.320) = 0$$

$$.018 + 8.978 - 1.102 F_{T_1} - .545 = 0$$

$$8.451 - 1.102 F_{T_1} = 0$$

$$1.102 F_{T_1} = 8.451$$

$$F_{T_1} = 7.669$$

Trigger

$$\sum M_s = 0$$

$$F_{T_2}(.428) - W(.218) + F_S(.451) - R(2.100) = 0$$

$$2.683(.428) - .054(.218) + 7.669(.451) - 2.1 R = 0$$

$$1.148 - .012 + 3.459 - 2.1 R = 0$$

$$4.595 - 2.1 R = 0$$

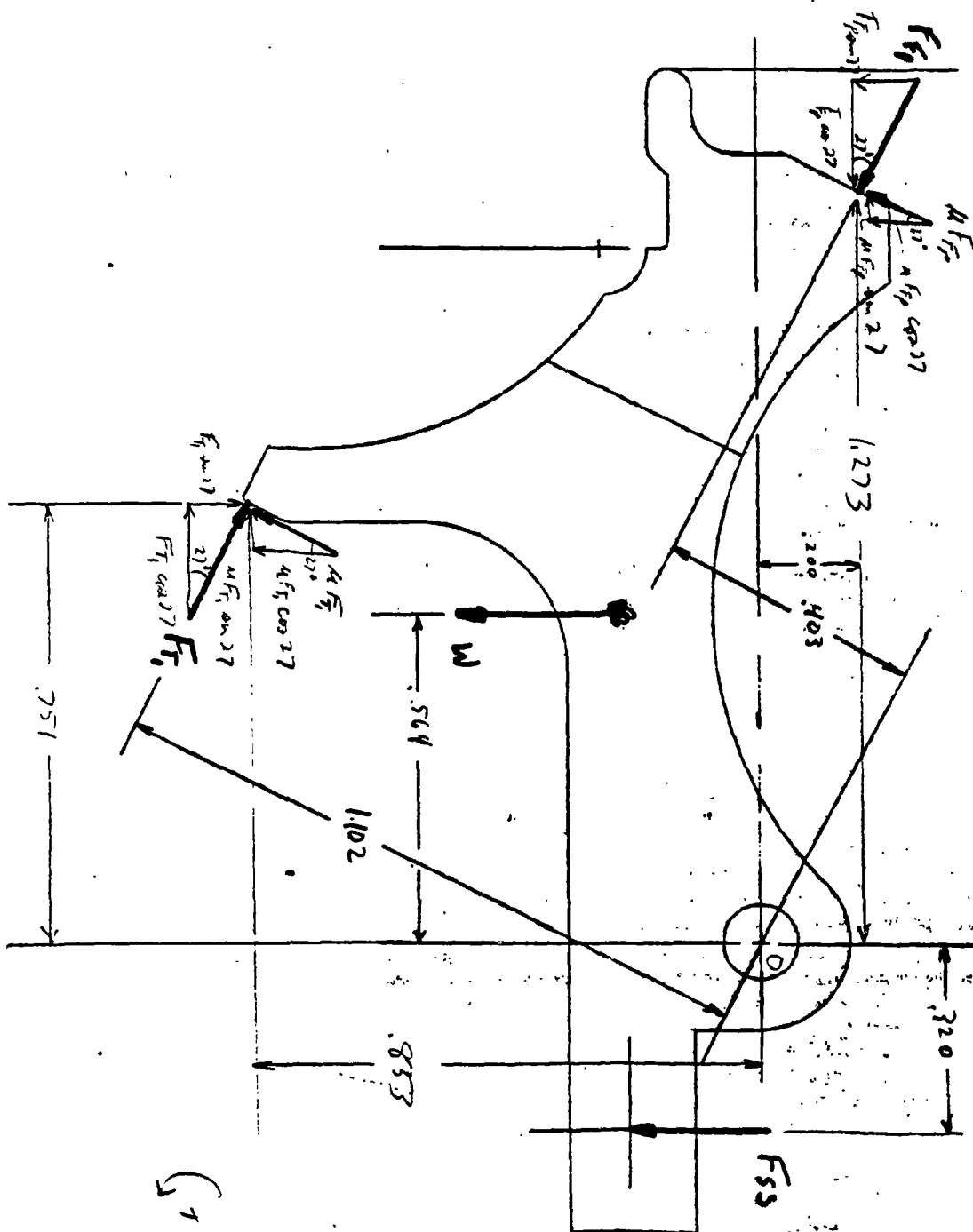
$$2.1 R = 4.595$$

$$R = 2.188$$

$$F_{T_2} = 2.683$$

$$W = .054$$

$$F_S = F_{T_1} \text{ (from above)} \\ = 7.669$$



Sear (no friction) (breaking oblique forces into x-y comp)

$$\sum M_o = 0$$

$$W(.564) + F_{fp} \sin 27 (1.273) - F_{fp} \cos 27 (.2) - F_T \cos 27 (.853)$$

$$- F_T \sin 27 (.751) - F_{ss} (.320) = 0$$

$$.032 (.564) + 22.279 \sin 27 (1.273) - 22.279 \cos 27 (.2) - F_T (.760)$$

$$- F_T (.341) - 1.703 (.320) = 0$$

$$.018 + 12.876 - 3.970 - .760 F_T - .341 F_T - .545 = 0$$

$$- 1.101 F_T + 8.379 = 0$$

$$1.101 F_T = 8.379$$

$$F_T = 7.61$$

Trigger breaking forces into components
No friction

$$\begin{aligned} W &= .054 \\ F_R &= 2.683 \\ F_S - F_R &= 7.61 \end{aligned}$$

$$\sum M_o = 0$$

$$F_R \sin 10 (.831) + F_R \cos 10 (.289) - W (.218) - F_S \sin 27 (.677)$$

$$+ F_S \cos 27 (.853) - R (2.1) = 0$$

$$2.683 \sin 10 (.831) + 2.683 \cos 10 (.289) - .054 (.218) - 7.61 \sin 27 (.677)$$

$$+ 7.61 \cos 27 (.853) - 2.1 R = 0$$

$$.387 + .764 - .012 - 2.339 + 5.784 - 2.1 R = 0$$

$$4.584 - 2.1 R = 0$$

$$+ 2.1 R = + 4.584$$

$$R = 2.183$$

$$\begin{aligned}
 W &= .032 \\
 F_{ss} &= 1.703 \\
 F_{fp} &= 22.279 \\
 \mu &= .78
 \end{aligned}$$

Sear

adding friction + breaking into components

$$\sum M_o = 0$$

$$W(.564) + F_{fp} \sin 27 (1.273) - F_{fp} \cos 27 (.20) - F_T \cos 27 (.853)$$

$$- F_T \sin 27 (.751) - F_{ss} (.320) + \mu F_T \cos 27 (.751) - \mu F_T \sin 27 (.853)$$

$$+ \mu F_{fp} \cos 27 (1.273) + \mu F_{fp} \sin 27 (.20) = 0$$

$$.032(.564) + 22.279 \sin 27 (1.273) - 22.279 \cos 27 (.2) - .76 F_T$$

$$- .341 F_T - 1.703(.320) + .78 F_T \cos 27 (.751) - .78 F_T \sin 27 (.853)$$

$$+ .78 (22.279) \cos 27 (1.273) + .78 (22.279) \sin 27 (.20) = 0$$

$$.018 + 12.876 - 3.970 - .76 F_T - .341 F_T - .545 + .522 F_T$$

$$- .302 F_T + 19.711 + 1.578 = 0$$

$$29.668 - .881 F_T = 0$$

$$+.881 F_T = +29.668$$

$$F_T = 33.675$$

Trigger - breaking forces into components
With Friction

$$W = .054$$

$$F_{T3} = 2.683$$

$$F_3 = F_{T1} = 33.675$$

$$\mu = .78$$

$$\Sigma M_1 = 0$$

$$F_{T3} \sin 10 (.831) + F_{T3} \cos 10 (.289) - W (.218) + F_3 \cos 27 (.853)$$

$$- F_3 \sin 27 (.677) + \mu F_3 \cos 27 (.677) + \mu F_3 \sin 27 (.853) - 2.1 R = 0$$

$$2.683 \sin 10 (.831) + 2.683 \cos 10 (.289) - .054 (.218) + 33.675 \cos 27 (.853)$$

$$- 33.675 \sin 27 (.677) + .78 (33.675) \cos 27 (.677) + .78 (33.675) \sin 27 (.853) - 2.1 R = 0$$

$$.387 + .764 - .012 + 25.594 - 10.350 + 15.844 + 10.172 - 2.1 R = 0$$

$$42.399 - 2.1 R = 0$$

$$- 2.1 R = - 42.399$$

$$R = 20.19$$

assume $\mu = .35$

then

$$.018 + 12.876 - 3.970 - .76 F_T - .341 F_T - .545 +$$

$$.35 F_T \cos 27 (.751) - .35 F_T \sin 27 (.853) + .35 (22.279) \cos 27 (.751)$$

$$+ .35 (22.279) \sin 27 (.2) = 0$$

$$8.379 - .76 F_T - .341 F_T + .234 F_T - .136 F_T + 8.544 + .708 = 0$$

$$-1.003 F_T + 17.931 = 0$$

$$F_T = 17.877$$

trigger

$$1.139 + 17.877 \cos 27 (.853) - 17.877 \sin 27 (.677) +$$

$$.35 (17.877) \cos 27 (.677) + .35 (17.877) \sin 27 (.853) - 2.1 R = 0$$

$$1.139 + 13.587 - 5.495 + 3.774 + 2.423 - 2.1 R = 0$$

$$15.428 - 2.1 R = 0$$

$$R = 7.347$$

Sear $\mu = .35$ $\text{sear angle} = 22^\circ$

$$.032(.564) + 22.279 \sin 27(1.273) - 22.279 \cos 27(.2)$$

$$- F_T \cos 22(1.853) - F_T \sin 22(1.751) - 1.703(.320) + .35 F_T \cos 22(1.751)$$

$$- .35 F_T \sin 22(1.853) + .35(22.279) \cos 27(1.273) + .35(22.279) \sin 27(.2) = 0$$

$$.018 + 12.876 - 3.970 - .791 F_T - .281 F_T - .545 + .244 F_T - .112 F_T + 8.844 + .708 = 0$$

$$17.931 - .940 F_T = 0$$

$$F_T = 19.076$$

Trigger $\mu = .35$ $\text{angle} = 22^\circ$

$$2.683 \sin 10(1.831) + 2.683 \cos 10(1.259) - .054(.218) + 19.076 \cos 22(1.853)$$

$$- 19.076 \sin 22(1.677) + .35(19.076) \cos 22(1.677) + .35(19.076) \sin 22(1.853) - 2.1R = 0$$

$$.387 + 1.764 - .012 + 15.087 - 4.838 + 4.191 + 2.133 - 2.1R = 0$$

$$17.712 - 2.1R = 0$$

$$R = 8.434$$

Sear assume $\mu = .35$ and angle = 32°

$$.032(564) + 22.279 \sin 27 (1.273) - 22.279 \cos 27 (.2)$$

$$- F_T \cos 32 (1.853) - F_T \sin 32 (1.751) - 1.703 (1.320) + .35 F_T \cos 32 (1.751)$$

$$- .35 F_T \sin 32 (1.853) + .35 (22.279) \cos 27 (1.273) + .35 (22.279) \sin 27 (.2) = 0$$

$$.015 + 12.874 - 3.970 - .723 F_T - .398 F_T - .545 + .223 F_T \\ - .158 F_T + 8.844 + .708 = 0$$

$$17.931 - 1.056 F_T = 0$$

$$F_T = 16.98$$

+1199.1 $\mu = .35$ angle = 32°

$$2.683 \sin 10 (1.831) + 2.683 \cos 10 (1.289) - .554 (1.218) + 16.98 \cos 32 (1.853)$$

$$- 16.98 \sin 32 (1.677) + .35 (16.98) \cos 32 (1.677) + .35 (16.98) \sin 32 (1.853) \\ - 2.1R = 0$$

$$1.387 + .764 - .012 + 12.283 - 6.072 + 3.412 + 2.686 - 2.1R = 0$$

$$13.428 - 2.1R = 0$$

$$R = 6.394$$

REMINGTON ARMS COMPANY, INC.

ENGINEERING DEPARTMENT  COMPUTATION SHEET

SHEET NO. _____

TITLE OF PROJ. _____ PROJ NO. _____

SUBJECT _____ WORKS _____

COMPUTER _____ DATE _____ 19__

Skeletonized 268.5 grains

Std 373

$$\frac{268.5}{1000 \text{ grains}} = .2685 \text{ oz.}$$

$$\frac{373.16}{1000} = .37316 \text{ oz.}$$

.239 oz difference

28 % reduction

$$428(F_{T3}) + 1.088(.35)(30) = +.218(.052) + 2.1(3)$$

$$428 F_{T3} = 6.3 + .0113 -$$

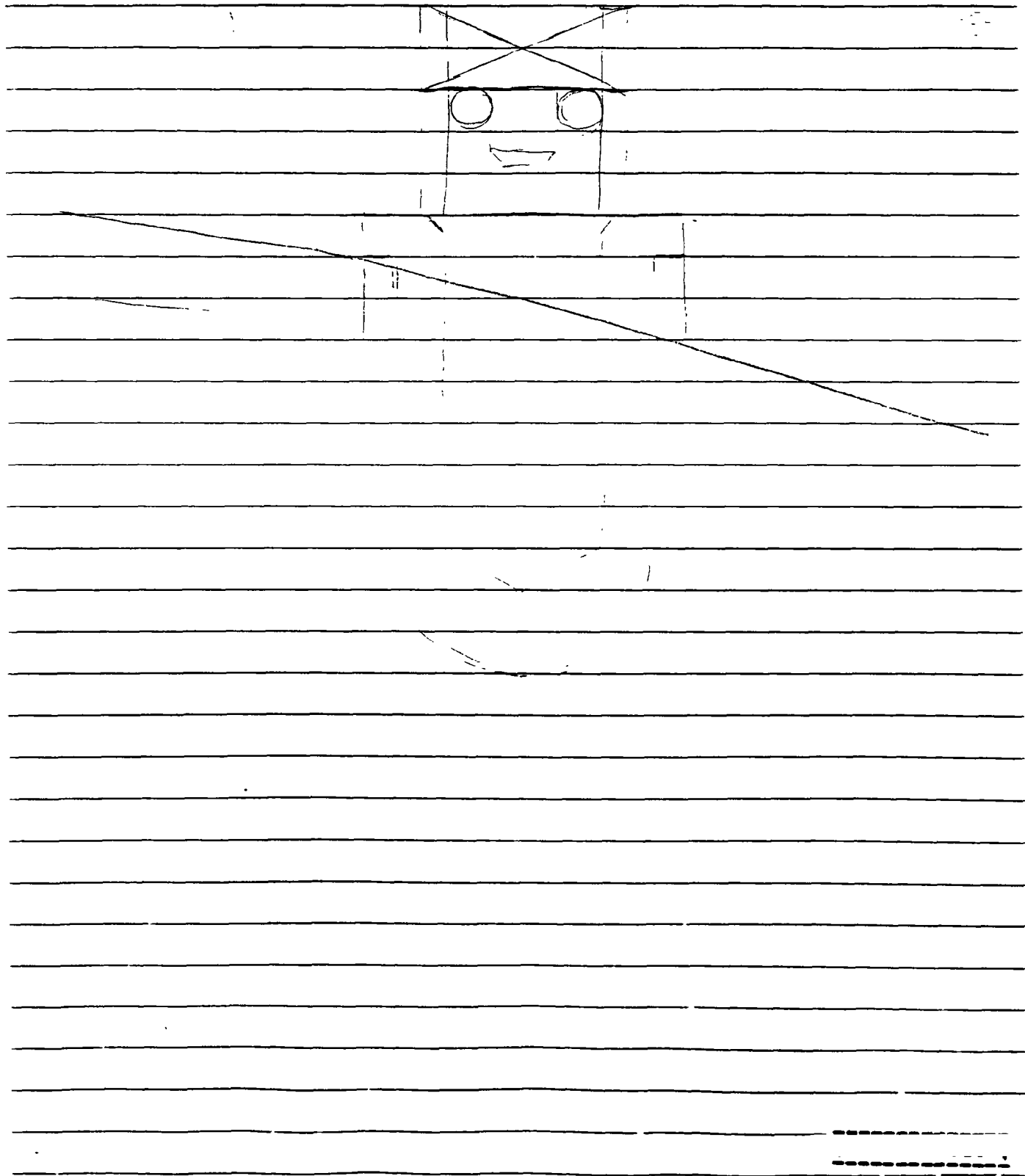
$$\frac{880(11.75)}{21} = \frac{4.96}{2.3}$$

~~$$21(2.75) = 58$$~~

Trigger Pull

Sear	3	4	5	6	7	8	9	10	
Angle									
41'30"									
	7		8		9		10		
27°									

On 90 diameter wat downstairs



1428

$$\begin{array}{r} 910 \cdot = x \\ 122.1 = \frac{701.1}{0.14} \\ \hline x \end{array}$$

$$7.67(.174) + .21(7.67)(1.074) - .218(.052) - 2.1R = 0$$

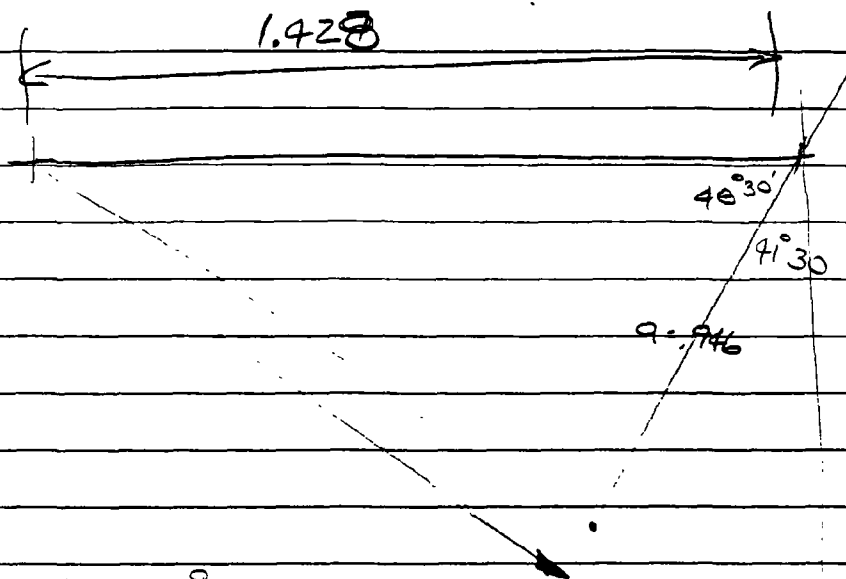
$$R = 1.45$$

$$423 \overset{0}{\cancel{(-F_{TS})}} + 7.67(.174) + .21(7.67)(1.074) - .218(.052) - 2.1(3) = 0$$

$$F_{TS} = 7.6 \text{ lbs}$$

$$7.67(.192) + .21(7.67)(1.071) - .218(.052) - 2.1R = 0$$

$$R = 1.51$$



$$\cos 48.5^\circ = \frac{a}{1.428}$$

$$a = .946$$

$$I = \frac{1}{2} M r^2$$

$$I = \frac{1}{2} M r^2$$

$$= \frac{0.59}{32.2} (1.01)^2$$

$$= 0.017$$

$$k = \sqrt{\frac{\frac{1}{2} M r^2}{m}}$$

$$k = \sqrt{\frac{1}{2} r^2} = \sqrt{\frac{r^2}{2}}$$

$$E_k = \frac{1}{2} I \omega^2$$

$$= 0.017 ($$

$$\frac{v}{r} = \omega$$

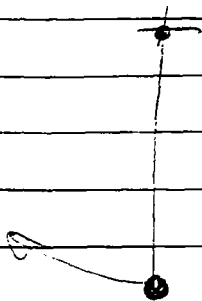
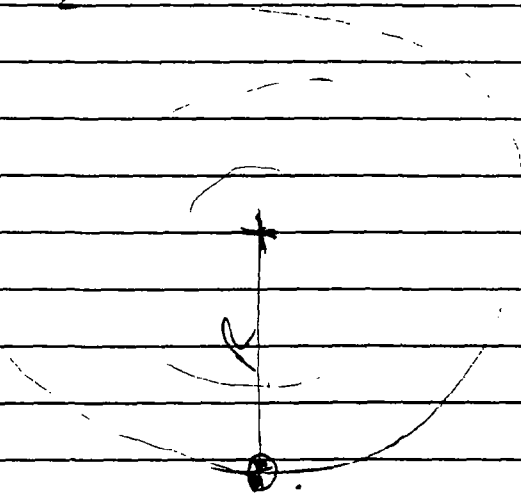
$$\frac{9.83}{1.01} = \omega$$

$$k = \frac{r}{\sqrt{2}}$$

$$E_k = \frac{m}{2} (r^2) \left(\frac{v}{r} \right)^2$$

$$v^2$$

$$E_k = \frac{1}{2} m (v^2) = \frac{1}{2} m v^2$$



$$W = .054 \text{ lbs}$$

$$x = 1.010 \text{ in}$$

$$E = mgh$$

$$= .054$$

$$= \frac{1}{2} m v^2$$

$$s = \frac{1}{2} a t^2$$

$$.333 = \frac{1}{2} (32.2) t^2$$

$$a = \frac{v}{t}$$

$$.43 = A$$

$$V = 4.63 \text{ ft/sec}$$

$$E = \frac{1}{2} m v^2$$

$$= \frac{1}{2} \left(\frac{.054}{32.2} \right) (4.63)^2$$

$$E = .018 \text{ ft lbs}$$

$$1.010$$

$$.018 = 1.5 (.012)$$

E	m	V
.018	.054	4.63 ft/sec
.081	.054	9.83 ft/sec
.018	.012	9.83 ft/sec

$$.012 \text{ vs } .054$$

4.5 times better

78% weight reduction

$$E = \frac{1}{2} m v^2$$

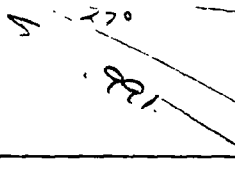
$$4.5 E = \frac{1}{2} m v^2$$

$$E = \frac{1}{2} \left(\frac{m}{4.5} \right)$$

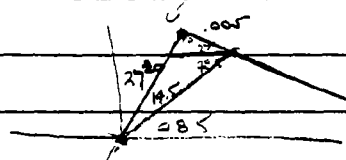
$$M = F S$$

$$= (.054)(1.010)$$

$$= .0545$$



434



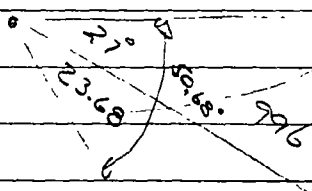
$$\tan 14.5 = \frac{x}{885}$$

$$x = 0.052$$

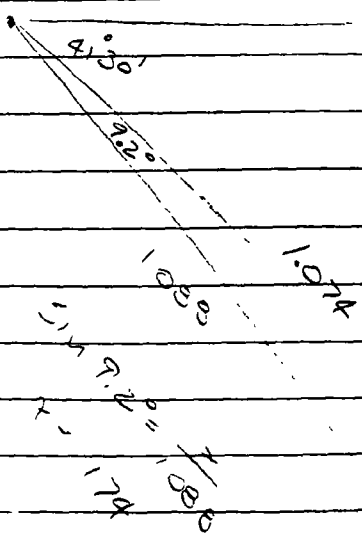
$$\sin 27 = \frac{x}{885}$$

$$x = 0.003$$

996 .437



1.088



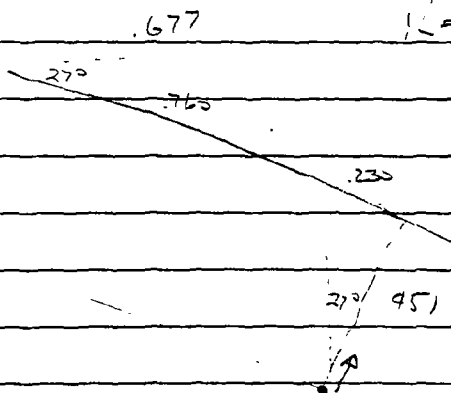
437

$$F_s (.428) + F_s (.451) - W (.218) - 2.1 R = 0$$

$$33.675 (.451) - .054 (.218) - 2.1 R = 0$$

$R = 7.1$ lbs trigger pull w/o friction
or trigger spring

$$R = 3.2 \text{ lbs}$$



$$\cos 27 = \frac{.677}{h}$$

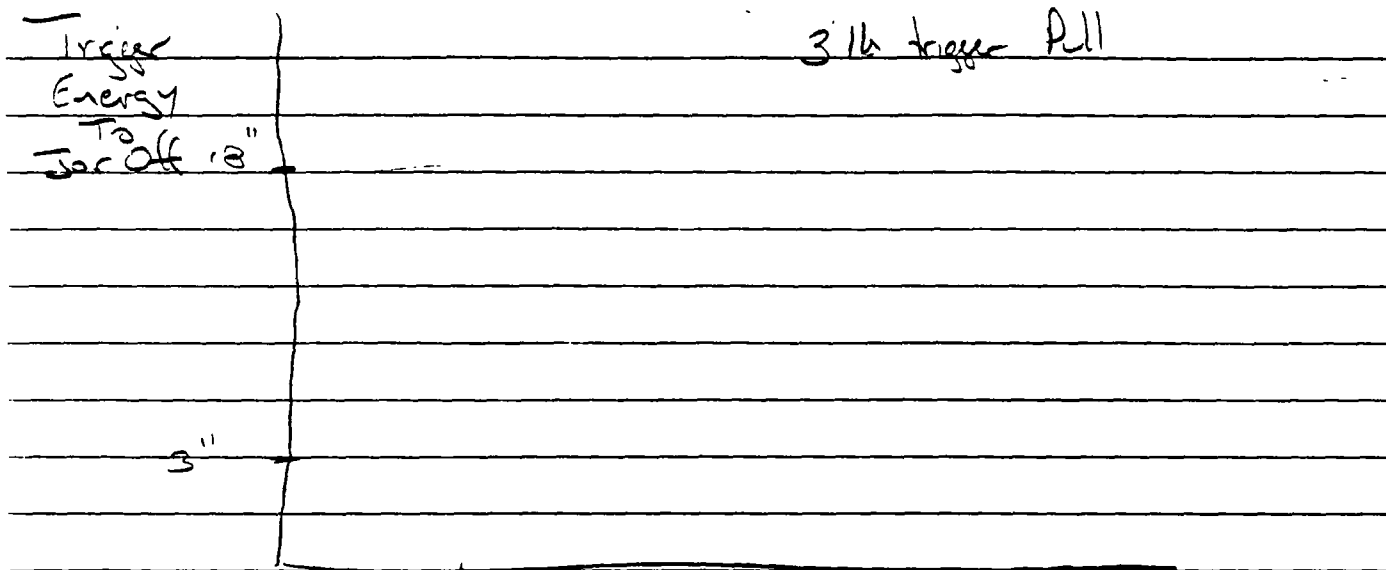
$$h = .760 + .230 = .990$$

$$\sin 27 = \frac{o}{.951}$$

$$o = .230$$

$$\mu .990 (33.675) = 2.1 R (.75)$$

$$\mu = .047$$



Sear Angle

Trigger
Energy
To
Jor off

27°

Trigger Pull

Trigger
Energy
To
Jor off

41°30

Trigger Pull

~~$$2.5(.174) = 2.1(F_s)$$~~

$$21 \times 2.5 = .174 x$$

$$x = 30.17$$

$$.162(1.074) + 428(F_s) = 2.1 \times 2.5$$

$$F_s = 11.85$$

$$1.074(.16)(\overset{7.65}{30.17}) = 428 x$$

$$x = 12.11$$

$$E = \frac{1}{2} m v^2$$

$$\frac{1}{2}$$

$$= .824 \text{ (8m)}$$

$$S = \frac{1}{2} a t^2$$

$$\frac{2}{3} = \frac{1}{2} 32.2 t^2$$

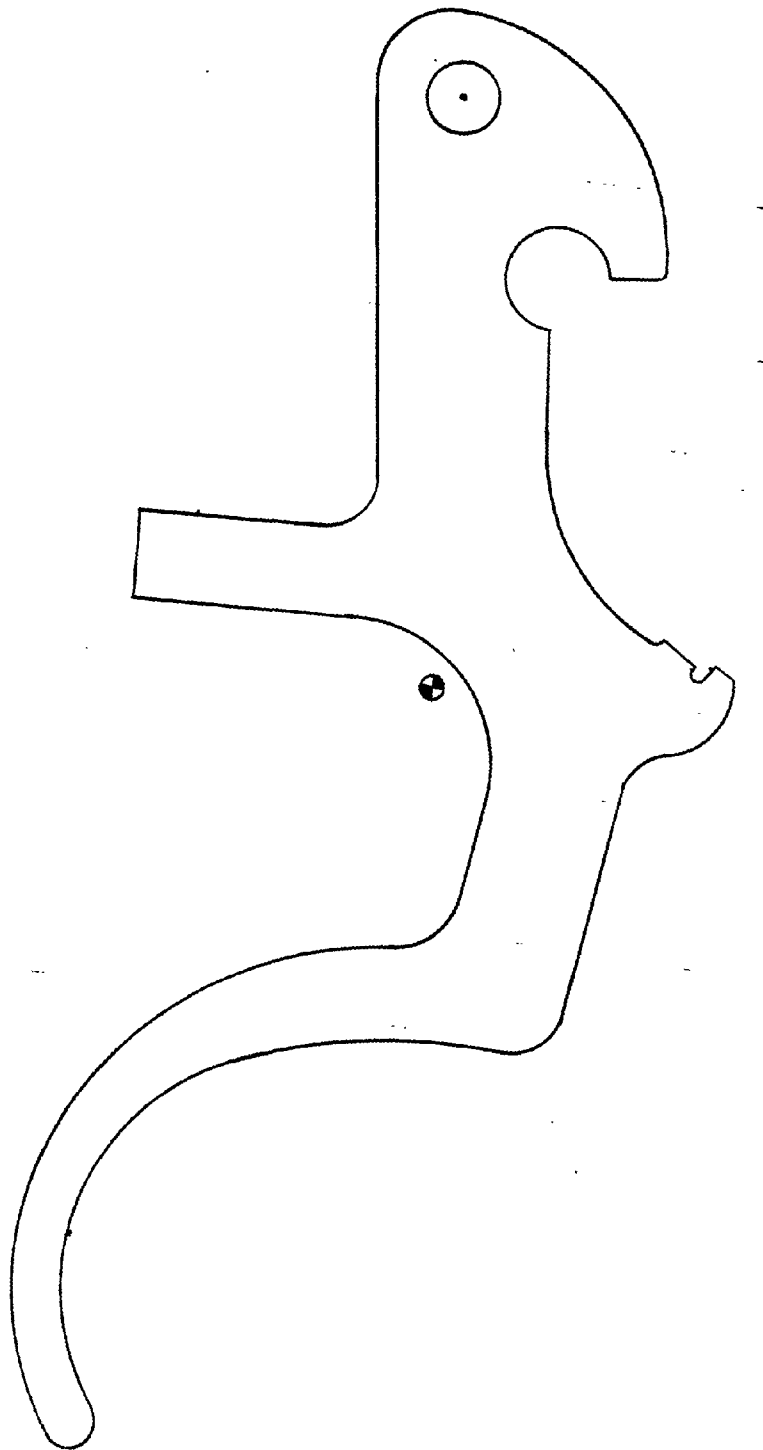
$$t = .2035$$

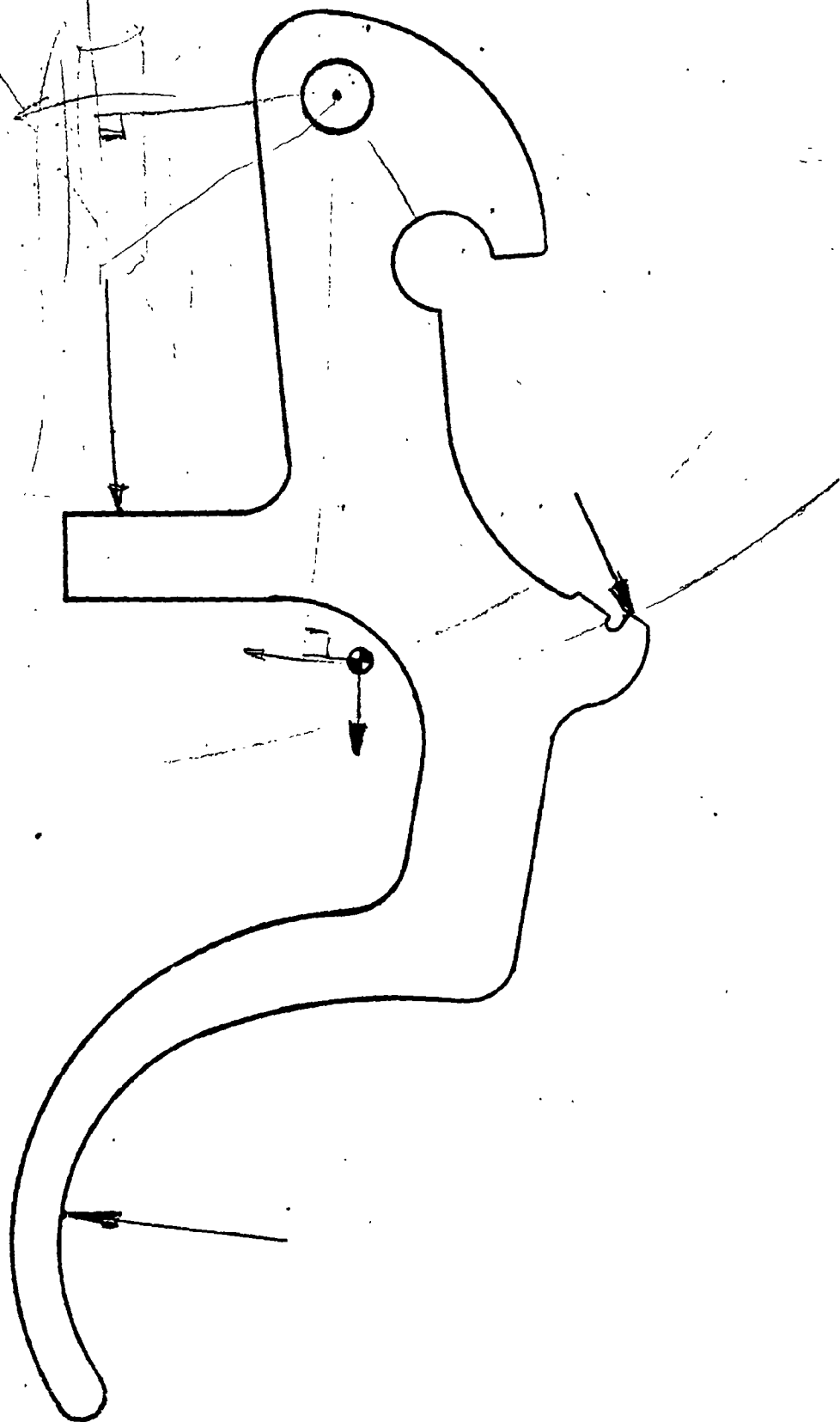
$$v = at$$

$$v_{\text{gun}} = 6.55 \frac{\text{ft}}{\text{sec}}$$

$$v_{\text{bullet}} = 9.83 \frac{\text{ft}}{\text{sec}}$$

$$E_{\text{gun}} = 1.835 \text{ ft-lbs}$$



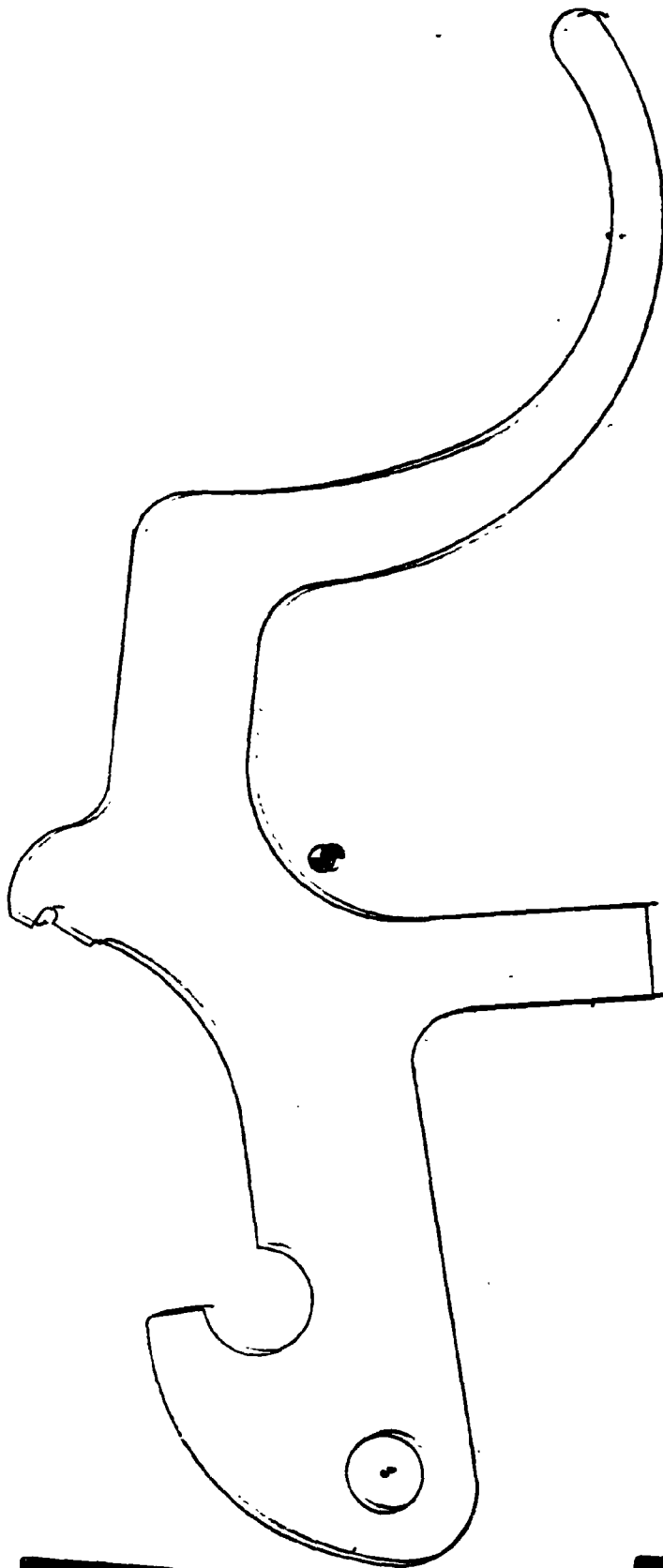


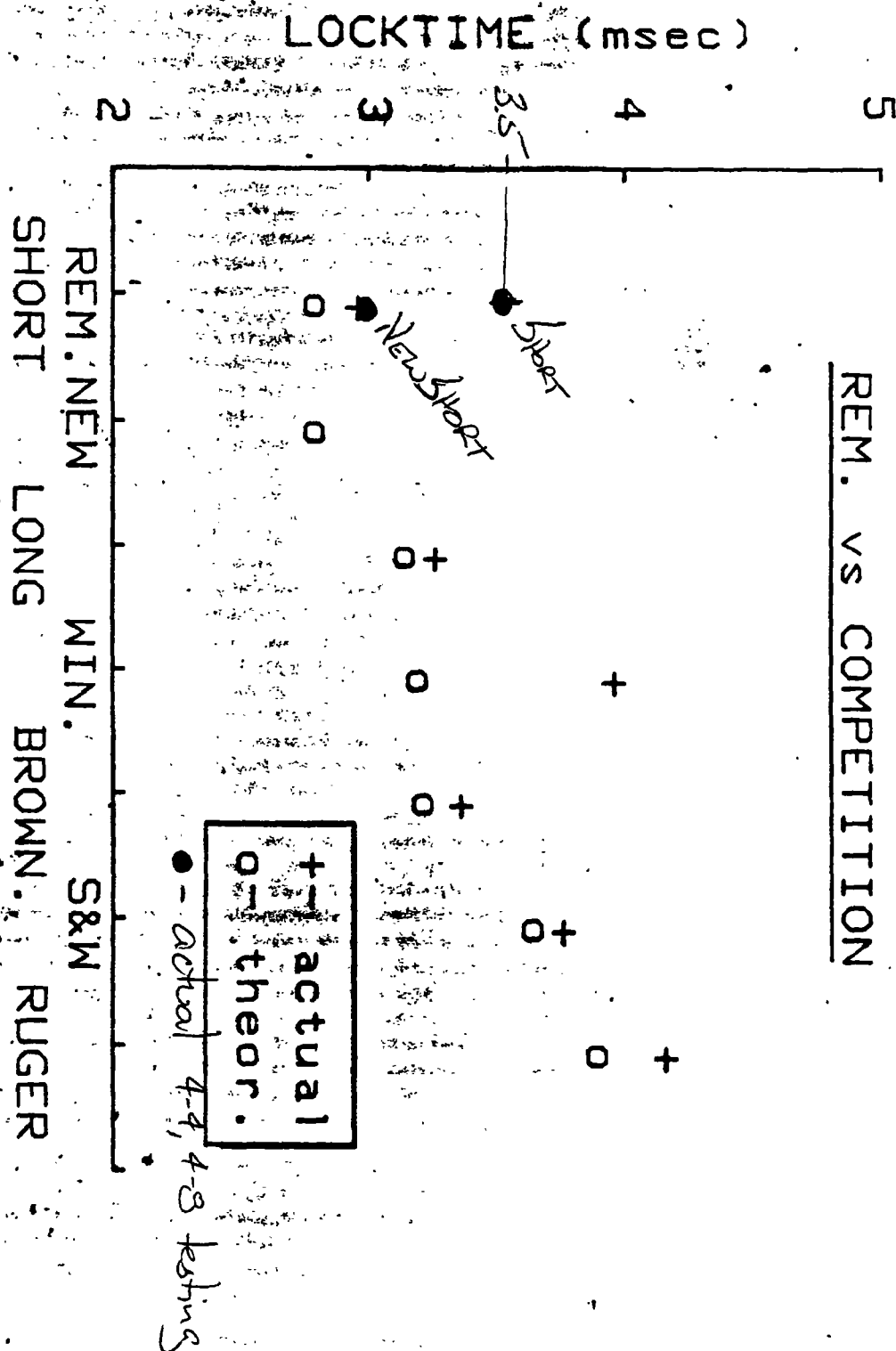
Exposed Firecontrol Presentation

Outline

^{project}
explain design
add force
add jpr-off results

explain base analysis + results





Current Trigger

3lb pull $\rightarrow$ 4.72 lb Trigger spr calc.
11.04 lb (w/ friction)

$$423(x) = 2.1(3)$$

$$x = 4.72$$

$$E = F \cdot s = 14.72(.022) = .324 \text{ in lb.}$$

$$11.04(.022) = .243 \text{ in lb.}$$

$$I = k \cdot x^2$$

$$= mgh$$

$$\frac{.243 \text{ in lb}}{.054 \text{ lb}} \cdot h = 4.5 \text{ in}$$

$$\frac{.324}{.054} \cdot 6 \text{ in}$$

std trigger

$$\frac{.243}{.038} \cdot 6.33 \cdot 10^{-2} \text{ effective mass}$$

$$\frac{.324}{.038} = 8.52$$

$$\frac{ES}{I} = 6269$$

$$\frac{FS}{I_s} = \frac{.243}{.117} = 4.02$$

$$.432 = m a h$$

$$19 = m a$$

Trigger Springs = Weight

$$F = S = m \cdot a \cdot S \cos \theta$$

$$(14.72) \left(\frac{.0253}{12} \right) = (.0016557) a \left(\frac{.02733}{12} \right) (.97) \times_{s.s.} = .0253$$

$$a = \underline{8410} \text{ ft/sec}^2 \quad \dot{x} = .02733$$

3^{lb} trigger pull and unmodified trigger, 51° sear angle
this gun jars off at 10", unacceptable a.

$$S = \frac{1}{2} a t^2$$

$$E = mgh = m a \cdot S$$

$$(32.2)$$

$$19.626 \left(\frac{.0253}{12} \right) = (.001192) a \left(\frac{.02733}{12} \right) (.97)$$

$$a = \underline{15713} \text{ ft/sec}^2$$

3^{lb} trigger & modified trigger 51° sear angle
gun will not jar off, 4 lb. Trigger pull

$$E_1 = .031 \text{ ft.lbs}$$

$$E_2 = .041 \text{ ft.lbs}$$

$$E = mgh$$

$$= (.001192) (32.2) (h)$$

$$h = .807 \text{ ft} = 9.69 \text{ in jar off at 3 lbs}$$

$$.041 = (.001192) (32.2) (h)$$

$$h = 1.065 \text{ ft} = 12.81 \text{ in jar off at 4 lbs}$$

$$F \cdot S = mgh =$$

$$(14.72) \left(\frac{.02298}{12} \right) = \frac{.614}{16} (h)$$

$$h = .734 \text{ ft} = \frac{8.81 \text{ in}}{.865} = 10.17 \text{ in}$$

$$(15.72) \left(\frac{.02298}{12} \right) = \frac{.614}{16} h$$

$$h = .784 \text{ ft} = \frac{9.41 \text{ in}}{.905} = 10.37$$

mechanical
advantage factor

.693 in difference for
every lb.

$$14.72 \left(\frac{.02298}{12} \right) = \frac{m_{oz}}{16 \cdot 32.2} (14.562) \left(\frac{.093}{12} \right) (\cos 12.2)$$

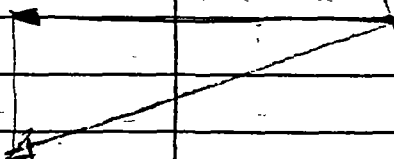
$$m = .634$$

$$(784) \left(\frac{.634}{\sin} \right) = .4977$$

Arrived at by using 14.72 kg/sps. (for 3" pull)
and energy generated by scalped trigger and
4" pull from various heights

Energy

$$F_{TS} \cdot S_{TS} = m \cdot a \cdot S_{TC \text{ travels}} / \cos \theta$$



$$6.87 \frac{ft}{sec^2}$$

$$1 = 0.1$$

$$F = ma$$

$$1.15 \frac{oz}{16}$$

$$.64 \text{ oz}$$

$$1 \frac{1}{2} \text{ oz}$$

$$.64 \text{ oz}$$

$$22 \text{ lb}$$

$$1472 \text{ lb}$$

$$a = \frac{F}{m}$$

$$a = \frac{122(32.2)(16)}{1 \frac{1}{2}}$$

$$a = \frac{14.72(16)(32.2)}{.64}$$

$$a = 2552 \frac{ft}{sec^2}$$

bring pin assembly

$$a = 12,351 \frac{ft}{sec^2}$$

trigger

wt power CG

1.65 ratio

.041 31b

2.19 ratio

.031 41b

2.72 ratio

.025 51b

$$AB = \frac{m}{F}$$

$$m = 372$$

if $m = .458 \text{ oz}$, performance should equal 4' level

$$\frac{0.245(.03)}{.84} = .994$$

565

ft. lbs

001269 Aug

001192

.614 oz trigger was used in drop tests
51° sear angle used → contributed 0.15 to
trigger pull

CG ≈ 1.080 from pivot, .02657

$F_{TS} \approx .934$ " " , .02298

$F_{sear} \approx .813$ " " , .020

$$2.25(2.1) = .428 \times$$

$$x = F_{TS} = 14.72$$

$$14.72 \left(\frac{.02298}{12} \right) = \left(\frac{.614}{16.322} \right) a \left(\frac{.02657}{12} \right) (\cos 12.2)$$

$$a = 10929 \frac{\text{ft}}{\text{sec}^2}$$

$$F = 15.72 \quad a = 11760$$

$$F = 19.62 \quad a = 14572$$

$$V = 7.326 \frac{\text{ft}}{\text{sec}}$$

$$A = .2275 \text{ sec}$$

As $a > 10929$ trigger will not be in a position to support the sear + 1/2 at

energy to compress t.s. = potential energy of trigger before drop

$$F \cdot s = mgh = \frac{1}{2}mv^2$$

$$.03198 = .03198$$

$$m_s = 3.1665 \times 10^{-5} \quad \text{mass in slugs}$$

$$3.1665 \times 10^{-5} \frac{(16)(32.2)}{1} = .0163 \quad \begin{array}{l} \text{mass in oz.} \\ \text{dist in in.} \end{array}$$

$$3^{lb} \quad h = .734 \text{ ft} \sim 8.8 \text{ in}$$

$$9^{lb} \quad h = .979 \text{ ft} \sim 11.75 \text{ in} \quad \sum_0$$

$$5^{lb} \quad 4.69 \quad \sum_0$$

$$(\times_m) \quad m.s. = ?$$

$$(.784)(.634) = 4977$$

oz. in

$$(.810)(.614) =$$

#08#
LIST MPO: MODEL ent d

VALUES ARE GIVEN WITH RESPECT TO MODEL SPACE COORDINATES.

Tag: (no tag selected)

VOLUME = 0.0821707
MASS = 0.0821707

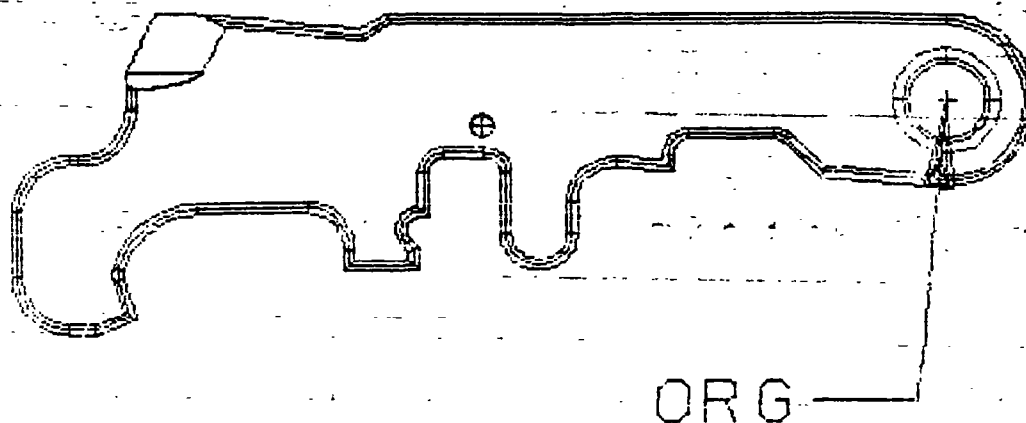
CENTROID:
X = -0.7629958 Y = 0.0000002 Z = -0.0442707

FIRST MOMENTS:
FX = -0.0626959 FY = 0.0 FZ = -0.0036378

MOMENTS OF INERTIA:
Ixx = 0.0015666 Iyy = 0.0663395 Izz = 0.0651655

PRODUCTS OF INERTIA:
Ixy = -0.0 Ixz = 0.0047839 Iyz = -0.0

#08#
#08#PLOT HARD



Analysis

Sear - sear spring
- firing pin head
- trigger

Trigger - sear
- trigger spring
- trigger pull
- trigger catch pin

Safety - Were will safety go-off?

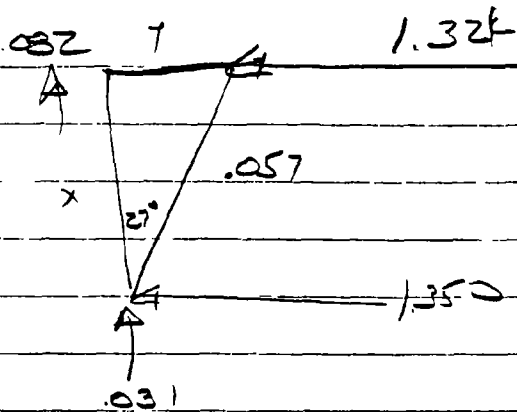
Firing Pin Analysis - Does it unload sear at
3rd pull and 1 ft drop?

F = 20-23

$$F = m a$$
$$22 \cdot \frac{1.5}{(16)(32.2)} a$$

$$a = 7556 \frac{\text{ft}}{\text{sec}^2}$$

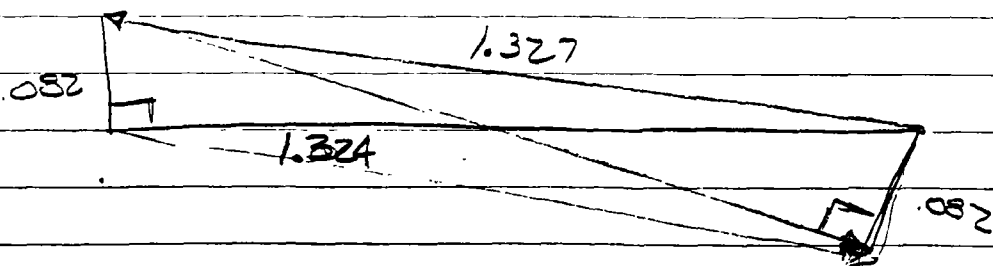
- For accelerations above 7556 sear has no effect on trigger
- below 7556 friction is acting to prevent trigger pull.

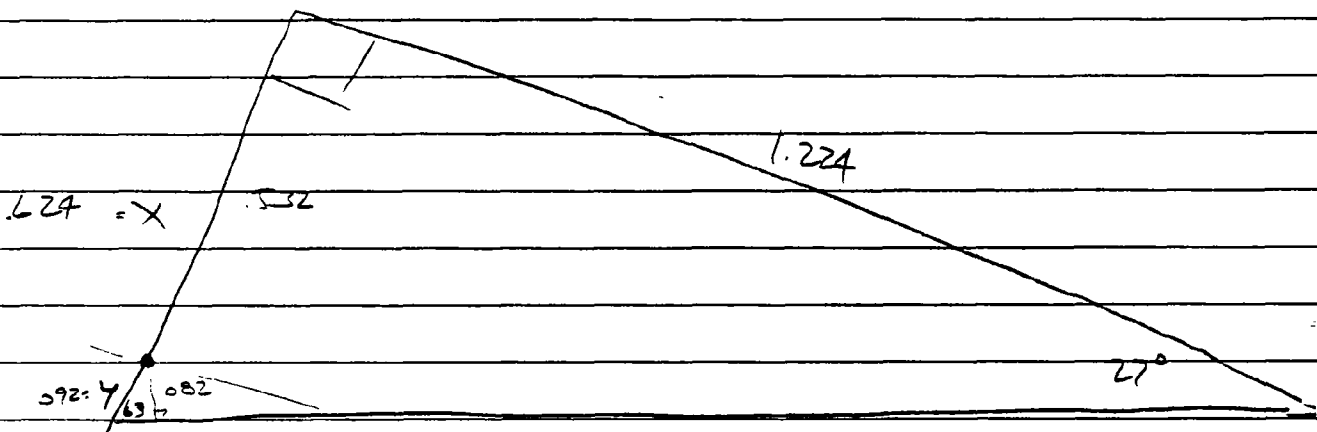


$$\cos 27 = \frac{x}{0.57}$$

$$x = .051$$

$$y = .026$$





$$\tan 27 = \frac{x}{1.224}$$

$$x = .624$$

$$\sin 63 = \frac{.082}{y}$$

$$y = .092$$

$$.624 - .092 = .532$$

- MAGAZINE BOX DESIGN

REMINGTON PRODUCTION PINS

<u>Diameter</u>	<u>Length</u>	<u>Head</u>	<u>Drawing Number</u>	<u>Name</u>
.052	.740	Spirol Roll	A - 90297	3200 - Bbl. Band Lock
.060	.280	Taper	A - 15459	XP-100 - Trigger Link Pin
.062	.250	Roll Pin	A - 14213	788 - Ejector Pin
.062	.312	Driv-Loc	A - 15660	870 - Front Sight Ret. Pin
.062	.375	Spirol	A - 90380	3200 - Ejector Stop Pin
.062	.500	_____	A - 15148	66 - Firing Pin Ret. Pin
.062	.593	_____	A - 16549	N/77 - Firing Pin Ret. Pin
.062	.875	_____	A - 16345	1100 - Carrier Latch Pin
.064	.720	_____	A - 16983	1100 - Carrier Release Pin, 20 LW
.065	.113	Rivet	A - 16524	66 - CTG. Feed Guide Spring Rivet
.068/.063	.550	Detent	A - 15875	1100 - Magazine Cap Detent
.078	.300	Driv-Loc "B"	A - 17571	740 - Operating Handle Retaining Pin
.078	.375	Spirol Pin M.B.K.	A - 33180	3200 - Selector Block Guide Pin
.078	.375	Driv-Loc "C"	A - 17676-W	700 - Ejector Pin
.078	.429	_____	A - 17018	40X - Bolt Pin
.078	.562	Driv-Loc "C"	A - 18325	760 - Ejector Retainer
.078	.595	.125 Ball	A - 15234	1100 - Breech Bolt Return Plunger
.079	.190	_____	A - 90370	3200 - Ejector Hammer Drive Pin
.080	.155	_____	A - 19822	552 - Extractor Pin
.080/.039	.300/.100	Step Pin	A - 17667	66 - Extractor Plunger
.086	.200	Ball	A - 15337	742 - Bolt Latch Pivot
.087	.200	_____	A - 15003	742 - Latch Spring Plunger
.093	.120	Flat	A - 17403	851 - Carrier Latch Rivet
.093	.240	_____	A - 16531	66 - Safety Lever Pin
.093	.290	Driv-Loc "B"	A - 16989	742 - Operating Handle Retaining Pin
.093	.415	Driv-Loc "E"	A - 25090	552 - Magazine Pin
.093	.437	.015 x 45°	B - 17022	700 - Firing Pin Cross Pin
.093	.485	Grooved	A - 16542	66 - Safety Detent Spring Pin
.093	.500	Driv-Loc "C"	A - 14225	788 L.H. - Bolt Assembly Pin 30-30
.093	.625	Driv-Loc "C"	A - 16451	700 - Floor Plate Latch Pin
.093	.750	Roll Pin	A - 90668	T. Trap - Slide Block Assembly Pin
.093	1.330	_____	B - 90363	3200 - Ejector Hammer Pin
.093	2.312	# 7 Hitch Pin	A - 90659	T. Trap - Main Spring Retaining Pin
.094	.296	Groove	B - 90387	3200 - Hammer Plunger
.094	.312	Roll Pin	A - 90341	3200 - Connector Pin
.094	.330	_____	A - 90362	3200 - Ejector Sear Pin
.094	.469	Roll Pin	A - 90495	3200 - Trigger Connector Spring Pin
.094	.540	_____	A - 90293	3200 - Top Lock Latch Pin
.094	.580	_____	B - 91113	3200 - Tang Connecting Block Pin
.094	.625	_____	A - 16453	700 BDL - Floor Plate Pivot Pin

REMINGTON PRODUCTION PINS
(Continued)

(2)

 <u>Diameter</u>	<u>Length</u>	<u>Head</u>	<u>Drawing Number</u>	<u>Name</u>
.094	.710	_____	B - 90322	3200 - Sear Block Pin
.094	.750	Roll Pin	A - 90386	3200 - Front Trigger Guard Pin
.096	.140	Step Pin	A - 16965	870 - Rear Sight Base Pin
.096	.368	Oval	A - 14632	700 ADL - Trigger Housing Rivet
.096	.400	_____	A - 16833	66 - Magazine Pin
.098	.755	_____	A - 17400	851 - Carrier Latch Pin
.099	.170	_____	B - 17595	1100 - Gas Cylinder Pin
.100	.170	Head	A - 19628	870 - Locking Block Stud
.100	.215	Step Pin	A - 19379	742 - Bolt Release Pin
.100	.470	_____	A - 17515	870 - Safety Spring Ret. Pin
.101	.375	Roll Pin	B - 14031	788 - Housing Pin Trigger Pin
.103	.950	3° Point	A - 19779	40X - Firing Pin Point
.105	.220	Step Pin	A - 15462	XP-100 - Sear Block Stud
.106	.240	Step Pin	A - 18781	851 - Carrier Dog Pin, All Ga.
.119	.207	.188 Dia.	A - 14721	1100 - Ejector Rivet, 410 Ga.
.119/.092	.175/.092	Step Pin	A - 14678	870 - Ejector Rivet, 410 Ga.
.119	.237	Flat	A - 18647	870 - Ejector Rivet Rear
 .123	1.210	_____	A - 15471	XP-100 - Trigger Bal. Pin
.124	.545	Groove	B - 17043	721 - Safety Pivot Pin
.123/.093	.197	Shoulder	A - 15855	1100 - Locking Block Retainer
.125/.094	.170/.050	Step Pin	A - 17420	1100 - Connector Pin
.125	.240	Rivet	A - 18866	40X - Bolt Handle Braze Rivet
.125	.250	Roll Pin	A - 14206	788 - Bolt Handle Guide Pin
.125	.295/.1.250	.010 x 45°	C - 24475	700 - Trigger Pin
.125	.312	_____	A - 14565	580 - Striker Cross Pin
.125	.375	Driv-Loc "BT"	A - 18382	742 - Firing Pin Ret. Pin
.125	.690	_____	A - 90399	3200 - Trigger Pin
.125	.760	_____	A - 90319	3200 - Sear Pin
.125	.875	Roll Pin	A - 13208	Wonder "B"
.125	.875	_____	A - 14017	582 - Carrier Pin
.125	1.150	_____	A - 16541	66 - Safety Lever Cam Pin
.133	.375	Roll Pin	B - 91126	788 - Sear Pin
.139	.340	Ball End	A - 17432	1100 - Extractor Plunger
.139	2.800	_____	A - 18350	722 - Sling Strap Link Blank
.150	.330	_____	A - 21525	851 - Firing Pin Ret. Pin
.150	.450	Driv-Loc "B"	A - 14297	1100 - Firing Pin Ret. Pin, 20 Ga. LW
 .150	.650	Driv-Loc "B"	A - 18623	870 - Firing Pin Ret. Pin
.154	.800	_____	A - 90401	3200 - Main Hammer Pin
.155	.140	Knurled	A - 16111	740 - Bbl. Lug Locating Pin
.155	.445	_____	A - 17463	1100 - Sear Pin

REMINGTON PRODUCTION PINS

(Continued)

(3)

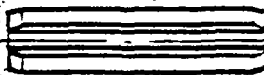
<u>Diameter</u>	<u>Length</u>	<u>Head</u>	<u>Drawing Number</u>	<u>Name</u>
.155	.530	Step Pin	A - 19032	851 - Hammer Pin
.155	.675	Step Pin	A - 16600	1100 - Hammer Pin
.155	.875	Driv-Loc "C"	A - 17533	1100 - Trigger Pin
.155	.895	Head	A - 18455	742 - Hammer Pin
.155	1.190	Head	A - 18390	742 - Action Bar Rivet
.156	.650	Step Pin	A - 19919	552 - Hammer Pin
.156	.750	Roll Pin	A - 90745	T. Trap - Indexing Clutch Pin Drive Sprocke
.156	1.150	_____	A - 16534	66 - Sear Assembly Pin
.156	1.767	_____	B - 32235	3200 - Firing Pin Housing Assembly Pin
.157	.340	Ball Ends	A - 19673	742 - Cam Pin
.160	.480	_____	A - 17467	851 - Link Pin
.160	.650	.030 x 10°	510 - E - 1	580 - Bbl. Assembly Pin
.164	.515	_____	A - 17363	851 - Action Spring Plunger Pin
.167	1.240/1.400	Grooved	B - 20600	1100 - Trigger Plate Pin
.176	.470	Step Pin	A - 16721	572 - Lock Bar Spring Stud
.187	.256	_____	A - 18758	700 Var. - Bolt Pin
.187	1.00	_____	A - 18513	742 - Action Tube Support Pin
.187	.750	Driv-Loc "G"	A - 90705	T. Trap - Elev. Screw Spring Mount.
.188	1.240	Grooved	A - 25120	552 - Trigger Plate Frt. Pin
.190	.435	Flat	A - 14015	788 - Safety Pivot Pin
.195	.500	Knurl	A - 90394	870 - Slide Assembly Pin
.199	.350	Ball Ends	A - 18384	762 - Cam Pin
.200	.687	Spirol Roll	A - 16514	66 - Firing Pin Stop Pin
.210	1.767	_____	B - 33665	3200 - Firing Pin Housing Assembly Pin
.222	.740	Oval	A - 15029	1051 - Carrier Rubber Stud
.227	.480	_____	A - 17471	851 - Locking Block Pin, 12 - 16 - 20 Ga.
.250	.370	_____	A - 90585	T. Trap - Throwing Arm Pivot Pin
.250	.750	Oval	A - 13504	Wonder - AC or DC
.250	1.240/1.400	Groove	B - 20605	1100 - Trigger Plate Pin Rear
.375	.940	Stud	A - 13042	Wonder All
.381	2.250	_____	A - 13090	Wonder All
.423	.319	Taper	B - 33360	3200 - Joint Pin
.423	.322	_____	A - 90290	3200 - Joint Pin
.430	1.845	Step Pin	B - 90923	870 - Swivel Pin
.437	1.234	.562 R	A - 13094	Wonder All
.437	1.750	Clevis Pin	A - 13106	Wonder "B"
.437	1.812	Stud	A - 13165	Wonder All
.499	1.531	Groove	B - 90769	T. Trap - Angling Crank Pin
.500	1.437	Stud	A - 13111	Wonder All

MS-10 374

ROLLPIN DATA

STD. SHT. NO. MM-E-200

COMPL. BY N.M. REED



PIN DIAMETER			SUGGESTED DRILL	WALL THICKNESS			STOCK LENGTHS		
NOM.	MAX.	MIN.		HEAVY DUTY	STD.	LIGHT DUTY	FROM	TO	IN INCREMENTS OF
1/16	.069	.066	1/16		.012		3/16	3/4	1/16
5/64	.086	.083	5/64		.018		1/4	1	1/16
3/32	.103	.099	.42		.022		1/4	1	1/16
1/8	.135	.131	3.2mm.		.028		3/8	1	1/16
5/32	.167	.162	.22		.032		1/2	1	1/16
3/16	.199	.194	.12		.040		1/2	1	1/16
7/32	.232	.226	.2		.048		3/4	2	1/16
1/4	.264	.258	6.4mm.		.048		5/8	3 1/4	1/8
5/16	.328	.321	8.0mm.		.062		1	4	1/4
3/8	.392	.385	9.6mm.		.077		1	4	1/4

1/2 DIA. PIN ALSO AVAILABLE - SEE MFGS. SPECS. FOR DATA.
 FOR 'ROLLPIN' NUMBERING SYSTEM SEE CAT. NO. 800 PAGE 15

MATERIAL

CARBON STEEL
 TYPE 920 CORR. RESIST. STEEL

FINISH

PLAIN - BLACK OILED
 ZINC & CADMIUM-SPECIAL

ELASTIC STOP NUT CORP.
 UNION, N.Y.

RESEARCH & DEVELOPMENT DEPT. REMINGTON ARMS COMPANY, INC. ELIZON, N.Y.

SEL-LOK PIN DATA

STD. SHT. NO. MM-E-301

COMPL. BY N.M. REED



PIN DIAMETER			SUGGESTED DRILL	WALL THICKNESS			STOCK LENGTHS		
NOM.	MAX.	MIN.		HEAVY DUTY	STD.	LIGHT DUTY	FROM	TO	IN INCREMENTS OF
$\frac{1}{16}$	.069	.066	$\frac{1}{16}$	REBROST	.012	.006	$\frac{1}{4}$	$\frac{3}{4}$	$\frac{1}{16}$
$\frac{5}{64}$	.086	.083	$\frac{5}{64}$		.018	.008	$\frac{1}{4}$	1	$\frac{1}{16}$
$\frac{3}{32}$	.103	.099	.42		.022	.012	$\frac{1}{4}$	1	$\frac{1}{16}$
$\frac{1}{8}$	.135	.131	3.2mm	NON HEATED	.028	.018	$\frac{3}{8}$	1	$\frac{1}{16}$
$\frac{5}{32}$	.167	.162	.22		.032	.022	$\frac{1}{2}$	1	$\frac{1}{16}$
$\frac{3}{16}$	.199	.194	.12		.042	.028	$\frac{1}{2}$	1	$\frac{1}{16}$
$\frac{1}{4}$	.267	.258	6.4mm	FULLY HEATED	.050	.032	$\frac{5}{8}$	1	$\frac{1}{16}$
$\frac{5}{16}$	.323	.321	8.0mm		.062	.040	$\frac{13}{16}$	1	$\frac{1}{16}$
$\frac{3}{8}$	.392	.385	9.6mm		.078	.050	1	4	$\frac{1}{4}$
$\frac{1}{2}$	.521	.513	$\frac{1}{2}$	DATA	.094	.062	$\frac{1}{2}$	4	$\frac{1}{4}$

* LONGER LENGTHS AVAILABLE - SEE MFGS. SPECS. FOR DATA

⊗ STD. WALL THICKNESS ONLY - FOR STOCK LGTHS. OF LIGHT DUTY PINS. SEE MFGS. SPECS.

FOR 'SEL-LOK' NUMBERING SYSTEM SEE 'SEL-LOK' SPEC. 601

MATERIAL

CARBON STEEL
STAINLESS STEEL

FINISH

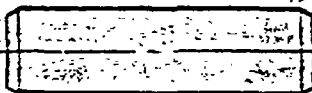
PLAIN - STD.
ZINC & CADMIUM - SPECIAL

STANDARD PRESSED STEEL CO.,
JENKINTOWN, PA.

SPIROL PIN DATA

STD. SHT. No. MM-E-202

COMPL. BY N.M. REED



PIN DIAMETER			SUGGESTED DRILL	WALL THICKNESS			STOCK LENGTHS		
NOM.	MAX.	MIN.		HEAVY DUTY	STD.	LIGHT DUTY	FROM	TO	IN INCREMENTS OF
$\frac{1}{16}$	.071	.067	$\frac{1}{16}$	.007	.005	.003	$\frac{1}{4}$	1	$\frac{1}{8}$
$\frac{5}{64}$	.087	.083	$\frac{5}{64}$	.007	.005	.003	$\frac{1}{4}$	1	$\frac{1}{8}$
$\frac{3}{32}$	.104	.099	$\frac{3}{32}$	.010	.007	.005	$\frac{3}{8}$	1	$\frac{1}{8}$
$\frac{7}{64}$	.119	.114	$\frac{7}{64}$	.010	.007	.005	$\frac{3}{8}$	1	$\frac{1}{8}$
$\frac{1}{8}$	.137	.131	$\frac{1}{8}$	.014	.010	.007	$\frac{1}{2}$	1	$\frac{1}{8}$
$\frac{5}{32}$	.170	.163	$\frac{5}{32}$	.017	.011	.007	$\frac{1}{2}$	1	$\frac{1}{8}$
$\frac{3}{16}$	.204	.196	$\frac{3}{16}$	.020	.015	.010	$\frac{1}{2}$	1	$\frac{1}{8}$
$\frac{7}{32}$	.238	.229	$\frac{7}{32}$	.024	.017	.011	$\frac{1}{2}$	1	$\frac{1}{8}$
$\frac{1}{4}$	.270	.260	$\frac{1}{4}$	.028	.020	.015	$\frac{1}{2}$	1	$\frac{1}{8}$
$\frac{5}{16}$	.340	.327	$\frac{5}{16}$	.032	.024	.017	1	2	$\frac{1}{4}$

* MAX. & MIN. PIN DIAS. ARE FOR STD. WALL THICKNESS PINS ONLY
DIAMETERS OF $\frac{1}{32}$, $\frac{3}{64}$, .052, $\frac{3}{16}$, $\frac{7}{16}$, & $\frac{1}{2}$ ALSO AVAILABLE - SEE
MFGRS. SPECS. FOR DATA - ALSO SPECIAL MAT. & FINISHES

MATERIAL & FINISH - STD.

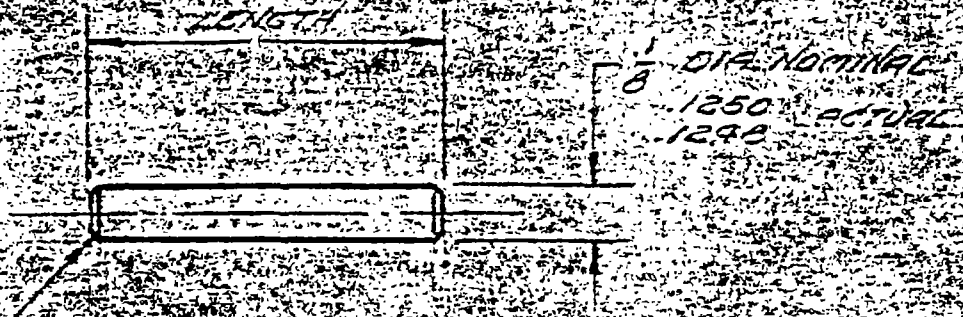
CARBON STEEL - OILED FINISH

CHROME ALLOY STAINLESS - OILED FINISH

NICKEL ALLOY STAINLESS (NOT H.T.) - OILED FINISH

CONNECTICUT ENGR. & MFG. CO.,
DANIELSON, CONN.

5-17-74
KINZOR REMINGTON ARMS COMPANY, INC. NEW YORK



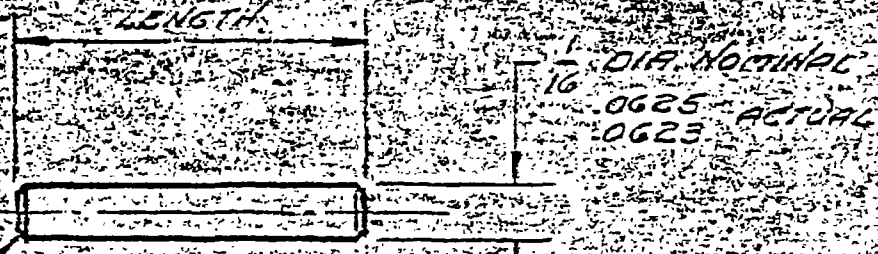
0.010-45° CHAMFER - BOTH ENDS
PIN STEEL - HON. & GRO.

SEE DWG NO. B-24975

STD. SHEET NO. ACT-E-203 COMPL. BY NCR REED

PART NO.	LENGTH
24975	860-870
24976	710-720
24977	355-365
24978	985-1000
24979	540-555
24980	620-630
24981	
24982	
24983	
24984	
24985	
24986	
24987	
24988	
24989	

REMINGTON ARMS COMPANY INC. ALBANY, N.Y.



.010 x 45° CHAMFER - BOTH ENDS
PIN - STEEL - HON. & GRD.

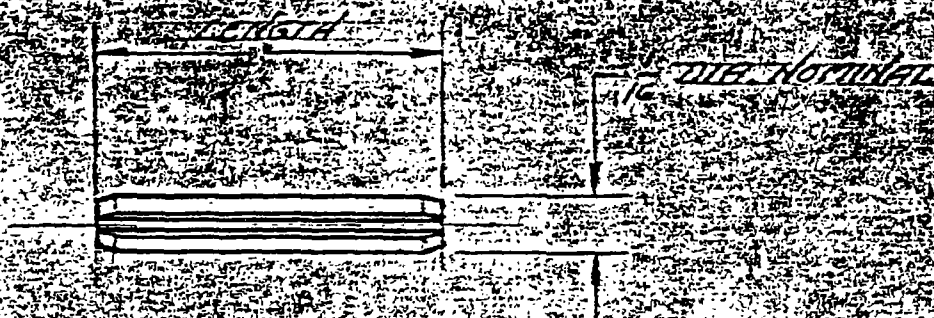
SEE DWG. NO. E-24210

STD. SHEET NO. MM-E-204

COMPL. BY N.M. REED

PART NO.	LENGTH
24210	160-166
24211	434-440
24212	182-192
24213	
24214	
24215	
24216	
24217	
24218	
24219	

KINZER RESEARCH & DEVELOPMENT DEPT.
 REMINGTON ARMS COMPANY, INC. ILION, NY



5CL-LOK SPRING PIN

SEE DWG NO. E-25335

STD SHEET NO. CM-E-205

COMPL BY NOT REED

PART NO.	LENGTH
25335	1/16
25336	5/16
25337	
25338	
25339	
25340	
25341	
25342	
25343	
25344	

REMINGTON ARMS CO. BANKING CO.

ENGINEERING DEPARTMENT CONSTRUCTION SHEET

SHEET 1-6

Outside Dia	Free Length	# Turns Direction	Wire Dia	End.
.070	.520	19 R.H. 510-E-23	.014 510	Plain Extractor App.
.075	.160	16.5 R.H. A-17572	.012 M/580	Turned in Ejector App.
.077	.550	19 R.H. A-17573	.016 580	Plain Ejector App.
.077	.183	7 R.H. A 16009	.016 58	Plain Mag Cap Plunger App.
.077	.700	25 R.H. A 15006	.016 N66	Plain Extractor App.
.078	.250	12 E.H. A 16513	.012 66	Plain Firing Pin Extractor App.
.087	.400	11 R.H. A 15413	.016 600	Ag & GR. Bolt Stop App.
.085	.260	8 R.H. A 16463	.016 742	— Bolt Latch App.
.112	.383	6 512-E-23	.014 510	Square Cartridge Stop Plunger App.
.114	.200	5 L.H. A 15400	.027 700 ADL	GR. Trigger App.
.115	.250	5½ E. H. A 16791	.022 11-48	— Operating Handle App.
.117	.470	11 510-E-38	.021 510	Plain Trigger App.
.117	.600	12 R.H. A 15827	.018 M/1100	1st COIL EACH END BENT IN. Break Bolt Return Plunger

REMINGTON ARMS COMPANY, INC.
ENGINEERING DEPARTMENT

COMPLETION SHEET

SHEET NO. 2-6

TITLE OF JOB

PROJ. NO.

SUBJECT

WORKS

DATE

.117	.470	11 E.H. A-15892	.021 1100	Plain Magazine Cap Detent App.
.117	.500	12 R.H. A 16360	.018 58	Bolt Return Slide Plunger App.
.120	.310	12 E.H. A 18182	.010 550	Plain Cartridge Stop Detent App.
.122	.920	18 R.H. Q-E-262	.018 550	Plain Sear App.
.122	1.056	20 E.H. A 16516	— 66	Hook Disconnect Pin App.
.125	.372	7½ E.H. A 17514	.022 1100	Plain Hammer App.
.130	.625	15 E.H. A 16517	.020 66	Hook on Lock End. Trigger App.
.130	.200	4 L.H. 19624	.016 510	Best in Qty Retainer App.
.135	1.309	30 — A-16292	.032 742	Plain Ejector App.
.136	1.820	38 R.H. A 14215	.016 788	Squared Ejector App.
.137	.610	14 E.H. A 18822	.026 870	Plain Extractor App.
.134	1.100	24 R.H. A 17019	.026 700	App F G.R. Ejector App.

REMINGTON ARMY CORP. TESTING
ENGINEERING DEPARTMENT (27) COMPUTATION SHEET

SHEET 3-6

TABLE OF DATA

FIG. NO.

S. 117.

WORKS

DATE

10

.137	.585	14 E.H. A 17433	.024 1100	Plain Extractor Spg.
.140	1.625	45 R.H. A 15702	.017 1100	Plain Carrying Pin Retractor Spg.
.142	.832	18 R.H. A 14045	.022 788	Ag & GR. Trigger Spg.
.147	1.973	41 E.H. A 17437	.019 870	Ag & GR. Carrying Pin Retractor Spg.
.148	.980	19 E.H. A 16966	.027 1100	Plain Carrier Hatch Spg.
.148	1.06	22 E.H. A 17415	.024 1100	Carrier Key Release Spg.
.152	.340	5 R.H. A 14029	.018 788	Ag & GR. Safety Plunger Spg.
.155	.515	7 E.H. A 19677	.020 742	Ag. Carrying Pin Retracting Spg.
.167	.460	8 R.H. A 17047	.028 700	Ag & GR ONE Slew Spg.
.175	.122	3 - A-16452	.022 700	Hook end Slow Plate Hatch Spg.
.195	.800	12 R.H. A 19948	.032 552	Plain Carrier Spg.
.200	.700	10 E.H. 18664	.022 510	Ag. Carrier Carrier Spg.

PAID NO

NOTE

DATE

NO

.207	26.4	178 R.H. A 18379	.022 Bent in 580 Main Spg.
.240	.510	7 E.H. A 16533	.025 Ag. 66 Safety Retent Spg.
.245	.536	8 R.H. A 14024	.025 Ag & G.R. 788 Bolt Stop Spg.
.250		9 1/2 R.H. A 17579	.046 G.R. 1051 Trigger Spg.
.250	6.0	82 R.H. A 16511	.030 Ag. 66 Acting Spg.
.228	.664	8 1/2 E.H. A 17518	.032 Reduced Dia 1100 Saw Spg.
.278	20.	139 R.H. A 14268	.018 Turned to Enroll 592 Magazine Spg.
.275	20	130 R.H. A 16523	.019 End Coil turned in 66 Magazine Spg.
.294	1.75	18 L.H. A 19014	.050 Plain 870 Hammer Spg.
.294	1.812	18 L.H. A 19930	.044 Plain 552 Hammer Spg.
.300	.746	6 R.H. A 17234	.040 Ag & G.R. 552 Main Spg.
.325	4.757	39 R.H. A 14223	.045 Ag & G.R. 788 Main Spg.

PROJ. NO.

WORKS

DATE

12

.330 4.65 45 R.H.
A 17244

.035 Ag & GR.
552 main App.

.337 2.395 22 R.H.
A 14013

.049 Plain GR.
580 main App.

.395 4.5 27 R.H.
A 16520

.035 Ag.
66 Sizing Pin Striker App.

.397 2.290 16 R.H.
19781

.055 Ag & GR.
40XB main App.

.405 3.63 24 RH
A 15411

.055 Ag & GR.
XP100 main App.

.405 5.26 33 R.H.
A 17058

.055 Ag & GR.
700 main App.

.421 11.995 79 E.H.
A 17360

.045 Closed.
11-48 Action App.

.478 18.0 42 E.H.
A 17497

.031 Ag.
11-48 Magazine App.

.475 10.610 51 E.H.
A 18332

.045 Plain
742 Action App.

.520 1.886 44 E.H.
A. 19848

.041 End Cail Closed
552 Action App.

.625 26.5 52 E.H.
A 17496

.035 Ag.
11-48 Magazine App.

.700 14.4 32 R.H.
A 19479

.042 Ag.
870 Magazine App.

TITLE OF PROJECT

SUBJECT

.720	10.250	24 R.H. A 16750	.027x.085 58	Open Magazine App.
.725	22.870	36 E.H. A 15382	.041 1100	App. Magazine App.
.725	25.75	40 E.H. A 17493	.041 11-48	App. Magazine App.
.750	8.5	32 R.H. A 19365	.040x.080 58	App. Action App.
.775	9.375	46 E.H. A 19638	851	App. Recall App.
.775	11.17	46 E.H. A 17512	.065 11-48	App. Recall App.
1.152	8.6	15 A 19314	.068x.200 11-48	App. Recall App.
.965	7.375	20 E.H. A 17511	.085 11-48	App. Recall App.

CONNECTICUT SPRING (NBAK 11th. Spring)

4

Appx. Cost

\$700

Roy
BERNARD

Springs

~ 100 ea.

3 thickness

WIRE DIA.

approx.

.045 - .047 - .049

John
Torda
is
sales rep.

DUE TO BE

DELIVERED BY

probably by Christmas

For 1990

need to be

filled by 12/3/87

Difference in cost to do 60 vs 12 springs?

Could do them if we had more later?

John Torda

I will have purchase order out ASAP

(See next
wh.)

have you a purch. order by 12/1/87

.045
.047
.049

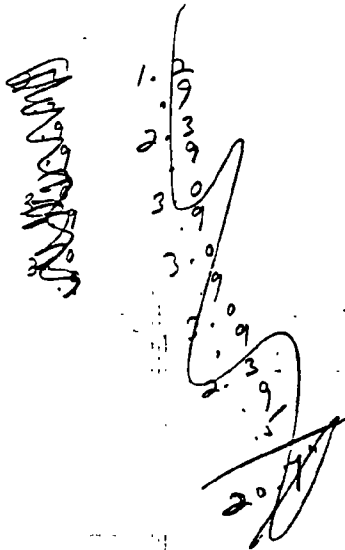
NBAR - staff for monthly report → D.C. Brennan



drill rod + Joe Haynes
want .0475

APPLICATIONS ENGR.

CONNECTICUT
SPRING
(203) 677-1341



~ 21" drill rod
.0475" dia

and print →

from that

I get you a purchase order

make dozen prototypes
(for 10 dia wire)
(you evaluate, talk about
timing, approx. cost)

circular cross section wire spring

BOX
MAGAZINE SPRING

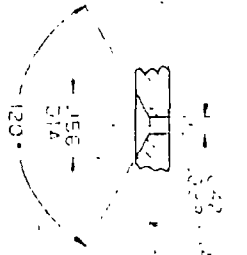
~ 17" over
~ 12.3" thick

Roy BERNARD

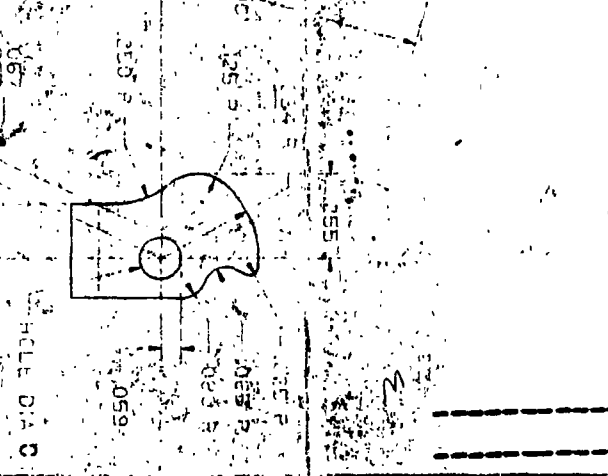
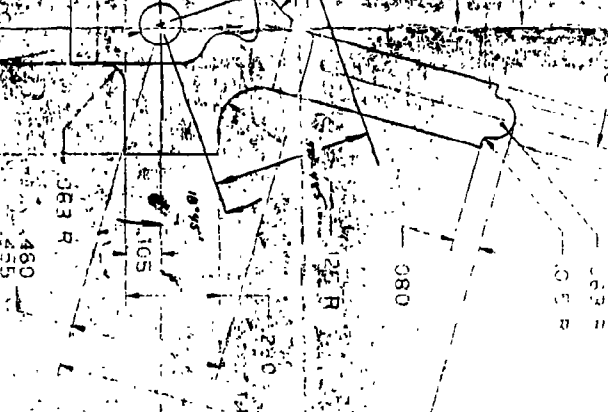
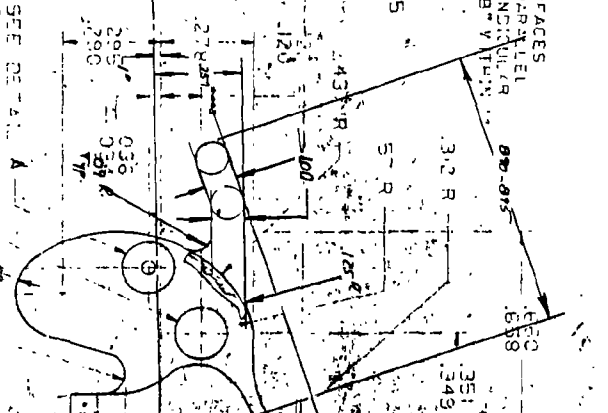
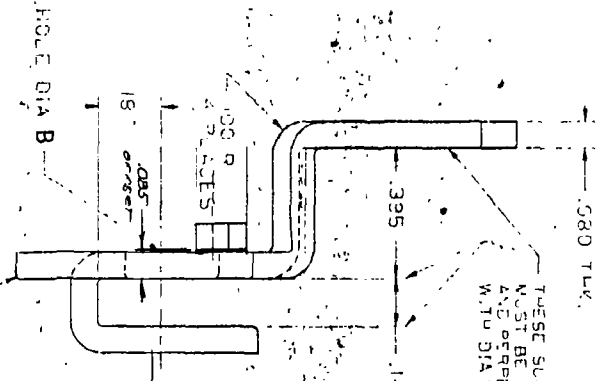
5 SPRING LANE
FARMINGTON INDUSTRIAL PARK
FARMINGTON, CONN

06032

951-0



DETAIL A
SCALE 5.



NAT. FACT. PING DIMS AFTER	
DIA. DIMENSION	LESS 1/16"
A	3.700
B	3.300
C	3.250

FOR 3/4" DIA. HOLE
ORDER 33343

HOLE DIA B FAR SIDE
HOLE DIA C NEAR SIDE

ALL DIMENSIONS ARE MADE TO CENTER UNLESS OTHERWISE SPECIFIED
HOLE DIA B FAR SIDE
HOLE DIA C NEAR SIDE

Approved by: *Pa. Moore, Dir.*
 Date: *1/16/54*
 Order: *33343*
 Part: *33343*
 Quantity: *1*
 Material: *STEEL*
 Finish: *AS SUPPLIED*
 Notes: *SEE DETAIL A FOR HOLE DIA B FAR SIDE*
SEE DETAIL A FOR HOLE DIA C NEAR SIDE
 C-33343

NEW BOLT ACTION RIFLE

T.G. BAUMAN 10-31-88

The purpose of the New Bolt Action Rifle (N'BAR) is to offer a replacement for the M/700 'BDL' Rifle currently being produced. The new design parameters will include:

- o Detachable Magazine Box
- o Improved Fire Control
 - No Connector
 - Two Trigger Pull Springs (Low Rate Spring)
 - Sealed Fire Control
 - Balanced Trigger
 - Trigger & Sear Block
 - Non-Retrofittable to M/700
- o Bolt Lock w/Override
- o New Scope Mounts - Possibly aftermarket bases and rings. To be offered with rifle package.
- o New Extractor System
- o New 'Custom Shop' Barrel Contour
 - Mountain Rifle Crown
- o Improved Bedding/Accuracy Features
 - Example:
 - Thicker barrel bracket
 - Relieved thread - rec. fit & full hub bearing
- o M/700 Receiver to start with same round blank size and cosmetically altered behind front ring of steel over locking lugs.
- o New Wood Stock - Cosmetically altered for fittings/dress up/checkering

The "N'Bar" Design features will initially be produced in five calibers (30-06, 270, 280, 25-06 & 7MM Mag.) during the first year of introduction. These design/cost estimates are based strictly on introduction of these five calibers only in long action standard and mag. calibers only. If at a later point in time other calibers and short actions are added to this program, they will have additional development and introduction costs added.

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- o Detachable Magazine Box
- o Improved Fire Control
 - No Connector
 - Two Trigger Pull Springs (Low Rate Spring)
 - Sealed Fire Control
 - Balanced Trigger 4# MAX NEEDS TO BE SET AT FACTORY
 - Trigger & Sear Block
 - Non-Retrofittable to M/700
- o Bolt Lock w/Override
- o New Scope Mounts - Possibly aftermarket bases and rings. To be offered with rifle package.
- o New Extractor System
- o New 'Custom Shop' Barrel Contour
 - Mountain Rifle Crown
- o Improved Bedding/Accuracy Features
Example:
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- Initial Design

Jan.'89 - Dec.'89

This includes preliminary experimental development work, sketches, scenarios, layouts, design, computer modeling, detailing and checking. This design will be a redesign of the existing M/700 Rifle currently in our line, only in those areas so stated above in the design parameters section. Short actions and additional calibers will be considered during initial design to allow them to be compatible for design inclusion at a later time. Personnel required to accomplish this will include: one Research Engineer full time, one Cad Designer and one CAD Detailer, and one Research Engineer 50% of time, as well as some part-time help from one EDL Engineer, Model Maker, N/C Programmer & Tester.

NBAR

850502 LockTime
851061 Dry Cycle Extractor
851261 Dry Cycle Extractor
852392 LockTime

RESEARCH TEST & MEASUREMENT LAB WORK REQUEST

☒ Developmental ☐ Design Acceptance ☐ Pre-Pilot ☐ Pilot ☐ Production Acceptance	<u>AREA OF TESTING</u> ☐ Safety Related ☐ Litigation ☐ Competitive Evaluation ☐ Warehouse Audit ☒ New Design ☐ Cost Reduction ☐ Design Change ☐ Stake _____ ☐ Plant Assistance ☐ Other _____	
<u>FIREARM STAT'S.</u> MODEL: <u>NBAR</u> CAL or GAGE: <u>.308</u> BARREL TYPE: <u>22"</u> PROOFED: YES ☒ NO ☐	<u>REPORT REQ'D.</u> FORMAL ☐ TEST RESULTS ONLY ☒	DATE REQUESTED: <u>2-19-85</u> DATE NEEDED BY: <u>3-1-85</u> REQUESTED BY: <u>R S MURPHY</u> WORK ORDER NO: <u>C-5003-</u>

TEST TYPE

☐ Strength Test	☐ Ammunition Test	☐ Dry Cycle Test	☐ Photo/Video
☐ Function Test	☐ Environmental Test	☐ Measurements	☒ Other <u>LOCKTIME</u>
☐ Accuracy Test	☐ Customer Complaint	☐ Endurance Test	<u>EVALUATION</u>

EXPLAIN IN DETAIL THE REASON FOR THIS TEST:

We have redesigned the firing pin assembly and we need to know what effect this has on locktime.

-GUNS REQUIRED:

XC-0405 } Will be supplied immediately upon
 XC-0407 } request.

NOTE: NO firearms or parts will be tested in the Labs unless they are accompanied by a Work Request, and both are delivered to the Labs by the designer or engineer. All Work Requests are to be filled out in detail. No Exceptions.

DATE COMPLETED: 4/9/85
 TEST COMPLETED BY: P. Carroll
 REPORT DATE: _____

MEASUREMENT LAB TEST RESULTS

REQUESTOR: Randy Murphy TESTER: Paul Conant DATE: 04/09/85

REPORT NO.: 850502 WORK ORDER NO.: C-5003-315-Y

TEST TYPE: Developmental, New Design

FIREARM STAT'S : MODEL: NBAR CAL or GAUGE: .308

BARREL TYPE: 22 in. PROOFED: YES * NO

REASON FOR TEST : The firing pin assembly has been redesigned. The effect of this design change must be tested as to the effect on the lock time.

EQUIPMENT REQUIRED : Experimental Gun XC-0405, .308 caliber, and Control gun M/700, SER. NO. 6841170, .308 caliber

TEST RESULTS :

In order to accomplish a "lock time" measurement, a new testing technique had to be developed. The new technique took the form of a digital electronic circuit that when interfaced to a M/700 or a new design bolt action rifle (with exposed firing pin), measured the change in time from trigger unlock, to firing pin impact. The interface network is connected non-destructively to the gun via special purpose clips and duct tape. The electronic circuit interfaces these connections with the 7854 oscilloscope.

The experimental gun was tested first. Ten shots were fired to assure validity in the test apparatus.

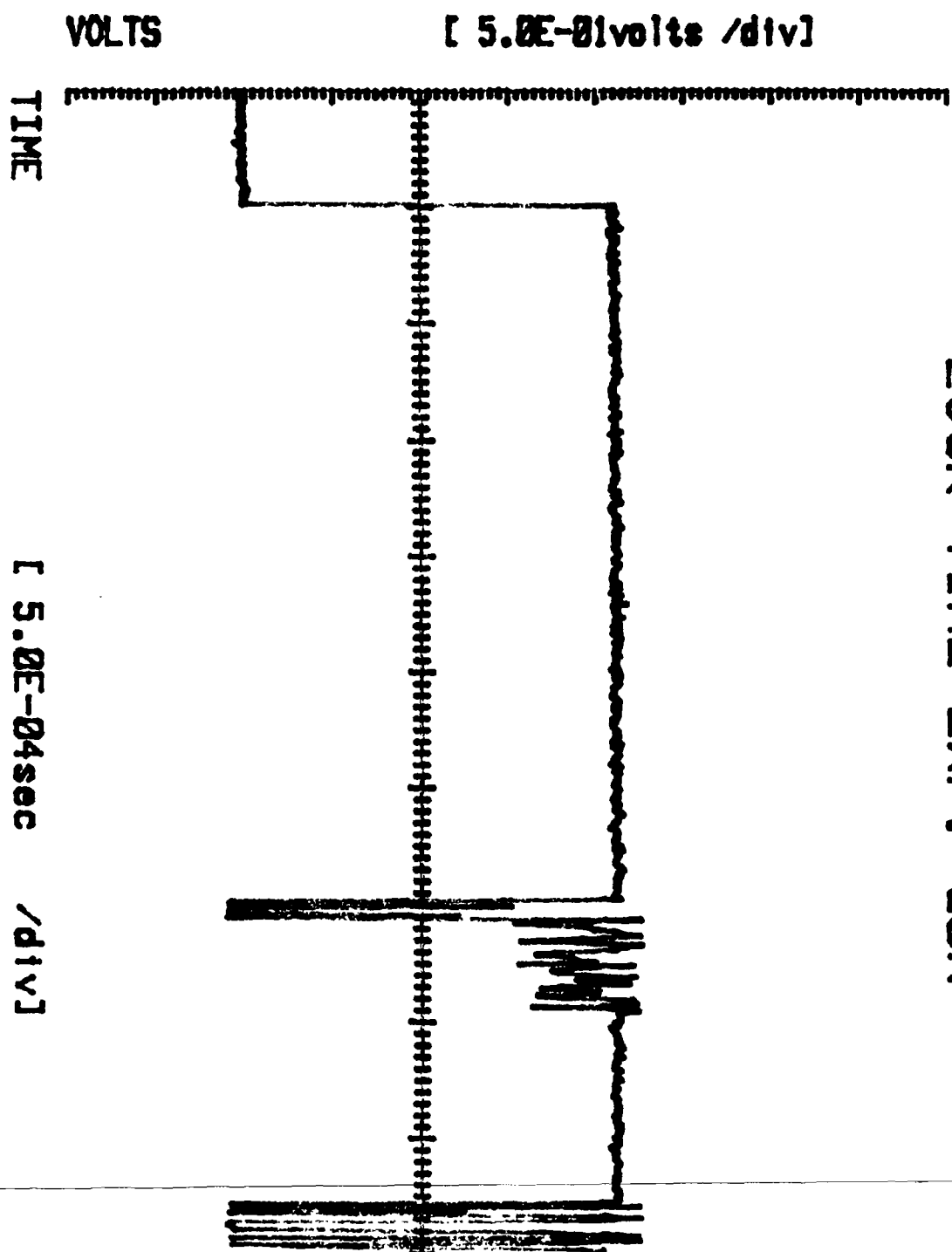
One of the waveforms was plotted to graphically show the lock time measurement. The control gun was then connected to the electronic circuit and tested in the same manner as explained before. One of the control gun waveforms was also plotted.

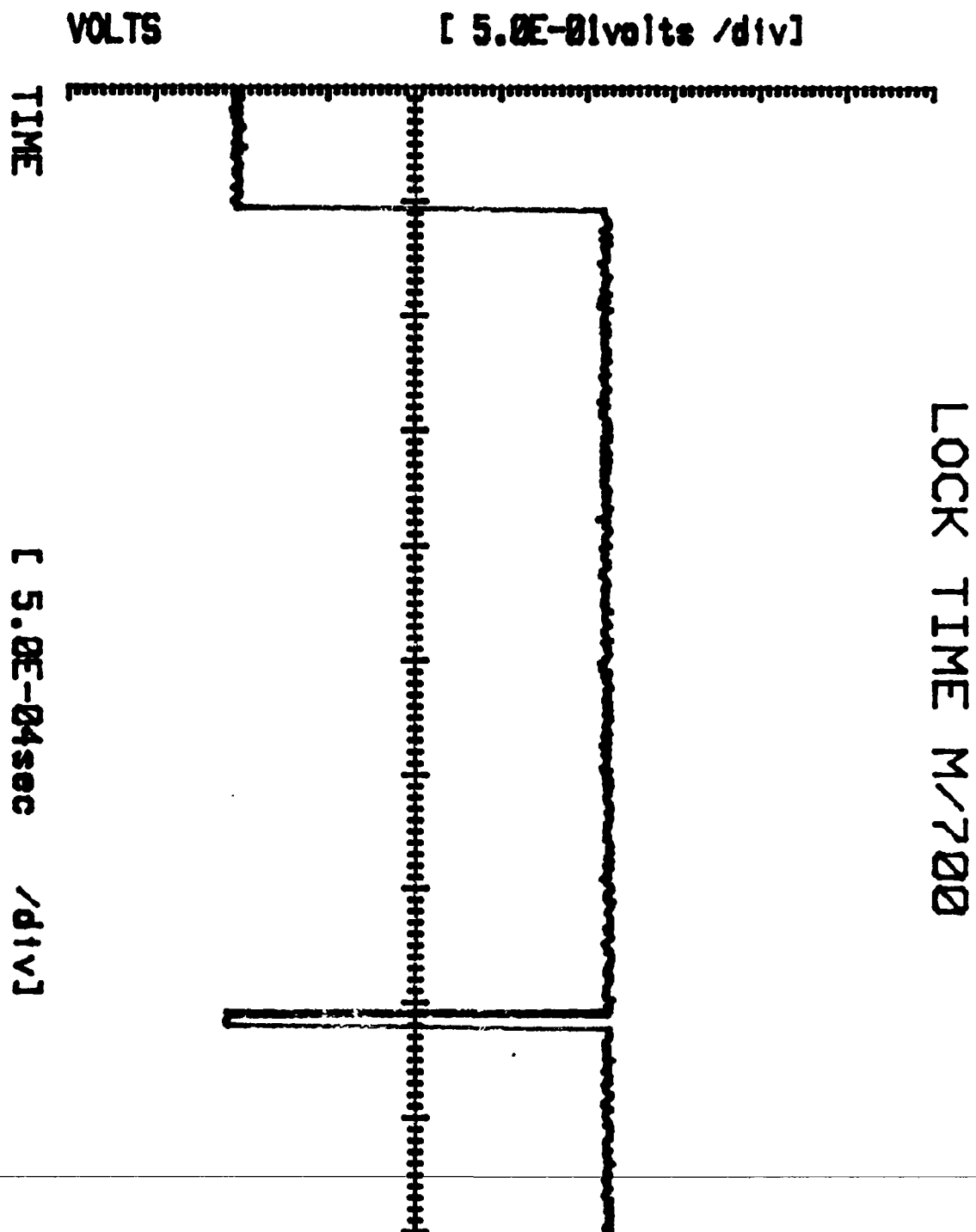
The test results are shown below:

CONTROL GUN: .0035 seconds

EXPERIMENTAL GUN: .0030 seconds

LOCK TIME EXP. GUN





Report No. SSICL1

— RESEARCH TEST & MEASUREMENT LAB WORK REQUEST —

☒ Developmental ☐ Design Acceptance ☐ Pre-Pilot ☐ Pilot ☐ Production Acceptance	<u>AREA OF TESTING</u> <table border="0"> <tr> <td>☐ Safety Related</td> <td>☐ Litigation</td> </tr> <tr> <td>☐ Competitive Evaluation</td> <td>☐ Warehouse Audit</td> </tr> <tr> <td>☒ New Design</td> <td>☐ Cost Reduction</td> </tr> <tr> <td>☐ Design Change</td> <td>Stake <u>A GREAT DEAL</u></td> </tr> <tr> <td>☐ Plant Assistance</td> <td>☐ Other</td> </tr> </table>		☐ Safety Related	☐ Litigation	☐ Competitive Evaluation	☐ Warehouse Audit	☒ New Design	☐ Cost Reduction	☐ Design Change	Stake <u>A GREAT DEAL</u>	☐ Plant Assistance	☐ Other
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☐ Competitive Evaluation	☐ Warehouse Audit											
☒ New Design	☐ Cost Reduction											
☐ Design Change	Stake <u>A GREAT DEAL</u>											
☐ Plant Assistance	☐ Other											
<u>FIREARM STAT'S</u> MODEL: <u>NBAR</u> CAL or GAGE: <u> </u> BARREL TYPE: <u> </u> PROOFED: YES <u> </u> NO <u> </u>	<u>REPORT REQ'D.</u> FORMAL <u> </u> TEST RESULTS ONLY ☒	DATE REQUESTED: <u>4-15-85</u> DATE NEEDED BY: <u>5-2-85</u> REQUESTED BY: <u>F.H. Smith</u> WORK ORDER NO: <u>C-5004-314</u>										

<u>TEST TYPE</u>			
☐ Strength Test ☐ Function Test ☐ Accuracy Test	☐ Ammunition Test ☐ Environmental Test ☐ Customer Complaint	☒ Dry Cycle Test ☐ Measurements ☐ Endurance Test	☐ Photo/Video ☐ Other <u> </u>

EXPLAIN IN DETAIL THE REASON FOR THIS TEST: DRY CYCLE NBAR EXTRACTOR

- PROVIDE A TEST FIXTURE TO DEFLECT NBAR EXTRACTOR .038"-.040"
- DRY CYCLE 10,000 CYCLES
- RECORD BREAKAGE - IF ANY

-GUNS REQUIRED:

-1- NBAR EXTRACTOR

NOTE: RESULTS NBAR EXTRACTOR DEFLECTED 50,000 CYCLES TO .040"
 NO BREAKAGE OR MALFUNCTIONS OF ANY KIND. STILL FUNCTIONS PROPERLY

NOTE: NO firearms or parts will be tested in the Labs unless they are accompanied by a Work Request, and both are delivered to the Labs by the designer or engineer. All Work Requests are to be filled out in detail. No Exceptions.

DATE COMPLETED: 5-2-85
 TEST COMPLETED BY: R HOWE
 REPORT DATE: X

Report No. 851261

RESEARCH TEST & MEASUREMENT LAB WORK REQUEST

☒ Developmental ☐ Design Acceptance ☐ Pre-Pilot ☐ Pilot ☐ Production Acceptance	<u>AREA OF TESTING</u> <table border="0"> <tr> <td>☐ Safety Related</td> <td>☐ Litigation</td> </tr> <tr> <td>☐ Competitive Evaluation</td> <td>☐ Warehouse Audit</td> </tr> <tr> <td>☒ New Design</td> <td>☐ Cost Reduction</td> </tr> <tr> <td>☐ Design Change</td> <td>Stake <u>AGREEMENT DEAL</u></td> </tr> <tr> <td>☐ Plant Assistance</td> <td>☐ Other</td> </tr> </table>		☐ Safety Related	☐ Litigation	☐ Competitive Evaluation	☐ Warehouse Audit	☒ New Design	☐ Cost Reduction	☐ Design Change	Stake <u>AGREEMENT DEAL</u>	☐ Plant Assistance	☐ Other
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☐ Competitive Evaluation	☐ Warehouse Audit											
☒ New Design	☐ Cost Reduction											
☐ Design Change	Stake <u>AGREEMENT DEAL</u>											
☐ Plant Assistance	☐ Other											
<u>FIREARM STAT'S. Proto. #1</u> MODEL: <u>NBAR</u> CAL or GAGE: <u> </u> BARREL TYPE: <u> </u> PROOFED: YES <u> </u> NO <u> </u>	<u>REPORT REQ'D.</u> FORMAL <u> </u> TEST RESULTS ONLY ☒	DATE REQUESTED: <u>5-3-85</u> DATE NEEDED BY: <u>5-10-85</u> REQUESTED BY: <u>F.H. SMITH</u> WORK ORDER NO: <u>C-5004-314</u>										

<u>TEST TYPE</u>			
☐ Strength Test ☐ Function Test ☐ Accuracy Test	☐ Ammunition Test ☐ Environmental Test ☐ Customer Complaint	☒ Dry Cycle Test ☐ Measurements ☐ Endurance Test	☐ Photo/Video ☐ Other <u> </u>

EXPLAIN IN DETAIL THE REASON FOR THIS TEST: DRY CYCLE NBAR EXTRACTOR

- DRY CYCLE 50,000 CYCLES (DEFLECT EXT. .035-.040).
- RECORD BREAKAGE - IF ANY

-GUNS REQUIRED: -1- NBAR PROTOTYPE EXTRACTOR

NOTE! RESULTS, N-BAR PROTOTYPE EXTRACTOR DEFELECTED .040" FOR 50,000 DRY CYCLES W/ NO BREAKAGE OR MALFUNCTIONS.

NOTE: NO firearms or parts will be tested in the Labs unless they are accompanied by a Work Request, and both are delivered to the Labs by the designer or engineer. All Work Requests are to be filled out in detail. No Exceptions.	DATE COMPLETED: <u>5/8/85</u> TEST COMPLETED BY: <u>R. HOWE</u> REPORT DATE: <u>5/8/85</u>
--	---

✓✓

MEASUREMENT LAB TEST RESULTS

REQUESTER: F. H. Smith TESTER: P. Conant DATE: 08/30/85

REPORT NO.: 852392 WORK ORDER NO.: C-5005-314

TEST TYPE: Design Acceptance

FIREARM STAT'S : MODEL: 700/N BAR CAL or GAUGE: 30-06

BARREL TYPE: _____ PROOFED: YES * NO _____

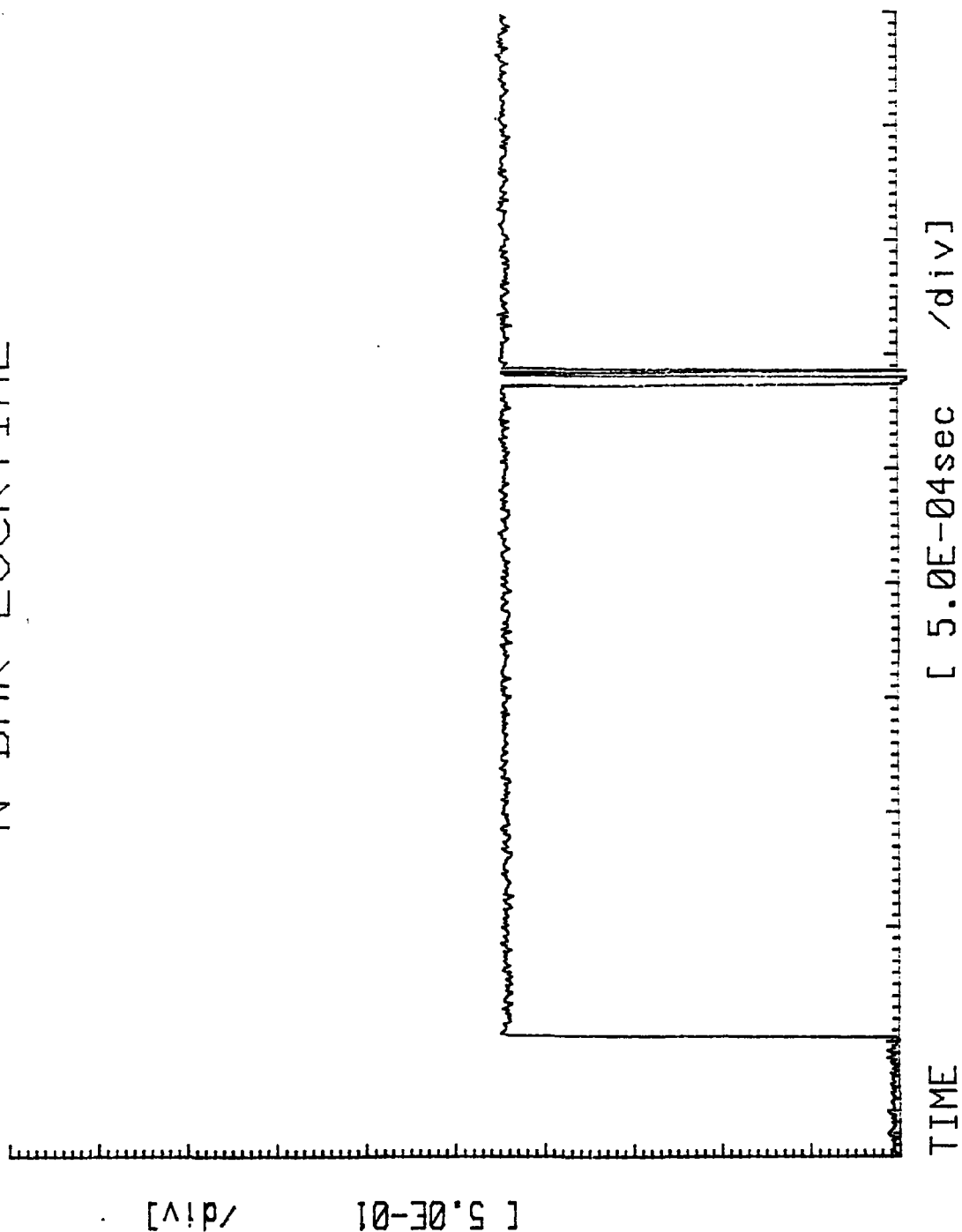
REASON FOR TEST : This test was initiated to determine lock-time for the NBAR
bolt assembly.

EQUIPMENT REQUIRED : Tektronix 7854 oscilloscope, 700 NBAR action (ser#
B6695575), lock time electronic test circuit.

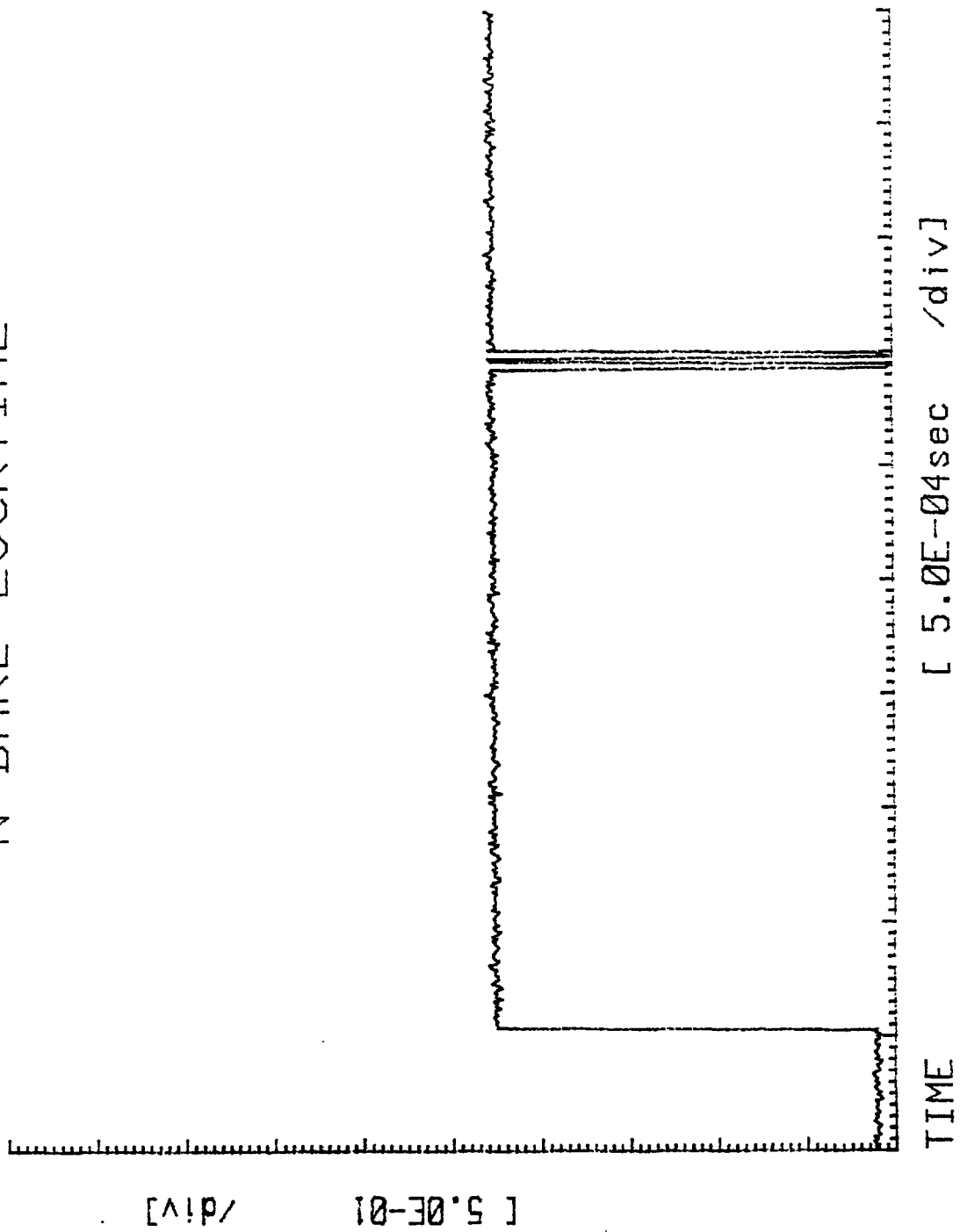
TEST PROCEDURE : The test circuit was connected to the gun with the output
signal observed on the oscilloscope. The trace was observed and copied to the
plotter. This procedure was repeated 3 times.

TEST RESULTS : The three waveforms showed the locktime to be approx. 2.8
milli-seconds. The plots of the three waveforms are included in this report.

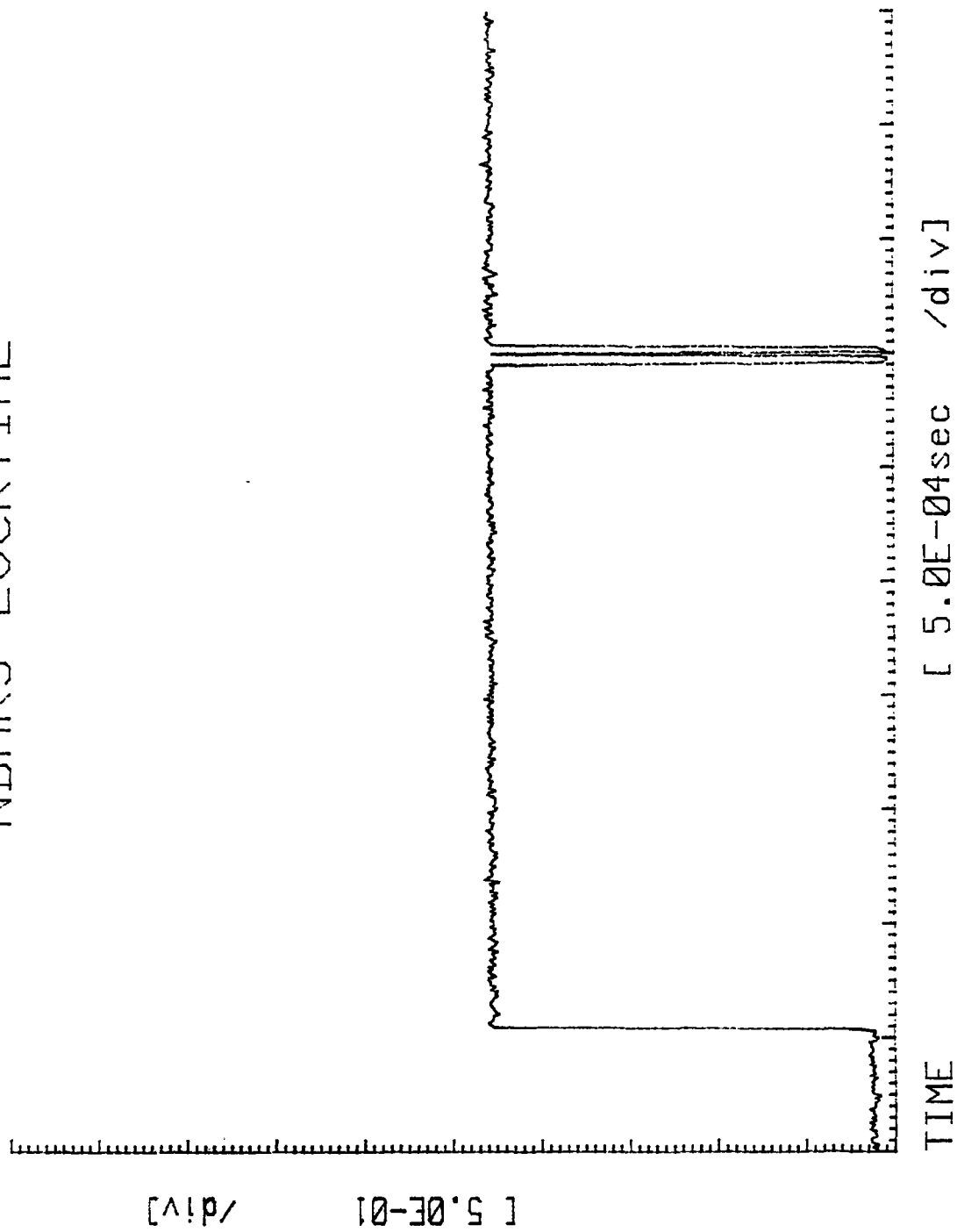
N BAR LOCKTIME



N BAR2 LOCKTIME



NBAR3 LOCKTIME



RESEARCH TEST & MEASUREMENT LAB WORK REQUEST

<u>AREA OF TESTING</u>		
☐ Developmental	☐ Safety Related	☐ Litigation
☒ Design Acceptance	☐ Competitive Evaluation	☐ Warehouse Audit
☐ Pre-Pilot	☒ New Design	☐ Cost Reduction
☐ Pilot	☐ Design Change	State <u>ALOT</u>
☐ Production Acceptance	☐ Plant Assistance	☐ Other

<u>FIREARM STAT'S.</u>	<u>REPORT REQ'D.</u>	
MODEL: <u>700/NBAR</u>	FORMAL ☐	DATE REQUESTED: <u>8-27-85</u>
CAL or GAGE: <u>30-06</u>	TEST RESULTS ONLY ☒	DATE NEEDED BY: <u>9-4-85</u>
BARREL TYPE: _____		REQUESTED BY: <u>F.H. Smith</u>
PROOFED: YES ☒ NO ☐		WORK ORDER NO: <u>C-5005-34</u>

<u>TEST TYPE</u>			
☐ Strength Test	☐ Ammunition Test	☐ Dry Cycle Test	☐ Photo/Video
☒ Function Test	☐ Environmental Test	☒ Measurements	☐ Other _____
☐ Accuracy Test	☐ Customer Complaint	☐ Endurance Test	_____

EXPLAIN IN DETAIL THE REASON FOR THIS TEST:

PLEASE MEASURE LOCK-TIME FOR NBAR
BOLT ASSEMBLY

-GUNS REQUIRED: 700/NBAR SUPPLIED BY ENGINEERING

NOTE: NO firearms or parts will be tested in the Labs unless they are accompanied by a Work Request, and both are delivered to the Labs by the designer or engineer. All Work Requests are to be filled out in detail. No Exceptions.

DATE COMPLETED: 9/3/85
TEST COMPLETED BY: P. Grant
REPORT DATE: _____

Mountain Rifle History



RECORDS CONTROL SCHEDULE

RECORDS CATEGORY OR TITLE:

R+D Periodic Reports

COPY "O" (OFFICIAL) ☒ "X" (EXTRA) ☐

TOTAL RETENTION:

10 yrs

GS-11050 Rev. 8/78

New br Arrow H. Co

QUPOINT	RECORDS CONTROL SCHEDULE
RECORDS CATEGORY OR TITLE:	
Product File	
COPY "O" (OFFICIAL) ☒ "X" (EXTRA) ☐	
TOTAL RETENTION:	
6 yrs after product disc.	
GS-11050 Rev. 8/78	

OPERATIONS NOTES:

October 8, 1981

- Big centerfire Market review, kickoff of ADL and BDL Restyle
- Preliminary scheduling of BAC (Model Seven) is shown
- Low priced bolt action market mentioned

November 11, 1981

- BAC to be introduced in 1983
- ADL and BDL Restyle to be introduced in 1984
- Production says scope mounts could be added in 1983 if Marketing can justify
- Advance funds authorized for BAC

December 9, 1981

- "Marketing, Production, and Research have agreed on a scope mount design for use on the Model 700...All components will be machined from aluminum extrusions and anodized."

January 15, 1982

- BAC progressing
- Scope mounts to be machined in Research N/C, polished and anodized by Production (for Classic .257 Roberts introduction)
- Model 700 Restyle (1984 introduction)
 - Research and Marketing met January 7 to review requirements of ADL and BDL
 - Agreed to conduct market research study to determine customer preference in wood styling and finish (Monte Carlo vs. Classic and high vs. medium gloss finish)
"Research expects to complete four models for use in the study by February 1."
 - Research ordered Emmons stock completed by February 1; Marketing and Research to evaluate. "Marketing and Research both indicated that the restyled stock design must be finalized no later than June." (note: 1983 intro.)

February 10, 1982

- Marketing outlined 4 year plan for Model 700

Production considerations:

- | | | | |
|------|---------|---|--|
| 1983 | ADL | - | full scale restyle production |
| | Classic | - | limited production run |
| | BDL | - | normal production year |
| 1984 | ADL | - | normal production year |
| | Classic | - | limited production run |
| | BDL | - | end BDL production in summer, begin restyle production in fall |
| 1985 | ADL | - | normal production year |
| | Classic | - | limited production run |
| | BDL | - | full scale restyle production |

Model Requirements:

- | | | | |
|------|---------|---|-------------------------------|
| 1984 | ADL | - | No change (from ADL Restyle) |
| | Classic | - | Special limited run |
| | BDL | - | No model change |
| 1985 | ADL | - | No change |
| | Classic | - | Special limited run |
| | BDL | - | New Emmons BDL w/scope mounts |

"The Chairman noted that Management is committed to the scope mount concept."

March 17, 1982

- Marketing market research study in February indicated a strong preference (75%) for Monte Carlo stock. Shooters equally divided between satin vs. high gloss finish.. Marketing recommends satin, lists final ADL model requirements.
- Marketing noted that the 700 BDL is scheduled for restyle in 1985; expect use of Emmons stock design, plus refinements to the barreled action.
- Marketing reviewed two 1983-85 Bolt Action strategy options

May 19, 1982

- "The Model Seven LWT schedule is very aggressive and contains little, if any, room for error." Ha!
- 700 ADL Restyle specs. listed
- Model 700 trigger pull specs. listed

June 30, 1982

- M/7 LWT progressing
- M/700 ADL Restyle progressing

July 28, 1982

- 700 ADL Restyle progressing
- Model 700 BDL Redesign (1986 introduction)

- "Marketing noted that the second phase of the Bolt Action Strategy involves a redesign of the Model 700 BDL. ...the new rifle will be a completely new rifle, not a restyle of the BDL."

- Research explained options being considered (see letter from Capeletti to Workman 4-30-82)

September 22, 1982 (Quarterly Report)

- Model 7 Progress Report
- Model 700 ADL Restyle Report
- New Bolt Action extensively layed out by CBW (1986 introduction, see following pages)

October 14, 1982

- Model 7 Progress Report
- Model 700 ADL Restyle Progress Report

December 15, 1982

- Shit hits fan on Model 7
- ADL Restyle warehoused

R. S. Murphy:ws
1-25-84

Our goal is to be able to warehouse guns by mid-1983.

Our main design concern at this time is the strength of the fore-end. Different methods of reinforcement are currently under investigation.

As the schedule shows, the series is planned to continue through 1984 and 1985.

In 1984 it is planned to offer three more versions of the Special, a 12 gauge rifled slug version, a 3" chambered waterfowl version and the LT-20 special field grade. The rifled slug model and the LT-20 special field grade will probably have the same individual features as this sample. Model requirements for the waterfowl design have not yet been defined, but some of the features being considered include interchangeable choke tubes, a manual load selector for 2-3/4" and 3" shells, rust resistant internal finishes, and low luster external finishes for both wood and metal parts.

In 1986 the series will be completed with rifled slug and waterfowl versions of the LT-20.

Production commented that Research and Marketing have proposed model requirements for a 12 gauge Model 1100 Special (Chart XLVIII) to be introduced in mid-1983. Production is estimating investment and manufacturing costs based on advance prints supplied by Research. Economics and an implementation schedule will be presented at the October 14 meeting. The critical features, as perceived by Production, are listed in Chart XLIX.

Model 870 Special

A similar series based on the Model 870 is also being considered. Features comparable to those discussed on the 1100 will be investigated. As with the 1100 Special, shortening the magazine tube is expected to complicate the design of the fore-end. How much of a problem this will be remains to be seen. Unlike the 1100, however, 870 barrels will not be interchangeable, since the short magazine will necessitate moving the barrel guide ring.

If no insurmountable problems are encountered, the special field version will be announced in 1984, followed by a series of models in 1985 and 1986, patterned after the 1100 series; rifled slug, waterfowl and 20 gauge.

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In July, a four-page list of design specifications for a bolt action rifle that is being considered as a replacement for the 700 was reviewed. Three contingency designs are being considered. Today, I will review what we feel are the key

design elements (Chart L) of this rifle: the receiver will be redesigned to provide the features that seem to be preferred by gunsmiths, gun writers, and customers; flat bottom and integral recoil lug. The external appearance will be similar to the sample Model Seven that was passed around.

It is desirable that the safety block the trigger as well as the firing pin, for the added margin of safety against accidental discharge. We feel that a bolt lock is a good selling feature and continue to feel that it should be independent of the safety switch for maximum protection.

A fully adjustable fire control is also a good selling feature and we will try to provide one. We would like to go the extra step of providing this feature without removing the action from the stock.

The combination of a high gloss, lightweight contour with a hammer marked barrel may prove incompatible with the process, but this will have to be investigated. It does offer unique styling opportunities.

The rotary magazine feed system offers three advantages:

1. Smooth operation;
2. Better feeding characteristics since you feed from a single location;
3. A more rigid receiver since the shell opening cut is not as large. This feature can contribute to improved accuracy.

In spite of the fact that our present extractor is stronger than most competitors, it is perceived by shooters as being a cheap, weak, unreliable stamping. We will try to correct that problem without compromising the superior strength of the 700.

Reduced lock time is a key factor in the recognized accuracy of the 788. We will try to duplicate that feature in this new rifle and at the same time provide our Marketing Department with laboratory measured effects of improved lock time at the target, to be used in sales promotions and advertising.

Finally, the stock will be walnut, designed in conjunction with leading stock makers, with features found only in custom-made stocks. The butt will be cast off and toed out to fit the natural contour of the human shoulder and enable the shooter to sight quickly with a more natural head position. Current methods of stock manufacturing should enable us to make three versions if necessary: cast off or on, toed in or out, or straight. We believe this touch of custom work is a good

sales feature. The two rifles shown contain some of the features discussed.

Our schedule (Chart LI) shows two possible announcement dates, with the availability of capital and the successful completion of the design phase being the determining factors.

Model 7400 Carbine

Two different versions of the 7400 Carbine are being developed. Prototypes of the 30-06 and .308 rifles have been made and tested, and at this point, are simply standard rifles with shorter barrels. These are scheduled for 1985 introduction.

The other version, scheduled for introduction in 1984, will be chambered for the .223 caliber. Styling options have been proposed and samples will be made.

In the .223, the proposed specifications (Chart LII) include an aluminum receiver with low luster finish, a slimmed down fore-end and a straight stock with no Monte Carlo or cheekpiece. Both stock and fore-end will be birch with a low gloss finish and no checkering. The 18-1/2" barrels will be provided with open sights. In keeping with the low cost of the .223 ammunition, and the rapid fire nature of the target sports, magazine capacity will be increased to 15 rounds.

The critical item on this schedule is the development of a 15-round magazine that feeds reliably.

The meeting adjourned at 12:40 p.m.


C. A. Nash
Secretary - Bridgeport


G. D. Campbell
Secretary - Ilion

0093N

Att.

MODEL REQUIREMENTS
NEW BOLT ACTION RIFLE

KEY ELEMENTS

CONTD.

FEED SYSTEM

- o ROTARY MAGAZINE

BOLT

- o FULLY ENCLOSED CLAW EXTRACTOR
- o REDUCED LOCK TIME

STOCK

- o WALNUT
- o CAST OFF - TOE OUT
- o SPECIAL BEDDING
- o SPECIAL STYLING

CBW:EB

9-21-82

PROJECT	1982			1983			1984			1985			1986		
	3	6	9	3	6	9	3	6	9	3	6	9	3	6	9
MODEL SEVEN															
MODEL 700 ADL															
MODEL 1100 SPECIAL FIELD															
MODEL 1100 SPECIAL DEER															
MODEL 1100 SPECIAL WATERFOWL															
MODEL 1100 LT-20 SPECIAL FIELD															
MODEL 1100 LT-20 SPECIAL DEER															
MODEL 1100 LT-20 SPECIAL WATERFOWL															
MODEL 870 SPECIAL FIELD															
MODEL 870 SPECIAL DEER															
MODEL 870 SPECIAL WATERFOWL															
MODEL 870 20 GA. SPECIAL FIELD															
MODEL 870 20 GA. SPECIAL DEER															
MODEL 870 20 GA. SPECIAL FIELD															
NEW BOLT ACTION RIFLE															
ELECTRONIC SHOTGUN															
MODEL 7400 LT. WT. .223 CARBINE															

CBW:EB
9-21-82

CENTERFIRE RIFLESMODEL 700 BDL SHORT ACTION LEFT HAND
(1984 Introduction)

The Secretary presented economics for the proposed Model 700 BDL Left Hand in Short Action calibers (Exhibits 11 and 12). Production reported that Trial and Pilot will be scheduled for the Third Quarter of 1983.

[REDACTED]

Research reported that a new bolt action rifle is being developed to replace the Model 700 BDL. This new rifle, to be introduced in November, 1984, will feature new styling and improved function (Exhibit 13). Styling items include a Stock designed by Bob Emmons, an octagonal Receiver with integral scope mounts, and a lightweight Barrel contour polished without removing the GFM hammer marks. Functional improvements will include a rotary Magazine Box for more reliable feeding, fully enclosed claw type Extractor for added strength, no bind, easy lift Bolt for smoother action, Receiver with a heavier, integral recoil lug for added stability, a redundant Safety Switch, and a fully adjustable Fire Control that does not require removal from the Stock. Due to priorities being placed on 1983 programs, preliminary design completion has been delayed until March.

The fourth model gun from Bob Emmons, featuring revisions to the Receiver by Pete Grisel, has been delayed until February. That gun will include a Tang Safety and a Schnabel Fore-end. Initial designs have also been completed for the rotary Magazine Box, the fully enclosed claw type Extractor, and Receiver with integral recoil lug. Tests of the Extractor will begin in January. However, priorities being placed on 1983 programs are delaying fabrication of key components.

Marketing noted that recent data indicate that some features proposed for the Model 700 BDL replacement are not as important to the customer as previously thought. Final specifications will be proposed in January.

CENTERFIRE RIFLESMODEL 7400 .223 REM - Cont'd.
(1983 introduction)

Research presented four prototype rifles for Committee review. They noted that finalized features include an aluminum Receiver, unchecked birch wood, low gloss finish on metal and wood, a four-shot Magazine Box, Sling Swivels, and an 18-1/2 inch Barrel. The concept of a lightweight Barrel has been proposed but not finalized.

Production reviewed the list of model requirements issued by Research (Exhibit 9). They noted that the design calls for a new Magazine, new Extractor, new Ejector, and a new Bolt. Capital investment required to implement the proposed design is estimated at \$270,000. Operations expenses are estimated at \$70,000.

Vendor quotations for the new Bolt Release and the new Magazine Filler Piece indicate a 14-week delivery for each component. Assuming orders were placed by March 1, 1983, these components could be received by mid-June, and Magazine Boxes could be assembled by the end of June. Research tests of Trial and Pilot guns could be completed by about August 1, with production quantities to follow in the Fourth Quarter.

Production estimates the 1983 unit factory cost for this gun at \$208.06, compared to \$211.95 for the standard Model 7400 in 30-06 caliber (Exhibit 10). Cost advantages gained in the Stock, Fore-end, and Trigger Plate are partially offset by increased costs for the aluminum Receiver, Breech Bolt, and Sling Swivel Studs, and by additional depreciation. Production indicated that most of the Receiver cost increase is due to material costs.

The Chairman noted that the Model 7400 sales picture is very disturbing and that the addition of the .223 REM, forecast at 3,000 units, does not provide sufficient improvement. Marketing indicated that additional .223 REM volume could be achieved with the addition of a 10-round Magazine. The Chairman asked that Marketing give more thought to this and other proposals to improve Model 7400 sales.

Marketing reported that a combination of several events have modified their Bolt Action rifle strategy. Ruger's introduction of a lightweight short action Model 77 in 1983, and

CENTERFIRE RIFLES

(1984 Introduction)

their apparent plans for a long action 30-06 version, suggests further movement toward full-size, lighter weight bolt action rifles.

While forecast numbers do not yet support the contention, trade reaction indicates that the Model 700 ADL Restyle will take some sales away from the Model 700 BDL. Marketing plans to replace the current Model 700 BDL with a new bolt action rifle in 1986. To prevent further sales erosion in the interim, and to possibly provide timing relief, they propose to introduce a new version of the Model 700 in 1984.

The new version will be offered in long action only, and dedicated to standard calibers (e.g., 270, 280 and 30-06). A slim profile Barrel, similar to the Model Seven LWT, but in 22 inch length, and a Bob Emmons styled Stock will be the main features of the new gun, to be designated the Model 700 LWT. Marketing proposes to drop the Model 700 Classic, and would continue to produce the Model 700 ADL and BDL in most of the calibers presently offered. Exhibit 11 details the specifications that would be deleted and added under this proposal.

Research reviewed the features proposed for the Model 700 LWT (Exhibit 12). They noted that scope mounts and rings will be considered if economically feasible. Sample mounts will be available by mid-March.

MODEL 788 - 22 INCH BARREL

(1984 Introduction)

Marketing reported that when the Model 788 was restyled in 1980, the Barrel length of hunting caliber rifles was reduced to 18-1/2 inches. This was done to provide a short barreled rifle in the line after the Mohawk 600 was discontinued. With the introduction of the Model Seven LWT, the short barreled Model 788 is no longer required. Both domestic field sales and International sales indicate the 22 inch Barrel in Model 788 will sell better in their respective markets. Marketing estimates that by making this change, 1984 sales will be 4,000 to 5,000 guns above the 1983 forecast.

MODEL 700 LWT PROPOSAL

SPECIFICATIONS TO BE DELETED

MODEL 700 CLASSIC

22-250
.243
6MM
.270
30-06
7MM REM Mag.
Classic Calibers
(One year runs)

SPECIFICATIONS TO BE ADDED

MODEL 700 LWT

.270
30-06
.280 (Classic Calibers
One year run)

EXHIBIT 12

MODEL 700 LIGHTWEIGHT

PROPOSED FEATURES:

- Replacement for Classic
- Stock: New styling (Bob Emmons)
Cut checkering
Medium gloss finish
- Barrel: Model Seven
No sights/drilled & tapped
- Receiver: Thicker recoil lug
No bind Follower
Low lustre finish
- Calibers: .270
30-06
.280
- Other: Scope mounts & bases provided
Model Seven Bolt Handle

Impact: Share restoration and dealer relations. Respond to numerous dealer requests as well as increasing popularity of low-priced .223 ammunition for plinking.

Economics: Incremental pretax earnings of \$168M for first year on sales of 2.5M units.

Comments:

- o Research expects to transmit design on June 10 after satisfactory test of no bind follower. Production anticipates trial and pilot ready for acceptance test in August, with production commencing in September and warehousing in November.
- o Chairman requested accuracy test be performed before design transmittal.

Action: Committee approved implementation of Research and Production programs leading to trial and pilot acceptance.

Reference: Addendum G.

Items:

- o Model XP-100 in .223 Rem. and 7mm-08 calibers
- o Model 7400 in .223 Rem. caliber
- o Model 788 long barrel

Comments: Above items have been withdrawn by Marketing in collaboration with Research and Production from 1984 introduction because of inadequate resources for implementation.

Position: High quality, higher priced center fire bolt action hunting rifle for long-range, flat shooting cartridges in mountainous terrain.

Impact: Share restoration - reverse competitive thrusts by USRAC (M70 featherweight) and Ruger (M77 ultra light).

Comments: Research plans for product acceptance and design transmittal during July 1983. Accuracy tests have been satisfactory and Marketing has approved prototype. Production anticipates a constraint on cut-checkering capacity; however, warehousing can be achieved during November 1984.

Reference: Addendum H.

~~CONFIDENTIAL~~
MAY 13, 1983

~~CONFIDENTIAL~~
Marketing Comments

In the fall of 1981, a competitive bolt action rifle audit was performed (Exhibit 1). Samples of Remington and competitive product were procured and reviewed by top management. Voting was close, but Remington and Ruger tied for first place when price was a consideration. Winchester's new featherweight took first place stock styling honors.

Exhibit 2 depicts a subjective marketing analysis of the features of the top three bolt actions. The first and most obvious conclusion from this chart is that a high degree of homogeneity exists in bolt action rifles. The competition, for this largest segment of center fire rifles, has been such that products have evolved to a very close relationship to one another. The functional pluses of Remington's perceived advantage in accuracy, trigger pull quality and strength are important with accuracy and trigger pull quality receiving special emphasis in our recent quality cue research. While strength is important to us from a product liability concern, it seems taken for granted by the consuming public, at least in the absolute - who's best kind of - analysis.

We also know from our quality research that the stock is a powerful visual cue in bolt action rifles. Stock styling and finish is certainly one of the prominent visual cues in the decision to buy a particular rifle. Relating closely to this is also the subject of balance, feel, and weight.

Remington's basic action has been and remains today in the functional sense, one of the best on the market. Our cost/price advantage has, in the comparison with Ruger, been mitigated to some degree in recent years. The visual appearance of some of our mechanical features like the extractor and safety switch are not in keeping with a rifle commanding a premium price. More importantly, the styling of the 700 dates back to the early 1960's when white line spacers, Monte Carlo stocks, and glossy finishes were the emerging fashion. Winchester and Ruger get plus scores in the area of stock styling because they offer what we believe today is more in vogue with 1980's bolt action rifle users.

The collection of magazines, books, slides, and photos represents documentation of what is happening in bolt action rifle styling. The credit for this trend goes back to the days of Jack O'Connor, then shooting editor of Outdoor Life. As one of the more prolific writers of the 60's and 70's, O'Connor's

Addendum H-1

description of the perfect big game rifle, known as the Light Mountain rifle, has become a standard. Custom builders have merely adopted his style and proliferated in number to fill a void not until now being recognized by industry.

The Light Mountain rifle is the epitome of what has become known in the current vernacular as "Classic." Straight comb with cheekpiece, fore-end tip, grip cap and butt pad all without white line spacers. The barrel is clean, free of sights and tapered more than normal to reduce weight but left at 22" as the best compromise for ballistics in .270 to 30-06 class rifles.

Ruger's M77, by no coincidence because it was designed by Len Brownell, leaned heavily in this direction. The M70 featherweight prototyped by Don Allen and Al Lind, two contemporary stock makers, also heads in this direction with the schnabel being the only excursion from the trend. Ruger's latest ultra light seen in long action at the NRA Show is the last of Len Brownell's efforts to refine Ruger's styling. It has all the features of O'Connor's Light Mountain rifle except the cheekpiece and 22" barrel.

So much for precedence. The 700 Mountain rifle, as I will refer to it, is not a competitor to the M7LWT. It is what the M7 can never be - a long-range, flat shooting, open country, high country, deer, antelope, goat, sheep, caribou, elk rifle. In 30-06 and .270, this model is aimed squarely at the main volume bolt action rifle sales and is a styling evolution of the 700BDL. The M7LWT is short action caliber, and with 18-1/2" barrel, was never intended to take over under these conditions. It was designed as a close hunting, brushy terrain, short to medium range deer, black bear gun. We propose to drop the 700 Classic in 1984 with the exception of one classic caliber. The mountain rifle is in the final analysis and by modern definition, more "classic" than the Classic. The Classic is not successful and needs to be changed.

This new M700 is aimed squarely at the M70 featherweight, the Ruger 77 and Ruger's new M77 ultra light. It will also take some volume from the BDL first because it is lighter, second because we believe it to be the emerging style of 1980's bolt actions. The success of the BDL configuration cannot be denied. We cannot say unequivocally this model will replace BDL styling. Share analysis suggests the trend is in that direction. The mountain rifle provides flexibility and contingency to our plans. It presents a direct style alternative without the expense of unnecessary mechanical change. If the demand for the BDL falls off, we can convert its other configurations to this new stock style. If the BDL demand continues, we now have two styling models with which to confront the competition. We believe for the next several

Addendum H-2

years, our bolt action rifle offering will be strengthened by this offering. Should all of these manipulations fail, R&D still has a brand new action with completely redesigned functional aspects in backup.

The documentation on this styling trend is considerable. The people who have been involved with the planning effort, and that includes Research and Production, are in agreement that this model is appropriate.

Research Comments

Proposed features for this rifle (Exhibit 3) include a Bob Emmons style stock, cut checkering, medium (30) gloss finish, Old English style recoil pad, Model Seven barrel contour, and provision of scope mounts and bases. Current plans include .270, 30-06, and .280 calibers. A prototype has been approved by Marketing and accuracy tests completed on all three calibers. The Development Schedule (Exhibit 4) includes product acceptance and design transmittal in July 1983. Accuracy test results (Exhibit 5) indicate no major problems with the design. The primary item remaining is completion of the stock drawing.

Production Comments

The larger checkering pattern will add burdening to the N/C checkering machines and development of a new bolt handle and stock former will require a timely release of the design.

Additional equipment may be required for the bolt line and N/C checkering facilities. Warehousing is planned for November 1984.

Addendum d-2

After inspecting all samples, please fill in matrix below. Best score = 1; Worst score = 7. Duplicates are acceptable.

	REM. 700-BDL	RUGER M/77	REM. 700-ADL	W-W 70-XTR	W-W 70-FWT	BROWNING BBR	S&W 1500
Stock Appearance	2	3	6	4	1	5	7
Action Smoothness	5	3	6	4	2	1	7
Metal Finish	2	5	3	6	4	1	7
Extractor, Ejector, Loading System	1	4	2	5	5	3	6
Safety	4	2	4	3	3	1	5
Accessory Parts (Grip Caps, Sights)	2 (2)	1 (3)	6 (5)	5 (5)	4 (4)	3 (1)	7 (6)
Best Overall w/o Price	1	3	6	4	2	5	7
Best Overall with Price	1	1	2	4	3	5	6

Number in Parenthesis is placement based on individual item scores above. Best overall W.O. and W. price reflect overall impression and other factors not identified as individual items.

COMMENTS:

EXHIBIT 1

EXHIBIT 2

BOLT ACTION RIFLES
COMPETITIVE COMPARISON

	<u>MZOO</u>	<u>MZO</u>	<u>MZZ</u>
STRENGTH	+	0	0
ACCURACY	+	0	0
TRIGGER PULL	+	0	0
EXTRACTOR	0	+	+
EXTRACTOR APPEARANCE	-	0	+
EJECTOR	0	0	0
FEEDING	0	0	0
SCOPE MT/SIGHTS	-	0	+
ACTION SMOOTHNESS	0	0	0
SAFETY	0	+	0
SAFETY APPEARANCE	-	+	+
METAL FINISH	0	0	0
STOCK FINISH	+	0	0
BALANCE, FEEL, WEIGHT	0	+	+
STOCK STYLING	0	+	⊕

+ = ADVANTAGE
⊕ = SLIGHT ADVANTAGE
0 = NO ADVANTAGE
- = DISADVANTAGE

MODEL 700 LIGHTWEIGHT

PROPOSED FEATURES:

- Replacement for Classic
- Stock: New styling (Bob Emmons)
Cut checkering
Medium (30) gloss finish
Old English style recoil pad
- Barrel: Model Seven contour
22" length
No sights/drilled and tapped
- Receiver: Thicker recoil lug
No bind follower
Low lustre finish
- Calibers: .270
30-06
.280
- Other: Scope mounts and bases provided
Model Seven bolt handle
Sling swivel studs

MODEL 700 LIGHTWEIGHT

Design Status

- Prototype approved by Marketing
- Accuracy test results completed

Development Schedule

- Model Requirements - May 1983
- Preliminary Design - May 1983
- Product Acceptance - July 1983
- Design Transmittal - July 1983

MODEL 700 LIGHTWEIGHTAccuracy Test

- Procedure: Two rifles per caliber
Three groups per condition
Five shots per group

- Results:

<u>Caliber</u>	<u>Spec.</u>	<u>Condition</u>	<u>Average</u>
30-06	3.0"	Free Floating	1.74"
		Padded	1.80"
.280	3.5"	Free Floating	2.58"
		Padded	1.57"
.270	3.5"	Free Floating	2.24"
		Padded	N/A

MONTHLY REPORT NOTES:

October 1981

Model 7 Bolt Action (Not BAC)

- second prototype in long action scheduled for completion in November

November 1981

Model 7 Bolt Action

- second prototype now scheduled for mid-December

December 1981

- objective of Model 7 Bolt Action is a premium bolt action rifle based on 700 family
- .257 Roberts prototype built; second prototype expected in January

January 1982

Model 7 Bolt Action - 2 samples to be completed in mid-February

Scope Mounts - prototypes based on aluminum extrusion to be tested in February. Material has been ordered by Research for 3,000 sets

February 1982

Emmons hand delivered 2 sample stocks. He is to make a third to be completed April 1, 1982

March 24, 1982

Model 7 Program

- octagonal receiver
- hammer worked bbl.
- new stock

Third prototype to include new fire control, integral scope mounts, tang safety switch

April 1982

New Bolt Action

- primary design requirements established for N.B.A. to replace Model 700; prototypes to be made to include both straight Classic and Monte Carlo w/cheekpiece
- third Emmons stock delivered (Production ready)
- fourth being made to illustrate potential alterations to barrel receiver and safety

May 1982

- Fourth Emmons gun expected in mid-June
- Three Research prototypes being made, one to include Emmons stock
- Sample scope mounts being reviewed by Marketing - new mounts to be designed following decision regarding styling and functional objectives

June 1982

- Three Research prototypes expected in September 1982 including custom stock and receiver designs by Emmons
- Fourth (called third) Emmons sample expected in July

July 1982

- Three prototype rifles being made, rotary box being detailed for fabrication

September 1982

- Three prototype rifles being made
Completion of prototype rifles, has been delayed until February
- Fourth (called third) sample from Emmons has been delayed until October

October 1982

- Three prototype rifles expected first quarter of 1983, drawings for rotary box and new extractor designs released to Model Shop
- Fourth Emmons sample expected in December

November 1982

- Work progressing on three models expected in first quarter of 1983, Emmons fourth sample could be delayed until mid-January

December 1982

New Bolt Action "to be introduced in November 1984" will include:

- octagonal receiver
- integral scope mounts
- hammer marked 1wt bbl.
- rotary box
- fully enclosed claw type extractor

- no bind easy lift bolt
- heavy recoil lug
- redundant safety switch
- fully adjustable fire control

"Preliminary design completion delayed until March due to priorities on 1983 programs." - Fourth Emmons gun expected in February.
"Priorities placed on 1983 programs are delaying fabrication of key components."

January 1983

Bolt Action Rifle

- Fourth Emmons gun expected in February
- Preliminary design of new rifle to replace the 700 BDL will be completed in March

February 1983

Bolt Action Rifle

- A new bolt action to replace the 700 Classic is being developed. It will be designated the Model 700 Lightweight. Design specs have been reviewed and a model will be available by April 1.
- Work is continuing on the replacement for the 700 BDL. A prototype with octagonal receiver will be completed in April.

R. S. Murphy:ws
1-25-84

March 83

a jam condition can be created which is difficult to clear without removal of the fire control. While no complaints have been received from the field, modifications have been considered which will prevent jamming under the above conditions. Proposed modifications include changes to the slide and carrier assemblies.

Preliminary tests have been successful using slides modified to include an additional shell latch and carriers modified to provide additional shell clearance. Three (3) modified Model 870 Riot endurance test shotguns have been turned over to the Research Test Lab for a 20,000 round endurance test. The test will include a 25 round test of the jam condition after every 1,000 rounds.

Marketing has expressed concern about the disassembly of the action. With the new design slide latch, the fire control must be removed in order to depress the slide latch to remove the action bar assembly. Revisions are being considered to both the slide latch and carrier to simplify the disassembly feature. Our goal is to make the disassembly no more difficult than the standard (field) Model 870. However, in order to correct the jam condition and still maintain our standard for malfunction rate, this may not be achievable.

MARCH 83

~~Bolt Action Rifle Development~~

(F. E. Martin, T. G. Bauman)

Two (2) new rifles are included in the bolt action program, replacements for the Model 700 Classic and BDL, respectively. The replacement for the Classic will be designated the Model 700 *Lightweight* and is planned for 1985 introduction. While a designation has not yet been determined, the replacement for the BDL is currently scheduled for 1986 introduction. Both rifles will feature a stock designed by Bob Emmons and a lightweight barrel contour. The BDL replacement will include other distinctive styling changes, such as an octagonal receiver with integral scope mounts. Functional improvements to the BDL will include a rotary magazine box for more reliable feeding, fully enclosed claw type extractor for added strength, no bind-easy lift bolt for smoother action, receiver with heavier — integral recoil lug for added stability, a redundant safety switch, and a fully adjustable fire control that does not require removal from the stock.

March 83

- 8 -

One (1) new Model 700 *Lightweight* with the latest design specifications has been assembled for review with Marketing. Parts list and drawings have been completed with the exception of the stock which will be completed in June.

The second generation of the Model 700 BDL replacement is scheduled for review in mid-April. A new extractor has been designed and fabricated to add strength and appearance to the bolt face. Testing has been delayed due to Project priorities. The fourth model gun from Bob Emmons featuring metal work by Pete Grisel has been received and evaluated by Research and Marketing. Some features may be considered by the BDL Replacement.

Model 7400/7600 Centerfire Rifles (R. S. Murphy, A. R. Eddy)

The Model 7400 and 7600 rifles were developed as replacements for the Model 742 and 760, respectively, and were introduced in 1981. The 7400 .223 Carbine is being developed as a sporting version of that popular cartridge to augment this product line. As this new version is implemented into production, continued Research support will be necessary to assist in start-up.

Model guns illustrating the newest design options and preliminary economics for the .223 Carbine have been reviewed by Marketing. Agreement has been reached on the stock and fore-end design with the final barrel configuration yet to be determined. The stock and fore-end will reflect the present contour with a toned down finish and birch wood. Marketing feedback has shifted design emphasis from the 4 shot box to one with a ten-round capacity. Specifications for the preferred design at this point include a magazine release on the box and no bolt release. Preliminary layouts have been completed and final drawings for two (2) designs will be completed by June. Test rifles are being built to reflect the latest design options.

STATUS - CURRENT PRODUCT DEVELOPMENT (J. W. Brooks)

Model 870 Police Shotgun (T. J. Plunkett)

Marketing has requested a shotgun in 12 Gauge with a 3" Magnum, 18 inch, full choke barrel and Parkerized finish for addition to the line

April 83

Model 870 Riot Shotgun

(A. A. Hugick, T. G. Bauman)

Three (3) test guns with the new slide block and carrier design have been tested to 750 rounds with no apparent problems. These endurance tests will be extended to 50,000 rounds to confirm acceptability of the design. Tests are being delayed due to priorities placed on other programs. Engineering drawings have been turned over to Process for cost evaluation. Alternative designs are being considered to facilitate disassembly.

Model 7400 Carbine

(R. S. Murphy, A. R. Eddy)

Preliminary design has been completed on a ten (10) shot magazine box for the Model 7400, .223 caliber carbine. Contact with vendors on magazine prototypes is scheduled for the week of April 25th. Function testing continues on the four (4) shot box with no significant problems after approximately 5,000 rounds. Turned barrels will be finished the week of April 25th.

~~REDACTED~~

APRIL 83

(F. E. Martin, T. G. Bauman)

The first sample of the Model 700 *Lightweight* (scheduled for 1985) has been completed and is being reviewed by Research and Marketing. A second sample (featuring a cast off-toe out stock) has been assembled and is available for examination.

Work on the Model 700 BDL replacement (tentatively scheduled for 1987) is continuing. The first prototype is 80% complete.

CURRENT PRODUCT DEVELOPMENT

(J. W. Brooks)

Model 870 Police Shotgun

(T. J. Plunkett)

A prototype has been completed of the 12 Ga. Magnum Police Shotgun with an 18" full choke barrel. Prototype barrels are ready for

~~Design Verification of point of impact. Tests will be completed by May 6.~~

May 83

Model 111 Autoloading Shotgun

(D. S. Findlay, J. L. Kast)

The Model 111 is tentatively scheduled to replace the Model 1100 in 1987. Objectives include improved strength, lighter weight, and new styling features. One (1) prototype is in endurance test. Four (4) additional samples will be assembled for Design Verification testing pending results of the test on the first sample.

Model 7400 .223 Carbine

(R. S. Murphy, A. R. Eddy)

Preliminary design has been completed on a ten (10) shot magazine box for the Model 7400 .223 caliber carbine. Contact has been made with two (2) vendors on fabrication of prototype magazines. They have been supplied with model drawings and a Request for Quote on development parts. Ten (10) additional Model 7400 .223 carbines with the latest specifications will be assembled the week of May 23rd. Function testing on the four (4) shot has been held at approximately 5,000 rounds due to project priorities.

~~CONFIDENTIAL~~

May 83

(F. E. Martin)

Two (2) prototypes of the Model 700 *Lightweight* have been completed and reviewed by Research and Marketing. Thirty-six (36) prototypes of 30-06, 270, and 280 caliber are being fabricated for testing. Barreled actions will be completed by mid-June. However, stocks will not be completed until the end of August.

Model 1100/870 Slug Barrel Investigation (A. A. Hugick)

Preliminary design investigation of a reduced I.D. barrel configuration is in progress. Prototypes with the barrel mounted scope mount and various choke/bore designs are planned for testing in July.

June 83

using 3 inch Magnums and 2-3/4 inch high base ammunition. At the end of each 1,000 rounds, 25 rounds are fired testing the jam condition.

There has been no apparent problems with the anti-jam design feature components and the guns will be continued to 20,000 rounds per gun endurance level. Estimated test completion date is August 1, 1983.

Engineering drawings have been turned over to Production for estimating.

Upon endurance completion and approval, finished model drawings will have to be prepared for Production and then transmitted to Production. Also, a new Model 870 Police gun catalog or supplement will have to be prepared and supplied.

~~Bolt Action Rifle Development~~ JUNE 83 (F. E. Martin)

Two (2) new rifles are included in the bolt action program, replacements for the Model 700 Classic and BDL, respectively. The replacement for the Classic will be designated the Model 700 Lightweight and is planned for 1985 introduction. While a designation has not yet been determined, the replacement for the BDL is currently scheduled for 1986 introduction. Both rifles will feature a stock designed by Bob Emmons and a lightweight barrel contour. The BDL replacement will include other distinctive styling changes, such as an octagonal receiver with integral scope mounts. Functional improvements to the BDL will include a rotary magazine box for more reliable feeding, fully enclosed claw type extractor for added strength, no bind-easy lift bolt for smoother action, receiver with heavier - integral recoil lug for added stability, a redundant safety switch, and a fully adjustable fire control that does not require removal from the stock.

The replacement rifle for the Model 700 Classic has been accepted by Research and Marketing. Parts list and drawings are being prepared to meet the transmittal date of August 1, 1983. Warehouse date of this rifle is planned for November 1984.

Work on the BDL Replacement will continue on completion of the

June 82

above program. Testing of the proposed extractor change is planned to start in September with the completion of the prototypes. Work on the rotary magazine components is continuing. A test schedule will be determined with the completion of the magazine assembly. The magazine rotor, spring retainers, and end plate have been completed. The magazine box is expected by July 20, 1983.

Model 7400/7600 Centerfire Rifles

(R. S. Murphy, A. R. Eddy)

The Model 7400 and 7600 rifles were developed as replacements for the Model 742 and 760, respectively, and were introduced in 1981. The Model 7400 .223 carbine was being developed as a sporting version of that popular cartridge to augment this product line.

Due to the cancellation of this project, efforts are being concentrated on collecting all technical data and design specifications and recording this information. For future reference, various prototypes will be completed and assigned to the Research Gun Library. An AI Report will follow.

All preliminary 7mm-08 and .25-06 work (orifice, pressure data) has been completed. A number of rifles in both calibers have been built and test fired satisfactorily. Drawings only would have to be updated for transmittal if this is desired. We are still waiting for a priority to get preliminary measurements on ten (10) standard .308 rifles. This is necessary before work can commence on data confirmation for the carbine length barrel.

One (1) .257 Roberts model has been built and orifice and pressure data is acceptable. This rifle has been field tested with very good results. Barrels are being readied so that additional models can be built to verify our results. Other calibers currently being considered for evaluation are the .250-3000 Savage, 7mm Mauser, and possibly the .35 Remington. Some barrels have been allotted for these calibers and efforts will be made to get orifice and pressure work done.

July

Parker Double Barrel Shotgun

(D. S. Findlay)

Reintroduction of the classic Parker side-by-side double barrel shotgun is being considered. Arrangements are proceeding to complete one VH Grade 12 Gauge Parker by August 15, 1983.

A partial set of drawings from Jesse Briley on a 20 Gauge Parker has been received. These drawings are undergoing engineering evaluation. Once the remaining drawings of the package have been received, they will be sent out for cost estimating by Process Engineering.

~~REDACTED~~

July 83

(F. E. Martin)

Work on the Model 700 Lightweight transmittal is 65% complete. Date for completion is August 15, 1983. Initial accuracy testing will start July 25, 1983. Prototype stocks are being made and will be available for additional testing August 20, 1983.

Drawings for the Model 700 BDL Replacement have been released to PE&C for a preliminary cost analysis.

Model 7400/7600 Centerfire Rifles

(R. S. Murphy, A. R. Eddy)

The Model 7400 .223 Carbine project has been discontinued. 7mm-08 and .25-06 testing has been completed and drawings need to be updated for transmittal when needed. The .308 caliber carbine testing has been delayed due to other development schedule priorities.

CURRENT PRODUCT DEVELOPMENT

(J. W. Brooks)

Model Seven Lightweight Rifles

(D. E. Bullis)

With the decision to go to an aluminum floor plate and trigger guard casting, drawings are being completed to be sent to a vendor by the first week of August. He will visit the plant the middle of August to discuss dimensioning if changes are required.

Preliminary testing of ten prototypes to over 2,000 rounds was satisfactory. Some dimensional changes were required and new prototypes are being built. They will be complete by September. A sensitivity and function test of the modified design will be run at that time.

August 23

Model 870P shotgun disassembly and assembly with the proposed anti-jam latch slide appeared to be a major problem for the F.B.I. Academy. Shotgun action disassembly/assembly difficulties demonstrated at the August 11 Remington Arms - F.B.I. contact meeting in Quantico, Virginia may require a redesign.

Parker Double Barrel Shotgun

(D. S. Findlay)

Reintroduction of the classic Parker side-by-side double barrel shotgun is being considered. One VH Grade 12 Gauge Parker has been completed and delivered to Marketing.

A partial set of drawings from Jesse Briley on a 20 Gauge Parker has been received. These drawings are undergoing engineering evaluation. Once the remaining drawings of the package have been received, they will be sent out for cost estimating by Process Engineering.

~~Model 760 Shotgun~~

AUGUST 23

(F. E. Martin)

Transmittal and accuracy testing will be complete by September 15.

Initial accuracy results for .30-06 gave a four gun average of 1.69". Present specification is 3.5".

Four guns are being assembled for Marketing Field Testing. These are to be completed by September 8.

CURRENT PRODUCT DEVELOPMENT

(J.W. Brooks)

Model Seven Lightweight (1984 Introduction)

(D. E. Bullis)

Drawings for the aluminum floor plate cover and trigger guard have been completed and delivered to Purchasing. They have been sent to the vendor and he will be here August 25 to discuss dimensioning and tolerances to fit in with proposed Process Engineering manufacturing processes.

The N/C Shop has completed a dozen prototype trigger guards. They will have floor plate covers by September 6.

A program is being written to have stocks inletted for the above prototype trigger guards.

Sensitivity tests will be run with the new design in September.

Sept. 87
(F. E. Martin)

Model 700 Lightweight drawing and parts list transmittal will be completed by October 1, 1983. Work on this model is expected to be complete by October 20.

Work on the Model 700 BDL Replacement will resume to meet the scheduled 1986 introduction. The new BDL will include the following functional improvements: a rotary box magazine for feeding reliability, a new fully enclosed claw extractor for added strength, a no-bind easy lift bolt for a smoother action, a receiver with a heavier integral recoil bracket for stability, and a fully adjustable fire control with redundant safety switches.

Testing of the new extractor will be starting in September with the completion of prototype assemblies.

STATUS - CURRENT PRODUCT DEVELOPMENT (J. W. Brooks)

Model 870/1100 Waterfowl Shotgun in 12 Gauge (1985 Introduction)

(P. Nasypany)

Marketing has received requests for shotguns that will better withstand the conditions under which they will be used.

The models will feature three inch magnum vent rib barrels with chrome plated bores, rust resistant Parkerized metal finish, and stained birch stock and fore-end with oil finish.

Ten Model 870 prototype shotguns for design verification will be ready by the end of September.

Two Model 1100 prototypes are ready for testing to determine the effect of a Parkerized finish on bolt velocity and gun function. Parts for twenty-five design verification models have been started.

Sportsman 12 Pump Shotgun (1984 Introduction)

(T. J. Plunkett)

Marketing has requested a low cost version of the Model 870 12 Gauge Pump Shotgun for 1984 and will call it the Sportsman 12 Pump. Prototypes have been made and shown to Marketing.

External appearance will remain the same except for the following:

- Reduced receiver finish. No mill and matt on top radii.

Roll marking on side panel to be Sportsman 12 Pump.

prevent the malfunction or make it easy to correct. Cost estimates for these designs will be available for review in November.

~~SPORTSMAN 74 AND 76~~ October 23 (R. S. Murphy, F. E. Martin)

A drawing package, complete with a preliminary stock drawing has been sent to Process for estimating. A total of 36 barreled actions have been built and the stocks are being processed. These guns will be used for the final Research accuracy and function testing.

Sportsman 74, Sportsman 76 (R. S. Murphy)

The drawing package for the Sportsman 74 is nearly complete. The parts list has been sent to PE&C for estimating. Process Engineering will be building all rifles for testing and evaluation. Work on the Sportsman 76 will begin Monday, October 24.

CURRENT PRODUCT DEVELOPMENT (J. W. Brooks)

Model Seven Lightweight - .308 and 7mm-08 Caliber
(D. E. Bullis)

Parts list and drawings of the aluminum trigger guard, floor plate cover, and other parts required with this change have been transmitted to Process Engineering.

Sensitivity testing of ten (10) prototype aluminum assemblies has been completed and results are satisfactory.

Model Sportsman 12 Pump (T. J. Plunkett)

Transmittal complete.

Model Sportsman 78 (T. J. Plunkett)

Transmittal complete.

MATERIALS AND PROCESS DEVELOPMENT (J. W. Bower)

Injection Molding - Firearms Components

(M. J. Topolski, K. C. Rowlands,
B. Panagian)

~~Additional M/700 magazine followers, showing various types of~~

NEW PRODUCT DEVELOPMENT

(J. S. Martin)

Model 1100 Special Field Shotgun

(D. S. Findlay, T. P. Powers)

The elastomer buffer fore-end design has been transmitted to the Plant and tooling and part fabrication for trial and pilot has been initiated. Production deliveries to the warehouse are scheduled to begin in March.

Model 870 Special Field Shotgun

(D. S. Findlay, F. H. Smith)

Samples for Marketing evaluation and catalog pictures are complete. Trial and pilot samples for testing and evaluation have been started. Pending Research approval, initial warehouse deliveries will begin in February.

Model 870 Restyle 12 Gauge

(D. S. Findlay, K. L. Calkins)

The Model 870 Restyle is being developed to replace the current 870 in 1985. The engineering estimate completed by Process on the drawing package supplied to them indicated a negative unit margin. As a consequence, Marketing, Research, and Process are reviewing current features, volumes, and selling prices to obtain a positive economic outlook for the program. It is anticipated that a revised economic forecast and drawing package will be ready to present in December.

Model 870/1100 Deer Gun

(D. S. Findlay, F. H. Smith)

It is planned to introduce a new deer barrel in 1985 to replace the current offering. This redesigned barrel in both models in 12 gauge will feature a 21" barrel and a rear sight base capable of mounting a long eye relief scope with a variety of mounts. Drawings for estimating by Process have been completed and samples will be completed by November 30.

~~REDESIGNED BARREL~~ NOVEMBER 30 (R. S. Murphy, F. E. Martin)

A drawing package has been sent to Process for estimating. A question has been raised with respect to Production's ability to checker the stock and alternate patterns are being developed. A total of 36 barreled actions have been built. The stocks for these actions are being made by the Custom Shop. Final Research accuracy and function testing will begin when these rifles have been completed.

Sportsman 74, Sportsman 76

(R. S. Murphy)

The Sportsman 74 parts list and drawing package is complete and awaiting authorization for transmittal. The Sportsman 76 parts list

Model 870-1100 Waterfowl Guns

(T. J. Plunkett)

These guns (1986 introduction) are being developed to offer Waterfowl shooters a specialized gun. They will complement the Deer Guns and have common features of Parkerized metal finishes, and oil finished brick stock and fore-end. Also included is a 30" full-choke, vent-rib barrel with chromed bore, and a camouflaged sling strap.

Prototype guns for test and Marketing evaluation have been assembled. Research testing is scheduled to be complete by January 30.

Choke Tube Development

(T. P. Powers)

A choke tube system is being developed to offer shooters the convenience of a variable choke barrel to adapt to different hunting situations encountered in the field. The initial strategy is to offer Briley choke tubes in mid-1984 and Remington tubes in 1986.

Testing of Briley's tube design is scheduled to be completed by February 15. Transmittal and approval is expected at the February Operations Committee meeting. The Remington design is to be tested by June 1984, with project approval and transmittal scheduled for August.

STATUS - RIFLE DEVELOPMENT

(R. S. Murphy)

~~CONFIDENTIAL~~ DECEMBER 23 (F. E. Martin)

The Mountain Rifle has been designed to deal with the higher end of the bolt action rifle line. It is scheduled for 1985 introduction as a replacement for the Model 700 Classic. Specifications include the lightweight Model Seven barrel contour, 30-06, 270, and 280 caliber offerings, and a new Bob Emmons style stock.

Stocks required for final accuracy testing have been completed by the Custom Shop and are being finished by Production. Accuracy testing will require approximately two weeks. Preliminary drawings have been given to Production for cost estimating.

New Bolt Action Rifle

(F. E. Martin, K. L. Calkins,
R. H. Smith)

~~A new bolt action rifle is being developed as a replacement~~

for the Model 700. A 1988 introduction is scheduled.

Model guns in three different configurations should be ready for review with Marketing by the end of May.

Sportsman 74/76

(A. R. Eddy)

These rifles are lower-priced versions of the Models 7400 and 7600, and continues the introduction of the Sportsman line of shotguns and rifles.

The drawing packages and parts lists are complete. Authorization to transmit is expected at the December Operations Committee meeting.

Model Seven Lightweight

(R. S. Murphy)

The Model Seven is a short, lightweight, bolt action centerfire rifle developed to replace the Model 600, which was discontinued in 1969. Trial and pilot testing indicated that the steel trigger guard assembly was unsatisfactory. A cast aluminum trigger guard has been designed as an alternative.

Trial and pilot productions guns with aluminum trigger guards are scheduled for Research verification testing in early February.

STATUS - CURRENT ARMS

(J. A. Lawrence)

Model 870 P Riot Shotgun

(A. A. Hugick)

Occasionally a shotgun shell can jam between the carrier and the slide assembly making the Model 870 P shotgun very difficult to operate. Several design modifications have been developed to prevent the malfunction.

Research has come up with a new design called the flexi-tab design. It requires the breech bolt and slide to be modified and the carrier to have the center section modified to act as a spring loaded shell stop.

Prototypes have been made and the system works well. Nine Model 870 P Riot Guns have been assembled with the new flexi-tab system. Samples have been turned over to our Field Representatives to evaluate with the F.B.I., California Highway Patrol, etc.

The new design corrects the jam condition, satisfied the complaints about the assembly/disassembly, and can be retrofitted

December 21, 1981

Bolt Action Program
1984 Introduction
Fire Control Revision & Redesign

Add to Fire Control

- Trigger Block
- Housing Clearance
Skeletonize
- Sear Clearance
Relieve
- Remove Connector
- Restyle Trigger

Extractor - M-1911-A1 Style

New Receiver Configuration
Barrel Bracket - .250 thick
Lighten Barrel
Ruger Patent on Action Screw - Diagonal Tension
Detachable Magazine - Mag Con
Sights - Rear P.E. & C.
Safety On Bolt Plug
Safety On Tang
Feeding
Restyle Trigger

Add caliber to short action line to be based on 7mm BR case .25 caliber.

F. E. Martin:ws

11/11/82

Best Action Program

1-5-82

Exercise - 83

1. Exhibit - reorganization of new concept. - check P. 111.
2. Source - unig - for. Exhibit -
3. 11/700 ADL - BDL -
no concept - classic
4. 11/700 "ADL"

Bob. Emerson, - - 84

Get a schedule for a completed stock.

- 1984

-
-

11/700 ADL - new - also - standard

11/700 BDL new - " "

11/700 Classic - new - " "

11/700 Latorbach Box —

11/100 Box - and Store.

11-100 FIRE CONTROL - PRESENT
CONNECTORLESS TRIGGER

11-100 FIRE CONTROL - PROPOSED
CONNECTORLESS TRIGGER - FOR DECKED
TRIG SAFETY
SIDE PLATES - SKEL ETCHED - FOR DECKED
TRIG SAFETY

TEST CASES - FIRE CONTROLS WITH
DECKED TRIG & SEAR
* LOW INT'L TO ELIM.
PLUNGER PROJ
* HEAT TREAT TRIGS

Sept. 81

1-7-53
2:46

Scope memo to:

for our above, sent and released -

BDL M/700 (Proposed)

Stock: Bob Emmens Style With Cheekpiece

- M/4 Grip Cap - Personalize
- Cut Checkering Full Patt. 20 L.P.I.
- Medium Gloss Finish
- Classic Style Pad
- Figured Walnut "B" Grade
- No White Line Spacers

Action: M/700

- No Iron Sights
- Milled No Bind Follower
- No Bolt Lock
- Jeweled Bolt
- Clean Bolt Handle
- Improved Metal Finish on all Parts
Bolt Plug, Bolt Handle, etc.
- Scope Mount Rings
- Detachable Box Magazine

Accessories:

- New Iron Sight Line
- Quality Sling - Cobra Type
- Remington Gun Case - Soft
 - Green
 - Labeled

1-8-82
F. E. Martin
72

TR.	SH.
C.R.	T.C.
	V.B.

Bolt Action Planning Meeting - 1-7-82

Bolt Action Carbine

- Discussion on metal finish
- Comparison on Butt end. (Steel Thickness)
- Sights - finish questionable
- 3 guns to be made - 1 marketing 1-production
1- Research
- Specification to be made by Marketing:
- Standards to be made by Research & Production
- Scope mounts? Check. make sure we have
the correct size of opening.
- Check ring Pattern - Check for size?
- Floor Plate Plastic Piece (Color)?
- Floor Plate Rattle? Check
- Roll marking - make new one to the latest
marking

Continued Bolt Action Planning Meeting

1-7-82

m/700 Reagle AOL

- options of iron sights.
- Defm - Calibers that will have sights
30.06 - .270 - .243 - .300 mag -
- Stock walnut - Check piece n.c.
m.c.
- This program is becoming a mess
- AOL - 1. Classic Stock
Earp Cap
Steel Butt Plate

1-7-82

To C.B. Wickman
T.L. Capolatti

From J.S. Martin

At the Belt Action Planning Meeting - Jan 7-82
I came up with the following items for specification,
needed on our Belt Action Unit

Belt Action Carbine

Stock

- Same as listed on letter dated 12-7-81

Action

- Same as listed on letter.

m/700 AOC Restyle

Stock

- Use Classic Stock
- Walnut wood
- PKW Finish
- BDL Type Grip Cap No white spacer
- Butt Plate m/4 with third white spacer
- Sliding Swivel Stds
- Cut Checkering - Small Pattern 18 Lines per inch

11/700 ADL ~~style~~ Continued

Actions

- Standard model without floor plate
- iron sights
- No bind stamped follower
-

1.7-52

2:46

Scope memo to:

find out about state and national -

BDL M/700 (Proposed)

Stock: Bob Emmens Style With Cheekpiece

- M/4 Grip Cap - Personalize
- Cut Checkering Full Patt. 20 L.P.I.
- Medium Gloss Finish
- Classic Style Pad
- Figured Walnut "B" Grade
- No White Line Spacers

Action: M/700

- No Iron Sights
- Milled No Bind Follower
- No Bolt Lock
- Jeweled Bolt
- Clean Bolt Handle
- Improved Metal Finish on all Parts
 Bolt Plug, Bolt Handle, etc.
- Scope Mount Rings
- Detachable Box Magazine

Accessories: ● New Iron Sight Line

- Quality Sling - Cobra Type
- Remington Gun Case - Soft
 - Green
 - Labeled

1-8-82

F. E. Martin

72

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE



Xc: C. B. Workman
P. H. Holmberg
T. W. Rawson
W. H. Forson
F. E. Martin

"CONFINE YOUR LETTER TO ONE SUBJECT ONLY"

March 2, 1982

TO: T. L. Capeletti
FROM: J. S. Martin *J.S. Martin*
SUBJECT: Visitation by Bob Emmons

Bob Emmons, Custom Stock Maker, arrived on Monday morning, February 22, 1982, and was here until mid-morning Wednesday, February 24, 1982.

Bob has completed two M/700 stocks requested by Research.

On Monday, Bob was given a tour of the Custom Shop and enlightened by a tour of the museum and Larry Goodstal's knowledge of firearms. Fred Martin of Research escorted Bob and aided in showing Bob sections of the Plant mainly the wood area and Custom Shop.

Research personnel reviewed the two stocks that Bob had completed. The stocks are well executed and we have a number of options to use from Bob's designs.

On Tuesday, February 23, 1982, the Marketing Department was here to see Bob Emmons and the new stocks (Paul Holmberg and Tom Rawson). The morning for Bob was divided with a tour of the Plant by John Linde and a review with Paul Holmberg and Tom Rawson.

A meeting was held with Bob including Marketing and Research to establish the design needed for the third model. The discussion was on both metal and wood. (Bob Emmons was shown two prototype bolt action rifles and he was very impressed. Bob's comment here was "what do you need me for?") A set of specifications was agreed upon and a list compiled (see attached sheet). The metal work is not done by Bob Emmons and will be sent out by Bob to Pete Grissel in Oregon. Bob was given two stock blanks and two barrel actions to complete the work with.

Wednesday morning, February 24, 1982, was spent summarizing the work needed and getting the actions and blanks for Bob.

Summary

Bob Emmons will start our new stock design with the specifications outlined. He will send one action to Pete Grissel to have the metal work outlined completed. We anticipate the completion time to be mid-April.

Research will continue with their prototypes and up date them to some of the new ideas that came from Bob Emmons and the meeting conducted. The two stocks are available to review cost and production processes with Plant personnel to establish how much can be used.

JSM:ws

2-23-82

Bob Emmons' Stock Design

New Model Specifications

Wood:

- Grip style - Bob Emmons
- New floor plate trigger inletting
- Cheek piece - like sample (no step) without line - first
- Grip cap - in house same size as samples
- Classic pad black & black
- Ebony two reinforcing pin holes
- Current studs
- Ebony fore-end tip
- Flat rails (top section of fore-end)
- Beveled ejection port

Metal:

- Shilen type barrel contour no. 1
- Tang safety - reshape tang (two position)
- New bolt handle
- Rear receiver cuts altered
- New floor plate design
- Flat bottom receiver design
- Restyle recoil lug

J. S. Martin:ws

RD-10-8

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Remington


PETERS


Xc: J. W. Brooks
J. S. Martin
F. E. Martin

"CONFINE YOUR LETTER TO ONE SUBJECT ONLY" _____

March 4, 1982

TO: C. B. WORKMAN
FROM: T. L. CAPELETTI *TC*
SUBJECT: BOLT ACTION CENTERFIRE RIFLE PRODUCT LINE — BUSINESS PLAN

Attached is a draft of a proposal Business Plan for bolt action rifles. It includes an outline of the overall Plan and detailed input on Research programs through 1985. Revisions have been made to incorporate comments from our Review Meeting yesterday. As input to Marketing for coordination of the Plan, I suggest that a copy of our proposal be provided to Clem Riley ASAP.

TLC:ws
Attach.

ROUGH DRAFT

BOLT ACTION CENTERFIRE RIFLE PRODUCT LINE
REMINGTON ARMS COMPANY
BUSINESS PLAN
MARCH 1982

BOLT ACTION CENTERFIRE RIFLE PRODUCT LINE - BUSINESS PLAN

TABLE OF CONTENTS

<u>ITEM</u>	<u>PAGE</u>
I. <u>MISSION</u>	I-1
II. <u>SITUATION SUMMARY</u>	
A. <u>Marketing History - Past Five Years</u>	
1) Sales Volume - Units and Dollars	
2) Earnings	
B. <u>Current Product Line Features</u>	II-B-1
1) Remington Firearms	II-B-1
2) Competitive Firearms	II-B-3
C. <u>Manufacturing Trends</u>	
III. <u>OBJECTIVES</u>	
A. <u>Business - Five Year Marketing Forecast/Goals</u>	
B. <u>Technical</u>	III-B-1
IV. <u>STRATEGIES - GENERAL PLANS</u>	
A. <u>Marketing Opportunities</u>	
B. <u>Technical</u>	IV-B-1
C. <u>Manufacturing</u>	
V. <u>TACTICS - SPECIFIC PROGRAM PLANS</u>	
A. <u>Marketing Plan</u>	
1) Market Development - Introduction of New Models	V-A-1
2) Pricing	
3) Selling - Advertising	
4) Organization	

B. Research Plan

- | | |
|--|-------|
| 1) Development Programs | V-B-1 |
| a) Current Product Upgrade | V-B-1 |
| b) Model 7 LWT Bolt Action Carbine Development | V-B-2 |
| c) Model Seven Development | V-B-3 |
| d) New Generation Bolt Action Rifle Development | V-B-4 |
| 2) Organization/Budget Plan - Five Year Forecast | V-B-5 |

C. Manufacturing Plan

- 1) Design Transmittals
- 2) Project Approvals
- 3) Equipment and Tooling Needs
- 4) Trial and Pilot Testing
- 5) Production - Warehouse Quantities

D. Capital Investment Plan

- 1) Capacity - Demand Forecast
- 2) Plant Modernization
- 3) Construction Forecast

VI. CASH FLOW FORECAST

VII. CONTINGENCY PLAN

VIII. INFORMATION AND CONTROL SYSTEMS

- A. Cost Accounting - Reporting
- B. MRP
- C. Customer Service
- D. Quality Assurance

MISSION

I-1

BOLT ACTION CENTERFIRE RIFLE PRODUCT LINE

To assure that Remington maintains a leadership position with maximum share in the bolt action centerfire rifle market.

KEYS TO SUCCESS

The domestic bolt action rifle market is extremely competitive and Remington products have experienced increased market pressure in recent years. Continued success of this product line will depend upon the following:

- Technical Features

- Continued innovation is required to maintain a competitive edge in features offered.
- A product line which satisfied mass merchandisers, independent gun shops, and the custom shooter is essential.

- Quality

- Improved metal and wood finishes and use of alternative protective coatings are required to improve out-of-box appearance.

- Price

- A pricing structure keyed to perceived value is required.

- Marketing Strategy

- An aggressive Marketing effort keyed to strengths of the product is essential.

SITUATION SUMMARY

II-B-1

BOLT ACTION CENTERFIRE RIFLE PRODUCT LINE

B. CURRENT PRODUCT LINE FEATURES

1) Remington Firearms

The current Remington product line consists of the models indicated below with comments about general features or strengths.

a) Model 788

- Inexpensive to manufacture
- Good out-of-box accuracy
- Fast lock time
- Detachable box magazine
- Designed for utility (i.e., Durability)

b) Model 700 ADL

- Strongest action in the field
- Stock — Monte Carlo & cheekpiece
- Adjustable fire control (Adjusted by Factory only)
- Good out-of-box accuracy
- Wide variety of calibers offered
- Sights — Can be used out-of-box
- Can be used easily and comfortably with scope
- RKW high gloss finish

c) Model 700 BDL

- Strongest action in the field
- Stock — Monte Carlo & cheekpiece
- Adjustable fire control (Adjusted by Factory only)
- Good out-of-box accuracy
- Wide variety of calibers offered
- Sights — Can be used out-of-box
- Can be used easily and comfortably with scope
- Cut checkering
- Sling and swivels
- Varmint model available
- Easily adapted to silhouette shooting
- Hinged floor plate
- RKW high gloss finish

d) M/700 Classic

- Classic stock
- Classic butt pad
- Hinged floor plate
- Cut checkering
- Sling swivel studs
- No sights - Clean barrel
- Adjustable fire control (Adjusted by Factory only)
- Satin finish

2) Competitive Firearms

Currently, the two major competitors are the Ruger Model 77 and the Winchester Model 70. General features for those two firearms lines are as summarized below.

a) Ruger Model 77

- Flat bottomed receiver
- Mauser extractor
- Integral scope mounts
- Calibers — 7 x 57, .220 Swift
- Classic stock — All but one model
- Adjustable fire control
- Tang safety
- Mannlicher stock (1982)
- High lustre metal finish

b) Winchester Model 70

- Flat bottomed receiver
- Three position safety
- Hinged steel floor plate
- High lustre metal finish
- Adjustable fire control
- Model 70 featherweight (1982)

OBJECTIVES

III-B-1

BOLT ACTION CENTERFIRE RIFLE PRODUCT LINE

B. TECHNICAL

- Provide facilities , programs , and personnel to fully support all aspects of the Manufacturing and Marketing Forecast.
- Develop programs to assure continued innovation and design of products with unique features which will maintain a leadership position in the bolt action rifle market.

STRATEGIES — GENERAL PLANS

IV-B-1

BOLT ACTION CENTERFIRE RIFLE PRODUCT LINE

B. TECHNICAL

- Short Range — Develop and implement improvements in the current product line consistent with Marketing Objectives, Manufacturing capability, competitive offerings, and perceived needs of the customer.
- Medium Range — Develop and implement new product lines consistent with Marketing Objectives, Manufacturing modernization plans, and conventional technology.
- Long Range — Develop and demonstrate new firearms concepts which will place Remington in a proprietary position based on both ammunition and firearms design.

TACTICS — SPECIFIC PROGRAM PLANS
BOLT ACTION CENTERFIRE RIFLE PRODUCT LINE

V-A-1

A. MARKETING PLAN

1) Market Development - Introduction of New Models

Proposed product line revisions are as follows:

- 1982 — Current Product Line
 - Announce special offering of M/700 Classic,
.257 Roberts, with scope mounts packaged with gun
- 1983 — Discontinue M/700 Classic
 - Upgrade M/700 ADL
 - Introduce M/7 LWT Carbine
- 1984 — No Model Changes
- 1985 — Introduce M/7 with Bob Emmons designed stock
- 1986 — No Model Changes

TACTICS — SPECIFIC PROGRAM PLANS

V-B-1

BOLT ACTION CENTERFIRE RIFLE PRODUCT LINE

B. RESEARCH PLAN

1) Development Programs

a) Current Product Upgrade

Plans for upgrading the current product line will include the following features:

i) 1982 — Scope Mounts

- Test market mounts based on the PE&C extruded aluminum design via a special offering of the M/700 Classic, .257 Roberts.
- Scheduled for completion in July 1982.

ii) 1983 — M/700 ADL Upgrade

- Revise Model Drawings to include the following features:
 - Classic stock modified to accept Model 4 grip cap
 - Model 4 grip cap
 - Medium gloss wood finish
 - Classic butt pad with red color similar to M/1100 LE
 - Reduced checkering to 18 lines/inch and reduced pattern to side panels only
 - Sling swivel studs
 - High lustre metal finish
 - No knurling on bolt handle

- No sights
- Remington scope mounts
- No-bind plated machined or cast follower
- To be completed by July 1982.

141) 1983 - M/700 BDL Upgrade

- Revise Model Drawings to include the following features:
 - No-bind plated machined or cast follower
 - High lustre metal finish
- Reduce stock dimensions to conform to Model Drawings.
- To be completed by July 1982.

b) Model 7 LWT Bolt Action Carbine Development

- Complete development of Model 7 LWT for 1983 introduction with the following features:
 - Walnut, straight comb stock with Schnable fore-end
 - Medium gloss wood finish
 - Cut checkering
 - Sling swivel studs
 - Model Four grip cap
 - Red Classic butt pad with black spacer
 - No bolt lock
 - Jeweled bolt body
 - Stamped steel trigger guard and floor plate assembly
 - Hinged floor plate
 - Stamped no-bind follower

- 18 $\frac{1}{4}$ " barrel with smaller OD than M/700
- M/700 front and rear sights
- Current M/700 metal finish
- To be completed by May 1982.

c) Model Seven Development With Bob Emmons Designed Stock

- Complete development of Model Seven for 1985 introduction with the following features:
 - Bob Emmons Stock with
 - Restyled grip and grip cap
 - New floor plate trigger inletting
 - Cheek piece - No Monte Carlo
 - Inserts for reinforcing pin holes
 - Fore-end tip
 - Flat rails on top of fore-end
 - Beveled ejection port - Matching receiver
 - Classic black butt pad with black spacer
 - Sling swivel studs (Hidden)
 - Octagonal, flat bottomed receiver
 - Scope mounts - No sights
 - Light weight firing pin
 - Hammer forged, smooth barrel
 - Improved fire control - Provide safe adjustment by customer
 - Tang safety featuring blocked trigger and sear
 - Bolt lock on bolt plug

- Heavy recoil lug
- Improved bedding
- Restyled bolt handle
- Improved extractor
- Improved feeding system
- Detachable, restyled floor plate
- Jeweled follower and bolt
- High lustre metal finish
- Medium gloss wood finish
- Completed by January 1983.

d) New Generation Bolt Action Rifle Development

New bolt action rifle concepts will be developed for introduction by 1990.

2) ORGANIZATION/BUDGET PLAN — FIVE YEAR FORECAST

Budget Year	:	1982	1983	1984	1985	1986
Assignable Manyears *	:	4	4	4	4	4
Funding (1982 \$M)	:	430	430	430	430	430

* Plus 0.5 Manyears support from Test Lab and N/C Shop personnel.

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE



Xc: H. K. Boyle
J. P. Linde
J. W. Brooks
J. S. Martin

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"CONFINE YOUR LETTER TO ONE SUBJECT ONLY"

March 15, 1982

TO: C. B. WORKMAN
FROM: T. L. CAPELETTI *TC*
SUBJECT: BOLT ACTION RIFLE MARKETING STRATEGY

Clem Riley called last Friday to indicate that they are revising the Marketing Strategy based on further discussions with Sales and Marketing personnel. The new strategy is as follows:

A. 1983

1) Restyled "ADL"

- New introduction
- New Model designation
- With scope mounts
- Direct competition with Ruger

2) BDL

- Unchanged
- No scope mounts (Not even on fulfillment)

3) Classic

- Unchanged
- Special Order only

4) Current ADL

- Unchanged
- Reduce to three (3) most popular calibers only (eg. 30-06, .243, etc.)
- Strategy is to offer through Mass Merchants (K-Mart)

B. 1984

1) Restyled "ADL"

- Add calibers

2) BDL

- Unchanged
- Phase down production to zero inventory

3) Classic

- Unchanged

4) Current ADL

- Unchanged

C. 1985

1) Restyled "ADL"

- Unchanged

2) Restyled "BDL"

- Approximately six (6) calibers
- Except for Varmint and Left-Hand specials

Bolt Action Rifle Marketing Strategy

page 3
3-15-82

- 3) Classic
 - Convert to Restyled BDL
 - Special calibers by order only
- 4) Current ADL
 - Delete or unchanged and delete in 1986

TLC:ws

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RemingtonBridgeport, Connecticut
April 16, 1982

TO: T. L. CAPELETTI
FROM: T. W. RAWSON *TRW*
SUBJECT: LONGER RANGE M700 REFORM PLANS

Per our phone conversation, I would very much like to be included in the planning sessions for the M700 rifle upgrade.

The research that I have done suggests an enumeration of features, which follows, should be helpful to identify the basic scope of work.

- ~~1.~~ 1. Barrel contour
- ~~2.~~ 2. Recoil bracket
- ~~3.~~ 3. Receiver shape
- 4. Bolt release
- ~~5.~~ 5. Safety
- ~~6.~~ 6. Bolt handle
- 7. Ejector/extractor
- 8. Trigger guard floor plate
- 9. Stock
 - a. Cheekpiece
 - b. Comb
 - c. Pistol grip shape
 - d. grip cap
 - e. Forend tip

- f. Butt pad
- g. Checkering
- h. Finish

I too believe there are some basically very desirable features of the 700 with a few less desirable details that can be upgraded to surpass competitive offerings.

While the committee will need to confront each of these items, I have suggestions which might speed up some of our evaluation.

It is believed the safety is a significant place for improvement. This is being called out here, however, only because an opportunity exists to evaluate an alternative. We have asked Bob Emmons to have Pete Grisel install a tang safety on our 4th prototype gun under contract. The tang safety is probably more desirable than our current mechanism because it will eliminate the appearance of a stamped part and the hole in the stock alongside the tang. The tang safety, however, is still a trigger lock safety and does not address the theoretical advantage of a striker lock safety. The Ken Jantz bolt sleeve safety that you and I viewed at the NRA show is seen as an alternative with appeal in several areas.

- It eliminates the stamped lever and hole in stock by virtue of bolt sleeve location.
- Is a striker lock system.
- Can provide the choice of two position or three position with the three position giving a choice of bolt lock and striker lock or blocked striker (only) for safe unloading.

This particular option is being mentioned now because Pete Grisel's work is going on - he may be able to replace or add the bolt sleeve safety to his barreled action work. While we would never produce a gun with both a tang and bolt sleeve safety the presence of both safety's on one gun does not cancel out the other and will provide a chance for instant comparison.

TWR/df

4/21/82
E

Check Piece Options as per Form Revision



=====

REMINGTON ARMS COMPANY, INC.

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CALIBER

PETERS
CALIBER

CONFIDENTIAL

Xc: R. E. Fielitz
C. A. Riley
P. H. Holmberg
W. H. Forson, Jr.
J. W. Brooks
J. S. Martin
F. E. Martin
J. A. Stekl

"CONFINE YOUR LETTER TO ONE SUBJECT ONLY" _____

Ilion, New York
April 21, 1982

TO: C. B. WORKMAN
FROM: T. L. CAPELETTI *TC*
SUBJECT: BOLT ACTION RIFLE DEVELOPMENT — REPLACEMENT FOR MODEL 700 BDL

Based on our discussion yesterday, suggested goals for a new generation bolt action rifle to replace the M/700 BDL are as indicated below. These are not intended to be firm specifications. They are for discussion only, to facilitate agreement on action items, deadlines, and design objectives. Target date for introduction of this product is for the 1985 model year; announcement in November 1984.

Proposed Goals:

- Stock - Optional (Emmons' design, Straight Classic, Monte Carlo, etc.)
 - Market Research needed
 - Decision needed by March 1983!
 - Walnut
 - Hidden Sling Swivel Studs
- Receiver - Integral, heavier recoil bracket
 - Glass/Epoxy bedding
 - Flat bottom
 - Non circular (Octagonal?) Cross-Section
 - Integral and Standard Scope Mounts
 - Front Lock (Triple Lug?)

- Safety - Multiple block (trigger, firing pin, sear)
 - Reposition switch (eg. Tang mount)
 - Independent bolt lock/cocking indicator
- Fire Control - Adjustable without removing action from stock (But, with limits on sear/trigger engagement)
- Barrel - Improved bullet spin system (eg. Tapered bore/ammunition)
 - Hammer Forged/High Gloss
 - Light Weight Contour
 - Target Crown
 - Muzzle Swell
 - Recoil reducing muzzle device
- Feed System - Rotary Feed
 - Floor Plate/Detachable Box Option (Unload without cycling bolt)
 - Smoother and more reliable than M/700 (eg. No bind follower)
- Bolt - New extractor
 - New bolt handle
 - Multiple lug
 - Short throw/Easy lift
 - Jeweled
 - Reduced lock time (Lightweight firing pin/redesigned spring)

TLC:ws

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

Remington
REM

PETERS
P

"CONFINE YOUR LETTER TO ONE SUBJECT ONLY" _____

CONFIDENTIAL

Xc: R. E. Fielitz
C. A. Riley
P. H. Holmberg
W. H. Forson, Jr.
J. P. Linde
G. D. Campbell
J. W. Brooks
J. S. Martin
F. E. Martin
J. A. Stekl

Ilion, New York
April 22, 1982

TO: C. B. WORKMAN
FROM: T. L. CAPELETTI *TC*
SUBJECT: BOLT ACTION RIFLE DEVELOPMENT - REPLACEMENT FOR THE MODEL 700

Based on our discussion yesterday with Marketing and PE&C personnel, the revised goals for the new generation bolt action rifle are as indicated below. Target date for introduction of this product is for the 1985 model year; announcement in November 1984. However, due to the extensive development time that may be required to finalize the design, that schedule may have to be delayed one year.

Design Goals:

- Stock - Optional (Emmons' design, Straight Classic, Monte Carlo, etc.)
 - Market Research needed
 - Decision needed by March 1983!
 - Walnut
 - Recessed Sling Swivel Studs
 - Cast off and toe out
 - Skeleton Butt Plate and Grip Cap
- Receiver - Integral, heavier recoil bracket
 - Glass/Epoxy bedding
 - Flat bottom
 - Non circular (Octagonal?) Cross-Section
 - Integral and Standard Scope Mounts
 - Front Lock (Triple Lug?)
 - Reposition bolt release and change process to eliminate starped release button
 - Short and Long Action
 - Add guide rail to bolt for smoother action

- Safety - Multiple block (trigger, firing pin, sear)
 - Reposition switch (eg. Tang mount)
 - Independent bolt lock/cocking indicator
 - Improved appearance
- Fire Control - Adjustable without removing action from stock (But, with limits on sear/trigger engagement)
 - Investigate safe lower limits on trigger pull
 - Double set trigger?
- Barrel - Hammer Forged/High Gloss
 - Light Weight Contour
 - Target Crown
 - Recoil reducing muzzle device - Offer as optional accessory
 - Stainless steel components offered as option
- Feed System - Rotary Feed
 - Floor Plate/Detachable Box Option (Unload without cycling bolt)
 - Smoother and more reliable than M/700 (eg. No bind follower)
- Bolt - New extractor
 - New bolt handle
 - Multiple lug
 - Short throw/Easy lift
 - Jeweled
 - Reduced lock time (Lightweight firing pin/redesigned spring)

TLC:ws

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE



Xc: J. W. Brooks
J. S. Martin
F. E. Martin

"CONFINE YOUR LETTER TO ONE SUBJECT ONLY"

April 30, 1982

TO: C. B. WORKMAN
FROM: T. L. CAPELETTI *TC*
SUBJECT: BOLT ACTION RIFLE DEVELOPMENT — REPLACEMENT FOR MODEL 700

Based on our discussion Friday, April 23, the proposed specifications for bolt action rifle development are as follows:

A. Preferred Design

B. Contingency Design #1

C. Contingency Design #2

1) Receiver

- | | | |
|-------------------------------------|-------------------------------------|--------------------------------|
| a) Flat bottom octagonal | a) Round bottom octagonal | a) Full round |
| b) Integral recoil lug | b) M/700 - thicker | b) M/700 - thicker |
| c) Integral & standard scope mounts | c) Integral & standard scope mounts | c) Standard scope mounts |
| d) Anti-bind bolt | d) M/700 - no bind | d) M/700 - no bind |
| e) Front lock — two lug system | e) Front lock — two lug system | e) Front lock — two lug system |
| f) Short and long actions | f) Short and long actions | f) Short and long actions |
| g) New bolt stop-release | g) New bolt stop-release | g) M/700 |

A. Preferred Design

B. Contingency Design #1

C. Contingency Design #2

2) Safety

- a) Block trigger and firing pin
- b) Reposition switch to bolt plug
- c) Independent bolt lock
- d) Cocking indicator

- a) Block trigger and firing pin
- b) Reposition switch to tang
- c) Independent bolt lock
- d) Cocking indicator

- a) Block trigger and sear
- b) M/700
- c) No bolt lock
- d) Cocking indicator

3) Fire Control

- a) Fully adjustable in stock - With limits on engagement - Safe lower limit
- b) Standard trigger
- c) Exposed components - No housing

- a) Weight of pull adjustable in stock - Pre set engagement and overtravel
- b) Standard trigger
- c) Skeletonized housing

- a) Tamper proof M/700
- b) Double set trigger
- c) Skeletonized housing

4) Barrel

- a) High gloss without removing hammer marks
- b) Light weight contour
- c) Target crown
- d) Recoil reducing muzzle device - Option
- e) Stainless steel - Option
- f) Clean barrel

- a) High gloss without removing hammer marks
- b) Light weight contour
- c) Target crown
- d) Recoil reducing muzzle device - Option
- e) Carbon steel
- f) Drilled & tapped for iron sights - no sights

- a) M/700
- b) Light weight contour
- c) Target crown
- d) No recoil reducing device
- e) Carbon steel
- f) Iron sights

A. Preferred DesignB. Contingency Design #1C. Contingency Design
#2Feed System

- a) Rotary magazine
— detachable
- b) No bind
- c) Unload with bolt open

- a) Floor plate and
detachable box - Option
- b) No bind
- c) Unload with bolt open

- a) Detachable box
- b) No bind
- c) —

1 Bolt

- a) Fully enclosed claw
type extractor
- b) Restyled knob bolt
handle
- c) Two lug system
- d) Easy lift
- e) Jeweled
- f) Reduced lock time
- g) Restyled bolt plug

- a) Fully enclosed claw
type extractor
- b) Spoon bolt handle
- c) Two lug system
- d) Easy lift
- e) Serrated
- f) Reduced lock time
- g) Restyled bolt plug

- a) M/700 extractor
- b) Smooth M/700
bolt handle
- c) Two lug system
- d) Easy lift
- e) Plated
- f) Reduced lock time
- g) Standard M/700
bolt plug

7) Stock

- a) Walnut
- b) Recessed sling swivel
studs
- c) Cast off and toe out
- d) Skeleton butt plate
and grip cap

- a) Walnut
- b) Recessed sling swivel
studs
- c) Cast off and toe out
- d) Skeleton butt plate
and grip cap

- a) Walnut
- b) Standard sling
swivel studs
- c) Straight
- d) Standard butt
plate and grip cap

alt Action

- 4 -

4-30-82

A. Preferred Design

B. Contingency Design #1

C. Contingency Design #2

1) Stock (cont'd)

e) Epoxy bedding

e) Epoxy bedding

e) No epoxy bedding

f) Emmons' stock

f) Monte Carlo and
cheek piece

f) Straight Classic

g) Medium gloss and
RKW finish

g) Medium gloss and
RKW finish

g) Medium gloss and
RKW finish

IC:ms

Bolt-Action Strategy

5-26-80

New BDL

- This gun has to look different.
- How do we make integral receiver details.
- Marketing wants octagonal top:
- Bottom should be flat - recoil lug. Pigeon and integral with receiver.
- Scope mounts
 - Redfield systems - "look me" and all.
 - elevation and windage needed?
 -
- Next, Bolt Bolt - Lug on BDL - gun smooth action.
- Short and long action.

Continued
+

• New belt stop - # return - 1-1 - look at outside

Safety : ?

m/700 - machining no problem.

m/788 - production likes better (John Smith)

• trigger should have 2 pull adjustment

• adjustment should be fail safe - down to

ground and half - ← settle on 3rd lower limit

• Sec - Change material - ? Powder metal
- to - ? Low steel

• external adjustment

• instructions folder - should be so that
as uniform customer how to adjust

#3

Continued Bolt detent line - BDC -

Safety :

Gun Control -

- new - light weight $2\frac{1}{2}$ # pull
- external adjustments
- new design - 788 - or different -
- Cocking indication

Bolt lock ? -

1. Independent bolt lock

Barrel :

1. High Gloss Hammer marks.

Gods I HATE GUNS

BARREL: HAMMER FORGE -

Feed System:

- Rotary magazine big deal -

marketing would like this would help
also give that total standard amm.

amm - mag cal. and round brs -

Bolt -

Stock: Cal. Checkering - 20.000
full pattern fore-and-
trans fore-and -

? Dackmeyer Round Sting Series

Stock Engraving - Schuhl - tip -

Engraving. Bolt section - with
10. 50. 111 -

medium glass -

Slung

no speers.

30-4000

7-4000

(Cal.)

22-250

7mm-4000

1. Steel floor plate - # Guard

2. Finish.

7mm 4000

new caliber

7mm-4000

250-3000

6mm-5000

~~25-3000~~

→ Advertise "rail driver" - accuracy
show driving a nail at 100 yds -
5 shots -

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE



cc: R. E. Fielitz
C. A. Riley
P. H. Holmberg
T. L. Capeletti
J. S. Martin
J. P. Linde

May 27, 1982

TO: C. B. WORKMAN
FROM: P. H. HOLMBERG
SUBJECT: MODEL REQUIREMENTS - MODEL 700 BDL

At our May 26 Kingston, New York meeting we reached a tentative agreement on preferred design requirements for a new bolt action rifle that will replace the present Model 700 BDL. Each element will be investigated to determine feasibility, with the understanding some may require alteration to meet design, manufacturing or cost criteria. Product objectives and tentative model requirements follow:

Objective

- Replace present Model 700 BDL (may obsolete ADL)
- Completely new visual appearance
- Retail selling price \$50-\$100 higher than ADL

Receiver

- Octagonal shape on top, slimmer than present Model 700, preference for flat bottom
- Integral recoil lug-for increased strength and better appearance where barrel fits to receiver
- Anti-bind bolt
- Front lock, 2 lug (3 lug to be considered)
- Short and long action
- New bolt stop release-same location, improved appearance, eliminate stamped part

Safety-Fire Control

- Standard trigger exposed components-no housing
- Trigger pull and over-travel externally adjustable within safe limits
- Safety blocks trigger and firing pin
- Safety switch may be re-positioned
- Bolt lock (to be determined whether independent from safety switch)
- Cocking indicator (optional)

May 27, 1982

Barrel

- Lighter weight contour
- No sights
- Same lengths as present Model 700
- Target crown
- High gloss without removing hammer marks
- Recoil reducing muzzle device (optional)

Feed System

- Unload with bolt open-no binding on follower
- Jeweled follower
- Rotary magazine, possible trade-off one less round in magazine

Bolt

- Fully enclosed claw type extractor
- New bolt handle, several versions to be considered
- Easy lift
- Two lug (3 lug may be considered)
- Jeweled
- Reduced lock time
- Restyled bolt plug

Stock

- Walnut, full pattern cut checkering (20 lines per inch), medium gloss finish
- Emmons' design with schnabel fore-end tip
- Cast off and toe out
- Skeleton butt plate and grip cap, recoil pad on magnums
- No spacers
- Recessed sling swivels
- Epoxy bedding
- No sling

Scope Mounts

- Improved Redfield style with windage and elevation adjustment

Market Research

Some of the tentative model requirements will require market research testing to determine consumer reaction. Those features where research is necessary are:

- Barrel finish-hammered appearance versus smooth high lustre
- Stock shape

WHF:daf

Bill

10-26-8
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J. W. Brooks
J. S. Martin
F. E. Martin

"CONFINE YOUR LETTER TO ONE SUBJECT ONLY" _____

June 16, 1982

TO: C. B. WORKMAN
FROM: T. L. CAPELETTI *TE*
SUBJECT: BOLT ACTION RIFLE DEVELOPMENT
--REPLACEMENT FOR MODEL 700 BDL

To assist in assignment of our resources, I reviewed with Paul Holmberg the list of proposed new features for a bolt action rifle to replace the Model 700 BDL. My intent was to assign a priority ranking to the proposed features as a guide to determining what features we might delete if we decide that we cannot complete all of the requirements scheduled. Depending on the results of our analysis, Paul indicated that timing for introduction of the new model was negotiable. I agreed that we would define what we thought could be accomplished in time for a 1985 vs. 1986 introduction and then review those plans with Marketing. Paul's ranking of the proposed features in order of decreasing priority was as follows:

- 1) New Stock Design
 - Emmon's stock with Schnobel fore-end
 - Cast off and toe out
 - Cut checkering
- 2) Scope Mounts
- 3) Rotary Magazine '1
- 4) New Fire Control *2*
- 5) Octagonal Receiver
- 6) Hammer Forged/Buffered Barrel
- 7) New (Claw Type) Extractor *3*
- 8) No Bind Follower
- 9) New Bolt Handle & Knob

BOLT ACTION RIFLE DEVELOPMENT
--REPLACEMENT FOR MODEL 700 BDL

Page 2
June 16, 1982

- 10) New Bolt Plug
- 11) Reduced Lock Time (New Firing Pin)
- 12) Light Weight Barrel Contour
- 13) Skeleton Butt Plate & Grip Cap
- 14) Integral Recoil Lug
- 15) New Bolt Stop & Release
- 16) Bolt Lock (Independent)
- 17) Recoil Reducing Muzzle Device
- 18) New (Repositioned) Safety

TLC:hv

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Xc: C. B. Workman
T. L. Capeletti

"CONFINE YOUR LETTER TO ONE SUBJECT ONLY" _____

July 27, 1982

TO: F. E. Martin
FROM: J. S. Martin *J. S. Martin*
SUBJECT: Bolt Action Rifle Development
- Replacement for Model 700 BDL

In order to establish personnel, priorities, scheduling, etc., I will need from you the following commitments:

- A weekly report on the design progress, work in the Model Shop and Test Lab.
- A once a week meeting at 9:00 am Monday in the conference room. This meeting is to inform Tami and Clark of our position.
- A research note book on this project that is well maintained and kept up-to-date.
- A.I. Report every six months so a final report can be put together.

Our goals have been outlined in a letter to C. B. Workman from T. L. Capeletti dated June 16, 1982.

If we are to meet an introduction date of 1985, more personnel are needed. I intend to put Tom Bauman on this project full time starting September 1, 1982 and will also have a new transfer employee on board by September 1982.

I feel the rotary box to be the most time consuming part of the design. I would like you to stay on this section (feeding) and make sure we have a design that will handle the various calibers. Tom Bauman's first assignment will be the new scope mounts. I will also have Tom Bauman working on a new claw extractor design. The new employee will be responsible for the Bob Emmon's stock design and relating components.

I will expect you to finalize the design with the octagonal receiver, new barrel (contour and outside appearance), new bolt handle design, bolt plug, and fire control.

This project must be ready to release in its final design by June 1983. I would like a schedule of when the first three models will be complete.

The Monday meetings will start August 30, 1982. For the first meeting, I would like an update of our program. This will include parts completed, drawings completed, a list of layouts to be made, and schedules.

JSM:ws

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 F. E. Martin

"CONFINE YOUR LETTER TO ONE SUBJECT ONLY" _____

Ilion, New York
 September 3, 1982

TO: C. B. WORKMAN

FROM: T. L. CAPELETTI *TC*

SUBJECT: BOLT ACTION RIFLE DEVELOPMENT — PRIORITY ITEMS

I have reviewed with Paul Holmberg the priority list of critical development items for the new bolt action rifle as presented at the July Operations Committee Meeting. Paul indicated that Marketing supports our priority listing as summarized in my memorandum on June 16, 1982 and the priority ranking of critical development items in order of decreasing priority as follows:

1. Rotary detachable magazine
2. Fire control — fully adjustable in the stock with limits on engagement and trigger pull
3. Fully enclosed claw type extractor
4. Reduced lock time
5. Recoil reducing muzzle device
6. Safety switch — trigger and firing pin block

TLC:ws
 Firearms Research Division

REMINGTON ARMS COMPANY, INC.

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Distribution: C. B. Workman
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F. S. Martin

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RESEARCH TEST and MEASUREMENT REPORT - Report No. 812441

NEW DESIGN M/700 TRIGGER/SEAR BLOCK EVALUATION

Prepared by: Ron Williams

Date Prepared: 9/10/82

Proofread and Cleared By:

J.H. Hearnings, / R.E. Nightingale,
Foreman-Test Lab / Foreman-Measurement Lab

[Signature] 9-15-82
Signature Date

C.E. Ritchie,
Sr. Supervisor - Testing,
Meas. & Mech. Analysis Lab

[Signature] 9-14-82
Signature Date

TEST & MEASUREMENT LAB REPORT

REPORT NUMBER: 812441
REPORT TITLE: New Design Trigger/Sear Block Evaluation
MODEL(S): 700 ADL
GAUGE OR CALIBER: 6MM Remington
DATE: 9/10/82
WORK ORDER NO.: C-1803-000
PART NAME: Trigger Assembly
DESIGNER/ENGINEER: F. Martin

TEST TYPE:

1. PHOTO LAB
2. STRENGTH TEST - NO. OF GUNS TESTED _____
3. FUNCTION TEST - NO. OF GUNS TESTED _____
4. ACCURACY TEST - NO. OF GUNS TESTED _____
5. MEASUREMENTS - TYPE: Static
6. ENVIRONMENTAL TEST
7. AMMUNITION TESTING & EVALUATION - TYPE: _____
8. VISUAL EVALUATION - _____ OUT OF _____ GUN SAMPLE
9. ENDURANCE - NO. OF GUNS TESTED: 5

NO. OF ROUNDS PER GUN 2,500

TOTAL ROUNDS FIRED IN TEST: 12,500

AMMO TYPE: MAGS. _____; TARGET: _____

RIM FIRE _____ CENTER FIRE 6mm

September 10, 1982

TO: J. H. Hearnings

FROM: R. Williams

REPORT TITLE: NEW DESIGN M/700 TRIGGER/SEAR BLOCK EVALUATION

ABSTRACT:

A total of (5) M /700 Fire control assemblies with the New Design safety assemblies, were delivered to the Test Lab by Fred Martin for testing. This safety assembly blocks the trigger and the sear so that the firing pin won't fall when the trigger is held back while the safety switch is pushed from the safe to fire position. Both dry cycle and live fire endurance tests were used to test the assemblies. A M/700 fire control assembly (Current Production) was used as a control and (4) out of the (5) New Design assemblies were used in the test.

SCOPE OF TEST

To evaluate the functional performance of the New Design safety assembly, in the M/700 Rifle during lab testing.

TEST RESULTS

No functional problems arose during testing. Both the New Design safety and the control functioned normally. There was no significant change in the safe On/Off forces measured before, during and after testing, on all the assemblies, including the control.

REPORT TEXT

All four (4) new trigger assemblies were subjected to the following trick test:

- o Place Safety Switch in the Safe "On" position.
- o Close the bolt.
- o Put constant pressure on the trigger attempting to fire the rifle.
- o Push the Safety Switch from the "On" position to the "Off" position.
- o Does the firing pin fall?

All four (4) New Design Trigger Assemblies with the trigger /sear blocked passed this test. In all four (4) guns the firing pin did not fall.

NOTE: The measurements recorded for the Safe On/Off forces are questionable. There is no way to determine if they are within Remington Standards, because there are no standards written for these forces with this fire control assembly. The only Remington Standards written for Safe On/Off forces, pertain to the common fire control. That Standard is:

4 - 8 lbs. - One sharp click
Double click not allowed

The Safe On/Off forces measured in this test range from 5.25 lbs to 10.2 lbs. - almost a 5 lb. difference. (Refer to Appendix A, Data Sheets No. 1 - 5 for all Safe On/Off measurements).

TEST PROCEDUREA. MEASUREMENTS

The following measurements were taken on the five rifles used in this test:

- o Headspace
- o Firing Pin Indent
- o Trigger Pull
- o Sear Lift
- o Sear Engagement
- o Safe On/Off Forces

B. TEST CONDITIONS

1. After every 20 rounds fired, the safety was checked. This was done by holding the trigger and pushing the safety switch from safe to fire.
2. After 1,000 rds. of live fire all the rifles were cleaned and they were remeasured. (Jack Shooting).
3. The rifles were then subjected to Safe On/Off dry cycle. Each rifle was cycled for 2,500 cycles, with Safe On/Off measurements taken every 500 cycles and Sear Lift and Engagement at the 2500 cycle level.
4. The rifles were then live-fired to the 2,000 round level. (Jack Shooting) Measurements were taken at this level.

TEST PROCEDURE - CONT'D.

5. The rifles were then subjected to another Safe On/Off dry cycle test. They were brought to the 5,000 cycle level. (2,500 additional cycles) Safe on/off measurements were taken every 500 cycles and sear lift and engagement wear measured at the 5,000 cycle level.

These same procedures were followed until live fire totaled 2,500 rounds per rifle and safe On/Off dry cycle totaled 7500 cycles per rifle.

C. AMMUNITION

Remington 80 grain Pointed Soft Point.

APPENDIX " A "

M-700 TRIGGER/SEAR BLOCK EVALUATION

Report No. 81244

No. 1

Aug. 31, 1982

R. Williams

M-700	6MM CAL. # A6752973	HEADSPACE	FIRING P-W INCHES	SAFE (lb)		TRIGGER Pull (lbs)	SEAR LIFT	SEAR ENGAGEMENT
				ON	OFF			
1	Sample No. 1							
2	START OF TEST	MIN. +.004"	.025"	6.2	6.0	4.0	.0105"	.035"
3								
4	LIVE FIRE							
5	after 1000 rds.	MIN. +.004"	.025"	6.2	6.8	4.25		
6								
7	DRY CYCLE							
8	500 cyc.			5.5	9.4			
9	1000 cyc.			5.8	9.7			
10	1500 cyc.			5.7	9.5			
11	2000 cyc.			5.5	9.7			
12	2500 cyc.			5.7	9.3		.0105"	.035"
13								
14	LIVE FIRE							
15	after 2000 rds.	MIN. +.004"	.025"	5.6	7.3	4.0	.0165"	.027"
16								
17	DRY CYCLE							
18	3000 cyc.			6.2	9.8			
19	3500 cyc.			6.5	10.3			
20	4000 cyc.			5.7	9.2			
21	4500 cyc.			6.2	9.5			
22	5000 cyc.			6.2	9.2		.0165"	.027"
23								
24								
25	LIVE FIRE							
26	after 2500 rds. + HL	MIN. +.004"	.025"	6.3	7.5	4.5		
27								
28	DRY CYCLE							
29	5500 cyc.			6.2	10.5	4.8		
30	6000 cyc.			6.2	10.0	4.6		
31	6500 cyc.			6.2	8.8	4.6		
32	7000 cyc.			6.0	7.8	4.8		
33	7500 cyc.			6.2	9.8	4.6		
34								
35								
36								
37								
38								
39								
40								

M-700 TRIGGER / SEAR BLOCK EVALUATION

No. 3

Aug. 31, 1982

R. Williams

	M-700	6MMcal. #A6744915 Sample No. 3	HEADSPACE	FIRING		SAFE		TRIGGER PULL (lb)	SEAR LET	SEAR ENGAGEMENT
				PEN	INDENT	(in lbs)	ON OFF			
1										
2		START OF TEST	Min. +.004"		.025"	9.1	6.4	4.7	.015"	.025"
3										
4		LIVE FIRE								
5		after 1000 rds.	Min. +.004"		.026"	9.7	5.7"	4.1		
6										
7		DRY CYCLE								
8		500 cyc.				8.2	6.9			
9		1000 cyc.				8.3	7.0			
10		1500 cyc.				8.8	6.3			
11		2000 cyc.				9.2	7.0			
12		2500 cyc.				9.8	6.0		.012"	.032"
13										
14		LIVE FIRE								
15		after 2000 rds.	Min. +.005"		.026"	10.2	5.2		.013"	.033"
16										
17		DRY CYCLE								
18		3000 cyc.				8.5	8.5			
19		3500 cyc.				9.2	7.2			
20		4000 cyc.				9.2	9.0			
21		4500 cyc.				8.7	9.7			
22		5000 cyc.				9.5	12.2		.015"	.032"
23										
24										
25		LIVE FIRE								
26		after 2500 rds. HL	Min. +.005"		.025"	9.8	5.2			
27										
28		DRY CYCLE								
29		5500 cyc.				8.3	8.3			
30		6000 cyc.				9.2	8.8			
31		6500 cyc.				9.7	9.3			
32		7000 cyc.				8.5	12.0			
33		7500 cyc.				9.5	12.0			
34										
35										
36										
37										
38										
39										
40										

	M-700	6MM CAL #6745544	HEADSPACE	FIRING		SAFE (lbs)	TRIGGER	SEAR	SEAR
				PIN	INDENT		PULL (lbs)	LIFT	ENGAGEMENT
		Sample No. 4				ON	OFF		
1									
2		START OF TEST	Min +002	.022		8.3	5.4	3.8	.018
3									.034
4		LIVE FIRE							
5		after 1,000 rds	Min +002	.022		6.8	5.2	4.0	
6									
7		DRY CYCLE							
8		500 cyc.				7.7	7.7		
9		1000 cyc.				7.8	7.5		
10		1500 cyc.				6.8	7.3		
11		2,000 cyc.				7.8	7.2		
12		2500 cyc.				7.2	7.7	.017	.035
13									
14		LIVE FIRE							
15		after 2,000 rds	Min +003	.022		7.3	4.5	3.8	.0155
16									.035
17		DRY CYCLE							
18		3000 cyc.				6.7	8.7		
19		3500 cyc.				7.5	7.7		
20		4000 cyc.				7.7	6.7		
21		4500 cyc.				7.5	7.7		
22		5000 cyc.				7.7	6.8	.017	.036
23									
24									
25		LIVE FIRE							
26		after 2,500 rds TH	Min +003	.022		8.8	4.3	4.3	
27									
28		DRY CYCLE							
29		5500 cyc.				8.2	9.0	4.5	
30		6000 cyc.				7.3	9.0	4.1	
31		6500 cyc.				7.5	9.3	4.2	
32		7000 cyc.				8.3	9.2	4.3	
33		7500 cyc.				8.7	8.3	4.3	
34									
35									
36									
37									
38									
39									
40									

Report No. 81244
M-700 TRIGGER / SEAR BLOCK EVALUATION
No. 5
Aug. 31, 1982
R. Williams

M-700	6MM CAL. #6747525	1		2		3		4		5		6	
		HEADSPACE	PIN INDENT	FIRING	SAFE (lbs)	TRIGGER	PULL (lbs)	SEAR	LIFT	SEAR	ENGAGEMENT		
	Sample No. 5												
	CONTROL GUN					ON	OFF						
	START OF TEST	Mint 003	.025	5.2	5.2	4.2		.017		.020			
	LIVE FIRE												
	after 1,000 rds.	Mint 003	.025	5.5	5.2	4.0							
	DRY CYCLE												
	500 cyc.			6.3	7.6								
	1000 cyc.			5.6	8.3								
	1500 cyc.			5.8	7.8								
	2000 cyc.			6.1	8.5								
	2500 cyc.			5.1	8.3			.021		.0205			
	LIVE FIRE												
	after 2,000 rds.	Mint 003	.025	5.5	5.1	4.5		.020		.020			
	DRY CYCLE												
	3,000 cyc.			6.6	8.1								
	3500 cyc.			6.8	8.1								
	4000 cyc.			6.1	7.6								
	4500 cyc.			6.1	7.3								
	5000 cyc.			6.0	6.5			.020		.020			
	LIVE FIRE												
	after 2,500 rds. HL	Mint 003	.025	5.1	4.8	5.1							
	DRY CYCLE												
	5500 cyc.			6.1	8.0	4.7							
	6000 cyc.			6.1	8.0	4.6							
	6500 cyc.			7.0	8.5	4.6							
	7000 cyc.			6.8	8.1	4.7							
	7500 cyc.			6.3	7.6	4.8							

MODEL REQUIREMENTS
NEW BOLT ACTION RIFLE
KEY ELEMENTS

CONTD.

FEED SYSTEM

- o ROTARY MAGAZINE

BOLT

- o FULLY ENCLOSED CLAW EXTRACTOR
- o REDUCED LOCK TIME

STOCK

- o WALNUT
- o CAST OFF - TOE OUT
- o SPECIAL BEDDING
- o SPECIAL STYLING

CBW:EB

9-21-82

PROJECT	YEAR			MONTH			1982			1983			1984			1985			1986		
							3	6	9	3	6	9	3	6	9	3	6	9	3	6	9
MODEL SEVEN																					
MODEL 700 ADL																					
MODEL 1100 SPECIAL FIELD																					
MODEL 1100 SPECIAL DEER																					
MODEL 1100 SPECIAL WATERFOWL																					
MODEL 1100 LT-20 SPECIAL FIELD																					
MODEL 1100 LT-20 SPECIAL DEER																					
MODEL 1100 LT-20 SPECIAL WATERFOWL																					
MODEL 870 SPECIAL FIELD																					
MODEL 870 SPECIAL DEER																					
MODEL 870 SPECIAL WATERFOWL																					
MODEL 870 20 GA. SPECIAL FIELD																					
MODEL 870 20 GA. SPECIAL DEER																					
MODEL 870 20 GA. SPECIAL FIELD																					
NEW BOLT ACTION RIFLE																					
ELECTRONIC SHOTGUN																					
MODEL 7400 LT. WT. .223 CARBINE																					

CBW:EB
9-21-82

CHART LI

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PETERS

Xc: C. B. Workman

"CONFINE YOUR LETTER TO ONE SUBJECT ONLY" _____

October 5, 1982

TO: T. L. CAPELETTI
FROM: J. S. MARTIN *[Signature]*
SUBJECT: NEW BDL M/700 RIFLE

On Friday, October 1, 1982, I called Bob Emmons on the stock work he is doing for us. Again he said that he had not received the barreled action from Pete Grizzel. I obtained Pete's telephone number from Bob and called him. Pete said he would have the action complete by October 8th and would send it to Bob Emmons for stocking. This action will have a tang safety and his other goodies (new bolt handle, receiver shapes, etc.).

I also talked to Pete about doing a three position safety on the bolt plug. He said if we would send him one, he would do it.

I will have Fred Martin send him a M/700 bolt assembly and disarm the firing pin (shorten). I will then call Pete to get a schedule for completion.

JSM:ws

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE



Xc: J. S. Martin
 T. G. Bauman
 F. E. Martin

"CONFINE YOUR LETTER TO ONE SUBJECT ONLY" _____

October 5, 1982

TO: C. B. WORKMAN

FROM: T. L. CAPELETTI *TC*

SUBJECT: BOLT ACTION RIFLE DEVELOPMENT
- ACTION ITEMS FROM OCTOBER 4, 1982 REVIEW

<u>ACTION ITEMS</u>	<u>RESPONSIBILITY</u>
1. Magazine box construction - For a plastic box, is nylon the best material?	F. E. Martin
2. Light weight barrel contour - Can we GFM the proposed contour (similar to Mauser) ?	F. E. Martin
3. Reduced lock time - Develop a conceptual design of a two piece, T-slot firing pin with a steel tip and an aluminum striker.	F. E. Martin
4. Shop assignments - Have Jack Bechard and Bob Sanzo initiate a weekly meeting to review new work orders to determine which shop should perform the work.	T. L. Capeletti

TLC:ws

RD-46-6
REMINGTON ARMS COMPANY, INC.
INTER-DEPARTMENTAL CORRESPONDENCE

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Xc: C. B. Workma
F. E. Martin
T. G. Bauman

"CONFINE YOUR LETTER TO ONE SUBJECT ONLY" _____

October 26, 1982

TO: T. L. CAPELETTI
FROM: J. S. MARTIN *JS*
SUBJECT: BOLT ACTION RIFLE PROGRAM

Introduction:

The new bolt action rifle program is designed to replace the M/700 BDL in 1985 or 1986. The project is to come up with a bolt action rifle with a complete new lock. The stock will be a Bob Emmons' creation with a schnabel type fore-end tip. The action will be a M/700-type but have a new extractor design. The receiver will be octagonal designed with a new bolt handle and bolt release. The bolt plug may house the bolt lock and will have an octagonal type configuration to match the receiver. The safety has not been defined at this time but could be a tang type or three-position on the bolt plug. The barrel will have the hammer forge effect (diamond) and be free of sights. It is planned to have an integral type scope mount with matching rings. The trigger is to have an external adjustment and will not adjust less than 3#. The magazine box will be the rotary type that can be detachable or fixed.

Progress to Date:

Three stocks have been made by Bob Emmons, the last being a stock that production agreed upon. The fourth one will be made when Pete Grisel (a metal worker) has completed his thing on our barrel action.

Fred Martin has four actions in process ~~2~~³ short, ~~1~~³ long, and 1 extra long anticipating a new shell from the Ammunition Research Department in Bridgeport.
Completion Date =

10-26-82

A rotary type magazine box has been detailed and is now in our N/C Shop to be fabricated. Out Date =

Tom Bauman has finished a new designed extractor and it is in the Model Shop for fabrication. Out Date =

Summary:

If we plan to announce this gun for 1985 — warehouse in November 1984, we must transmit to the plant 18 months prior to November 1984. This means May of 1983. With 1982 almost gone and only two people working on the project, things have to change.

I will need two more engineers and a top priority to complete this job as scheduled. Also, I will need commitments of the design specifications in writing. There are too many things up in the air at this time - i.e., safety, trigger, bolt lock, etc. This I have trouble with. I think we need an outline or business plan that will again take us through this project on schedule.

JSM:ws

1

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE



Xc:

C. B. Workman
T. L. Capeletti

"CONFINE YOUR LETTER TO ONE SUBJECT ONLY" _____

December 6, 1982

TO: I. S. MARTIN
FROM: F. E. MARTIN
SUBJECT: MODEL STOCK - BOB EMMONS' FINAL VERSION

Per telephone conversation, Bob Emmons' has agreed to the following features to be used on the final stock complete.

- Schnabel fore-end tip
- Full steel grip cap
- Thin black rubber pad
- Fleur-de-lis checkering pattern (not like Winchester)
- Ebony reinforcement plugs
- Pete Grisel trigger guard and floor plate
- Pete Grisel metal work (restyled barrel and receiver)
- Approximate completion - January 1, 1983

Fi
FEM:ws

FIREARMS RESEARCH DIVISION

Origination Date _____

Update(s) _____

Project Title: M/700 Lightweight

Project No.: C-9052-000

Objective: To design a new concept M/700 rifle with lighter weight and be complemented by a new stock design (Bob Emmons) type. The barrel will be a M/7 outside contour. The calibers will be 30-06, 270, and 280 Rem.

Commitment: The planned announcement is 1985 with warehouse in November 1984. Guns are to be tested by August 1983 and transmittal to the Plant will follow.

Personnel Assigned: Jim Martin - Manager
Fred Martin - Engineer

Budget: Operating Expenses \$ _____ (including testing)

Research Capital Project/Expenses \$ _____

Uncertainties: • Can Production produce this type of quality stock?
 • Can Research test and transmit to the schedule?
 • Accuracy on Production guns.

FIREARMS RESEARCH DIVISION

<u>Program Steps and Timing</u>	<u>Responsibility</u>	<u>Completion Date</u>
• Investigate the design	Martin	Complete
• Set up prototype for Management/ Marketing approval	Martin	Complete
• Fabricate models for test — 6 samples each (3) calibers	Martin	Complete
• Set up drawings for transmittal	Martin	August 16, 1983
• Set up models for Field Testing and Marketing evaluation	Martin	August 16, 1983
• Test pilot line production guns	Research	March 1, 198
• Warehouse	Production	October 1984
• Ship	Production	December 198

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Xc: R. E. Fielitz
T. W. Rawson
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J. W. Brooks
J. P. Linde
G. D. Campbell
D. S. Findlay
R. S. Murphy
F. E. MartinIlion, New York
February 18, 1983TO: T. L. CAPELETTI
FROM: J. S. MARTIN
SUBJECT: RESEARCH/MARKETING MEETING

From the report dated February 10, 1983, priorities are as follows:

- Model 8700 Pump
- Model 700 LIGHTWEIGHT (Replaces Classic)
- Model 7 .223 and 250 Savage
- Model 8700 Special Field
- Model 8700 Waterfowl and Model 1100 Waterfowl
- Model 1100 and Model 8700 Deer Gun
- Model XP-100 New Calibers

Specification sheets for the Model 8700 Pump, Model 700 LIGHTWEIGHT, and Model 8700 Special Field are attached.

JSM:ws
Ilion Research Division
Attach.

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

Remington
SUPER

PETERS
SUPER

"CONFINE YOUR LETTER TO ONE SUBJECT ONLY" _____

February 18, 1983

MODEL 8700 PUMP

(1984)

Design Specification:

Gauge: 12 Only
Barrel: Vent Rib; 26" Imp. Cyl., 28" Mod., and 30"
Full Choke.
Chamber Length: 3"
Stock and Fore-end: Walnut with cut checkering

Stock & Fore-end

- Cut checkering new pattern
- 30 Gloss finish
- Recoil Pad - Old English style - 0.800" thick Pachmayr
- Grip - New contour (Bob Emmons type)
- Grip Cap - New plastic (plain similar to Bob Emmons type)
- Fore-end - New styling (M/12 Win. type)
Full wrap around cut checkering

Receiver

- Plain side panels - Rollmark to be small similar to M/1100 Special
- Finish - 3 samples needed to evaluate
 - Standard polish
 - Glass bead top and bottom radius
 - Glass bead all over
- Ejection Port - New contour (Research to provide models)
- Outside Appearance - Research to provide models with changes to top radius, sight lines, etc.

Barrel Assembly

- Add use the M/1100 barrel with 870 guide ring
- Use M/1100 sight line (parallel centerline)
- M/1100 vent rib tapered with undercut post
- Front sight - Investigate smaller type ivory bead.
Also, set up barrel with standard metal front sight. (No middle sight)

Magazine Cap

- Use standard M/870 design

Trigger Guard

- Action bar release - Investigate new finger release
- Finish to match receiver
- New rounded trigger contour

J. S. Martin:ws

REMINGTON ARMS COMPANY, INC.

INTERDEPARTMENTAL CORRESPONDENCE



"CONFINE YOUR LETTER TO ONE SUBJECT ONLY" _____

February 18, 1983

MODEL 700 LIGHTWEIGHT

(1984)

Design Specification:

The Model 700 LIGHTWEIGHT replaces the Model 700 CLASSIC.

Wood:Stock

- Bob Emmons type stock
- Fore-end tip = black dull finish (plastic)
- Cut checkering = point to point - similar to stock no. 1 (Bob Emmons) 20 L.P.I.
- Black plastic grip cap = design similar to the steel one on stock no. 4 (Bob Emmons)
- Recoil pad = Old English - 0.800" thick Pachmayr
- Sling swivel studs
- Cast off - toe out?

Metal:Receiver

- Full round
- Thicker recoil lug
- Scope mounts = standard
- M/700 anti-bind bolt
- Front lock system

- Long action only
- Fire control (same as M/700)

Barrel Assembly

- M/7 LWT contoured barrel
- Drilled and tapped - no sights (no sights to be added)
- Standard barrel length

Bolt Assembly

- M/7 bolt handle
- Reduced lock time

Feed System

- Anti-bind follower
- Standard M/700 BDL floor plate/guard and feed system

Stock and Metal Finishes:

- Stock - 30 Gloss
- Metal - Standard M/700 finish

Calibers:

- 270
- 30-06
- 280

J. S. Martin:ws

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE



"CONFINE YOUR LETTER TO ONE SUBJECT ONLY" _____

February 18, 1983

MODEL 8700 SPECIAL
(1984)

Design Specification:

Gauge:	12 and 20
Barrel:	Vent Rib; 21" Full, Mod. & Imp. Cyl. chokes
Chamber Length:	3" only
Stock:	English Type (Walnut)
Fore-end:	Shorten M/870 type (Walnut)
Checkering:	New cut type
Magazine Capacity:	3 shells

Stock & Fore-end

- English straight grip type (add use the M/1100 Special)
- Cut-checkering - M/1100 Special pattern
- Recoil Pad - Old English style - 0.800" thick Pachmayr
- Fore-end overall length to balance with shortened tube and Barrel
- Both Stock and Fore-end to have 30 gloss finish

Model 8700 Special

-2-

Barrel Assembly - Vent Rib only 3" Chamber

- Length - 21"
- Choke - Full, mod and imp. cylinder
- Guide Ring - moved back 1.750
- Front Sight - Bradley Ivory Bead (small)
- Middle Sight - standard
- Finish and Rollmark - standard

Receiver Assembly

- Rollmarking - similar to M/1100 Special
- Shorter Magazine Tube - 3 shot capacity
- Finish to be standard

Fire Control

- Standard

JSMartin:js

ADL

ADL m/700 - How?

Jim Martin

I. Choice -

Stock : Classic

- Walnut (Birch - cost)
- RKW Finish
- Grip Cap - BDL ?
- Butt Plate - old style Plain m/4
- ~~String Swivels~~
- Cut Checker - small Pattern
- white line spacers thin -

Actions : m/700

- ~~of~~ Floor Plate -
- iron sights Present Line
- No bird "Stamped" Follower ?
- No Bolt Lock
- ~~stamped~~ Bolt - Polish . Bolt
- improved metal Finish
- m/700 bolt handle w/ checkering
- Standard Finish

Accessories :

- Scope mount rings
- Slng. Swivels

BDL

BDL m/700 How - ?

Stock Bob Emmerts "Style"

- Grip Cap - m/4
- Sling Swivels Stots
- Full Pattern Checkering 20 lines, 20
- medium Gloss Finish
- ~~Present BDL Butt Plate~~ Classic Style.
- Figured walnut. "B" Grade
- no white line spacers
-

Actions:

- m/700 with steel trigger guard ^{Box Type} ~~Blow Plug~~
- no iron sights - clear
- no bird cast milled mag. follower
- no bolt lock
- jeweled bolt.
- m/700 bolt handle w/ checkering
- improved metal finish on all parts
- scope mount rings.

Also:

New sights -

I. Description of New Products (Include Impact on Other Product/Programs)

- Basic Model 700 Action
- New stock design (Bob Emmon's type)
- Octagon type receiver
- New bolt handle (including possibility of bolt lock)
- New extractor design
- New magazine box design (rotary)
- New fire control
- Available for shipment in November 1985

II. Development Responsibility (Check One) X Research Production

III. Development Schedule

Prototypes Available 12-1-83 3 Mos. Inventory Established ?
Trial & Pilot Complete 3-1-85 Announce to Trade 11-85

IV. Estimates

	Years				
	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>
	<u>83</u>	<u>84</u>	<u>85</u>	<u>86</u>	
• Forecast Sales Volume (M Units)					
Total					
Incremental					
• Pretax Earnings (\$M)					
Full Book					
Incremental					
• Program Investment (\$M)					
(Incremental Costs to Implement)					
Research Expense	130,000	105,000	25,000		
Production Expense					
Permanent Investment					
Increase in Working Capital					
• Net Return on Program Investment					
(Years 1 & 3 only)					
• Payback (# of Years)					
• Manpower (Man Years of Effort)	Mktg.	Prod.	Res.	2	
• Probability of Success (Check One)	<u>X</u> High	Medium	Low		

V. Preparers

Marketing Production
Research J. S. Martin Business Services

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

Remington



cc: C. A. Riley
W. H. Forson
J. P. Linde

June 23, 1983

TO: C. B. WORKMAN
FROM: T. W. RAWSON *TWR*
SUBJECT: NEW PRODUCT DEVELOPMENT REQUEST
NEW GENERATION BOLT ACTION RIFLE

A request has been made for high spot economic evaluation of the new generation bolt action rifle planned for 1987 introduction as replacement to the Model 700.

It is expected that process modernization will have some effect on costs at that point in time.

We would also like to have some feel for the cost of some of the more innovative intended changes (e.g. rotary magazine).

**REMINGTON ARMS CO.
RECEIVED**

JUN 27 1983

FIREARMS RESEARCH DIVISION

TWR:daf
Attach.

DATE June 22, 1983

SECTION A

I. Description of New Product

New Generation Bolt Action Rifle

II. How Fit Strategic Plan/Business Mission

Replaces Model 700 Rifle starting in 1987. New mechanism and styling. Upgrade of mechanical and styling features. Provides competitive advantage over major competition

III. Economic Estimates (Outset)

Dist. Price in 1983 \$280.00

YEARS				
1	2	3	4	5

A. Forecast Sales Volume (M Units)

Total	100	125
Incremental	0	0

B. Pretax Earnings (\$M)

Full Earnings
Incremental

C. Program Investment (\$M)
(Incremental Costs to Implement)

Research Expense
Production Expense
Permanent Investment
Increase in Working Capital

D. Net Return on Program Investment
(Years 1 & 3 Only)

E. Payback (# of Years) _____

F. Manpower (Man Years of Effort) Mktg. .2 Prod. _____ Res. _____

G. Probability of Success (Check One) _____ High _____ Medium _____ Low

IV. Development Responsibility (Check One) _____ Research _____ ProductionV. Marketing Approval

Director Finance _____

Director Legal _____

Director Marketing _____

Director Production _____

Director R & D _____

New Bolt Action
Rifle Design

NEW PRODUCT DEVELOPMENT REQUEST

DATE April 20, 1983

I. Description of New Products (Include Impact on Other Product/Programs)

- Basic Model 700 Action
- New stock design (Bob Emmon's type)
- Octagon type receiver
- New bolt handle (including possibility of bolt lock)
- New extractor design
- New magazine box design (rotary)
- New fire control
- Available for shipment in November 1985

II. Development Responsibility (Check One) ☒ Research ☐ Production

III. Development Schedule

Prototypes Available 12-1-83 3 Mos. Inventory Established ?

Trial & Pilot Complete 3-1-85 Announce to Trade 11-85

IV. Estimates

Years				
<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>
<u>83</u>	<u>84</u>	<u>85</u>	<u>86</u>	

- Forecast Sales Volume (M Units)

Total
Incremental

- Pre-tax Earnings (\$M)

Full Book
Incremental

- Program Investment (\$M)
(Incremental Costs to Implement)

Research Expense	130,000	105,000	25,000
Production Expense			
Permanent Investment			
Increase in Working Capital			

- Net Return on Program Investment
(Years 1 & 3 only)

- Payback (# of Years) _____

- Manpower (Man Years of Effort) Mktg. _____ Prod. _____ Res. 2

- Probability of Success (Check One) ☒ High ☐ Medium ☐ Low

V. Preparers

Marketing _____ Production _____

Research J. S. Martin Business Services _____

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE



Randey

xc: J.S. Martin
F.E. Martin
R.H. Smith
L.B. Bosquet

"CONFINE YOUR LETTER TO ONE SUBJECT ONLY" _____

Ilion, New York
August 5, 1983

To: C.B. Workman

From: *JW* J.W. Bower

Subject: High-Spot Investment and Cost Estimate for
Proposed New Generation Bolt Action Rifle

Based on the drawings given to me by F.E. Martin, the Process Development Department estimates that the required investment for this proposed rifle will range from \$750M to \$2,100M, and the per gun cost will range from a reduction of \$2.51 to an increase of \$4.43 over the present M/700.

We estimated the rotary magazine box only out of plastic. The investment for four molds is projected to be \$145M. The estimated per part cost for the four-piece magazine box assembly is \$1.28, which compares with \$1.85 for the present ADL assembly, and \$4.92 for the present BDL assembly.

We did look briefly at the possibility of injection molding the rotary magazine parts out of metal but decided that the price would be prohibitive.

Two receiver alternatives were reviewed. The least expensive is a round receiver design with cut facets. Investment for this alternative is estimated at \$600M and the per receiver cost at \$21.43. Cost of the present M/700 receiver ranges from \$19.43 to \$20.30.

To: C.B. Workman

-2-
8/5/83

The second receiver alternative involved a faceted receiver made from flat bar stock. Estimated investment for this design is \$1,195M with a per receiver cost of \$24.43.

A savings on the investment for receiver manufacturing will be realized if Firearms Modernization's flexible system is successful. Assuming that equipment is available when this design is transmitted, the investment for the faceted round receiver will drop from \$600M to \$430M. In the case of the faceted flat receiver, the investment will be decreased from \$1,950M to \$980M.

While the cost of producing the new receiver over a flexible machine line should be significantly cheaper, so would the cost of producing the existing receiver. The added costs of grinding and polishing the facets would still be present.

The estimate has only looked at the magazine box and receiver. For purposes of this estimate, no drawings were provided for any other parts. At such time as a more formal estimate is made, drawings for the complete rifle will be needed to verify that no other parts will effect investment and piece price.

JWB:js
Ilion Research Division

FIREARMS DEVELOPMENT SCHEDULE - REQUIRED MODELS							
8/17/83							
		ENGINEERING PROTOTYPES 1	WORKING PROTOTYPES 2	DESIGN VERIFICATION 3	PRE TRANS. FIELD REVIEW 4	POST TRANS. FIELD REVIEW 5	TRIAL & PILOT 6
							7
1	M/700 Lightweight		1 Ea. Cal.	5 Ea. Cal.	10 Any Cal. Mix	10 Any Cal. Mix	
✓ 2	Low Priced M/870		1	N.A.	10	N.A.	
✓ 3	M/870 Restyle		1 Ea. Ga.	5 Ea. Ga.	10 Any Mix	10 Any Mix	
✓ 4	M/1100 Restyle		1 Ea. Ga.	5 Ea. Ga.	10 Any Mix	10 Any Mix	
✓ 5	Low Priced M/700		1 Ea. Cal.	5 Ea. Cal.	10 Any Mix	N.A.	
✓ 6	M/700 250 Savage		1	5	N.A.	N.A.	
✓ 7	M/870 Waterfowl		1	5	10	N.A.	
✓ 8	M/1100 Waterfowl		1	25	10	10	
✓ 9	Low Priced M/1100		1 Ea. Ga.	5 Ea. Ga.	10 Any Mix	10 Any Mix	
✓ 10	Model Seven New Caliber		1 Ea. Cal.	5 Ea. Cal.	N.A.	Any Mix	
✓ 11	338 Win. Mag. M/700		1	5	N.A.	N.A.	
✓ 12	M/870 Special Field 12 Ga.		1	5	10	10	
✓ 13	M/870 Special Field 20 Ga.		1	5	10	10	
14	New Bolt Action Rifle		1 Ea. Cal.	5 Ea. Cal.	10 Any Cal. Mix	10 Any Cal. Mix	
15	Choke Tubes		1 Set	TBD	10	10 Sets	
16	New Auto/Pump Shotgun		5 Ea. Ga.	50 Auto Ea. Ga. 10 Pump	10 Ea.	35 Ea.	
17	REFAS		5 Ea. Cal.	50 Ea. Cal.	10	35 TBD	
18	HIPEX		5 Ea. Cal.	50	10	35	
19	Orifice Selector		5 Ea. Ga.	25	10	35	
20	All 3" Chamber		1 Ea. Ga.	5 Ea. Ga.	10	10	
21	New Cheap Shotgun		5 Ea. Ga.	50 Ea. Ga.	10 Any Mix	35 Any Mix	
22	New Slug Barrel		5 Ea. Ga.	25 Ea. Ga.	10	35	
23							
24							
25	M/7400 Carbine		1 Ea. Cal.	10 Ea. Cal.	10	10	
26	M/7600 Carbine		1 Ea. Cal.	5 Ea. Cal.	10	10	
27	M/7400 New Caliber		1	10	10	10	
28	M/7600 New Caliber		1	5	10	10	
29	M/700 L.H. Short Action		1	5	N.A.	N.A.	
30	M/870 Comp. Trap Set		1	5	10	10	
31	Cheap Rimfire Auto		2	10	10	35	

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

Remington
PUMP*PETERS*
PUMP

Xc: J. W. Bower

"CONFINE YOUR LETTER TO ONE SUBJECT ONLY" _____

Ilion, New York
December 9, 1983

To: T. W. Rawson

From: R. S. Murphy RSM

I would like you to address the following questions concerning the Sportsman 12 Auto and the New Bolt Action Rifle. We need some direction in these areas to help streamline our design efforts.

Sportsman 12 Auto (Model 1100 El Cheapo)

Do we want a 3" chamber as in the Sports 12 Pump?

If so, what endurance life should we design for: i.e., do we also want the magnum inertia sleeve and orifice diameter?

What loads should operate this gun?

How long will this gun be in the line?

New Bolt Action Rifle

We are presently in the design stage of two new fire control options for this rifle.

- How strongly do you feel about the need for a connector? Can we drop this?
- In a new "exposed components" firecontrol, do we really want the customer to be able to adjust the engagement in addition to the weight of pull?
- 3 position safety.

RSM:ws
Ilion Research Division

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

Remington
OUTPOST*PETERS*
OUTPOST

"CONFINE YOUR LETTER TO ONE SUBJECT ONLY" _____

January 13, 1984

To: J. W. Bower
From: R. S. Murphy *RSM*
Subject: New Bolt Action vs. Mountain Rifle

It seems to me from talking to Clark that the 1988 introduction of the New Bolt Action preferred design may not be as flexible as we think. The FMS is scheduled to produce parts for a 1988 introduction and the New Bolt Action receivers seem to be first in line. Does it matter whether the receivers run on the FMS belong to a Mountain Rifle or a New Bolt Action?

We agreed that the need for a new rifle in 1988 was questionable if the Mountain Rifle was to completely take over the BDL line in the preceeding three years. The question now may be: if the New Bolt Action is a given for 1988, can we justify an entire BDL takeover by the Mountain Rifle in the interim?

I will determine what F.M. is expecting for the FMS so that we can discuss it before Wednesday.

RSM:ws

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

Remington
UPPENT

PETERS
UPPENT

"CONFINE YOUR LETTER TO ONE SUBJECT ONLY" _____

January 27, 1984

TO: J. W. Bower
FROM: R. S. Murphy RSM
SUBJECT: Model 700 Mountain Rifle History

The following pages represent a fairly complete history of the Model 700 Mountain Rifle from its beginning. The three sections include:

1. Excerpts from Operations Committee Minutes (where available)
2. Excerpts from Monthly Reports
3. Interdepartmental correspondence

RSM:ws
Attach.

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

Remington



XC.

to WLF
CAR
I M BOWER ✓

February 14, 1984

Handy -
For information

To: T. W. Rawson

From: R. F. Dietz

See attached copy of a letter from Bob Hagel. He's one of the numerous proponents among serious writers for the three-stage safety. Based on what I know, I believe this would be a positive step for us someday, should it be economically feasible. Is this still an open possibility?

R.F.D.

R. F. Dietz

RFD:1b
Attach

Remington.



REMINGTON ARMS COMPANY, INC.

TELEFAX
964 201
BRIDGEPORT CT

SPORTING ARMS-AMMUNITION-TARGETS-TRAPS

939 BARNUM AVENUE
P.O. BOX 1939

TELEPHONE
203-333-1112

BRIDGEPORT, CONNECTICUT 06601

February 14, 1984

Mr. Bob Hagel
HC 10, Box 1190
Gibbonsville, ID 83463

Dear Bob:

Thanks for your letter. I'm glad the unit arrived safely.

Having read you for a number of years, I'm aware of your feelings about the three-position safety. I would certainly expect you to continue promoting something you believe so strongly in. In the meantime, I'm passing your letter around here to those who should be aware of your feelings.

Best wishes,

A handwritten signature in dark ink, appearing to read "R. Dietz".

Richard F. Dietz
Manager
Product Information

RFD:lb

BOB HAGEL
HC 10, BOX 1190
GIBSONVILLE, IDAHO 83463
PHONE (208) 866-2221
Feb. 9, 1984

RECEIVED

FEB 13 1984

RE: KINZLER

Dear Dick,

Just a quick note to let you know the trigger arrived and how much I appreciate your kind efforts in obtaining it for me. Of course all I needed was the safety lever, but will swap the parts with no problem to get what I want.

Do wish the engineers at Remington would come up with a three-stage trigger setup so that the bolt handle could be locked down. As much as I like the M-700 action, I would not buy a Model 700 with the new safety setup for serious hunting of big game--especially any game that could possibly be dangerous. Any time you are hunting where you may be in the brush there is the possibility that the bolt handle may be up a little when you need to shoot in a hurry. Anyone who doesn't believe that hasn't spent much time hunting brown bear in coastal Alaska.

I can appreciate Remington's concern with the liability angle, with so damn many people sue-happy, but a three-stage trigger arrangement would take care of both situations. Why don't you put pressure in the right place for that kind of safety setup. If there is any way I can help to make one of the best rifle actions ever developed have a safety as good as the action, just give me a yell.

Don't worry, Dick, I won't write anything on the trigger swap. I will, however, continue to express my opinion in print on safeties that do not lock the bolt handle on rifles designed to be used for hunting big game.

Thanks again for this and the many past favors.

Best,

Bob Hagel

Tang safety → legality

Build 3 pos. safety on bolt plug

Gas Direction at rear of Bolt
along left side of bolt raceway

Timing of ejection/feed.

problem: Shell ejects before bolt
is stroked far enough to pick up
feeding shell. can short stroke.

also vs. Mauser captive action bolt.

problem: shell can slide fwd. into
empty chamber + shooter won't know
it gun is loaded causing second feed
+ firing out of battery

8-29-84

* Standards Note on Completion Date

Gus Walker "Brainstorming"

Bolt Assy 310 savings

no extractor undercut (done as assembly)
assembly savings of extractor
on rotation lug

Firing Pin Assy Increase 483

bolt plug increase

Screwed assy

Firecontrol Savings 342

new design
fewer parts
easier assy

Magazine

trigger guard + floorplate - wash
~~no spacers~~ ~~52708~~

Wash totally

Stock assume wash

Safety Assy

141 increase

adding function new design

Xc: J. W. Bower
F. E. Martin
R. S. Murphy

New Bolt Action Program Timing, August 3, 1984

Management Review	September 12, 1984
Fabricate Prototypes (6)	December 1, 1984
Engineering Test and Evaluation	January 1, 1985
Transcribe to C.V. and Review	January 1, 1985
Redesign and Rebuild (100 Samples)	May 1, 1985
Drawings to Plant for Process Estimation	May 15, 1985
Design Acceptance Testing	August 1, 1985
Final Economics	September 1985
Management Approval	October 1985
Design Transmittal	October 1985

RSM:ws

CENTERFIRE RIFLESMODEL 700 BDL SHORT ACTION LEFT HAND
(1984 Introduction)

The Secretary presented economics for the proposed Model 700 BDL Left Hand in Short Action calibers (Exhibits 11 and 12). Production reported that Trial and Pilot will be scheduled for the Third Quarter of 1983.

[REDACTED]

Research reported that a new bolt action rifle is being developed to replace the Model 700 BDL. This new rifle, to be introduced in November, 1984, will feature new styling and improved function (Exhibit 13). Styling items include a Stock designed by Bob Emmons, an octagonal Receiver with integral scope mounts, and a lightweight Barrel contour polished without removing the GFM hammer marks. Functional improvements will include a rotary Magazine Box for more reliable feeding, fully enclosed claw type Extractor for added strength, no bind, easy lift Bolt for smoother action, Receiver with a heavier, integral recoil lug for added stability, a redundant Safety Switch, and a fully adjustable Fire Control that does not require removal from the Stock. Due to priorities being placed on 1983 programs, preliminary design completion has been delayed until March.

The fourth model gun from Bob Emmons, featuring revisions to the Receiver by Pete Grisell, has been delayed until February. That gun will include a Tang Safety and a Schnabel Fore-end. Initial designs have also been completed for the rotary Magazine Box, the fully enclosed claw type Extractor, and Receiver with integral recoil lug. Tests of the Extractor will begin in January. However, priorities being placed on 1983 programs are delaying fabrication of key components.

Marketing noted that recent data indicate that some features proposed for the Model 700 BDL replacement are not as important to the customer as previously thought. Final specifications will be proposed in January.

CENTERFIRE RIFLES

MODEL 7400 .223 REM - Cont'd.
(1983 Introduction)

Research presented four prototype rifles for Committee review. They noted that finalized features include an aluminum Receiver, unchecked birch wood, low gloss finish on metal and wood, a four-shot Magazine Box, Sling Swivels, and an 18-1/2 inch Barrel. The concept of a lightweight Barrel has been proposed but not finalized.

Production reviewed the list of model requirements issued by Research (Exhibit 9). They noted that the design calls for a new Magazine, new Extractor, new Ejector, and a new Bolt. Capital investment required to implement the proposed design is estimated at \$270,000. Operations expenses are estimated at \$70,000.

Vendor quotations for the new Bolt Release and the new Magazine Filler Piece indicate a 14-week delivery for each component. Assuming orders were placed by March 1, 1983, these components could be received by mid-June, and Magazine Boxes could be assembled by the end of June. Research tests of Trial and Pilot guns could be completed by about August 1, with production quantities to follow in the Fourth Quarter.

Production estimates the 1983 unit factory cost for this gun at \$208.06, compared to \$211.95 for the standard Model 7400 in 30-06 caliber (Exhibit 10). Cost advantages gained in the Stock, Fore-end, and Trigger Plate are partially offset by increased costs for the aluminum Receiver, Breech Bolt, and Sling Swivel Studs, and by additional depreciation. Production indicated that most of the Receiver cost increase is due to material costs.

The Chairman noted that the Model 7400 sales picture is very disturbing and that the addition of the .223 REM, forecast at 3,000 units, does not provide sufficient improvement. Marketing indicated that additional .223 REM volume could be achieved with the addition of a 10-round Magazine. The Chairman asked that Marketing give more thought to this and other proposals to improve Model 7400 sales.

~~CONFIDENTIAL - REMINGTON~~
~~CONFIDENTIAL - REMINGTON~~

Marketing reported that a combination of several events have modified their Bolt Action rifle strategy. Ruger's introduction of a lightweight short action Model 77 in 1983, and

CENTERFIRE RIFLES

(1984 Introduction)

their apparent plans for a long action 30-06 version, suggests further movement toward full-size, lighter weight bolt action rifles.

While forecast numbers do not yet support the contention, trade reaction indicates that the Model 700 ADL Restyle will take some sales away from the Model 700 BDL. Marketing plans to replace the current Model 700 BDL with a new bolt action rifle in 1986. To prevent further sales erosion in the interim, and to possibly provide timing relief, they propose to introduce a new version of the Model 700 in 1984.

The new version will be offered in long action only, and dedicated to standard calibers (e.g., 270, 280 and 30-06). A slim profile Barrel, similar to the Model Seven LWT, but in 22 inch length, and a Bob Emmons styled Stock will be the main features of the new gun, to be designated the Model 700 LWT. Marketing proposes to drop the Model 700 Classic, and would continue to produce the Model 700 ADL and BDL in most of the calibers presently offered. Exhibit 11 details the specifications that would be deleted and added under this proposal.

Research reviewed the features proposed for the Model 700 LWT (Exhibit 12). They noted that scope mounts and rings will be considered if economically feasible. Sample mounts will be available by mid-March.

MODEL 788 - 22 INCH BARREL
(1984 Introduction)

Marketing reported that when the Model 788 was restyled in 1980, the Barrel length of hunting caliber rifles was reduced to 18-1/2 inches. This was done to provide a short barreled rifle in the line after the Mohawk 600 was discontinued. With the introduction of the Model Seven LWT, the short barreled Model 788 is no longer required. Both domestic field sales and International sales indicate the 22 inch Barrel in Model 788 will sell better in their respective markets. Marketing estimates that by making this change, 1984 sales will be 4,000 to 5,000 guns above the 1983 forecast.

EXHIBIT 11

MODEL 700 LWT PROPOSAL

SPECIFICATIONS TO BE DELETED

MODEL 700 CLASSIC

22-250

.243

6MM

.270

30-06

7MM REM Mag.

Classic Calibers
(One year runs)

SPECIFICATIONS TO BE ADDED

MODEL 700 LWT

.270

30-06

.280 (Classic Calibers
One year run)

EXHIBIT 12

MODEL 700 LIGHTWEIGHT

PROPOSED FEATURES:

- Replacement for Classic
- Stock: New styling (Bob Emmons)
Cut checkering
Medium gloss finish
- Barrel: Model Seven
No sights/drilled & tapped
- Receiver: Thicker recoil lug
No bind Follower
Low lustre finish
- Calibers: .270
30-06
.280
- Other: Scope mounts & bases provided
Model Seven Bolt Handle

Impact: Share restoration and dealer relations. Respond to numerous dealer requests as well as increasing popularity of low-priced .223 ammunition for plinking.

Economics: Incremental pretax earnings of \$168M for first year on sales of 2.5M units.

Comments:

- o Research expects to transmit design on June 10 after satisfactory test of no bind follower. Production anticipates trial and pilot ready for acceptance test in August, with production commencing in September and warehousing in November.
- o Chairman requested accuracy test be performed before design transmittal.

Action: Committee approved implementation of Research and Production programs leading to trial and pilot acceptance.

Reference: Addendum G.

Items:

- o Model XP-100 in .223 Rem. and 7mm-08 calibers
- o Model 7400 in .223 Rem. caliber
- o Model 788 long barrel

Comments: Above items have been withdrawn by Marketing in collaboration with Research and Production from 1984 introduction because of inadequate resources for implementation.

~~_____~~
~~_____~~
Position: High quality, higher priced center fire bolt action hunting rifle for long-range, flat shooting cartridges in mountainous terrain.

Impact: Share restoration - reverse competitive thrusts by USRAC (M70 featherweight) and Ruger (M77 ultra light).

Comments: Research plans for product acceptance and design transmittal during July 1983. Accuracy tests have been satisfactory and Marketing has approved prototype. Production anticipates a constraint on cut-checkering capacity; however, warehousing can be achieved during November 1984.

Reference: Addendum H.

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MAY 13 1983
~~CONFIDENTIAL~~

Marketing Comments

In the fall of 1981, a competitive bolt action rifle audit was performed (Exhibit 1). Samples of Remington and competitive product were procured and reviewed by top management. Voting was close, but Remington and Ruger tied for first place when price was a consideration. Winchester's new featherweight took first place stock styling honors.

Exhibit 2 depicts a subjective marketing analysis of the features of the top three bolt actions. The first and most obvious conclusion from this chart is that a high degree of homogeneity exists in bolt action rifles. The competition, for this largest segment of center fire rifles, has been such that products have evolved to a very close relationship to one another. The functional pluses of Remington's perceived advantage in accuracy, trigger pull quality and strength are important with accuracy and trigger pull quality receiving special emphasis in our recent quality cue research. While strength is important to us from a product liability concern, it seems taken for granted by the consuming public, at least in the absolute - who's best kind of - analysis.

We also know from our quality research that the stock is a powerful visual cue in bolt action rifles. Stock styling and finish is certainly one of the prominent visual cues in the decision to buy a particular rifle. Relating closely to this is also the subject of balance, feel, and weight.

Remington's basic action has been and remains today in the functional sense, one of the best on the market. Our cost/price advantage has, in the comparison with Ruger, been mitigated to some degree in recent years. The visual appearance of some of our mechanical features like the extractor and safety switch are not in keeping with a rifle commanding a premium price. More importantly, the styling of the 700 dates back to the early 1960's when white line spacers, Monte Carlo stocks, and glossy finishes were the emerging fashion. Winchester and Ruger get plus scores in the area of stock styling because they offer what we believe today is more in vogue with 1980's bolt action rifle users.

The collection of magazines, books, slides, and photos represents documentation of what is happening in bolt action rifle styling. The credit for this trend goes back to the days of Jack O'Connor, then shooting editor of Outdoor Life. As one of the more prolific writers of the 50's and 70's, O'Connor's

Addendum H-1

description of the perfect big game rifle, known as the Light Mountain rifle, has become a standard. Custom builders have merely adopted his style and proliferated in number to fill a void not until now being recognized by industry.

The Light Mountain rifle is the epitome of what has become known in the current vernacular as "Classic." Straight comb with cheekpiece, fore-end tip, grip cap and butt pad all without white line spacers. The barrel is clean, free of sights and tapered more than normal to reduce weight but left at 22" as the best compromise for ballistics in .270 to 30-06 class rifles.

Ruger's M77, by no coincidence because it was designed by Len Brownell, leaned heavily in this direction. The M70 featherweight prototyped by Don Allen and Al Lind, two contemporary stock makers, also heads in this direction with the schnabel being the only excursion from the trend. Ruger's latest ultra light seen in long action at the NRA Show is the last of Len Brownell's efforts to refine Ruger's styling. It has all the features of O'Connor's Light Mountain rifle except the cheekpiece and 22" barrel.

So much for precedence. The 700 Mountain rifle, as I will refer to it, is not a competitor to the M7LWT. It is what the M7 can never be - a long-range, flat shooting, open country, high country, deer, antelope, goat, sheep, caribou, elk rifle. In 30-06 and .270, this model is aimed squarely at the main volume bolt action rifle sales and is a styling evolution of the 700BDL. The M7LWT is short action caliber, and with 18-1/2" barrel, was never intended to take over under these conditions. It was designed as a close hunting, brushy terrain, short to medium range deer, black bear gun. We propose to drop the 700 Classic in 1984 with the exception of one classic caliber. The mountain rifle is in the final analysis and by modern definition, more "classic" than the Classic. The Classic is not successful and needs to be changed.

This new M700 is aimed squarely at the M70 featherweight, the Ruger 77 and Ruger's new M77 ultra light. It will also take some volume from the BDL first because it is lighter, second because we believe it to be the emerging style of 1980's bolt actions. The success of the BDL configuration cannot be denied. We cannot say unequivocally this model will replace RDL styling. Share analysis suggests the trend is in that direction. The mountain rifle provides flexibility and contingency to our plans. It presents a direct style alternative without the expense of unnecessary mechanical change. If the demand for the BDL falls off, we can convert its other configurations to this new stock style. If the RDL demand continues, we now have two styling models with which to confront the competition. We believe for the next several

Appendix E-2

years, our bolt action rifle offering will be strengthened by this offering. Should all of these manipulations fail, R&D still has a brand new action with completely redesigned functional aspects in backup.

The documentation on this styling trend is considerable. The people who have been involved with the planning effort, and that includes Research and Production, are in agreement that this model is appropriate.

Research Comments

Proposed features for this rifle (Exhibit 3) include a Bob Emmons style stock, cut checkering, medium (30) gloss finish, Old English style recoil pad, Model Seven barrel contour, and provision of scope mounts and bases. Current plans include .270, 30-06, and .280 calibers. A prototype has been approved by Marketing and accuracy tests completed on all three calibers. The Development Schedule (Exhibit 4) includes product acceptance and design transmittal in July 1983. Accuracy test results (Exhibit 5) indicate no major problems with the design. The primary item remaining is completion of the stock drawing.

Production Comments

The larger checkering pattern will add burdening to the N/C checkering machines and development of a new bolt handle and stock former will require a timely release of the design.

Additional equipment may be required for the bolt line and N/C checkering facilities. Warehousing is planned for November 1984.

Addendum 2-2

After inspecting all samples, please fill in matrix below. Best score = 1; Worst score = 7. Duplicates are acceptable.

	REM. 700-BDL	RUGER M/77	REM. 700-ADL	W-W 70-XTR	W-W 70-FWT	BROWNING BBR	SSW 1500
Stock Appearance	2	3	6	4	1	5	7
Action Smoothness	5	3	6	4	2	1	7
Metal Finish	2	5	3	6	4	1	7
Extractor, Ejector, Locking System	1	4	2	5	5	3	6
Safety	4	2	4	3	3	1	5
Accessory Parts (Grip Caps, Sights)	2 (2)	1 (3)	6 (5)	5 (5)	4 (4)	3 (1)	7 (6)
Best Overall No Price	1	3	6	4	2	5	7
Best Overall With Price	1	1	2	4	3	5	6

Number in Parenthesis is placement based on individual item scores above. Best overall B.O. and W. price reflect overall impression and other factors not identified as individual items.

COMMENTS:

EXHIBIT 1

EXHIBIT 2

BOLT ACTION RIFLES
COMPETITIVE COMPARISON

	<u>M700</u>	<u>M70</u>	<u>M77</u>
STRENGTH	+	0	0
ACCURACY	+	0	0
TRIGGER PULL	+	0	0
EXTRACTOR	0	+	+
EXTRACTOR APPEARANCE	-	0	+
EJECTOR	0	0	0
FEEDING	0	0	0
SCOPE MT/SIGHTS	-	0	+
ACTION SMOOTHNESS	0	0	0
SAFETY	0	+	0
SAFETY APPEARANCE	-	+	+
METAL FINISH	0	0	0
STOCK FINISH	+	0	0
BALANCE, FEEL, WEIGHT	0	+	+
STOCK STYLING	0	+	0

+ = ADVANTAGE
 0 = SLIGHT ADVANTAGE
 0 = NO ADVANTAGE
 - = DISADVANTAGE

MODEL 700 LIGHTWEIGHT

PROPOSED FEATURES:

- Replacement for Classic
- Stock: New styling (Bob Emmons)
Cut checkering
Medium (30) gloss finish
Old English style recoil pad
- Barrel: Model Seven contour
22" length
No sights/drilled and tapped
- Receiver: Thicker recoil lug
No bind follower
Low lustre finish
- Calibers: .270
30-06
.280
- Other: Scope mounts and bases provided
Model Seven bolt handle
Sling swivel studs

MODEL 700 LIGHTWEIGHT

Design Status

- Prototype approved by Marketing
- Accuracy test results completed

Development Schedule

- Model Requirements - May 1983
- Preliminary Design - May 1983
- Product Acceptance - July 1983
- Design Transmittal - July 1983

MODEL 700 LIGHTWEIGHTAccuracy Test

- Procedure: Two rifles per caliber — —
Three groups per condition
Five shots per group

- Results:

<u>Caliber</u>	<u>Spec.</u>	<u>Condition</u>	<u>Average</u>
30-06	3.0"	Free Floating	1.74"
		Padded	1.80"
.280	3.5"	Free Floating	2.58"
		Padded	1.57"
.270	3.5"	Free Floating	2.24"
		Padded	N/A

MONTHLY REPORT NOTES:

October 1981

Model 7 Bolt Action (Not BAC)

- second prototype in long action scheduled for completion in November

November 1981

Model 7 Bolt Action

- second prototype now scheduled for mid-December

December 1981

- objective of Model 7 Bolt Action is a premium bolt action rifle based on 700 family
- .257 Roberts prototype built; second prototype expected in January

January 1982

Model 7 Bolt Action - 2 samples to be completed in mid-February

Scope Mounts - prototypes based on aluminum extrusion to be tested in February. Material has been ordered by Research for 3,000 sets

February 1982

Emmons hand delivered 2 sample stocks. He is to make a third to be completed April 1, 1982

March 24, 1982

Model 7 Program

- octagonal receiver
- hammer worked bbl.
- new stock

Third prototype to include new fire control, integral scope mounts, tang safety switch

April 1982

New Bolt Action

- primary design requirements established for N.B.A. to replace Model 700; prototypes to be made to include both straight Classic and Monte Carlo w/cheekpiece
 - third Emmons stock delivered (Production ready)
 - fourth being made to illustrate potential alterations to barrel receiver and safety
-
-

May 1982

- Fourth Emmons gun expected in mid-June
- Three Research prototypes being made, one to include Emmons stock
- Sample scope mounts being reviewed by Marketing - new mounts to be designed following decision regarding styling and functional objectives

June 1982

- Three Research prototypes expected in September 1982 including custom stock and receiver designs by Emmons
- Fourth (called third) Emmons sample expected in July

July 1982

- Three prototype rifles being made, rotary box being detailed for fabrication

September 1982

- Three prototype rifles being made
Completion of prototype rifles, has been delayed until February
- Fourth (called third) sample from Emmons has been delayed until October

October 1982

- Three prototype rifles expected first quarter of 1983, drawings for rotary box and new extractor designs released to Model Shop
- Fourth Emmons sample expected in December

November 1982

- Work progressing on three models expected in first quarter of 1983, Emmons fourth sample could be delayed until mid-January

December 1982

New Bolt Action "to be introduced in November 1984" will include:

- octagonal receiver
- integral scope mounts
- hammer marked lwt bbl.
- rotary box
- fully enclosed claw type extractor

- no bind easy lift bolt
- heavy recoil lug
- redundant safety switch
- fully adjustable fire control

"Preliminary design completion delayed until March due to priorities on 1983 programs." - Fourth Emmons gun expected in February.
"Priorities placed on 1983 programs are delaying fabrication of key components."

January 1983

Bolt Action Rifle

- Fourth Emmons gun expected in February
- Preliminary design of new rifle to replace the 700 BDL will be completed in March

February 1983

Bolt Action Rifle

- A new bolt action to replace the 700 Classic is being developed. It will be designated the Model 700 Lightweight. Design specs have been reviewed and a model will be available by April 1.
- Work is continuing on the replacement for the 700 BDL. A prototype with octagonal receiver will be completed in April.

R. S. Murphy:ws
1-25-84

March 23

a jam condition can be created which is difficult to clear without removal of the fire control. While no complaints have been received from the field, modifications have been considered which will prevent jamming under the above conditions. Proposed modifications include changes to the slide and carrier assemblies.

Preliminary tests have been successful using slides modified to include an additional shell latch and carriers modified to provide additional shell clearance. Three (3) modified Model 870 Riot endurance test shotguns have been turned over to the Research Test Lab for a 20,000 round endurance test. The test will include a 25 round test of the jam condition after every 1,000 rounds.

Marketing has expressed concern about the disassembly of the action. With the new design slide latch, the fire control must be removed in order to depress the slide latch to remove the action bar assembly. Revisions are being considered to both the slide latch and carrier to simplify the disassembly feature. Our goal is to make the disassembly no more difficult than the standard (field) Model 870. However, in order to correct the jam condition and still maintain our standard for malfunction rate, this may not be achievable.

MARCH 23

~~CONFIDENTIAL~~

(F. E. Martin, T. G. Bauman)

Two (2) new rifles are included in the bolt action program, replacements for the Model 700 Classic and BDL, respectively. The replacement for the Classic will be designated the Model 700 *Lightweight* and is planned for 1985 introduction. While a designation has not yet been determined, the replacement for the BDL is currently scheduled for 1986 introduction. Both rifles will feature a stock designed by Bob Emmons and a lightweight barrel contour. The BDL replacement will include other distinctive styling changes, such as an octagonal receiver with integral scope mounts. Functional improvements to the BDL will include a rotary magazine box for more reliable feeding, fully enclosed claw type extractor for added strength, no bind-easy lift bolt for smoother action, receiver with heavier — integral recoil lug for added stability, a redundant safety switch, and a fully adjustable fire control that does not require removal from the stock.

March 83

- 8 -

One (1) new Model 700 *Lightweight* with the latest design specifications has been assembled for review with Marketing. Parts list and drawings have been completed with the exception of the stock which will be completed in June.

The second generation of the Model 700 BDL replacement is scheduled for review in mid-April. A new extractor has been designed and fabricated to add strength and appearance to the bolt face. Testing has been delayed due to Project priorities. The fourth model gun from Bob Emmons featuring metal work by Pete Grisel has been received and evaluated by Research and Marketing. Some features may be considered by the BDL Replacement.

Model 7400/7600 Centerfire Rifles (R. S. Murphy, A. R. Eddy)

The Model 7400 and 7600 rifles were developed as replacements for the Model 742 and 760, respectively, and were introduced in 1981. The 7400 .223 Carbine is being developed as a sporting version of that popular cartridge to augment this product line. As this new version is implemented into production, continued Research support will be necessary to assist in start-up.

Model guns illustrating the newest design options and preliminary economics for the .223 Carbine have been reviewed by Marketing. Agreement has been reached on the stock and fore-end design with the final barrel configuration yet to be determined. The stock and fore-end will reflect the present contour with a toned down finish and birch wood. Marketing feedback has shifted design emphasis from the 4 shot box to one with a ten-round capacity. Specifications for the preferred design at this point include a magazine release on the box and no bolt release. Preliminary layouts have been completed and final drawings for two (2) designs will be completed by June. Test rifles are being built to reflect the latest design options.

STATUS - CURRENT PRODUCT DEVELOPMENT (J. W. Brooks)

Model 870 Police Shotgun (T. J. Plunkett)

Marketing has requested a shotgun in 12 Gauge with a 3" Magnum, 13 inch, full choke barrel and Parkerized finish for addition to the line

April 83

Model 870 Riot Shotgun

(A. A. Hugick, T. G. Bauman)

Three (3) test guns with the new slide block and carrier design have been tested to 750 rounds with no apparent problems. These endurance tests will be extended to 50,000 rounds to confirm acceptability of the design. Tests are being delayed due to priorities placed on other programs. Engineering drawings have been turned over to Process for cost evaluation. Alternative designs are being considered to facilitate disassembly.

Model 7400 Carbine

(R. S. Murphy, A. R. Eddy)

Preliminary design has been completed on a ten (10) shot magazine box for the Model 7400, .223 caliber carbine. Contact with vendors on magazine prototypes is scheduled for the week of April 25th. Function testing continues on the four (4) shot box with no significant problems after approximately 5,000 rounds. Turned barrels will be finished the week of April 25th.

~~Model 700 Lightweight~~ APRIL 83 (P. E. Martin, T. G. Bauman)

The first sample of the Model 700 Lightweight (scheduled for 1985) has been completed and is being reviewed by Research and Marketing. A second sample (featuring a cast off-toe out stock) has been assembled and is available for examination.

Work on the Model 700 BDL replacement (tentatively scheduled for 1987) is continuing. The first prototype is 80% complete.

CURRENT PRODUCT DEVELOPMENT

(J. W. Brooks)

Model 870 Police Shotgun

(T. J. Plunkett)

A prototype has been completed of the 12 Ga. Magnum Police Shotgun with an 18" full choke barrel. Prototype barrels are ready for Design Verification of point of impact. Tests will be completed by May 6.

May 23

Model 111 Autoloading Shotgun

(D. S. Findlay, J. L. Kast)

The Model 111 is tentatively scheduled to replace the Model 1100 in 1987. Objectives include improved strength, lighter weight, and new styling features. One (1) prototype is in endurance test. Four (4) additional samples will be assembled for Design Verification testing pending results of the test on the first sample.

Model 7400 .223 Carbine

(R. S. Murphy, A. R. Eddy)

Preliminary design has been completed on a ten (10) shot magazine box for the Model 7400 .223 caliber carbine. Contact has been made with two (2) vendors on fabrication of prototype magazines. They have been supplied with model drawings and a Request for Quote on development parts. Ten (10) additional Model 7400 .223 carbines with the latest specifications will be assembled the week of May 23rd. Function testing on the four (4) shot has been held at approximately 5,000 rounds due to project priorities.

~~Model 700 Lightweight~~

May 23

(F. E. Martin)

Two (2) prototypes of the Model 700 Lightweight have been completed and reviewed by Research and Marketing. Thirty-six (36) prototypes of 30-06, 270, and 280 caliber are being fabricated for testing. Barreled actions will be completed by mid-June. However, stocks will not be completed until the end of August.

Model 1100/870 Slug Barrel Investigation (A. A. Hugick)

Preliminary design investigation of a reduced I.D. barrel configuration is in progress. Prototypes with the barrel mounted scope mount and various choke/bore designs are planned for testing in July.

June 30

using 3 inch Magnums and 2-3/4 inch high base ammunition. At the end of each 1,000 rounds, 25 rounds are fired testing the jam condition.

There has been no apparent problems with the anti-jam design feature components and the guns will be continued to 20,000 rounds per gun endurance level. Estimated test completion date is August 1, 1983.

Engineering drawings have been turned over to Production for estimating.

Upon endurance completion and approval, finished model drawings will have to be prepared for Production and then transmitted to Production. Also, a new Model 870 Police gun catalog or supplement will have to be prepared and supplied.

~~Police Catalog Supplement~~ JUNE 30 (F. E. Martin)

Two (2) new rifles are included in the bolt action program, replacements for the Model 700 Classic and BDL, respectively. The replacement for the Classic will be designated the Model 700 Lightweight and is planned for 1985 introduction. While a designation has not yet been determined, the replacement for the BDL is currently scheduled for 1986 introduction. Both rifles will feature a stock designed by Bob Emmons and a lightweight barrel contour. The BDL replacement will include other distinctive styling changes, such as an octagonal receiver with integral scope mounts. Functional improvements to the BDL will include a rotary magazine box for more reliable feeding, fully enclosed claw type extractor for added strength, no bind-easy lift bolt for smoother action, receiver with heavier - integral recoil lug for added stability, a redundant safety switch, and a fully adjustable fire control that does not require removal from the stock.

The replacement rifle for the Model 700 Classic has been accepted by Research and Marketing. Parts list and drawings are being prepared to meet the transmittal date of August 1, 1983. Warehouse date of this rifle is planned for November 1984.

Work on the BDL Replacement will continue on completion of the

above program. Testing of the proposed extractor change is planned to start in September with the completion of the prototypes. Work on the rotary magazine components is continuing. A test schedule will be determined with the completion of the magazine assembly. The magazine rotor, spring retainers, and end plate have been completed. The magazine box is expected by July 20, 1983.

Model 7400/7600 Centerfire Rifles

(R. S. Murphy, A. R. Eddy)

The Model 7400 and 7600 rifles were developed as replacements for the Model 742 and 760, respectively, and were introduced in 1981. The Model 7400 .223 carbine was being developed as a sporting version of that popular cartridge to augment this product line.

Due to the cancellation of this project, efforts are being concentrated on collecting all technical data and design specifications and recording this information. For future reference, various prototypes will be completed and assigned to the Research Gun Library. An AI Report will follow.

All preliminary 7mm-08 and .25-06 work (orifice, pressure data) has been completed. A number of rifles in both calibers have been built and test fired satisfactorily. Drawings only would have to be updated for transmittal if this is desired. We are still waiting for a priority to get preliminary measurements on ten (10) standard .308 rifles. This is necessary before work can commence on data confirmation for the carbine length barrel.

One (1) .257 Roberts model has been built and orifice and pressure data is acceptable. This rifle has been field tested with very good results. Barrels are being readied so that additional models can be built to verify our results. Other calibers currently being considered for evaluation are the .250-3000 Savage, 7mm Mauser, and possibly the .35 Remington. Some barrels have been allotted for these calibers and efforts will be made to get orifice and pressure work done.

July

Parker Double Barrel Shotgun

(D. S. Findlay)

Reintroduction of the classic Parker side-by-side double barrel shotgun is being considered. Arrangements are proceeding to complete one VH Grade 12 Gauge Parker by August 15, 1983.

A partial set of drawings from Jesse Briley on a 20 Gauge Parker has been received. These drawings are undergoing engineering evaluation. Once the remaining drawings of the package have been received, they will be sent out for cost estimating by Process Engineering.

~~XXXXXXXXXXXXXXXXXXXX~~

July 83

(F. E. Martin)

Work on the Model 700 Lightweight transmittal is 65% complete. Date for completion is August 15, 1983. Initial accuracy testing will start July 25, 1983. Prototype stocks are being made and will be available for additional testing August 20, 1983.

Drawings for the Model 700 BDL Replacement have been released to PE&C for a preliminary cost analysis.

Model 7400/7600 Centerfire Rifles

(R. S. Murphy, A. R. Eddy)

The Model 7400 .223 Carbine project has been discontinued. 7mm-08 and .25-06 testing has been completed and drawings need to be updated for transmittal when needed. The .308 caliber carbine testing has been delayed due to other development schedule priorities.

CURRENT PRODUCT DEVELOPMENT

(J. W. Brooks)

Model Seven Lightweight Rifles

(D. E. Bullis)

With the decision to go to an aluminum floor plate and trigger guard casting, drawings are being completed to be sent to a vendor by the first week of August. He will visit the plant the middle of August to discuss dimensioning if changes are required.

Preliminary testing of ten prototypes to over 2,000 rounds was satisfactory. Some dimensional changes were required and new prototypes are being built. They will be complete by September. A sensitivity and function test of the modified design will be run at that time.

August 23

Model 870P shotgun disassembly and assembly with the proposed anti-jam latch slide appeared to be a major problem for the F.B.I. Academy. Shotgun action disassembly/assembly difficulties demonstrated at the August 11 Remington Arms - F.B.I. contact meeting in Quantico, Virginia may require a redesign.

Parker Double Barrel Shotgun (D. S. Findlay)

Reintroduction of the classic Parker side-by-side double barrel shotgun is being considered. One VH Grade 12 Gauge Parker has been completed and delivered to Marketing.

A partial set of drawings from Jesse Briley on a 20 Gauge Parker has been received. These drawings are undergoing engineering evaluation. Once the remaining drawings of the package have been received, they will be sent out for cost estimating by Process Engineering.

~~Model Seven Lightweight Shotgun~~ August 23 (F. E. Martin)

Transmittal and accuracy testing will be complete by September 15.

Initial accuracy results for .30-06 gave a four gun average of 1.69". Present specification is 3.5".

Four guns are being assembled for Marketing Field Testing. These are to be completed by September 8.

CURRENT PRODUCT DEVELOPMENT (J.W. Brooks)

Model Seven Lightweight (1984 Introduction) (D. E. Bullis)

Drawings for the aluminum floor plate cover and trigger guard have been completed and delivered to Purchasing. They have been sent to the vendor and he will be here August 25 to discuss dimensioning and tolerances to fit in with proposed Process Engineering manufacturing processes.

The N/C Shop has completed a dozen prototype trigger guards. They will have floor plate covers by September 6.

A program is being written to have stocks inletted for the above prototype trigger guards.

Sensitivity tests will be run with the new design in September.

(F. E. Martin)

Model 700 Lightweight drawing and parts list transmittal will be completed by October 1, 1983. Work on this model is expected to be complete by October 20.

Work on the Model 700 BDL Replacement will resume to meet the scheduled 1986 introduction. The new BDL will include the following functional improvements: a rotary box magazine for feeding reliability, a new fully enclosed claw extractor for added strength, a no-bind easy lift bolt for a smoother action, a receiver with a heavier integral recoil bracket for stability, and a fully adjustable fire control with redundant safety switches.

Testing of the new extractor will be starting in September with the completion of prototype assemblies.

STATUS - CURRENT PRODUCT DEVELOPMENT (J. W. Brooks)

Model 870/1100 Waterfowl Shotgun in 12 Gauge (1985 Introduction)
(P. Nasypany)

Marketing has received requests for shotguns that will better withstand the conditions under which they will be used.

The models will feature three inch magnum vent rib barrels with chrome plated bores, rust resistant Parkerized metal finish, and stained birch stock and fore-end with oil finish.

Ten Model 870 prototype shotguns for design verification will be ready by the end of September.

Two Model 1100 prototypes are ready for testing to determine the effect of a Parkerized finish on bolt velocity and gun function. Parts for twenty-five design verification models have been started.

Sportsman 12 Pump Shotgun (1984 Introduction)

(T. J. Plunkett)

Marketing has requested a low cost version of the Model 870 12 Gauge Pump Shotgun for 1984 and will call it the Sportsman 12 Pump. Prototypes have been made and shown to Marketing.

External appearance will remain the same except for the following:

- Reduced receiver finish. No mill and matt on top radii.
Roll marking on side panel to be Sportsman 12 Pump.

prevent the malfunction or make it easy to correct. Cost estimates for these designs will be available for review in November.

~~CONFIDENTIAL~~ OCTOBER 23 (R. S. Murphy, F. E. Martin)

A drawing package, complete with a preliminary stock drawing has been sent to Process for estimating. A total of 36 barreled actions have been built and the stocks are being processed. These guns will be used for the final Research accuracy and function testing.

Sportsman 74, Sportsman 76 (R. S. Murphy)

The drawing package for the Sportsman 74 is nearly complete. The parts list has been sent to PE&C for estimating. Process Engineering will be building all rifles for testing and evaluation. Work on the Sportsman 76 will begin Monday, October 24.

CURRENT PRODUCT DEVELOPMENT (J. W. Brooks)

Model Seven Lightweight - .308 and 7mm-08 Caliber
(D. E. Bullis)

Parts list and drawings of the aluminum trigger guard, floor plate cover, and other parts required with this change have been transmitted to Process Engineering.

Sensitivity testing of ten (10) prototype aluminum assemblies has been completed and results are satisfactory.

Model Sportsman 12 Pump (T. J. Plunkett)

Transmittal complete.

Model Sportsman 78 (T. J. Plunkett)

Transmittal complete.

MATERIALS AND PROCESS DEVELOPMENT (J. W. Bower)

Injection Molding - Firearms Components

(M. J. Topolski, K. C. Rowlands,
B. Panagian)

Additional M/700 magazine followers, showing various types of

NEW PRODUCT DEVELOPMENT

(J. S. Martin)

Model 1100 Special Field Shotgun

(D. S. Findlay, T. P. Powers)

The elastomer buffer fore-end design has been transmitted to the Plant and tooling and part fabrication for trial and pilot has been initiated. Production deliveries to the warehouse are scheduled to begin in March.

Model 870 Special Field Shotgun

(D. S. Findlay, F. H. Smith)

Samples for Marketing evaluation and catalog pictures are complete. Trial and pilot samples for testing and evaluation have been started. Pending Research approval, initial warehouse deliveries will begin in February.

Model 870 Restyle 12 Gauge

(D. S. Findlay, K. L. Calkins)

The Model 870 Restyle is being developed to replace the current 870 in 1985. The engineering estimate completed by Process on the drawing package supplied to them indicated a negative unit margin. As a consequence, Marketing, Research, and Process are reviewing current features, volumes, and selling prices to obtain a positive economic outlook for the program. It is anticipated that a revised economic forecast and drawing package will be ready to present in December.

Model 870/1100 Deer Gun

(D. S. Findlay, F. H. Smith)

It is planned to introduce a new deer barrel in 1985 to replace the current offering. This redesigned barrel in both models in 12 gauge will feature a 21" barrel and a rear sight base capable of mounting a long eye relief scope with a variety of mounts. Drawings for estimating by Process have been completed and samples will be completed by November 30.

NOVEMBER 83 (R. S. Murphy, F. E. Martin)

A drawing package has been sent to Process for estimating. A question has been raised with respect to Production's ability to checker the stock and alternate patterns are being developed. A total of 36 barreled actions have been built. The stocks for these actions are being made by the Custom Shop. Final Research accuracy and function testing will begin when these rifles have been completed

Sportsman 74, Sportsman 76

(R. S. Murphy)

The Sportsman 74 parts list and drawing package is complete and awaiting authorization for transmittal. The Sportsman 76 parts list

Model 870-1100 Waterfowl Guns

(T. J. Plunkett)

These guns (1986 introduction) are being developed to offer Waterfowl shooters a specialized gun. They will complement the Deer Guns and have common features of Parkerized metal finishes, and oil finished brick stock and fore-end. Also included is a 30" full-choke, vent-rib barrel with chromed bore, and a camouflaged sling strap.

Prototype guns for test and Marketing evaluation have been assembled. Research testing is scheduled to be complete by January 30.

Choke Tube Development

(T. P. Powers)

A choke tube system is being developed to offer shooters the convenience of a variable choke barrel to adapt to different hunting situations encountered in the field. The initial strategy is to offer Briley choke tubes in mid-1984 and Remington tubes in 1986.

Testing of Briley's tube design is scheduled to be completed by February 15. Transmittal and approval is expected at the February Operations Committee meeting. The Remington design is to be tested by June 1984, with project approval and transmittal scheduled for August.

STATUS - RIFLE DEVELOPMENT

(R. S. Murphy)

Mountain Rifle Development (F. E. Martin)

The Mountain Rifle has been designed to deal with the higher end of the bolt action rifle line. It is scheduled for 1985 introduction as a replacement for the Model 700 Classic. Specifications include the lightweight Model Seven barrel contour, 30-06, 270, and 280 caliber offerings, and a new Bob Emmons style stock.

Stocks required for final accuracy testing have been completed by the Custom Shop and are being finished by Production. Accuracy testing will require approximately two weeks. Preliminary drawings have been given to Production for cost estimating.

New Bolt Action Rifle

(F. E. Martin, K. L. Calkins,
R. H. Smith)

A new bolt action rifle is being developed as a replacement

for the Model 700. A 1988 introduction is scheduled.

Model guns in three different configurations should be ready for review with Marketing by the end of May.

Sportsman 74/76

(A. R. Eddy)

These rifles are lower-priced versions of the Models 7400 and 7600, and continues the introduction of the Sportsman line of shotguns and rifles.

The drawing packages and parts lists are complete. Authorization to transmit is expected at the December Operations Committee meeting.

Model Seven Lightweight

(R. S. Murphy)

The Model Seven is a short, lightweight, bolt action centerfire rifle developed to replace the Model 600, which was discontinued in 1969. Trial and pilot testing indicated that the steel trigger guard assembly was unsatisfactory. A cast aluminum trigger guard has been designed as an alternative.

Trial and pilot productions guns with aluminum trigger guards are scheduled for Research verification testing in early February.

STATUS - CURRENT ARMS

(J. A. Lawrence)

Model 870 P Riot Shotgun

(A. A. Hugick)

Occasionally a shotgun shell can jam between the carrier and the slide assembly making the Model 870 P shotgun very difficult to operate. Several design modifications have been developed to prevent the malfunction.

Research has come up with a new design called the flexi-tab design. It requires the breech bolt and slide to be modified and the carrier to have the center section modified to act as a spring loaded shell stop.

Prototypes have been made and the system works well. Nine Model 870 P Riot Guns have been assembled with the new flexi-tab system. Samples have been turned over to our Field Representatives to evaluate with the F.B.I., California Highway Patrol, etc.

The new design corrects the jam condition, satisfied the complaints about the assembly/disassembly, and can be retrofitted

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

Remington**PETERS****"CONFINE YOUR LETTER TO ONE SUBJECT ONLY"_____**

March 18, 1985

TO: J.W. Bower
F.E. Martin
F.H. Smith

FROM: R.S. Murphy *RS*

Competitive Reviews - Fire Control & Safety

On Monday, March 11, and Thursday, March 14, competitive reviews of bolt action fire controls were held in the Research Conference Room. Six major competitor's designs were reviewed and a listing of comments follows.

Weatherby Vanguard (S&W 1500 similar)

- o plunger trigger block, no sear block
- o 788 style sear
- o cast trigger
- o right side tang safe; null position possible
- o S&W has no trigger overtravel stop screw
- o trigger adjustable out of stock
- o fully machined flat bottom receiver
- o plunger safety detent
- o can't put safety on after firing
- o can put safety on with bolt open

Browning BBR

- o trigger block, no sear block (screw through trigger)
- o center tang safe
- o torsion spring for safety detent
- o bolt lock on safe
- o can't put safe on after firing or with open bolt
- o lots of trigger/sear engagement
- o weight of pull adjustable out of stock
- o stamped metal housing
- o safety link not peened or staked

Ruger 77

- o tang safe
- o trigger housing part of cast receiver
- o bolt lock on safe
- o can't put safe on after firing or with bolt open
- o torsion safety detent spring
- o weight of pull adjustable from bottom in stock
- o safety link not peened or staked
- o flat bottom receiver

Winchester 70

- o bolt plug three position safety, firing pin block
- o extremely hard to put safe on
- o exposed component fire control
- o pre-set engagement, lots of overtravel
- o weight of pull adjustable out of stock
- o trigger pull factory set to 6 lbs.

Sako L61R

- o action tailored to cartridge size (fewer feeding problems)
- o trigger block, no sear block
- o plunger safety detent; null position probable
- o fully adjustable out of stock
- o firing pin head/sear engagement determined by pivot and two screw arrangement
- o sear slides vertically in operation

Colt Sauer

- o bolt lock on bolt handle
- o housing all stampings
- o engagement adjustable in stock
- o trigger block, no sear block
- o roller on top of sear
- o center tang safety
- o stamped safety detent
- o can't put safe on after firing
- o can put safe on with bolt open
- o loaded chamber indicator on receiver

A drop test of these models will be scheduled to determine what happens when weight of pull adjustment screws are backed out.

I will also attempt to determine what court cases are pending against our competitors as well as the issues concerned.

A Ruger 77-22 with a bolt plug safety that blocks the firing pin and sear will be purchased for evaluation.

RSM:sps

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

Remington



PETERS



xc: File

"CONFINE YOUR LETTER TO ONE SUBJECT ONLY" _____

April 12, 1985

TO: J.W. Bower
F.E. Martin
F.H. Smith

FROM: R.S. Murphy RSMCompetitive Review - Magazine Systems

A meeting was held on March 18 to review competitive magazine box systems and compare them to our NBAR proposed offering. The magazine function latch system, material, construction and aesthetics were evaluated. I have listed below summary of the comments with a short description of each system.

Weatherby Vanguard has a one piece black anodized aluminum trigger guard with an aluminum hinged floorplate. The trigger guard screws are exposed and the latch is located on the front of the trigger guard bow. The latch is rotated to open the floorplate and recoil would tend to move the latch similarly. Storage of rounds in the magazine is staggered and pressure to present a feeding round is supplied by a flat W-spring. The follower is a stamped assembly.

Comments:

- when unlocked, the floorplate hits finger, poor placement of latch
- spring supplies good pressure to front of follower

Smith & Wesson 1500 system is identical to the Weatherby Vanguard with the following exceptions:

Magazine Systems

Page 2

April 12, 1985

- floorplate is a stamped metal assembly
- subtle follower design modifications
- micro-bonded stamped floorplate and cast aluminum guard (probably for color match)

Comments:

- cheap stamped follower
- cast aluminum 1 piece guard and magazine
- poorly designed floorplate, stamping difficult to assemble

Ruger M77 is comprised of two major assemblies. The trigger guard is investment cast in aluminum and the latch, spring and pivot is assembled to it. The latch is rotated to unlock the floorplate and is operated from inside of the trigger bow. It appears to be balanced to negate the effects of recoil. The guard is held in place by two screws, the front of which is covered by the floorplate. The floorplate assembly is comprised of the hinge, hinge pin, floorplate, W-spring and follower. The hinge supplies a bearing surface for and is held in place by a take down screw and is part of Ruger's patented recoil lug. The hinge, floorplate and follower are investment cast. The hinge, floorplate and trigger guard are made of aluminum and black oxidized, however, the follower is steel and has been plated. The magazine stores shells in a staggered arrangement, is a stamping, and is held front and rear by the hinge and guard respectively.

Comments:

- latch won't hit finger
- W-spring tips down easily

Winchester 70 floorplate and trigger guard is a two-piece cast steel design. The floorplate latch which is housed in the trigger guard must be translated to operate and is very similar to the Remington Model Seven. Two screws fasten the guard in place and the front screw is covered by the floorplate. The floorplate is pinned to the hinge and the hinge is fastened by a single screw. The magazine is a steel stamping held in place by the hinge and trigger guard and a W-spring supports the cast steel follower. all components except the follower and spring are black oxidized.

Comments:

- difficult to operate with gloves
- W-spring has holes in it
- floorplate pivot is very loose
- doesn't release well

Magazine Systems

Page 3

April 12, 1985

Browning BBR magazine system is by far the most costly among those evaluated. It is a two-piece design with a cast aluminum trigger guard and floorplate. The floorplate latch operates similar to our Model Seven. The floorplate is pinned to a steel hinge and is spring biased to the open position. The stamped steel magazine is spring clipped to the floorplate and is detachable. The staggered feed magazine has a cast steel insert, an aluminum follower and a unique torsion magazine spring.

Comments:

- very nice well done system
- cheap follower
- insert into magazine changes for different calibers
- seam on magazine hard to find, good workmanship
- poorly done latch, hits finger, difficult to operate
- scissor spring yields uniform pressure
- magazine assembles from bottom

Colt Sauer features a one-piece cast steel trigger guard and a single feed detachable magazine. Their latch is similar to the Model 7400 and is between the magazine and guard. The magazine is stamped, has a stamped follower and employs a W-spring. It is also spring biased such that when released, it falls from the gun.

Comments:

- single feed box, reliable release points

Sako L61R uses a one-piece cast and machined steel guard and floorplate. The latch is similar to our Model Seven. The follower supports a W-spring and a cast steel follower. A stamped steel magazine is placed above the trigger guard. All parts except the follower and spring are black oxidized.

Comments:

- bomb-bay floorplate, poor latch placement

RSM:sps

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

Remington



PETERS

xc: File

"CONFINE YOUR LETTER TO ONE SUBJECT ONLY" _____

April 12, 1985

TO: J.W. Bower
F.E. Martin
F.H. Smith

FROM: R.S. Murphy RSMCompetitive Review - Bolt Stop and Bolt Lock

On March 21 a meeting was held to review our competition's bolt stop and bolt lock designs. We were primarily interested in their placement of the bolt stop, the existence of a bolt lock and the execution of the designs.

S&W 1500 - stamped side tang bolt stop behind receiver
- no bolt lock
- bolt stop is cheap stamped part, serrated for a positive grip

Colt Sauer - bolt stop incorporated into fire control - pull trigger to release bolt
- bolt locks on safe with optional override option, button located on bolt handle
- poor design can pinch thumb, difficult to operate wearing gloves

Browning BBR - side receiver bolt stop, operates through receiver, rocking action
- bolt locks on safe

Sako L61R - side receiver bolt stop, operates through receiver, rocking action
- safety locks bolt on safe
- poorly executed bolt lock, safe not positively detented

Bolt Stop and Bolt Lock

Page 2

April 12, 1985

Winchester 70 - side tang bolt stop behind receiver
- bolt lock accomplished by 3-position safety on bolt plug
- safety on bolt plug
- fire, safe unlocked, and safe locked positions
- poor execution, very difficult to operate

Weatherby Vanguard - side receiver bolt stop, operates through receiver, rocking action
- no bolt lock

Ruger 77 - side receiver bolt stop, operates through receiver, pivots about rear end to operate
- bolt locks on safe
- can't put safe on with bolt open
- poor bolt stop design, difficult to operate
- bolt stop can't be activated accidentally

RSM:sps

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

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"CONFINE YOUR LETTER TO ONE SUBJECT ONLY" _____

April 15, 1985

TO: J.W. Bower
F.E. Martin
F.H. Smith

FROM: R.S. Murphy RSM

Competitive Review -
Bolt Handle, Bolt Plug, Metal and Wood Finishes

A meeting was held on Monday, April 1, to complete our series of bolt action rifle competitive reviews. The final topics of discussion included the bolt handle, bolt plug, and metal and wood finishes.

The length, size and shape of the various bolt handles was evaluated in terms of the effect on function. Bolt plugs were evaluated on their ability to deflect escaping gas, the existence of a cocking indicator and aesthetics. And the metal and wood finishes were evaluated with regard to finish quality, polish (luster), color match, rollmark size, sanding (or machine) marks and checkering. A summary of the comments made is listed below.

- S & W 1500 - oddly shaped bolt handle, long slender handle, knob may be too small
- bolt plug does not deflect gas from rails
 - exposed firing pin head
 - good metal finish
 - barrel finish doesn't match receiver
 - purple finish on bolt plug
 - poor wood finish - open grain
 - skip line checkering, gloss finish
 - terrible cut checkering
 - angular square fore-end
 - no sanding marks
 - good uniform inletting
 - only caliber rollmark on barrel, remainder on receiver

Ruger 77 - bolt handle swept back close to hand
- large smooth bolt handle
- bolt plug blocks gas flow down rail
- exposed firing pin head
- very nice polishing, high luster
- bolt handle, plug, receiver, barrel color matches perfectly, floorplate and guard distinctly different
- satin finish, some open grain
- good uniform inletting
- hand checkered, better than S&W, still uneven and not good
- very wide rails along barrel
- moderate rollmark on barrel
- safe works over wood

Browning BBR - large smooth spherical bolt handle
- massive well designed bolt plug, deflects gas from rails and encloses firing pin head
- cocking indicator painted red
- excellent metal finish
- square ugly fore-end, same as S&W
- gloss finish with open grain, pin holes
- hand cut checkering not good, overruns
- double border on checkering a mistake, shows every flaw
- grip checkering patterns not symmetrical
- top inletting not uniform
- wide rails along barrel
- delicate rollmarking on barrel
- separate wooden gripcap

Colt Sauer - ugly styling
- smooth teardrop shaped bolt handle
- no bolt plug exposed, only end of bolt body
- enclosed bolt body
- cocking indicator has red paint worn off
- excellent polish and metal finish
- gloss finish, open grain
- sanding marks
- narrow rails along barrel
- poor checkering, flat diamonds, overruns
- wooden grip cap insert
- yellow line spacers
- very little rollmarking on barrel

Competitive Review

Page 3

April 15, 1985

Winchester 70 - spherical knurled bolt handle, poorly done, looks cheap

- bolt plug does not deflect gas from rail
- two-piece bolt plug encloses firing pin head
- cocking indicator painted red
- poor metal finish, purple bolt plug
- satin finish, open grain
- excellent checkering
- simple cheekpiece design
- poor inletting, poor stock fit at tang
- moderate rollmarking on barrel

Weatherby Vanguard - teardrop shaped knurled bolt handle

- same shape as S&W
- poor knurling, looks cheap
- bolt plug looks too long, does not deflect gas from rail
- enclosed firing pin head
- unpainted cocking indicator
- good metal finish
- low gloss stock
- flat bottomed fore-end
- poor, coarse checkering, double border
- yellow line spacer
- caliber only rollmark on barrel

Sako L61R - small bolt handle, poor knurling

- bolt plug does not deflect gas, from rail
- exposed firing pin head
- rough polished metal work doesn't look bad
- bolt handle and plug finish doesn't match
- no crown on barrel
- stock top profile almost symmetrical
- square, low cheekpiece
- terrible checkering, double border
- good inletting
- very little rollmarking on barrel

RSM:sps

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

Remington.*PETERS*

"CONFINE YOUR LETTER TO ONE SUBJECT ONLY" _____ April 16, 1985

TO: J.W. Bower

FROM: R.S. Murphy *R.S.M.*Monthly Report - April 1985New Bolt Action Rifle - R.S. Murphy - F.E. Martin - F.H. Smith

The completion of the first phase of developmental jar-off testing has left us short of our design goals. An analysis of the test data and design, however, has indicated what we need in the second generation design to fulfill the performance requirements. A layout and CV mass properties study of the trigger is being done to determine if a redesign to meet the design parameters is feasible.

Since our initial drop test results did not look favorable, the contingency design is being updated to incorporate the design features desired in the new fire control. Specifically, the bolt lock must be added, the safety must be relocated to the tang, and the fire control adjustment must be relocated.

A schedule to test NBAR sub-assemblies in M/700 test vehicles has been developed and is being implemented.

High Velocity Limited Range Centerfire - F.H. Smith - C.F. desJardins

The non-standard custom barrels purchased for the ammunition development are still in the Custom Shop to be hubbed, chambered, and instrumented. They have been given a very low priority, are being worked in to a busy schedule and have been there over six weeks. First generation prototype ammunition has been finalized and can be loaded in one day when the barreled actions are ready.

M/700 Classic .350 Rem. Mag. - F.H. Smith

A second trial and pilot sample of guns selected has been tested for accuracy and field function with acceptable results. The visual inspection is being held pending the receipt of rifles with the correct stock reinforcement screw configuration.

RSM:sps

Apr 78 700 AIL 700 AIL H/7 Class 2
row 81 row 83 row 83

1

Strategies implications & ramifications

look at history

① Mountain Rifle mid-85 (86) in 20, 30-06, 280
and selected "Classic" calibers (1 per year) only.
delete "Classic" at same time, in 1988 (89) introduce
NBA rifle in all BDL-calibers

Strategy

Operations Approval - Mountain Rifle

April 84

14-16 month program

Warehouse June - August 85

looks like 1986 intro

Potential Problems: • stock is difficult to
process - sculptured

• program schedule through
J & P is extremely tight

planned for 85

• no classic caliber

• stock former via C.V.
route is critical path item and does not look
promising

Strong Points • Research work is done on
3 calibers.

• Test work, regarding new stock

* no slim barrel
fits M14 need

→ offering to compete directly with
Fuser 77 and Win. M70 Fullweight.

Operations Approval NBA - April 85

Production to Warehouse Oct 87

Potential Problems:

- combined with new shotgun and FMS. This becomes lowest priority and may not be feasible for 1988
- considerable development must be done based on Marketing's preferred choice
 - extractor
 - lock time
 - strength
 - stock endurance
 - firecontrol design acceptance
- stock must be modeled
- large number of receivers (difficult part) must be fabricated for test.

Strong Points

- when BSL is replaced by NBA the oldest rifle in line will be 5 yrs old
- should carry rifle program well into the 1990's
- legal - new firecontrol/safety

- ② Mountain Rifle mid-85 (86) ^{Send}
 Tone down NBA to stock, barrel, firecontrol,
 safety, bolt assy, changes for 1988
 (leave out receiver, complete stock)
 Save receiver for electronic gun (1990)
- removes FMS from picture, can do receiver as presently done with present technology
 - can add use most of stock (at least difficult areas)
 - legal - new firecontrol/safety
 - simplifies testing somewhat

- ③ Mountain Rifle mid-85 (86)
 Convert rest of BDL line to MR 1988
 Combine NBA w/electronic gun
 Pro: • new rifle is simply derivation of existing models.
- no need for FMS.
 - assuming MR. is well accepted this is safest way to go.
- Con: • no new firecontrol/safety for legal
- position may not be strong enough to retain or increase market share against Ruger H/77 & Win Featherweight

① Do nothing but assist production

- Pro - work is already done
 bolt assembly could be re-worked } 1987
 safety/fire control could be re-worked }
 tore down stock - 30 gloss }
 - no wht. spacers } 1987
 - new checkering }
 - much needed shotgun work could be ~~done~~ assisted.

Con: 700 ~~BL~~ sales will not continue forever
 Ruger is overtaking us and will eventually (soon)
 have a larger market share

Bolt Actions

MR vs. 88 NBA

safety, change
extractor "

sales are strong

Bud Weeks - Market Research

why is 700 demand so strong?

latest 83 data

- auto rifle sales down

conversion to bolts

ADL & BDL shares (83) both up (82)

Ruger 77 up more than we are
2 alt.

• forget completely + price juggle

• or intro. just 30-06 - 270, -280

plant benefit

- leave alone (as is)
w/ classic

vs. dropping 6 ^{classic} ~~BL~~ Specs.

22-250

6mm 243 270 30-06
and extra offerings (1 or 2)

instead of 3 M.R.

(can market test new bol. contour
+ stock styling

what could we offer in 1987 (86)
in terms of a N.B.A.

T. McCormack

• talk to him about M.R. specs.
new former

Receiver Design

- redesigned to provide the features that seem to be preferred by gunsmiths, gun writers, and customers; flat bottom and integral recoil lug, octagonal top

It is desirable that the safety block the trigger as well as the firing pin (2) for the added margin of safety against accidental discharge.

We feel that a bolt lock is a good selling feature and continue to feel that it should be independent of the safety switch for max. protection

A preset engagement, preset over travel firecontrol with the weight of pull adjustable in the stock (with a safe lower limit) is a good selling feature and we can provide one. A fully adjustable firecontrol is not desirable from a legal point of view.

Summary

	Current	Preferred	
Bolt Assembly	6.324	6.589	+.265
Barrel Assembly	10.777	11.234	+.457
- Barrel Assembly Complete	21.153	18.824	-1.833
Barrel	3.201	3.063	-.138
Receiver	5.613 + .835	7.197 +.50	+.749
Firing Pin Assembly	3.097	3.644	+.547
Magazine + Trigger Guard Assy	8.736	7.087	-1.649
Stock Assembly	25.376	27.25	+1.874
Trigger Assembly	4.437	4.784	+.347
Accessories	3.913	4.980	+1.067
Final Assembly + Gallery etc.	5.423	5.423	-
	72.135	71.992	(-.143)

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

Remington
*PETERS*
**"CONFINE YOUR LETTER TO ONE SUBJECT ONLY"** _____

March 5, 1985

TO: J.W. Bower
F.E. Martin
F.H. SmithFROM: R.S. Murphy *RSM*Bolt Action Rifle Competitive Review

Please plan to attend a series of meetings to be held every Monday and Thursday at 2:00 p.m. in the R & D conference room. The topics of discussion (listed below) are intended to give us a better understanding of how our new bolt action rifle will fit into the marketplace.

✓ Scope Mount	March 7
✓ Fire Control	March 11
✓ Safety	March 14
✓ Magazine Box System	March 18
✓ Bolt Lock	March 21
✓ Bolt Stop	April 1
Bolt Handle, Bolt Plug	April 4
Stock, Barrel Finish	April 8

Additional topics can be added as required. I have tentatively selected the following competitive offerings for review.

Ruger 77
Smith & Wesson 1500
Winchester 70
Browning BBR
Weatherby Vanguard
Sako L61R
Colt Sauer

RSM:sps

Marple

• TITLE SLIDE

• GOOD MORNING - I HAVE TWO BASIC OBJECTIVES TODAY -

FIRST, I WILL BRIEFLY REVIEW THE FIREARMS BUSINESS MISSION AND KEY ISSUES AS DEFINED BY THE FIREARMS STRATEGY TEAM. SECOND, I WILL DISCUSS OUR PRIORITIES AND HOW WE PLAN TO ALLOCATE OUR ENGINEERING RESOURCES TO MEET OUR BUSINESS OBJECTIVES.

• THE MISSION

• THREE KEY ISSUES WERE ADDRESSED BY THE STRATEGY TEAM. THESE ISSUES REQUIRE HEAVY INVOLVEMENT BY PRODUCTION, MARKETING AND RESEARCH.

IN ORDER TO MEET RESEARCH COMMITMENTS TO THIS STRATEGIC PLAN IT IS NECESSARY TO DRASTICALLY REALLOCATE OUR ENGINEERING RESOURCES.

• THIS CHART ILLUSTRATES THE SHIFT IN EMPHASIS BY COMPARING OUR 1983 AND 1984 MANPOWER ASSIGNMENTS.

THE DE-EMPHASIS OF PROCESS AND MATERIALS RESEARCH COMBINED WITH A SIGNIFICANT INCREASE IN DISCRETIONARY RESEARCH ACCOUNTS FOR THE MAJORITY OF THE READJUSTMENT. THIS HAS THE EFFECT OF INCREASING OUR COMMITMENT TO LONG RANGE PRODUCT INNOVATION FROM 30% TO 44% OF OUR ENGINEERING MANPOWER. OTHER SERVICES AND SUPPORT LEVELS REMAIN RELATIVELY CONSTANT. OVERALL, WE WILL OPERATE AT A LEVEL OF 5 FEWER EXEMPT SALARY IN 1984 THAN WE STARTED WITH IN 1983.

• THE LONG RANGE PLAN CALLS FOR NEW PRODUCTS IN BOTH CENTERFIRE RIFLE AND SHOTGUNS TO BE INTRODUCED IN 1988. AT PRESENT, NEITHER OF THESE PRODUCTS HAS FEATURES THAT ADVANCE THE STATE OF THE ART IN SPORTING FIREARMS. THE RIFLE, COMBINES ALL THE DESIRED FEATURES, REAL AND IMAGINED, THAT THE CUSTOMER PERCEIVES TO BE TO HIS ADVANTAGE. A TRULY INNOVATIVE FEATURE THAT WOULD SIGNIFICANTLY INCREASE ACCURACY OR DECREASE RECOIL, FOR EXAMPLE, WOULD BE MOST BENEFICIAL. ANY OF THESE ITEMS ON THIS LIST COULD PROVIDE A SIGNIFICANT SELLING FEATURE. IT IS TIME WE COMMITTED A MEANINGFUL PORTION OF OUR RESOURCES TO GAIN BETTER UNDERSTANDING OF THESE BASIC ELEMENTS FOR USE IN FUTURE GUN DESIGNS. YOU HAVE HEARD ABOUT SEVERAL SYNERGISTIC PROGRAMS ALREADY. THIS LIST IS JUST A STARTING POINT IN AN EFFORT TO PURSUE ADDITIONAL ADVANTAGES.

• THIS IS A LIST OF THE PROJECTS THAT WILL RECEIVE NO FIREARMS RESEARCH SUPPORT IN 1984. EACH OF THE PROCESS RESEARCH PROGRAMS COULD BE PICKED UP BY PRODUCTION OR FIREARMS MODERNIZATION AND PURSUED AS INDIVIDUALLY JUSTIFIED. THE TWO FIREARMS PROGRAMS HAVE VERY LOW PRIORITY SUPPORT FROM MARKETING.

• I WILL NOW CONCENTRATE ON WHAT WE SEE AS MAJOR RESEARCH RESPONSIBILITIES AS DETAILED IN THE KEY ISSUES.

CONTINUE SELECTIVE INTRODUCTION OF NEW PRODUCTS

• THIS CHART SHOWS OUR DEVELOPMENT SCHEDULE AS OUTLINED IN THE STRATEGY TEAM REPORT. IT LISTS THE NEW PRODUCTS IN ORDER OF PRIORITY, WITH THEIR REQUESTED ANNOUNCEMENT DATES, AND SHOWS THE 1984 ENGINEERING MANPOWER ASSIGNED TO EACH DEVELOPMENT PROJECT.

THE FIRST FIVE ITEMS ON THIS CHART ARE THE PRODUCTS THAT WILL BE COMPLETED BY RESEARCH AND READY FOR TRANSMITTAL THE LAST QUARTER OF THIS YEAR. NONE OF THESE ITEMS ARE EXPECTED TO PRESENT ANY SIGNIFICANT PROBLEMS TO INTERFERE WITH A 1984 ANNOUNCEMENT. MODEL REQUIREMENTS FOR THESE PRODUCTS HAVE BEEN REVIEWED AT THE OPERATIONS COMMITTEE SO I WILL NOT REPEAT THEM HERE.

FOR 1985 A RESTYLED 870, A MODEL 700 MOUNTAIN RIFLE, WATERFOWL VERSIONS OF THE 1100 AND 870, AND A LOW PRICED MODEL 1100 ARE PLANNED.

FOR THE 870 RESTYLE, THERE ARE STILL THREE OPTIONS UNDER CONSIDERATION FOR RECEIVER STYLING. A MATTED TOP RADIUS WITH A RAISED RECEIVER RIB, A STANDARD RECEIVER CONTOUR WITH A MATTED TOP RADIUS SIMILAR TO THE COMPETITION TRAP GUN AND A STANDARD 870 RECEIVER WITH NO CHANGES EXCEPT FOR THE ROLLMARK. SOME FORM OF MATTING IS DESIRABLE AND PREFERRED BUT TIMING FOR THE 1985 ANNOUNCEMENT WILL BE THE DETERMINING FACTOR.

THE FORE-END WILL HAVE A COMPLETELY NEW CONTOUR WITH A MEDIUM GLOSS FINISH AND CUT CHECKERING.

THE STOCK WILL BE A STANDARD 870 SHAPE WITH AN EIGHTH OF AN INCH ADDED TO ITS LENGTH, AND A NEW GRIP CAP CONTAINING THE OLD STYLE COAT OF ARMS THAT IS CURRENTLY ON THE BUTT PLATE OF THE 1100 SPECIAL FIELD. IT WILL BE FINISHED IN MEDIUM GLOSS AND CUT CHECKERED TO MATCH THE FORE-END, WITH NO WHITE LINE SPACERS AND AN OLD ENGLISH STYLE RECOIL PAD.

• THE 700 MOUNTAIN RIFLE IS A BASIC MODEL 700 ACTION WITH THE MODEL SEVEN BARREL CONTOUR EXTENDED TO 22 INCHES, A TARGET CROWN ON THE MUZZLE, AND CHAMBERED IN 30-06, .270 AND .280. IT WILL HAVE A COMPLETELY NEW STOCK STYLED BY BOB EMMONS WITH A LOW GLOSS FINISH, CUT CHECKERING, NO SPACERS, BLACK FORE-END TIP AND GRIP CAP, AND TWO REINFORCING SCREWS.

OUR MAIN CONCERNS WITH THIS RIFLE ARE ACCURACY AND STOCK STRENGTH. AS SHOWN IN THE MODEL REQUIREMENTS TWO REINFORCING SCREWS HAVE BEEN USED AS INSURANCE AGAINST CRACKED STOCK. ACCURACY TESTS SO FAR IN MODIFIED M/700 STOCKS INDICATE THAT NO SPECIAL BEDDING IS REQUIRED IN ANY OF THE THREE CALIBERS.

• FOUR 30-06 RIFLES WITH EMMONS STOCKS MADE IN THE CUSTOM SHOP HAVE PERFORMED WELL. THIS CHART SHOWS THE AVERAGES OF 3, 5 SHOT GROUPS PER RIFLE. THESE ARE ALL WELL WITHIN THE FACTORY SPECIFICATIONS OF $3\frac{1}{2}$ ". TWELVE (12) ADDITIONAL RIFLES IN EACH CALIBER WILL BE TESTED TO VERIFY THESE RESULTS.

THE SCHEDULE CALLS FOR DESIGN TRANSMITTAL BY OCTOBER 1, 1983.

• MODEL REQUIREMENTS FOR THE WATERFOWL VERSIONS OF THE 870 AND 1100 ARE SHOWN ON THIS CHART. AS THE NAME INDICATES THESE SHOTGUNS ARE TAILORED FOR WATERFOWL HUNTING WITH NON-GLARE RUST RESISTANT FINISHES AND PLAIN BIRCH STOCKS. A CAMOUFLAGED SLING HAS BEEN ADDED TO AID IN PORTABILITY WHILE CARRYING DECOYS AND GAME. CHROME PLATED BORES CONTRIBUTE TO EASE OF MAINTENANCE AND SALEABILITY. WE EXPECT NO PROBLEMS WITH THE 870. ONLY THE EFFECT OF PARKERIZING THE MAGAZINE TUBE ON THE 1100 PRESENTS POSSIBLE FUNCTIONAL DIFFICULTIES WHICH CAN BE OVERCOME BY PROTECTING THE MAGAZINE TUBE DURING THE PARKERIZING PROCESS.

• THE LOW PRICED 1100 IS THE LAST 1985 OFFERING. NO PROBLEMS ARE ANTICIPATED BY RESEARCH AS FAR AS FUNCTION, SAFETY, AND ENDURANCE ARE CONCERNED. IT IS ESSENTIALLY THE SAME QUALITY AND APPEARANCE LEVEL AS THE LOW PRICED 870. THE MAJOR QUESTION TO BE ANSWERED IS WHETHER OR NOT THE MANUFACTURING COST WILL POSITION IT FAVORABLY WITH LOW COST AUTOLOADING COMPETITORS SUCH AS THE WINCHESTER 140 AND THE NEW MOSSBERG.

FOR ALL PRACTICAL PURPOSES, WE FEEL WE CAN WRAP UP ALL OF THESE NEW PRODUCT OFFERINGS BY THE END OF 1983. MINOR LEVELS OF SUPPORT HAVE BEEN PROVIDED IN 1984 FOR UNFORSEEN PROBLEMS.

• TWO PRODUCTS ARE SHOWN FOR 1986 ANNOUNCEMENTS. SHOTGUN CHOKE TUBES AND THE 1100 RESTYLE.

CHOKE TUBES ARE NOW FOUND ACROSS THE FULL SPECTRUM OF COMPETITIVE SHOTGUNS FROM EXPENSIVE PERAZZI'S TO MOSSBERGS AND RANGE FROM TOTAL INTERCHANGEABILITY TO MATCHED SETS FOR USE IN ONE BARREL. IT IS NO LONGER FEASIBLE TO IGNORE THEIR IMPACT ON SPARE BARREL SALES. IT IS ALSO NOT PRUDENT TO RUSH INTO PRODUCTION UNTIL WE FULLY UNDERSTAND THEIR PERFORMANCE LIMITATIONS AND SENSITIVITY TO MANUFACTURING TOLERANCES. WE ARE WORKING WITH THE APPLIED STATISTICS SECTION OF ESD TO DEVELOP AN EVALUATION PROGRAM AIMED AT RESOLVING THE KEY ISSUES SHOWN ON THIS CHART.

IT IS ESSENTIAL THAT WE UNDERSTAND THE EFFECTS OF ECCENTRICITY, ANGULARITY, SURFACE FINISH AND DIMENSIONAL TOLERANCES ON THEIR PERFORMANCE SO THAT ADEQUATE MANUFACTURING METHODS CAN BE DEVELOPED. THE DEGREE OF INTERCHANGEABILITY MUST BE CONFIRMED SINCE IT IS DESIREABLE TO BE ABLE TO BUY THE CHOKE TUBE AS AN ACCESSORY ITEM. PERFORMANCE WITH THE FULL RANGE OF AMMUNITION INCLUDING STEEL SHOT AND RIFLED SLUGS MUST ALSO BE FULLY UNDERSTOOD INCLUDING THE EFFECTS OF CORROSION AND RESIDUE. WHILE A RELATIVELY LOW LEVEL OF ENGINEERING COMMITMENT IS FORECAST FOR 1984, WE EXPECT A HEAVY WORKLOAD IN THE TEST LAB TO PROVIDE DATA THAT IS STATISTICALLY SIGNIFICANT. THE DEVELOPMENT OF CHOKE TUBES OBVIOUSLY CAN IMPACT ALL NEW SHOTGUN PROGRAMS AS WELL AS OUR CURRENT PRODUCT LINE.

• THE OTHER PRIORITY PROJECT FOR 1986 IS THE 1100 RESTYLE. THIS CAN BE AS SIMPLE AS A COSMETIC CHANGE SIMILAR TO THE 870 RESTYLE OR IT CAN INCLUDE SUCH ITEMS AS CHOKE TUBES, AN ORIFICE SELECTOR OR A NEW SLUG BARREL. DESIGN SPECIFICATIONS MUST BE ESTABLISHED TO KEEP THIS PROGRAM ON SCHEDULE. OUR GOAL IS TO ESTABLISH FIRM DESIGN REQUIREMENTS WITH MARKETING BEFORE THE END OF THIS MONTH.

• IN 1984 ROUGHLY 68% OF THE AVAILABLE ENGINEERING MANPOWER ASSIGNED TO PRODUCT DEVELOPMENT WILL BE WORKING ON TWO NEW SHOTGUN PROGRAMS, THE NEW LOW COST SHOTGUN AND THE NEW CONCEPT SHOTGUN FAMILY. THE MAJOR DIFFERENCES IN THESE TWO PROGRAMS WILL BE IN THE CONSUMERS PERCEIVED PRICE VALUE RELATIONSHIP. EXTERNALLY WE EXPECT THESE TWO PRODUCT LINES

TO BE DIFFERENT. INTERNALLY, HOWEVER, EVERY EFFORT WILL BE MADE TO GET MAXIMUM UTILIZATION OF COMMON PARTS FOR MANUFACTURING ECONOMY. NEITHER PRODUCT LINE HAS FIRMLY ESTABLISHED PRODUCT REQUIREMENTS AT THIS TIME BUT PRELIMINARY PROPOSALS HAVE BEEN DRAWN UP. OUR GOAL IS TO HAVE A FULL SET OF MODEL REQUIREMENTS DEVELOPED AND APPROVED BEFORE NOVEMBER 1.

THE PROPOSED REQUIREMENTS FOR THE LOW COST FAMILY ARE RATHER SIMPLY STATED. IT MUST HAVE A VISUAL QUALITY LEVEL TO COMPETE WITH THE MOSSBERG 500 AND MUST BE COMPETITIVELY PRICED IN THE MARKETPLACE. TO GET A FEEL FOR THE MAGNITUDE OF THE JOB, INDUSTRIAL ENGINEERING WAS ASKED TO PROVIDE US WITH A THEORETICAL COST STRUCTURE NECESSARY TO PRODUCE THE 870 AT A FACTORY COST OF \$75.00.

● BASED ON THE CURRENT FACTORY COST OF A TYPICAL MODEL 870, ATTAINING A \$75.00 FACTORY COST WOULD REQUIRE AN OVERALL REDUCTION OF 45% AT CURRENT VOLUMES. THE THEORETICAL CHANGE BY COST ELEMENT WOULD BE AS SHOWN HERE.

I.E. ALSO PROVIDED US WITH SEVERAL USEFUL RULES OF THUMB AS GUIDELINES.

● AT CURRENT OVERHEAD AND VARIANCE RATES \$1.00 SAVED IN STANDARD MATERIAL WOULD RESULT IN A \$1.21 SAVINGS IN FACTORY COST. A \$1.00 SAVINGS IN STANDARD LABOR WOULD REDUCE FACTORY COST BY \$5.55.

HOWEVER, IF STANDARD LABOR WERE REDUCED BY INSTALLATION OF MORE AUTOMATED EQUIPMENT, COST ELEMENTS SUCH AS MAINTENANCE AND DEPRECIATION WOULD PRESUMABLY INCREASE, AND THE OVERALL SAVINGS WOULD BE SOMEWHAT LESS THAN THE RATIO WOULD INDICATE.

IN ADDITION \$1.00 SAVED IN STANDARD LABOR WILL JUSTIFY BETWEEN \$4.00 AND \$8.00 INVESTMENT IN CAPITAL EQUIPMENT.

• THE COST BREAKDOWN BY ASSEMBLY IS SHOWN IN THIS CHART, GIVING A GOOD INDICATION OF WHERE THE EFFORT MUST BE DIRECTED IN ORDER TO ACHIEVE OUR GOALS OF A WORKING PROTOTYPE BY THE FIRST QUARTER OF 1985.

SEVERAL KEY ISSUES BECOME IMMEDIATELY OBVIOUS:

1. WILL THE CUSTOMER ACCEPT AN ALUMINUM OR A SHEET METAL FORMED RECEIVER IN THIS GRADE GUN AND CAN ONE BE DEVELOPED TO MEET COST CONSTRAINTS?
2. WILL EXTENSIVE USE OF PLASTICS AND SYNTHETIC MATERIALS BE ACCEPTABLE FOR TRIGGER PLATES, STOCKS AND FORE-ENDS?

OTHER ISSUES WILL BECOME CLEARER AS WE DEVELOP FIRM PRODUCT REQUIREMENTS.

RECENTLY A SUGGESTION WAS MADE TO REINTRODUCE THE OLD M/58 AS OUR LOW PRICED AUTOLOADER. THIS SUGGESTION HAS THE BENEFIT OF UTILIZING MOST OF THE M/870 EQUIPMENT ALREADY INSTALLED. OUR STAMPING VENDOR HAS MOST OF THE TOOLING NECESSARY TO RESUME PRODUCTION OF STAMPED PARTS. WE HAVE REQUESTED A COST ANALYSIS FROM PRODUCTION TO EVALUATE THIS PROPOSAL. A SAMPLE IS AVAILABLE FOR YOUR REVIEW.

• THE NEW CONCEPT SHOTGUN HAS NOT YET BEEN DEFINED. WE HAVE EIGHT PAGES OF PERFORMANCE SPECIFICATIONS THAT MUST BE MET, USING THE MODEL 1100 AS A STANDARD. FOR THE MOST PART, THESE SPECIFICATIONS HAVE BEEN ATTAINED BY THE XSG-XPG PROJECT BUT ONE ESSENTIAL INGREDIENT IS LACKING. THIS INGREDIENT WAS OUTLINED IN THE DISCUSSION OF DISCRETIONARY RESEARCH. WHAT IS NEEDED IS AN INNOVATIVE FEATURE THAT PERCEPTIVELY ADVANCES THE STATE OF THE ART IN CONTEMPORARY SHOTGUNS. WE DO NOT YET KNOW WHAT THAT FEATURE OR FEATURES IS. OUR OBJECTIVE IS TO DEFINE THE PRODUCT REQUIREMENTS FOR THE NEW SHOTGUN FAMILY THE 1ST QUARTER OF 1984.

NEW BOLT ACTION RIFLE

• THE LAST ITEM ON THE DEVELOPMENT SCHEDULE FOR TODAY'S DISCUSSION IS THE NEW BOLT ACTION RIFLE. THIS RIFLE IS THE FINAL PHASE OF OUR BOLT ACTION STRATEGY. LAST YEAR WE REVIEWED THE PRODUCT REQUIREMENTS FOR THIS RIFLE ALONG WITH TWO CONTINGENCY POSITIONS. TODAY I WILL REVIEW THE KEY ELEMENTS OF THE PREFERRED DESIGN AND OUR PROGRESS TO DATE.

• THE RECEIVER HAS BEEN REDESIGNED TO PROVIDE FEATURES THAT ARE PREFERRED BY CUSTOM GUNSMITHS, GUN WRITERS AND CUSTOMERS. TO DATE, ONE RIFLE IN 7mm-08 CALIBER, INCORPORATING ALL THESE RECEIVER FEATURES HAS BEEN COMPLETED AND READY FOR TEST.

BECAUSE OF THE COMPLICATED LINKAGES REQUIRED TO BLOCK BOTH THE TRIGGER AND FIRING PIN WITH A SINGLE SAFETY SWITCH, THE REQUIREMENTS HAVE BEEN MODIFIED TO BLOCK THE SEAR AND THE TRIGGER. FIVE SAMPLE ASSEMBLIES HAVE BEEN COMPLETED AND ARE IN THE LAB FOR A SERIES OF TESTS. DRY CYCLE TESTING OF EACH ASSEMBLY TO 7500 CYCLES AND 2500 ROUNDS OF LIVE FIRING HAVE BEEN SUCCESSFULLY COMPLETED - ADVERSE CONDITION TESTING FOR DIRT, LUBRICATION, RUST AND TEMPERATURE EXTREMES MUST STILL BE DONE. ANALYSIS FOR MANUFACTURABILITY MUST ALSO BE COMPLETED. WE SEE THE BOLT LOCK, AS A GOOD SELLING FEATURE, AND CONTINUE TO FEEL THAT IT SHOULD BE INDEPENDENT OF THE SAFETY SWITCH. THE DESIGN USED ON EARLY PROTOTYPES OF THE MODEL SEVEN IS STILL OUR CHOICE AND WE ARE LOOKING AT MORE ECONOMICAL WAYS TO PRODUCE IT.

NO PROGRESS HAS BEEN MADE ON PROVIDING A FULLY ADJUSTABLE FIRE CONTROL.

THE LIGHTWEIGHT CONTOUR ON THE BARREL HAS BEEN TESTED ON THE MOUNTAIN RIFLE WITH EXCELLENT RESULTS AS WE HAVE ALREADY REPORTED. BARRELS WITH HAMMER MARKS HAVE BEEN MADE AND WILL BE INCLUDED IN THE TEST PROGRAM THAT IS SCHEDULED TO START AFTER THE FIRST OF THE YEAR.

THE ROTARY MAGAZINE HAS BEEN DESIGNED, DETAILED AND SENT TO THE MODEL SHOP.

THE FULLY ENCLOSED CLAW EXTRACTOR HAS BEEN DESIGNED AND SAMPLES MADE TO OVERCOME THE PERCEIVED INADEQUACIES OF OUR PRESENT CENTERFIRE EXTRACTOR. SAMPLES ARE AVAILABLE FOR YOU TO LOOK AT.

THE FIRST REDESIGN OF THE FIRING PIN ASSEMBLY FAILED TO PRODUCE THE DESIRED REDUCTION IN LOCK TIME. A REDESIGN OF THE MAINSPRING IS IN PROGRESS.

THE STOCK IS STYLED ESSENTIALLY THE SAME AS THE MOUNTAIN RIFLE. TESTING ON THE MOUNTAIN RIFLE INDICATES THAT NO SPECIAL BEDDING IS REQUIRED. THIS MUST BE RECONFIRMED WITH THE NEW RECEIVER.

IN SUMMARY, PROTOTYPE RIFLES WITH EACH OF THE FEATURES SHOWN SHOULD BE IN TEST IN JANUARY WITH THE EXCEPTION OF THE EXTERNALLY UNSTABLE FIRE CONTROL.

• KEY ISSUES THAT MUST BE RESOLVED ARE SHOWN HERE:

1. WILL THE TIMING OF THE TRIAL & PILOT COINCIDE WITH THE AVAILABILITY OF THE FMS?
2. CAN A POLISHING PROCESS BE IMPLEMENTED TO FINISH OCTAGONAL RECEIVERS ECONOMICALLY?
3. WILL THE EXTRACTOR BE ACCEPTABLE FROM THE STANDPOINT OF FUNCTION, COST AND SAFETY?
4. WILL THE NEW FIRE CONTROL BE READY TO TRANSMIT WITH THE REST OF THE DESIGN?

CBWo: man

Illior Firearms Research

FIREARMS RESEARCH

...
Clark Workman

OBJECTIVES

- o *MISSION*

KEY ISSUES

- o *PRIORITIES*

RESOURCE ALLOCATION

DEVELOPMENT SCHEDULING

MISSION

- o *STRENGTHEN DOMESTIC POSITION*
- o *REDIRECT INTERNATIONAL POSITION*
- o *15% PRETAX MARGINS BY 1988*

KEY ISSUES

1. HOW TO ACHIEVE 15% PROFITABILITY
IN 1988
2. HOW TO ACHIEVE 30% RETAIL MARKET
SHARE IN 1988
3. HOW TO STRENGTHEN INTERNATIONAL
PARTICIPATION

EXEMPT
RESOURCE ALLOCATION

	<u>1983</u>	<u>1984</u>
NEW PRODUCTS	11	11
NEW PROCESSES & MATERIALS	9	4
DISCRETIONARY RESEARCH	1.5	5
PROJECTS & SERVICES	1.5	1.5
PROTOTYPES & TEST	7	6
OTHER WORK	3.5	3
LEGAL SUPPORT	1.5	1.5
MANAGEMENT & SUPERVISION	4	3
ESD ENGINEERS	2	1
	<u>41</u>	<u>36</u>

DEVELOPMENT PROGRAMS	ASSIGNABLE				
	EXEMPT	84	85	86	87 88
870 SPECIAL FIELD	0				
LOW PRICE M/870	0				
LOW PRICE M/700	0				
M/700 250 SAVAGE	0				
MODEL SEVEN .223 CAL	.1				
M/870 RESTYLE	.1				
NEW LOW COST SHOTGUN	3.5				
NEW CONCEAL SHOTGUN	2.0				
NEW H&I ACTION RIFLE	2.0				
M/700 MOUNTAIN RIFLE	.1				
IMMC	2.5				
SHOTGUN CHOKE TUBES	1.0				
CUT CHECKERING	1.5				
M/1100 RESYTLE	.5				
M/1100/870 WATERFOWL	.1				
LOW PRICE M/1100	.1				
TOTAL	15.0				

DISCRETIONARY RESEARCH

RIFLE ACCURACY

- o TAPERED BORES
- o GAIN TWIST/PARTIAL RIFLING
- o LOCK TIME
- o BARREL CONTOURS & VIBRATION
- o BEDDING

SHOTGUNS

- o CHOKES & CHOKE SYSTEMS
- o SPECIAL SLUG BARRELS

GENERAL

- o RECOIL & RECOIL REDUCTION
- o MUZZLE DEVICES
- o ACTUATING SYSTEMS

SYNERGISTIC SYSTEMS

- o MICROCOMPUTER APPLICATIONS
- o ELECTRONIC IGNITION
- o EXPENDABLE/CONSUMABLE CASE AMMO
- o RAIL GUN CONCEPTS

UNMANNED PROGRAMS
IN ORDER OF PRIORITY

DISCRETIONARY TOPICS ?

- o AUTO TEST & INSPECT
- o .338 WIN. MAG FOR CLASSIC
- o INEXPENSIVE RIMFIRE AUTOLOADER
- o FOUR SLIDE TOOLING DEVELOPMENT
- o FORM ROLLING
- o AUTO SANDING
- o NEW COATINGS
- o ALTERNATIVE MATERIALS

RESEARCH RESPONSIBILITY

*CONTINUE SELECTIVE INTRODUCTION
OF NEW PRODUCTS*

DEVELOPMENT PROGRAMS	ASSIGNABLE EXEMPT					
	1984	84	85	86	87	88
870 SPECIAL FIELD	0					
LOW PRICE M/870	0					
LOW PRICE M/700	0					
M/700 250 SAVAGE	0					
MODEL SEVEN .223 CAL	.1					
M/870 RESTYLE	.1					
NEW LOW COST SHOTGUN	3.5					
NEW CONCEPT SHOTGUN	3.5					
NEW BOLT ACTION RIFLE	2.0					
M/700 MOUNTAIN RIFLE	.1					
IMMC	2.5					
SHOTGUN CHOKE TUBES	1.0					
CUT CHECKERING	1.5					
M/1100 RESTYLE	.5					
M/1100/870 WATERFOWL	.1					
LOW PRICE M/1100	.1					
TOTAL	15.0					

DEVELOPMENT PROGRAMS	ASSIGNABLE EXEMPT					
	1984	84	85	86	87	88
NEW LOW COST RIFLE	0					
NEW LOW COST M/870	0					
NEW LOW COST M/700	0					
M/700 200 SAAMI	0					
NEW LOW COST M/1100	0					
M/870 RESTYLE	.1					
NEW LOW COST SHOTGUN	3.5					
NEW CONCEPT SHOTGUN	3.5					
NEW BOLT ACTION RIFLE	2.0					
M/700 MOUNTAIN RIFLE	.1					
IMMC	2.5					
SHOTGUN CHOKE TUBES	1.0					
CUT CHECKERING	1.5					
M/1100 RESYTLE	.5					
M/1100/870 WATERFOWL	.1					
LOW PRICE M/1100	.1					
TOTAL	15.0					

6

6

M/870 RESTYLE

RECEIVER

- o MATTED / RAISED RIB
- o MATTED / STANDARD
- o PLAIN / STANDARD

FOREEND

- o NEW SHAPE
- o MEDIUM GLOSS
- o CUT CHECKERING

STOCK

- o LENGTHENED M/870
- o NEW GRIP CAP
- o MEDIUM GLOSS
- o CUT CHECKERING
- o NO SPACERS
- o OLD ENGLISH RECOIL PAD

M/700 MOUNTAIN RIFLE

ACTION

- o MODEL 700 WITH FLOOR PLATE

BARREL

- o MODEL SEVEN CONTOUR
- o 22-1/2 INCHES
- o TARGET CROWN
- o 30-06, .270, .280

STOCK

- o EMMONS STYLING
- o LOW GLOSS
- o CUT CHECKERING
- o NO SPACERS
- o BLACK FOREEND TIP
- o BLACK GRIP CAP
- o REINFORCING SCREWS

ACCURACY
MOUNTAIN RIFLE

<i>GUN</i>	<i>AVG. GROUP SIZE</i>
1	1.52"
2	1.54"
3	1.87"
4	1.83"

FACTORY SPECIFICATION

3.5"

M/1100 — M/870
WATERFOWL

METALFINISH

- PARKERIZED

BREECH BOLT

- BLACK OXIDE

STOCK & FOREEND

- BIRCH
- NO SPACERS
- NO CHECKERING
- NO GRIP CAP

MISCELLANEOUS

- SLING
- CHROME PLATED BORE & CHAMBER

DEVELOPMENT PROGRAMS	ASSIGNABLE				
	EXEMPT	84	85	86	87 88
870 SPECIAL FIELD	0				
LOW PRICE M/870	0				
LOW PRICE M/700	0				
M/700 250 SAVAGE	0				
MODEL SEVEN .223 CAL	.1				
M/870 RESTYLE	.1				
NEW LOW COST SHOTGUN	3.5				
NEW CONCEPT SHOTGUN	3.5				
NEW BOLT ACTION RIFLE	2.0				
M/700 MOUNTAIN RIFLE	.1				
IMMC	2.5				
SHOTGUN CHOKE TUBES	1.0				
CUT CHECKERING	1.5				
M/1100 RESYTLE	.5				
M/1100/870 WATERFOWL	.1				
RESEARCH AND DEVELOPMENT					
TOTAL	15.0				

DEVELOPMENT PROGRAMS	ASSIGNABLE EXEMPT					
	1984	84	85	86	87	88
870 SPECIAL FIELD	0					
LOW PRICE M/870	0					
LOW PRICE M/700	0					
M/700 250 SAVAGE	0					
MODEL SEVEN .223 CAL	.1					
M/870 RESTYLE	.1					
NEW LOW COST SHOTGUN	3.5					
NEW CONCEPT SHOTGUN	3.5					
NEW BOLT ACTION RIFLE	2.0					
M/700 MOUNTAIN RIFLE	.1					
IMMC	2.5					
NEW CONCEPT RIFLE	7.5					
CUT CHECKERING	1.5					
NEW CONCEPT RIFLE	7.5					
M/1100/870 WATERFOWL	.1					
LOW PRICE M/1100	.1					
TOTAL	15.0					

KEY ISSUES CHOKE TUBES

POINT OF IMPACT & PERFORMANCE

⋮

- o *ECCENTRICITY*
- o *ANGULARITY*
- o *SURFACE FINISH*
- o *DIMENSIONAL TOLERANCE*
- o *INTERCHANGEABILITY*
- o *STEEL SHOT*
- o *SLUGS*
- o *CORROSION*
- o *RESIDUE*

DEVELOPMENT PROGRAMS	ASSIGNABLE EXEMPT					
	1984	84	85	86	87	88
870 SPECIAL FIELD	0					
LOW PRICE M/870	0					
LOW PRICE M/700	0					
M/700 250 SAVAGE	0					
MODEL SEVEN .223 CAL	.1					
M/870 RESTYLE	.1					
NEW LOW COST SHOTGUN	3.5					
NEW CONCEPT SHOTGUN	3.5					
NEW BOLT ACTION RIFLE	2.0					
M/700 MOUNTAIN RIFLE	.1					
IMMC	2.5					
SHOTGUN CHOKE TUBES	1.0					
CUT CHECKERING	1.5					
NEW RESTYLE	1.0					
M/1100/870 WATERFOWL	.1					
LOW PRICE M/1100	.1					
TOTAL	15.0					

DEVELOPMENT PROGRAMS	ASSIGNABLE					
	EXEMPT	1984	84	85	86	87 88
870 SPECIAL FIELD	0					
LOW PRICE M/870	0					
LOW PRICE M/700	0					
M/700 250 SAVAGE	0					
MODEL SEVEN .223 CAL	.1					
M/870 RESTYLE	.1					
NEW BOLT ACTION RIFLE	2.0					
M/700 MOUNTAIN RIFLE	.1					
IMMC	2.5					
SHOTGUN CHOKE TUBES	1.0					
CUT CHECKERING	1.5					
M/1100 RESYTLE	.5					
M/1100/870 WATERFOWL	.1					
LOW PRICE M/1100	.1					
TOTAL	15.0					

REQUIREMENTS FOR REDUCING M/870
FACTORY COST TO \$75.00

	<u>CURRENT</u>	<u>PROPOSED</u>	<u>NET CHANGE</u>
STANDARD MATERIAL	\$ 24.25	\$ 13.22	\$ 11.03
MATERIAL VARIANCE	---	---	---
STANDARD LABOR	19.49	10.62	8.87
DIRECT VARIANCE	11.83	6.45	5.38
DIRECT CHARGES	41.65	22.70	18.95
MANUFACTURING O/H	16.34	8.90	7.44
PLANT O/H	24.06	13.11	10.95
FACTORY COST	<u>\$137.62</u>	<u>\$ 75.00</u>	<u>\$ 62.62</u>

GUIDELINES

SAVINGS		FACTORY COST
STANDARD MATERIAL	\$1.00	\$1.21
STANDARD LABOR	\$1.00	\$5.55
		INVESTMENT
STANDARD LABOR	\$1.00	\$4.00 - \$8.00

AVERAGE FACTORY COST — MODEL 870

<u>COST ITEM</u>	<u>% OF TOTAL FACTORY COST</u>
RECEIVER ASSEMBLY	21.0%
BARREL ASSEMBLY	19.1
STOCK ASSEMBLY	18.0
TRIGGER PLATE ASSEMBLY	8.7
FOREEND ASSEMBLY	8.1
MISC. MACHINING OF COMPONENTS	7.4
BREECH BOLT ASSEMBLY	7.3
FINAL ASSEMBLY	5.4
GRATIS REPAIR, PROJ.CHARGES, ETC	2.5
TEST AND TARGET	1.3
PACKING	1.2
AVERAGE TOTAL FACTORY COST	<u>100.0</u>

DEVELOPMENT PROGRAMS	ASSIGNABLE EXEMPT					
	1984	84	85	86	87	88
870 SPECIAL FIELD	0					
LOW PRICE M/870	0					
LOW PRICE M/700	0					
M/700 250 SAVAGE	0					
MODEL SEVEN .223 CAL	.1					
M/870 RESTYLE	.1					
NEW LOW COST SHOTGUN	3.5					
NEW CONCEAL SHOTGUN	3.5					
NEW BOLT ACTION RIFLE	2.0					
M/700 MOUNTAIN RIFLE	.1					
IMMC	2.5					
SHOTGUN CHOKE TUBES	1.0					
CUT CHECKERING	1.5					
M/1100 RESYTLE	.5					
M/1100/870 WATERFOWL	.1					
LOW PRICE M/1100	.1					
TOTAL	15.0					

DEVELOPMENT PROGRAMS	ASSIGNABLE EXEMPT					
	1984	84	85	86	87	88
870 SPECIAL FIELD	0					
LOW PRICE M/870	0					
LOW PRICE M/700	0					
M/700 250 SAVAGE	0					
MODEL SEVEN .223 CAL	.1					
M/870 RESTYLE	.1					
NEW LOW COST SHOTGUN	3.5					
NEW CONCEPT SHOTGUN	3.5					
NEW CONCEPT SHOTGUN	3.5					
M/700 MOUNTAIN RIFLE	.1					
IMMC	2.5					
SHOTGUN CHOKE TUBE	1.0					
CUT CHECKERING	1.5					
M/1100 RESYTLE	.5					
M/1100/870 WATERFOWL	.1					
LOW PRICE M/1100	.1					
TOTAL	5.0					

MODEL REQUIREMENTS
NEW BOLT ACTION RIFLE
KEY ELEMENTS

RECEIVER

- FLAT BOTTOM – OCTAGONAL TOP
- INTEGRAL RECOIL LUG
- INTEGRAL AND STANDARD SCOPE MOUNTS

SAFETY

- BLOCK TRIGGER AND FIRING PIN
- INDEPENDENT BOLT LOCK

FIRE CONTROL

- FULLY ADJUSTABLE – IN STOCK

BARREL

- HIGH GLOSS W/HAMMER MARKS
- LIGHT WEIGHT CONTOUR

FEED SYSTEM

- ROTARY MAGAZINE

BOLT

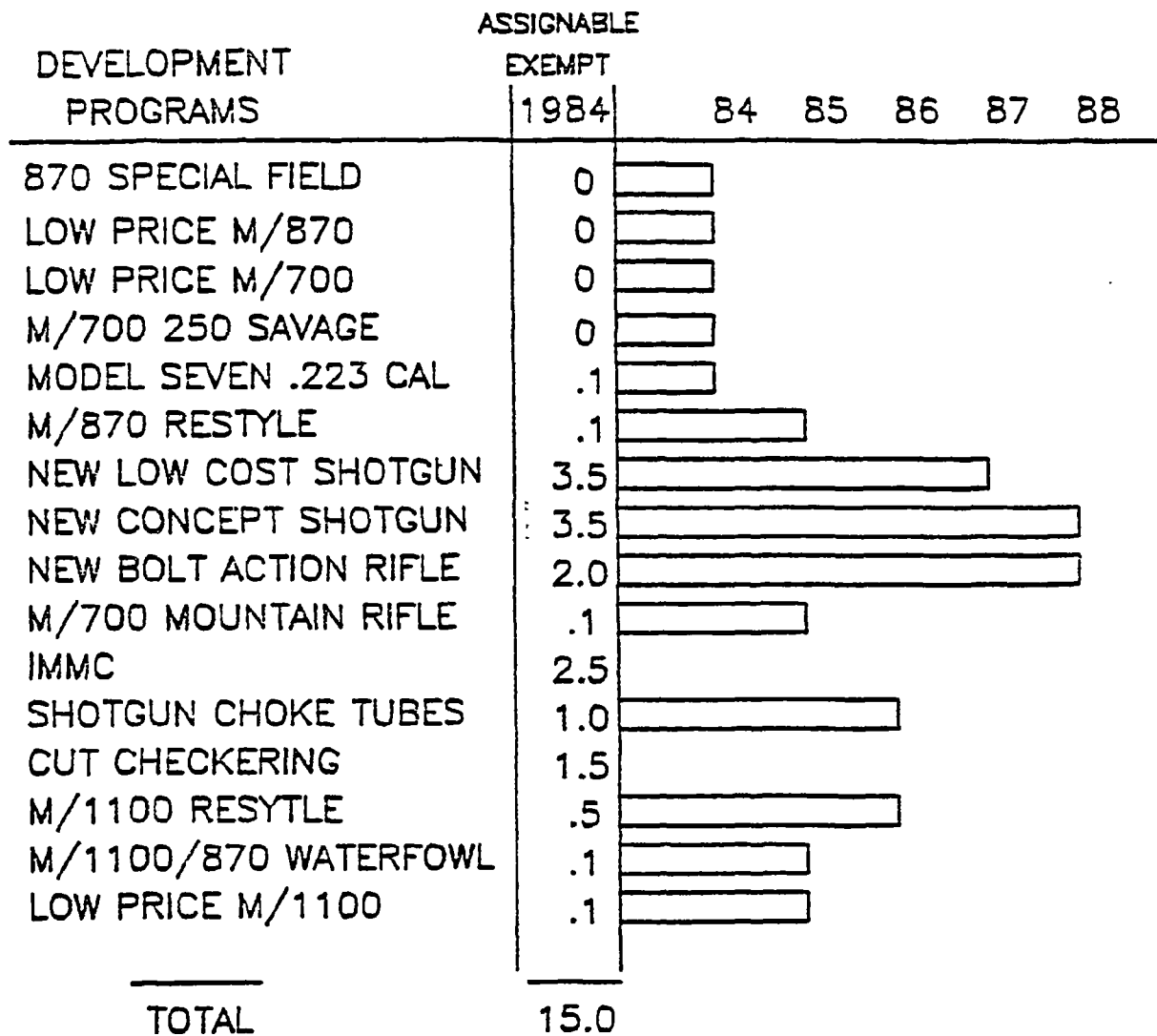
- FULLY ENCLOSED CLAW EXTRACTOR
- REDUCED LOCK TIME

STOCK

- WALNUT
- CAST OFF – TOE OUT
- SPECIAL BEDDING
- SPECIAL STYLING

KEY ISSUES
NEW BOLT ACTION RIFLE

- o *TIMING vs FMS*
- o *RECEIVER POLISHING*
- o *EXTRACTOR*
- o *ADJUSTABLE FIRE CONTROL*



New Colt Action Rifle

1988 introduction Warehouse Oct '87

Complete T&P by July '87

M/D transfer Jan 88 Prototype testing compl Nov 84
Management review Apr 84

Real Prototype testing Compl Apr '84

Ruffed design except Receiver - all scope rings included

Safety - block trigger & rear

- safety in M/700 configuration
could yield on tang

Fire Control - no options - built

- skeletonized housing built - have lost
built exposed components.

Barrel - problem with initial defects on GFM'd bolts?

- Recoil reducing muzzle device not tried
- stainless steel action - Mark preference?

Feed System

- Rotary magazine box - in M/5
- follower?
- geared follower

Bolt

- Needs work, difficult to machine
- Reduced lock time

Lighter F.P. spring - did not produce expected result

Stock

5 Cast off & too out - clamp inhibiting to accept rifle received

~~Skid on anti-static & strips~~
Easy bedding

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE



"CONFINE YOUR LETTER TO ONE SUBJECT" _____

xc: C. B. Workman

J. S. MartinF. E. MartinS. A. Fanelli

Ilion, New York
December 11, 1980

*Workman
file with Bolt Action
"new ideas"
Jim*

TO: J. P. GLAS

FROM: T. L. CAPELETTI *TC*

SUBJECT: POTENTIAL IMPROVEMENTS TO BOLT ACTION RIFLES

I have discussed potential improvements to our bolt action rifles with Fred Martin and Sal Fanelli in response to your inquiries concerning why Remington may be losing position in that market and what we might do to regain that position. In view of the new Winchester Model 70 light weight, this is an opportune time to review results of those discussions for you. Fred and Sal's suggestions, summarized below, fall into three general categories: Improvements in a.) Design, b.) Appearance, and c.) Marketing Philosophy. These suggestions have not been fully reviewed with either Jim Martin or Clark Workman. However, I feel they merit further consideration. Significant change in our market position will probably require focused attention on a complete redesign of the firearms combined with a more aggressive marketing approach.

Design

Areas where design changes may be beneficial are in the receiver, feeding, and fire control systems. It may be possible to design a bolt action with enough commonality in the receiver to permit use of one magazine box and fire control system with all of our centerfire rifles (autoload, pump, and bolt action). Commonality would have obvious cost improvement advantages and is worth serious consideration. However, our bolt actions have an excellent reputation for accuracy and durability and one of the program objectives would certainly be to maintain that performance and reputation.

Short of complete redesign of the line, improvements are possible in the feeding and fire control systems of the current designs. The magazine in the M/700 ADL 7mm magnum can only accommodate

two (2) rounds with ease; holding three (3) rounds sometimes requires special adjustments. Magazines should be designed to easily accommodate three (3) magnum rounds or four (4) standard rounds. In fact, we need focused attention on the feeding systems on all our bolt actions, including the rimfires. Regarding the fire controls, we already have a program to develop improved systems. Those improvements should be aggressively pursued and implemented.

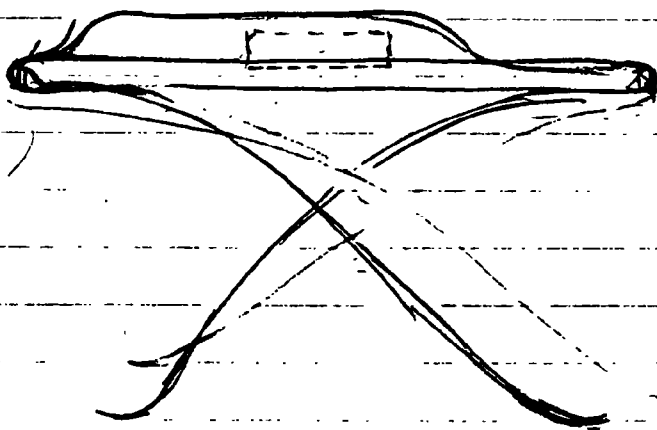
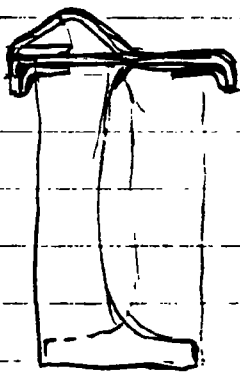
Appearance

When properly cleaned and displayed, our bolt action centerfires have an excellent appearance and give an impression of rugged dependability. However, out-of-the-box appearance is generally not as favorable due to salt bleedout problems, use of oil coatings for rust prevention, and dull sights. Salt bleedout is not a new problem and we have taken steps to eliminate bleedout where we have a known recurring problem. Oil coating for rust prevention is a standard Remington procedure which is not used by some of our competitors. We should investigate alternative protective coatings, such as dry lubricants. Our powder metallurgy sites have a dull appearance due to porosity even when polished. We should consider a complete change in our sight line.

Marketing Philosophy

Our marketing approach for bolt actions has been unchanged for many years. We need some innovations in design combined with more emphasis on strengths of our current line. The M/700 has the strongest locking system and is the most accurate bolt action centerfire rifle on the market. While our extractors are stronger than those of our competitors, they do not have the same massive appearance. We need to take advantage of existing test data to counter the implication that massive appearance correlates with strength. Finally, we should advertise availability of special calibers on custom orders or make special calibers available to preferred dealers or customers. One possibility is to introduce a special edition 35 Whalen caliber rifle as a commemorative to Col. Townsend Whalen.

TLC:ws
Firearms Research Division



MODEL SEVEN LWT 1980



RECORDS CONTROL SCHEDULE

RECORDS CATEGORY OR TITLE:

PROJECT RECORDS

PROJECT FILE

COPY "O" (OFFICIAL) ☒ "X" (EXTRA) ☐

TOTAL RETENTION: MAX. LIFE OF

FACILITY OR MODEL

GS-11050 Rev. 8/78

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE



Xc: C.B. Workman

"CONFINE YOUR LETTER TO ONE SUBJECT ONLY" _____

MEMORANDUM OF MEETING

NEW BOLT ACTION RIFLE

November 15, 1979

PRESENT: L. G. Wilke D. E. Bullis
L. B. Bosquet ← J. W. Brooks
D. D. Parker P. G. Johnson
K. F. Blumer

This meeting was held so Process Engineering could look at the first proposed model and suggest problem areas of manufacture that should be reviewed before final prototype models are made.

1. The checkering pattern is large and close to top of stock and bottom of grip. It may go over radius of grip and fore end too far for custom checkering.
2. The top edge of stock along barrel and receiver should be approx. .050 min. width to meet present manufacturing processes.
3. Define tang area with more detail to establish safety button clearance with stock, safety arm clearance to prevent breakthru during sanding, and possible machining operation to help improve blend sanding of tang area.
4. It would be nice to have rear grip end radius as close as possible to radius on bottom of stock at rear of grip for machining purposes.
5. Can bolt handle cut be described so that it can be put on at inletter rather than with Z-arm router.
6. Inletting of floor plate should have as many common radii as possible and as large as possible.
7. Screw holes in butt end of stock should be same as in M600 to use same fixtures if possible.
8. Pitch should be same as M600 to use same fixtures if possible.

JWB:T

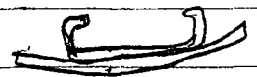
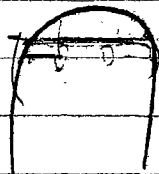
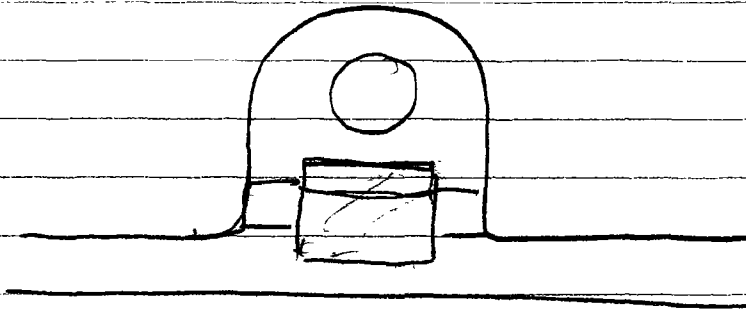
Ilion Research Division

Stock will be new - need drugs by Feb 1 - (Mar 1 at latest)

est. by May 1

quately April 1

drugs - by Feb. 1



FURN. PRINTS

Ilion Research Division

RD - 6514

DATE		CARBINE							
		BOLT ACTION CENTER FIRE RIFLE							
SHEET OF	1 3	Dotted line (----) indicates same part number.							
DWG. NO.		PART NUMBER	308 WIN	6 MM REM	243 WIN	7MM DB	358 WIN	22 REM	
			PART NUMBERS						
D-34990		BARREL ASSEMBLY	34990	34991	34992	34993		34994	
D-32420		BARREL	32425	32423	32422	32426		32424	
B-91827		BARREL BRACKET	91827	---	---	---	---	---	
A-15128		BRACKET BLANK	15128	---	---	---	---	---	
D-		RECEIVER		---	---	---			
C-15787		"						15787	
C-		(BBL & REC. MARKINGS)							
B-34980		BOLT FINAL ASSEMBLY	34980	---	---	---		34981	
D-34970		BOLT ASSEMBLY (REF. A-26705)	34970	34971	34972	34973		34974	
D-26710		BOLT BODY ASSEMBLY	26710	---	---	---	---		
D-26780		" " "						26780	
C-15407		BOLT BODY	15407	---	---	---	---		
C-28500		(BODY BLANK)	28502	---	---	---	---	---	
A-18493		BOLT BODY BRAZING SLUG	18493	---	---	---	---	---	
C-15479		BOLT HEAD	15479	---	---	---	---		
C-15851		" "						15851	
A-18758		BOLT PIN	18758	---	---	---	---	---	
B-17011		EJECTOR WASHER	17011	---	---	---	---	---	
D-26330		BOLT HANDLE	26330	---	---	---	---	---	
C-20185		BRAZING SHIM	20186	---	---	---	---	---	
A-17017		EJECTOR	17017	---	---	---	---	---	
A-17676		EJECTOR PIN	17676	---	---	---	---	---	
A-17019		EJECTOR SPRING	17019	---	---	---	---	---	
B-14669		EXTRACTOR	14669	---	---	---	---		
C-15850		"						15850	
C-27340		EXTRACTOR RIVET	27340	---	---	---	---	27342	
A-28600		FIRING PIN ASSEMBLY	28600	---	---	---	---	---	
C-15676		BOLT PLUG	15676	---	---	---	---	---	
C-15674		(PLUG BLANK)	15674	---	---	---	---	---	
B-15410		FIRING PIN	15410	---	---	---	---	---	
B-17022		FIRING PIN CROSS PIN	17022	---	---	---	---	---	
C-23320		FIRING PIN HEAD	23321	---	---	---	---	---	
B-27975		(HEAD BLANK)	27975	---	---	---	---	---	
A-15411		MAIN SPRING	15411	---	---	---	---	---	
A-17113		EXTRUDED STOCK (F. PIN HEAD)	17113	---	---	---	---	---	

DATE		CARBINE BOLT ACTION CENTER FIRE RIFLE						
SHEET OF	2 3	Dotted line (- - - -) indicates same part number.						
DWG. NO.		PART NUMBER	308 WIN	6 MM REM	243 WIN	7 MM 08	358 WIN.	223 REM.
			PART NUMBERS					
C-15412	BOLT STOP	15412	---	---	---	---	---	---
C-24475	BOLT STOP PIN	24484	---	---	---	---	---	---
A-15413	BOLT STOP SPRING	15413	---	---	---	---	---	---
C-22035	FRONT GUARD SCREW	22037	---	---	---	---	---	---
C-15373	FRONT SIGHT	15373	---	---	---	---	---	---
C-15719	" (ALTERNATE)	15719	---	---	---	---	---	---
B-28510	FRONT SIGHT RAMP	28510	---	---	---	---	---	---
B-16724	(RAMP BLANK	16724	---	---	---	---	---	---
B-28505	FRONT SIGHT RAMP SCREW (2)	28505	---	---	---	---	---	---
C-16715	MAGAZINE	16715	---	---	---	---	---	---
B-16716	MAGAZINE							16716
C-90982	MAGAZINE FOLLOWER	90982	---	---	---	---	---	---
C-90953	MAGAZINE FOLLOWER							90951
B-15742	MAGAZINE SPACER							15742
C-17891	MAGAZINE SPRING	17891	---	---	---	---	---	---
C-91133	MAGAZINE SPRING							91133
A-15287	REAR GUARD SCREW	15287	---	---	---	---	---	---
B-32520	REAR SIGHT ASSEMBLY	32520	---	---	---	---	---	---
C-32510	REAR SIGHT OPERATURE	32510	---	---	---	---	---	---
C-91595	REAR SIGHT BASE (BLANK C-31000)	91595	---	---	---	---	---	---
B-28505	REAR SIGHT BASE SCREW (2)	28505	---	---	---	---	---	---
C-90905	REAR SIGHT SLIDE (BLANK C-90925)	90905	---	---	---	---	---	---
B-90906	ELEVATION SCREW	90906	---	---	---	---	---	---
B-90904	WINNAGE SCREW	90904	---	---	---	---	---	---
B-17934	RECEIVER PLUG SCREW (5)	17934	---	---	---	---	---	---
C-24475	SEAR PIN (2)	24476	---	---	---	---	---	---

DATE		CARRING BOLT ACTION C.F. RIFLE						
SHEET OF	3 3	Dotted line (-----) indicates same part number.						
DWG. NO.		PART NUMBER	308 WIN	6MM REM	243 WIN	7MM OB.	222 REM	
			PART NUMBERS					
		STOCK ASSEMBLY BIRCH						
		A-15741 BUTT PLATE	15741	---	---	---	---	
		C-25410 BUTT PLATE SCREW (2)	25410	---	---	---	---	
		A-15375 REINFORCING SCREW (2)	15375	---	---	---	---	
		B-15651 REINFORCING SCREW (2)	15651	---	---	---	---	
NEW		E- STOCK (CHECKERING PATTERN)		---	---	---	---	
		A-15356 SWIVEL SCREW, FRONT	15356	---	---	---	---	
		A-15358 SWIVEL SCREW, REAR	15358	---	---	---	---	
		TRIGGER ASSEMBLY						
		C-91828 BOLT STOP RELEASE	91828	---	---	---	---	
		C-91828 SAFETY ASSEMBLY	91828	---	---	---	---	
		C-91828 SAFETY	91828	---	---	---	---	
		C-91828 SAFETY THUMBPIECE	91828	---	---	---	---	
		B-23220 SAFETY DETENT BALL	23220	---	---	---	---	
		A-15368 SAFETY DETENT SPRING	15368	---	---	---	---	
		B-17043 SAFETY PIVOT PIN	17043	---	---	---	---	
		A-17044 SAFETY SNAP WASHER	17044	---	---	---	---	
		C-91470 SEAR SAFETY CAM	91470	---	---	---	---	
		A-17047 SEAR SPRING	17047	---	---	---	---	
		C-15280 TRIGGER -600	15280	---	---	---	---	
		B-17053 TRIGGER-ADJUSTING SCREW	17053	---	---	---	---	
		A-15436 TRIGGER CONNECTOR	15436	---	---	---	---	
		B-91128 TRIGGER ENGAGEMENT SCREW	91128	---	---	---	---	
		C-26655 TRIGGER HOUSING ASSY.	26655	---	---	---	---	
		A-14632 TRIGGER HOUSING RIVET (4)	14632	---	---	---	---	
		B-14630 TRIGGER HOUSING SPACER FRONT	14630	---	---	---	---	
		B-14631 TRIGGER HOUSING SPACER REAR	14631	---	---	---	---	
		C-30780 TRIGGER SIDE PLATE, RIGHT	30780	---	---	---	---	
		C-30780 TRIGGER SIDE PLATE, LEFT	30781	---	---	---	---	
		C-24475 TRIGGER PIN	24475	---	---	---	---	
		A-15400 TRIGGER SPRING	15400	---	---	---	---	
		A-15481 TRIGGER STOP SCREW	15481	---	---	---	---	
NEW		TRIGGER GUARD ASSEMBLY		---	---	---	---	
		FLOOR PLATE		---	---	---	---	
		FLOOR PLATE COVER		---	---	---	---	
		FLOOR PLATE LATCH		---	---	---	---	
		FLOOR PLATE LATCH SPRING		---	---	---	---	
		FLOOR PLATE PIVOT PIN		---	---	---	---	
		C-14971 TRIGGER GUARD	14971	---	---	---	---	

R2539205

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE



XC: L. B. Bosquet
D. E. Bullis
L. G. Wilke
C. B. Workman

"CONFINE YOUR LETTER TO ONE SUBJECT ONLY" _____

Ilion, New York
May 5, 1980

TO: JOHN LINDE
JOHN BROOKS

FROM: GARY CAMPBELL *GC*

BOLT ACTION CARBINE MEETING

Per our meeting of May 5, 1980, the following agreements were reached:

Process Engineering will

- ° Complete preliminary economics by 5/9/80
- ° Obtain quotations for purchased parts as soon as firm designs are available
- ° Order long delivery equipment and tooling prior to project approval (especially for Stock and Receiver)
- ° Complete pilot work by August, 1981

Research will

- ° Furnish Stock and Receiver drawings by 5/9/80
- ° Furnish drawings of all components and a complete parts list by 6/1/80. Designs will be considered firm, pending product acceptance.
- ° Transmit final design immediately after product acceptance in June or July.

GDC:eb

xc: R.L. Hall
H.K. Boyle
J.P. Linde
G.E. Fletcher
C.B. Workman
J.W. Brooks
L.B. Bosquet

Est. File #4152

May 13, 1980

G.D. Campbell

Bolt Action Carbine

Estimated 1980 factory cost for the Bolt Action Carbine rifle has been developed. The costs are based on Research and Development's latest product design and Process Engineering estimate of April 1980 which include a birch stock.

The attached listing is itemized by the Bolt Action Carbine's component assemblies and is presented at 1980 full book factory cost levels. Also illustrated for comparison are the 1980 full factory costs of the M/700 ADL and the Mohawk 600.

Please see the attached listing.

J.C. Hutton
J.C. Hutton, Superintendent
Industrial Engineering Section

By: S.M. Morris

SMM/kc
Attached

CONFIDENTIAL-SUBJECT TO PROTECTIVE ORDER
KINZER V. REMINGTON

(BOLT LOCK)

PROCESS ENGINEERING ESTIMATE - TRIAL AND PILOT SHEET

700 €

Bolt Action

• SEQUENCE OF OPERATIONS •

MODEL CARBINE

COMPONENT

BOLT ASSE MBU

PART NO

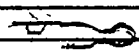
SK D. 3553

DATE 5-23-80

COMPUTER

KOWALSK

SHEET 1 OF 1

OPER NO.	OPERATION NAME	MACHINE	DEPT. NO.	HOURS DESIGN	HOURS BUILD
	NOTE: SAME AS PRESENT M/600 BOLT ASSEMBLY # 29870 PROCESS EXCEPT FOR THE ADDITIONAL OPERATION				
36	MILL BOLT LATCH SURF ON END & DEBURR	1-18 C.I.N.J MILLER OR EQUIV			
		FIXTURE	NEW	90	120
		FORM WATER	"	10	20
		AIRBOR	AM	-	-
		CAGES	NEW	70	180
TOTAL					

RD-6568

1-18-63

CONFIDENTIAL-SUBJECT TO PROTECTIVE ORDER
KINZER V. REMINGTON

R2539209

(Bolt Lock)

PROCESS ENGINEERING ESTIMATE - TRIAL AND PILOT SHEET

M/ 700 Bolt Action

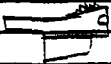
• SEQUENCE OF OPERATIONS •

MODEL CARBINE COMPONENT BOLT LATCH

SK- C-3550

DATE 5-23-80 COMPUTER KOWALSKI

SHEET 1 OF 1

OPER NO.	OPERATION NAME	MACHINE	DEPT. NO.	HOURS DESIGN	HOURS BUILD
	PURCHASE INVESTMENT CASTING FROM VENDOR				
	 EST. PRICE - \$ 1.10 / EA				
	EST. TOOLING - \$ 4500.00				
	PURCHASE INSPECTION	BENCH			
		COMPARATOR SCREEN	NEW	10	1
		COMP. FIXTURE	STD	1	1
		GAGES	STD A.4	1	1
10	DRILL CROSS PIN HOLE	1 SPINDLE DRILL PRESS			
	 #2 DRILL	DRILL JIG	NEW	40	90
		DRILL #52 (0635)	STD	1	1
		GAGES	NEW	35	105
20	DEBUR	BENCH			
30	BUFF TOP	POLISHING JACK			
40	CYANIDE HARDEN				
50	LINDBERG DRAW				
60	INSPECT FOR ROCKWELL				
70	BLACK OXIDE				
	TO DISPATCH AREA	TOTAL			

RD-6568

1-18-63

(Bolt Lock)
PROCESS ENGINEERING ESTIMATE - TRIAL AND PILOT SHEET

M/700 ¹/₂ Bolt Action

• SEQUENCE OF OPERATIONS •

MODEL M/700 COMPONENT Bolt Plug

SK-D-3551
 PART NO. 3551

DATE 5-27-80 COMPUTER KOWALSKI

SHEET 1 OF 3

OPER. NO.	OPERATION NAME	MACHINE	DEPT. NO.	HOURS DESIGN	HOURS BUILD
	PURCHASE SCREW MACHINE BLANK FROM VENDOR.				
	EST PRICE - .58¢ EACH				
	 EST. TOOLING - \$150.00				
	PURCHASE INSPECTION	GAGE	STD/AN	-	-
		COMP SCREEN	NEW	8	-
12	MILL FIRING PIN HEAD SLOT # FLATS ON BOTTOM	SAME AS PRESENT M/700 PT # 17012			
(NEW) 15	MILL FLAT ON SIDE	0.8 CWN MILLER OR EQUIV. 75			
		FIXTURE	NEW	45	135
		CUTTER	"	5	100.00
		ARBOR	STD	-	-
		GAGE	NEW	40	120
24	HAND REAM FIRING PIN HEAD HOLE TO REMOVE BURR IN SLOT # BURR BOTH SIDES OF FIRING PIN HEAD SLOT	SAME AS PRESENT M/700 PT # 17012			
TOTAL					

RD-6568

1-18-63

PROCESS ENGINEERING ESTIMATE - TRIAL AND PILOT SHEET

MODEL M1700 & Bolt Action Machine COMPONENT Bolt Plug PART NO. 3551
 DATE 5-27-80 COMPUTER KOWALSKI SHEET 2 OF 3

SEQUENCE OF OPERATIONS

OPER NO.	OPERATION NAME	MACHINE	DEPT. NO.	HOURS DESIGN	HOURS BUILD
(NEW) 25	LOAD & UNLOAD	7 STA. SPEC. MACHINE - INDEX TYPE			
	MILL FRONT END OF BOLT LATCH SLOT				
	PROTRUS REAR END " " "	MACHINE COST	(NEW)		100,000 ⁰⁰
	DRILL 1 ST STARTING HOLE	FIXTURE (TREAD)	"	70	\$7,000 ⁰⁰
	" 2 ND " " "	PERISHABLE TOOLS	"	6	\$50 ⁰⁰
	MILL SMALL SLOT	TOOL HOLDERS	"	20	\$750 ⁰⁰
	MILL FORM IN CENTER SECTION	GAGES	"	180	550
	CYCLE TIME - 45 SEC (APPROX)				
(NEW) 26	BUTT & DRILL TO DEPTH	2 SPDRS DRILL PRESS			
	DETENT PLUNGER HOLE				
		DRILL JIG	(NEW)	60	120
		TOOLS	STD " "	2	\$15 ⁰⁰
		GAGES	"	40	110
(NEW) 27	BUTT, SPOT DRILL - REAM	4 SPDRS DRILL PRESS			
	RETAINING PIN HOLE				
		DRILL JIG	(NEW)	60	120
		TOOLS	STD " "	6	\$25 ⁰⁰
		GAGES	"	35	95
(NEW) 27.5	DEBURR	BENCH			
28	SUPERSTHEEN	(SAME AS M1700)			
TOTAL					

RD-6568

1-18-63

PROCESS ENGINEERING ESTIMATE - TRIAL AND PILOT SHEET

• SEQUENCE OF OPERATIONS •

MODEL CARBINE COMPONENT DETENT PLUNGET

SK-B-3549
PART NO.

DATE 5-22-60 COMPUTER KOWALSKI

SHEET 1 OF 1

OPER NO.	OPERATION NAME	MACHINE	DEPT. NO.	HOURS DESIGN	HOURS BUILD
	PURCHASE FROM VENDOR				
	EST PRICE - 20¢ EACH				
	EST TOOLING - 100.00				
	PURCHASE INSPECTION	BENCH			
		STD GAGES ETC	STD		
10.	CYANIDE HARDEN				
20.	NITE BLACK COLOR				
	TO DISPATCH AREA.				
	TOTAL				

RD-6568

1-18-63

CONFIDENTIAL-SUBJECT TO PROTECTIVE ORDER
KINZER V. REMINGTON

R2539214

PROCESS ENGINEERING ESTIMATE - TRIAL AND PILOT SHEET

2/703

Bolt Action

• SEQUENCE OF OPERATIONS •

MODEL CASINE

COMPONENT

DETENT PLUNGET SPRING

PART NO.

DATE 5-23-20

COMPUTER

KOWALSKI

SHEET 1 OF 1

RD-6568 1-18-63

PROCESS ENGINEERING ESTIMATE - TRIAL AND PILOT SHEET

Boy Action

• SEQUENCE OF OPERATIONS •

MODEL CARBINE

COMPONENT DETENT PLUNGER RETAINING PIN

PART NO. _____

DATE 5-28-80

COMPUTER KOWALSKI

SHEET 1 OF 1

1-18-63

R2539216

PROCESS ENGINEERING ESTIMATE - TRIAL AND PILOT SHEET

• SEQUENCE OF OPERATIONS •

PART NO. _____

SHEET 1 OF 1

RD-6368 1-18-63

xc: R.L. Hall
H.K. Boyle
J.P. Linde
C.B. Workman
J.W. Brooks
L.B. Bosquet

Est. File #4152

May 27, 1980

G.D. Campbell

Bolt Action Carbine Rifles

Estimated 1980 factory cost for the walnut stocked version of the Bolt Action Carbine rifle has been developed. The processing of this stock parallels that of the Model 700 Classic. Specifications will include machine cut checkering and M/III finish with no grip cap or fore-end tip.

Illustrated on the first attached sheet is the 1980 full book factory costs of both the birch and walnut versions of the Bolt Action Carbine rifle. For comparison, the cost of an M/700 ADL and Mohawk 600 are also presented.

The second attachment compares the cost differences between the component assemblies of the aforementioned guns on an incremental cost basis. The incremental analysis will provide Research and Process Engineering a more definitive structural review of the proposed products.

Please see the attachments.

J. C. Hutton
J.C. Hutton, Superintendent
Industrial Engineering Section

By: S.M. Morris

SMM/kc
Attach. (2)

BOLT ACTION CARBINE - 1980 Full Book
FACTORY COSTS

COMPONENT ASSEMBLY	1980 Bolt Action Carbine		1980 Full Book Factory	
	Full Book Factory Cost		Cost Per:	
	W/BIRCH	W/WALNUT	M/700ADL	M/4. 600
BARREL ASSEMBLY	\$ 28.45	\$ 28.45		
BOLT FINAL ASSEMBLY	10.71	10.71		
FIRING PIN ASSEMBLY	3.99	3.99		
REAR SIGHT ASSEMBLY	3.39	3.39		
STOCK ASSEMBLY - BIRCH	20.82	—		
STOCK ASSEMBLY - WALNUT	—	37.09		
TRIGGER ASSEMBLY	3.80	3.80		
TRIGGER GUARD ASSEMBLY	7.02	7.02		
MISC.				
BOLT STOP PIN & SPRING	.24	.24		
FRONT SIGHT RAMP & SCREWS	1.29	1.29		
MAGAZINE FOLLOWER & SPRING	3.48	3.48		
FRT. & RR. GUARD SCREWS & PIN	.41	.41		
FINAL ASSEMBLY	13.41	13.41		
TEST & TARGET	6.26	6.26		
PACK	1.14	1.14		
SUB-TOTAL	\$ 104.41	\$ 120.68		
ADDITIONAL DEPRECIATION	1.24	1.24		
ADDITIONAL FLOOR SPACE	.08	.08		
1980 FACTORY COST	\$ 105.73	\$ 122.00	\$ 113.46	\$ 84.16

S.M. MORRIS
 5-22-80

John M.

5-24-80

M/700 Bolt Action Carbine Estimate

Bolt Assembly	
Bolt Latch	SK-C-3550
DETENT Plunger	SK-B-3549
" " Spring	—
" " RET. P.N.	—
Bolt Plug	SK-D-3551
Trigger Pin Assy	
Final Assembly	

X

Gary,

This is the estimate for the Bolt Lock - the drawings we rec'd were for the M/700, but we were requested to include this on the Bolt Action Carbine estimate.

Ernie
5/24/80

John -

Work this up & issue to IE for estimate on its own.
They can add to BAC as separate item.

Frank
GC

DWG EST'D	NAME		ESTD BY	DWG REC'D 5/29/80
A-91849	FLOOR PLATE PIVOT PIN	A.D. A-16451 DROPPED	S.B	
No DWG	FLOOR PLATE LATCH RET'N'G SPG	AD B-91133 C-17891 DROPPED		
C-91905	MAGAZINE SPRING			
B-91848	LATCH LOCK (NAME CHANGED TO: FLOOR PLATE LATCH SPG.		S.B	B-91848
No DWG	FINAL ASSEMBLY			
C-91842	FLOOR PLATE COVER ASSEMBLY		Z.K	C-91842
	TRIGGER GUARD		?	C-91951

BOLT ACTION CARBINE 6/2/80 JAB

ESTIMATED DWG	NAME		EST'D. BY	DWG REC'D 5/29/80
SK-C-3550	BOLT LATCH #4		ZK	SK-C-3550
SK-D-3551	BOLT PLUG		ZK	SK-D-3551
SK-D-3553	BOLT ASSEMBLY		ZK	SK-D-3551
SK-B-3549	DETENT PLUNGER		ZK	SK-B-3549
No DWG	BOLT LATCH RETAINING PIN		Z.K.	SK-B-3554
No DWG	FIRING PIN ASSEMBLY		Z.K.	
No DWG	FINAL ASSEMBLY		ZK.	
No DWG	STOCK		L.W.	142E-91950
C-91843	FLOOR PLATE LATCH	REDDESIGN	S.B.	C-91843
B-91827	BARREL BRACKET		S.B.	B-91827
C-91877	RECEIVER (222 CAL.)		Z.K.	C-91877
D-91876	RECEIVER		Z.K.	D-91876
C-91882	BARREL & RECEIVER MARKING		Z.K.	C-91882
D-34990	BARREL ASSEMBLY		Z.K.	D-34990
B-34980	BOLT - FINAL ASSEMBLY		R.B.	B-34980
D-34970	BOLT ASSEMBLY		R.B.	D-34970
B-91881	REAR GUARD SCREW		S.B.	B-91881
C-91828	BOLT STOP RELEASE		S.B.	C-91828
C-91851	SAFETY		S.B.	C-91851
G-91852	SAFETY BUTTON		S.B.	C-91852
B-91853	SAFETY ASSEMBLY		S.B.	B-91853
C-91850	FLOOR PLATE BASE ASSEMBLY		Z.K.	C-91850
C-91840	FLOOR PLATE BASE		S.B.	C-91840
B-91845	TRIGGER GUARD PLATE		S.B.	B-91845
C-91841	FLOOR PLATE COVER		S.B.	C-91841
C-91846	MAGAZINE SPRING RETAINER		S.B.	C-91846
C-91844	FLOOR PLATE PAD - NYLON	4 WAYS	R.P.	C-91844

xc: R.L. Hall
H.K. Boyle
J.P. Linde
C.B. Workman
J.W. Brooks
L.B. Bosquet

Est. File #4152

June 3, 1980

G.D. Campbell

Bolt Action Carbine Rifles

Following our submission of the 1980 factory costs for the (2) versions of the Bolt Action Carbine Rifle, a request for suggested 1980 retail prices was forwarded. Accompanying this request was a Marketing directive to establish the retail prices using the current 1980 M/700 ADL and BDL factory margins. Respectively, these margins would be aligned to the birch and walnut versions of the B.A.C.

Please see the attached subdivision #3.

J.C. Hutton

J.C. Hutton, Superintendent
Industrial Engineering Section

By: S.M. Morris

SM/kc
Attached

BOLT ACTION CARBINE - ESTABLISH A 1980 SUGGESTED RETAIL PRICE BY MAINTAINING M/700 ADL & BDL FACTORY MARGINS.

	M/700 ADL	M/700 BDL	BOLT ACTION CARBINE W/BIRCH	BOLT ACTION CARBINE U/WALNUT
QUANTITY				
1980 RETAIL PRICE	\$ 297.95	\$ 357.95	\$ —	\$ —
1980 SUGGESTED RETAIL PRICE	—	—	\$ 277.65	\$ 324.18
NET SELLING PRICE	\$ 157.84	\$ 189.62	\$ 147.09	\$ 171.74
LESS: TOTAL COST	\$ 131.83	\$ 156.84	\$ 122.85	\$ 142.05
PRETAX EARNINGS	\$ 26.01	\$ 32.78	\$ 24.24	\$ 29.69
% OF NET SELLING	16.5%	17.3%	16.5%	17.3%

[illegible]

R2539227

Red 5-29-80

DATE		CARBINE Bolt Action Centerfire Rifle							
5-13-80		☒ NEW PARTS ☐ ESTIMATED							<i>ESTIMATED</i>
SHEET OF	1 3	Dotted line (- - - -) indicates same part number.							
DWG. NO.		PART xxxxxxx NAME	308 Win.	6mm Rem.	243 Win.	7mm-08	222 Rem.		
			PART NUMBERS						
B-34990		BARREL ASSEMBLY	34990	34991	34992	34993	34994		
D-32420		Barrel	32425	32423	32422	32426	32424		
B-91827		Barrel Bracket	91827	----	----	----	----		
A-15128		Bracket Blank							
B-91876		Receiver	91876	----	----	----			
C-91877		Receiver					91877		
C-91882		(Bbl. & Rec. Markings)							
B-34980		Bolt Final Assembly	34980	----	----	----	34981		
D-34970		Bolt Assembly (Ref. D-26705)	34970	34971	34972	34973	34974		
D-26710		Bolt Body Assembly	26710	----	----	----			
D-26780		Bolt Body Assembly					26780		
C-15407		Bolt Body	15407	----	----	----			
C-28500		(Body Blank)							
A-18493		Bolt Body Brazing Slug	18493	----	----	----	----		
D-28665		Bolt Head	28665	----	----	----			
D-28665		Bolt Head					28667		
A-18758		Bolt Pin	18758	----	----	----	----		
B-17011		Ejector Washer	17011	----	----	----	----		
D-26330		Bolt Handle	26330	----	----	----	----		
C-20185		Brazing Shim	20186	----	----	----	----		
A-17017		Ejector	17017	----	----	----	----		
A-17676		Ejector Pin	17676	----	----	----	----		
A-17019		Ejector Spring	17019	----	----	----	----		
C-91816		Extractor	91816	----	----	----			
C-91906		Extractor					91906		
B-28600		FIRING PIN ASSEMBLY	28600	----	----	----	----		
B-15410		Bolt Latch							
B-17022		Bolt Plug							
SKD 3561		(Plug Blank)							
B-15410		Firing Pin	15410	----	----	----	----		
B-17022		Firing Pin Cross Pin	17022	----	----	----	----		
C-23320		Firing Pin Head	23321	----	----	----	----		
B-27975		(Head Blank)							
A-15411		Main Spring	15411	----	----	----	----		
B-17113		Plunger							
B-17113		Plunger Spring							
A-17113		Extruded Stock (F. Pin Head)	17113	----	----	----	----		

1-25-91950

DATE		CARBINE						
5-13-80		Bolt Action Centerfire Rifle						
SHEET OF	3	Dotted line (- - - -) indicates same part number.						
DWG. NO.		PART NUMBER	NAME	308 Win.	6mm Rem.	243 Win.	7mm-08	222 Rem.
		PART NUMBERS						
		TRIGGER ASSEMBLY						
		Bolt Stop Release	91828	----	----	----	----	
		Safety Assembly	91853	----	----	----	----	
		Safety	91851	----	----	----	----	
		Safety Button	91852	----	----	----	----	
B-23220		Safety Detent Ball	23222	----	----	----	----	
A-15368		Safety Detent Spring	15368	----	----	----	----	
B-17043		Safety Pivot Pin	17043	----	----	----	----	
A-17044		Safety Snap Washer	17044	----	----	----	----	
C-15666		Sear Safety Cam	15666	----	----	----	----	
A-17047		Sear Spring	17047	----	----	----	----	
C-15280		Trigger	15280	----	----	----	----	
B-17053		Trigger Screw Front	17053	----	----	----	----	
C-19461		Trigger Connector	19461	----	----	----	----	
B-91128		Trigger Engagement Screw	91128	----	----	----	----	
C-26655		Trigger Housing Assembly	26655	----	----	----	----	
A-14632		Trigger Housing Rivet (4)	14632	----	----	----	----	
B-14630		Trigger Housing Spacer, Front	14630	----	----	----	----	
B-14631		Trigger Housing Spacer, Rear	14631	----	----	----	----	
C-30780		Trigger Side Plate, Right	30780	----	----	----	----	
C-30780		Trigger Side Plate, Left	30781	----	----	----	----	
C-24475		Trigger Pin	24477	----	----	----	----	
A-15400		Trigger Spring	15400	----	----	----	----	
A-15481		Trigger Stop Screw	15481	----	----	----	----	
		TRIGGER GUARD ASSEMBLY						
		Floor Plate Base Assembly	91850	----	----	----	----	
		Floor Plate Base	91840	----	----	----	----	
		Trigger Guard Plate	91845	----	----	----	----	
		Floor Plate Cover Assembly	91842	----	----	----	----	
		Floor Plate Cover	91841	----	----	----	----	
		Magazine Spring Retainer	91846	----	----	----	----	
		Floor Plate Latch	91843	----	----	----	----	
		Floor Plate Latch Spring	91848	----	----	----	----	
		Floor Plate Pad	91844	----	----	----	----	
A-16451		Floor Plate Pivot Pin	16451	----	----	----	----	
		Trigger Guard	91951	----	----	----	----	

DON'T SAY IT—WRITE ITTo BradDate 1/29/80From Jim

Found these prints, for the Salt Action Carbine,
on my desk. I assume they replace the ones I have
already given you. Reminder that I need the
estimate by 3/15, including the stock.

All swaps replaced
1-29-80

KEEP SAFETY IN MIND IN '79

xc: R.L. Hall
H.K. Boyle
J.P. Linde
C.B. Workman
J.W. Brooks
L.B. Bosquet

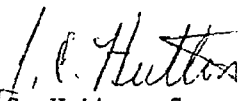
Est. File #4152

June 16, 1980

G.D. Campbell

Bolt Action Carbine

A hi-spot cost analysis of a Bolt Action Carbine rifle with a birch stock and N/C cut checkering has been made. The processing of this stock was reviewed with Larry Wilke, and at that time it was decided to use M/III finish. The resulting 1980 factory cost for this version of gun would be \$112.51. Please see the attached comparison.


J.C. Hutton, Superintendent
Industrial Engineering Section

By: S.M. Morris

SMM/kc
Attached

BOLT ACTION CARBINE - 1980 Full Power
FACTORY COSTS

COMPONENT ASSEMBLY	1980 Bolt Action CARBINE Full Book Factory Cost			1980 Full Book Factory Cost For:	
	W/BIRCH CUSTOM CHECKERING	W/WALNUT	W/BIRCH N/C CHECKING	M/100 ADL	M/4. 600
BARREL ASSEMBLY	28.45	28.45	28.45		
BOLT FINAL ASSEMBLY	10.71	10.71	10.71		
FIRING PIN ASSEMBLY	3.99	3.99	3.99		
REAR SIGHT ASSEMBLY	3.39	3.39	3.39		
STOCK ASSEMBLY - BIRCH	20.82	—	27.60		
STOCK ASSEMBLY - WALNUT	—	37.09			
TRIGGER ASSEMBLY	3.80	3.80	3.80		
TRIGGER GUARD ASSEMBLY	7.02	7.02	7.02		
MISC.					
BOLT STOP PIN = SPRING	.24	.24	.24		
FRONT SIGHT RAMP = SCREWS	1.29	1.29	1.29		
MAGAZINE FOLLOWER = SPRING	3.48	3.48	3.48		
FRT. = RR GUARD SCREWS = PIN	.41	.41	.41		
FINAL ASSEMBLY	13.41	13.41	13.41		
TEST & TARGET	6.26	6.26	6.26		
PACK	1.14	1.14	1.14		
SUB-TOTAL	\$ 104.41	\$ 120.68	\$ 111.19		
ADDITIONAL DEPRECIATION	1.24	1.24	1.24		
ADDITIONAL FLOOR SPACE	.08	.08	.08		
'80 FACTORY COST	\$ 105.73	\$ 122.00	\$ 112.51	\$ 113.46	\$ 84.16

S.M. MORRIS
 6-17-80

xc: R.L. Hall
H.K. Boyle
J.P. Linde
C.B. Workman
J.W. Brooks
L.B. Bosquet

Est. #4152

July 9, 1980

G.D. Campbell

Bolt Action Carbine

The high spot cost analysis of the proposed Bolt Action Carbine rifle has been revised to include the following changes:

- Substitute the M/600 Magazine Follower for the M/700 Magazine Follower (\$2.54 cost reduction).
- Substitute the M/700 Package for the M/600 Package (\$.29 cost reduction).
- Re-estimate the Walnut and Birch Stock with N/C cut checkering per processes supplied by PE&C (\$1.25 cost reduction for Walnut Stock; \$.62 cost increase for Birch Stock with N/C checkering).

Unit costs for the three options being considered are shown in the attached table. All costs are expressed in 1980 full book dollars. The proposed Bolt Latch mechanism is not included in these costs.

J.C. Hutton

J.C. Hutton, Superintendent
Industrial Engineering Section

By: T.R. Andrews

TRA/kc
Attached

BOLT ACTION CARBINE

1980 FULL BOOK FACTORY COSTS

TR9
7/9/80

COMPONENT ASSEMBLY	Birch w/ Custom Checker	Walnut w/ NC Checker & Vinyl Finish	Birch w/ NC Checker & Model III Finish					M/700 ADL	MOHAWK 600			
BARREL ASSEMBLY	\$ 28.45	28.45	\$ 28.45									
BOLT FINAL ASSEMBLY	10.71	10.71	10.71									
FIRING PIN ASSEMBLY	3.99	3.99	3.99									
REAR SIGHT ASSEMBLY	3.39	3.39	3.39									
STOCK ASSEMBLY-BIRCH	20.82	-	28.22									
STOCK ASSEMBLY-WALNUT	-	35.84	-									
TRIGGER ASSEMBLY	3.80	3.80	3.80									
TRIGGER GUARD ASSEM.	7.02	7.02	7.02									
MISC.												
BOLT STOP, PIN & SPRING	.24	.24	.24									
FRONT SIGHT, RAMP & SCWS	1.29	1.29	1.29									
MAGAZINE & FOLLOWER	.94	.94	.94									
FRT. RR. GUARD SCWS & SEAR PIN	.41	.41	.41									
FINAL ASSEMBLY	13.41	13.41	13.41									
TEST & TARGET	6.26	6.26	6.26									
PACK	.85	.85	.85									
SUB-TOTAL	101.58	116.60	108.92									
ADDITIONAL DEPRECIATION	1.24	1.24	1.24									
ADDITIONAL FLOOR SPACE	.08	.08	.08									
TOTAL	\$ 102.90	\$ 117.92	\$ 110.30					\$ 113.46			\$ 84.16	
PREVIOUS ESTIMATE	\$ 105.73	\$ 122.00	\$ 112.51									

ESTIMATE

Title BAL BOLT LOCKDate 6-2-80Estimated by Z. KOWALSKIG. CAMPBELL
J. M. KEEG. E. FLETCHER
T. R. ANDREWS
30 HADCOFF
J. P. LINDE
D. C. BROOKSJ. L. HUTTON
W. E. HIGGINS
G. J. HILL
W. W. COOK
R. T. JOHNS
R. HALL
H. F. CLYDE

Copies to:

ALL FIGURES IN \$

CAP.

OPER.

1 DEVELOPMENT

Investigation

Design

Model Making

Design testing

Models for test

Development - Dryden Method

Development - Molds

Energy Release - G. O. C. Step

2 PRODUCT ENGINEERING

Process eng. & trial run

Pilot lot testing

3 TOOLING

Design

Fixtures & Gages

Molds

Perishable tools

Tool revisions

Vendors tooling

4 SPECIAL MACHINES

Construction

Design

Tooling

Perishable tooling

Operations

5 REMINGTON MACHINES

Construction

Design

Tooling

Perishable tooling

Operations

6 STANDARD MACHINES & EQUIP.

7 PRODUCTION AIDS

Construction

Operations

8 PLANT OPERATIONS

Machine alterations

Pilot lot mfg.

Machine rearrangement

Comp. obsolescence

Provision for advancing

Wages & material costs

-- BLD

-- Plant

TOTAL

GRAND TOTAL

Totals	\$0

xc: R.L. Hall
H.K. Boyle
J.P. Linde
C.B. Workman
J.W. Brooks
L.B. Bosquet
R.S. Swartz

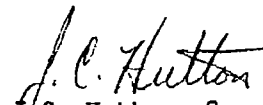
Est. #4152

July 16, 1980

G.D. Campbell

Bolt Action Carbine - Bolt Lock Mechanism

An evaluation of the proposed bolt lock mechanism for the Bolt Action Carbine indicates it will result in \$3.99 in additional cost on a 1980 full book basis. The additional costs are summarized by component in the attached table.


J.C. Hutton, Superintendent
Industrial Engineering Section

By: T.R. Andrews

TRA/kc
Attached

Bolt Action Carbine
Bolt Lock Mechanism

Est # 4152

TRG
7/14/80

1980 Full Book FACTORY Cost

Component	FACTORY COST		Additional Cost
	w/Bolt (Full Book)	wo/Bolt Lock (Full Book)	
Bolt Plug	2.69	1.44	1.25
Bolt Latch	1.95	-	1.95
Detent Plngr.	.24	-	.24
Detent Plngr Spring	.01	-	.01
Detent Plngr Ret. Pin	.01	-	.01
Bolt Assembly	2.63	2.39	.24
Firing Pin Assembly	.79	.52	.27
Final Assembly	13.43	13.41	.02
TOTAL	\$21.75	\$17.76	\$3.99