

RESEARCH DEPARTMENT

REMINGTON ARMS CO INC

CONFIDENTIAL-SUBJECT TO PROTECTIVE ORDER  
KINZER V. REMINGTON

R2539344

From Page No. \_\_\_\_\_

the model shop will be assembled and evaluated  
one problem showing up is the hole it is to  
operate in is too small - must be opened up and  
have dim on drawing changed

NOTEBOOK COMPLETE - NO FURTHER ENTRIES WILL BE MADE IN THIS BOOK.

THIS BOOK MICROFILMED  
AS COMPLETE  
MAKE NO ADDITIONAL ENTRIES

JUL 23 1987

To Page No. \_\_\_\_\_

Witnessed &amp; Understood by me,



Date

w/ 4/86

Invented by

Date

Recorded by

TITLE

New Bolt Action Rifle

Book No. \_\_\_\_\_

From Page No. \_\_\_\_\_

high trigger pulls with springs that were below model drawing specifications - it should have been evident that we would have higher trigger pulls when the springs are made to model drawing. I have felt before as I do now the <sup>lever</sup> angle is the determining factor for trigger pull in this system -

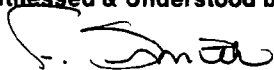
\* Initial testing for accuracy was shot by the writer and is recorded here Gun No. XC 0405 shot groups 2.52 - 2.22 - 2.53 for an average of 2.32 Gun No. XC 0407 shot groups of 1.55 - 2.00 - 1.30 for an average of 1.61 well below the required factory spec. of 3.50" for this caliber.

New bolt locks have been received and will be assembled and evaluated as soon as the remaining bolt locks are received.

the trigger spring returner received from

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Date

3-1-85

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But it was felt that length and wgt were close enough for testing - the trigger springs exhibit the same problem -

trigger spring

Measured load	free length
3.6	.875
1.9	.843
1.8	.832
2.6	.868

as before new springs were made and measured results is shown below

trigger Spring (New)	free length
measured load 2.2	.879
2.3	.873
2.5	.877
2.4	.878
2.4	.878
2.5	.885
2.3	.871
2.3	.875

Now as before the springs did not meet completely the model drawing specs but were used anyway.

It should be noted now that we have experienced

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F. Smith

Date

11/4/86

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3-1-85

TITLE

New Bolt Action Rifle

Book No. \_\_\_\_\_

From Page No. \_\_\_\_\_

and a free length of .875. In the case of the rear spring all samples measured did not have the required load and with the exception of one did not meet the free length spec.

Rear Springs - (Original)

<u>measured load</u>	<u>free length</u>
1.9	.440
3.2	.470
4.3	.485

New rear springs were made and heat treated and measured with the results shown below

Rear Springs (New)

<u>Meas. Load</u>	<u>free length</u>
4.0	.475
4.4	.485
4.5	.477
4.0	.474
4.2	.484
4.7	.483
4.4	.479
4.4	.478

Model stop parts still do not meet the model drawing

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R. Smith11/4/86Recorded by F. E. Martin3-8-85

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More notes for NBAR fabrication

- Bolt lock cam to be redesigned - offset cam radius at start to be more gradual - Need a new method of keeping in place (cam)
- Check bolt lock plunger length
- Bolt lock cam spring should be wavy warden - coil spring will crowd thru slot in cam after start period of operation
- Check on the use of same material thickness for bolt lock and bolt stop
- Lengthen rotor shaft to set cam and bell crank out away from side of receiver - cam may be binding on radius of bolt lock foot

During assembly trigger pulls were taken and found to be heavier than had been expected

several rear and trigger springs were checked to see how they compared to the model drawing for load and free length

Mod. drawing for the rear spring is - load of 5.55<sup>#</sup> to 6.78<sup>#</sup> and a free length of .480 the trigger spring load is 2.64<sup>#</sup> to 3.04<sup>#</sup>

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Assembly of the "New Bolt Action Rifle" to be referred to as the NBAR was started Jan 16, 1985 noted will be problem areas and areas for change or correction:

- Bolt Plugs need assembly slots for firing pin head. (Firing Pin Assy)
- Bolt body should be protected from deformation when brazing tangles on
- Need bolt lock slot in bolt - need new dim
- Bolt lock slot in receiver can be wider
- Check dimension on trigger from C of front hole to top of trigger plunger surface
- Add dimension for bolt stop slot - broached dimension - to drawing (receiver)
- Add clearance for "safety" <sup>TM</sup> ~~pin~~ to bolt stop
- Bolt lock to be redesigned - longer foot for plunger end cam contact - redesign spring - close ends
- New ~~for~~ spring for Bolt Lock Lever
- Trigger & Sear had to be "lopped" for safety rotor - rotor was binding when bolt was closed

not for production

To Page No. \_\_\_\_\_

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R. Smith

Date

11.4.86

Invented by

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J. C. Martin

Date

3-1-85



## INSTRUCTIONS

1. The primary purpose of this book is to record original laboratory data in a manner that will:
  - a. Comply with the instructions and intentions of the Federal Good Laboratory Practices Regulations, and
  - b. Assist the Patent-Rights of the Company.
2. When starting a project, write in precise language your purpose and a general plan for the study. Such a plan should include:
  - a. Reference to an approved study protocol or a written description for informational studies.
  - b. Methodology to be used including references to procedures to be followed.
  - c. A list of reagents and equipment required for the study.
  - d. A statistically sound method for evaluating results.
3. Record your work as you progress giving sufficient details. Handwrite directly in the book. Avoid making notes on loose paper to be copied later.
4. All entries should be in ink. Do not use pencil.
5. A Title and Project Number should be accurately recorded when starting work.
6. In chronological order give a complete, accurate account of what you did, and what resulted. Enter all results, both good and bad. In case of error, draw a line through the incorrect entry. Then continue with the correct entry. Descriptions with complete details are preferable. Better too much, than too little. Always keep in mind the necessity of original data to prove any new discoveries.
7. Names of co-participants in study activities should be recorded. In the case of experiments which are of possible patentable importance, contact your supervisor regarding a witnessing procedure. Normally, to provide patent protection at least one witness, not claiming to be a co-discoverer, should sign and date the bottom of the notebook page.
8. New ideas, plans, procedures, sketches, etc., should be recorded immediately in this book at the time they occur. These should be disclosed to, and understood by your supervisor who signs and dates this fact.
9. Calculations that do not require formal recording should be made on the blank sheet on the left side of the book.
10. This notebook and all information recorded therein are the exclusive property of this Company. All contents are strictly *Confidential*. The employee *must return* this book upon completion, upon request or upon termination of employment. The person to whom this book is assigned must take every precaution to safeguard against loss. In case of fire, theft, or disappearance of this book, the employee will immediately notify his supervisor. A written report describing the circumstances surrounding the loss should follow.
11. In general, only one subject should be recorded on each page. Long term projects should have separate books. All projects should be so recorded that any co-worker may continue the operation in your absence or reassignment.

Laboratory No. \_\_\_\_\_

Book No. 2148

Department \_\_\_\_\_

Charge No. \_\_\_\_\_

Date Issued \_\_\_\_\_

Date Closed \_\_\_\_\_

JUL 23 1987

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## LABORATORY NOTEBOOK

Assigned to: \_\_\_\_\_

Previous Data Books: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Next Data Book: \_\_\_\_\_

Names of others making entries in this book:

NAME

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

### A&B Scientific Notebook Co.

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xc: C. A. Riley  
W. H. Forson

## REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

August 4, 1983

Remington



TO: C. B. WORKMAN

FROM: T. W. RAWSON *[Signature]*

SUBJECT: CONFIRMATION OF PHONE CONVERSATION AUGUST 3, 1983  
ON MARKETING PRIORITY OF FIREARMS PROJECTS

In summary, Marketing is not able to combine technical and non-technical category work into a single prioritized list. We view the non-technical type of product innovation as necessary to capitalize on short term market opportunities. Such products are the result of customer demand therefore, needed quickly but because they are innovative of existing product, should not require long term sophisticated engineering effort. It is these products which make Remington appear innovative, responsive and provide income to keep things moving while the more expensive longer lead time significant engineering concepts become reality.

Your effort to differentiate and treat these ideas equally but separately is very much appreciated. Following is a "top of the head" priority per our conversation.

As also discussed we have more ideas for the "low technical" list which we'd like to discuss when appropriate.

Non-Technical Projects

1. M/700 LWT
2. M/870 Restyle
3. M/1100 Restyle
4. M/870 Waterfowl
5. M/1100 Waterfowl
6. M/700 Classic 338 Win. Mag.
7. Low priced M/1100
8. M/870 Comp. Trap set  
(new stock & 16 yd. barrel)

Significant Engineering Projects

1. Choke tubes (screw in)
2. 3" chamber all models
- 2a. Orifice selector
3. New auto/pump shotgun
4. New cheap shotgun (Mossberg)
5. New bolt action
6. New rim fire auto (also for Mag.)
7. New slug barrel
8. REFUS/HYPEX
9. XP100

TWR:daf

REMINGTON ARMS CO.  
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AUG 8 1983

FIREARMS 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	N.A. 10 Any Mix		
10	Model Seven New Caliber		1 Ea. Cal.	5 Ea. Cal.	N.A.	N.A. 10 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		TBD-1 Ea. Ga	5 Ea. Ga. TBD	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		

NON-TECHNICAL PROJECTS  
IN ORDER OF PRIORITY

	<u>1st Year</u>	<u>1983 Completion</u>
<u>NON-TECHNICAL PROJECTS</u>		
1. Model 700 Lightweight (Mountain Rifle)	85	X
2. 870 Special Field	84	X
3. Low Price - 870	84	X
4. Model 870 Restyle	85	X
5. Model 1100 Restyle	86	
6. Low Price Model 700	84	X
7. Model 700 250-3000	84	X
8. Model 870/1100 - Waterfowl	85	
9. Low Price M/1100	85	
10. Model 7400-7600 Carbines and New Calibers	?	X
11. L.H. Short Action	?	X
12. Model Seven New Caliber	84	X
13. .338 Win. Mag/Classic	85	
14. 870 Comp. Trap Set	?	

8/3/83

NON-TECHNICAL PROJECTS  
IN ORDER OF PRIORITY

- o Model 700 Lightweight  
(Mountain Rifle)

Design verification is two months late. If no problems arise, the schedule can be met as shown.

Key Issues

- .243 short action?
- Accuracy
- Stock strength
- Magnum actions

- o Model 870 Special Field

No significant problems have arisen so far. Last obstacle is trial and pilot.

- o Low Price Model 870

No problems for Research if model requirements remain unchanged.

- o Model 870 Restyle

Apparently Marketing and Sales have not agreed on model requirements. If these change, project could be delayed one year.

Key Issues

- Marketing agreement on styling
- Receiver (process) for frosted top/bottom and contour styling
- 12 and 20 Ga. or only 12 Ga. - (16 Ga. speced)

NON-TECHNICAL PROJECTS - Contd.

-2-

o Model 1100 Restyle

If model requirements are not established by September 1983, Project could slip to a 1987 announcement date.

Key Issues

- Marketing agreement in styling
- Endurance testing
- Should we combine the Barrel projects with this project (choke tubes, orifice selector, 3" chamber and slug Barrel)
- 12 and 20 Ga. or only 12 Ga.

o Low Price Model 700

No problems for Research other than those outlined under key issues unless model requirements change.

Key Issues

- Will the .243 function in the long action without major redesign?
- POI with M/788 open sights

o Model 700 250 Savage (250-3000)

No problems anticipated.

o Model 870/1100 Waterfowl

If model requirements are unchanged from March 4, 1983 schedule can be met.

870 Key Issues

- Agreement on specifications

1100 Key Issues

- Agreement on specifications
- Will parkerizing affect action?

NON-TECHNICAL PROJECTS - Contd.

-3-

o Low Price Model 1100

Schedule cannot be met for 1985 introduction since no model requirements have been agreed to. If simple downgrade, see key issues.

Key Issues

- Agreement on specifications
- Can we reduce this to be competitive with low cost autos in the market place?

o Model 7400-7600 Carbines and New Calibers

Work will have been completed before January 1984. No 1984 effort anticipated.

o L.H. Short Action

No significant Research effort will be required in 1984.

o Model Seven New Caliber

.223 will be completed in 1983. No new Calibers are forecast.

o .338 Win. Mag Classic/Classic

No problems except as itemized in Key Issues. Marketing decision needed.

Key Issues

- Will it feed without a major redesign?

o 870 Comp. Trap Set

No work scheduled.

Key Issues

- Cost of developing and tooling new stock.

8/3/83



TECHNICAL PROJECTS  
IN ORDER OF PRIORITY

	<u>1st Year</u>	<u>Shotgun Barrels</u>	<u>Shotguns</u>	<u>C.F. Rifles</u>
<u>TECHNICAL PROJECTS</u>				
1. New Bolt Action Rifle	88			X
2. Choke Tubes	86	X	X	
3. New Auto-Loading Pump/ Shotgun	?		X	
4. Refas	?		X	X
5. Hipex	?	X	X	
6. Orifice Selector	85	X	X	
7. 3" Chambers in all Shotguns	85	X	X	
8. New inexpensive Pump Shotgun	87(?)		X	
9. New Shotgun Slug Barrel and Deer Gun	85	X	X	
10. Cheap Rimfire Magnum or Standard Autoloader	?			

8/3/83

TECHNICAL PROJECTS  
IN ORDER OF PRIORITY

o New Bolt Action Rifle

Because of problems with the 1100 Special Field and the Model Seven and the advent of the Model 700 Lightweight, this project is approximately nine (9) months behind schedule and as such will probably not be available for 1987 introduction unless significant design concessions are made.

Key Issues

- Will gun be ready for installation of F.M.S.
- Can a polishing process be implemented to finish octagonal components?
- Will the new extractor be acceptable and how many redesigns will have to take place?
- Will the all new Fire Control be ready for a 1987 announcement date?
- Can or will a bolt lock be initiated in this project - what effect?
- Will hammer forge Barrel design be acceptable?

o Choke Tubes

Firm product specifications must be developed and agreed to with Marketing and Sales. According to the time line we are now six months behind a schedule that would give Marketing a shipping date of mid-1985. There are many unanswered questions on this one as Key Issues list points out.

Key Issues

- Interchangeability
- Concentricity
- Angularity
- Residue

Safety (rifled slugs shooting competitor tubes in Remington guns)

- Pattern quality - performance
- Steel shot - R. slugs - Ammo?
- Finish
- Establish dimensional limits on each tube
- Endurance
- Material
- Corrosion

## TECHNICAL PROJECTS - Contd.

-2-

## o New Autoloading Pump Shotgun

The primary concern on this project is the establishment of Product Requirements i.e. Conventional or Futuristic. Time line will be developed when this is done.

## Key Issues

- New Gage - Ammunition (Hipex) (Refas)
- Develop set of agreed to specifications
- Can we use XSG type Receiver?
- Marketing input will be needed. ASAP - looks, endurance, models, etc.
- New concept Fire Control discussion needed.
- Do we need a new Locking System?

## o Refas

Basic work is needed and agreement with Marketing and Sales on what the Customer will accept. This will be primary subject of a meeting on innovative new products this month (August).

## Key Issues

- Reliability in adverse field conditions.
- What will the first gun be?  
(Shotgun, rifle, target guns, etc.)
- "Ignition" - Can a primer be made for cost safety reliability, etc.?
- Will "chips", wires, printed circuits, etc. withstand firing loads, shock, etc.
- Endurance of components, trigger pull, lock time, etc.

## o Hipex

Need realistic goals established - could be combined with Refas and/or new Auto/Pump Shotgun, depending on needs.

## Key Issue

- Can ammunition and/or barrel be developed to control the pattern at ranges much in excess of what we currently experience.

## TECHNICAL PROJECTS - Contd.

-3-

## o Orifice Selector

No major problems other than Key Issues.

## Key Issues

- Will it plug up?
- Can it be turned off/on so the user understands it?
- Endurance?

## o 3" Chambers in all Shotguns

Sales wants to delay this Phase in until 1985 in conjunction with the M/870 Restyle - Our schedule could accomodate this. 1984 would be very speculative and require moving without statistically significant test results to back up our product performance.

## Key Issues

- Will all shells eject satisfactory?
- Will the long chamber effect the pattern, P.O.I. or range vs. our standard 2 3/4" chambers.
- How will the Barrels be rollmarked?
- Testing to prove out concept.

## o New Inexpensive Pump Shotgun

This is a major development project. Sample of one version is available for review for basic concept. Specifications are needed now to meet 1987. Heavy commitment will be required.

## Key Issues

- Should this be an autoloader also?
- Can we produce a gun that is cheaper - material/labor than our Model 870?
- Will the customer accept stamping (such as the Receiver) plastic for the trigger guard, stock and fore-end - this type of gun?

TECHNICAL PROJECTS - Contd.

-4-

o New Shotgun Slug Barrel and Deer Gun

Again - Clear model requirements must be established and a decision on Ammunition development must be made.

Key Issues

- Can we produce a gun/ammo system that will increase the accuracy of a slug?
- Will rifling in the bore of a shotgun barrel produce a better accuracy?
- Can we make a sabot type slug rotate and give better ballistics?

85% of extra bbls. are 12 Ga. = 56,000 bbls./year  
41% of extra bbl. sales are slug bbls. = 22,000./year  
5% of new gun sales = slug guns = 15,700 slug guns  
Total 12 Ga. Slug bbls.  $\approx$  38,000/year

o Cheap Rimfire Magnum and/or Standard Autoloader

This is tied in with our maximizing the injection molded powder metal process and our four slide machine.

Key Issues

- Will Marketing support this type program?

8/3/83

BASIC SYSTEMS RESEARCH PROJECTS  
KEY ISSUES

SHOTGUN BARRELS

"How hard does it shoot?"

- o Forcing cone vs. recoil
- o Forcing cone vs. pattern
- o Forcing cone vs. pressure
- o Forcing cone vs. velocity
- o Bore diameter vs. recoil
- o Bore diameter vs. pattern
- o Bore diameter vs. velocity
- o Choke constriction vs. range
- o Bore and choke surface finish vs. pattern performance, velocity, pressure

8/3/83

FIREARMS DEVELOPMENT SCHEDULE			REQUIRED MODELS		8/3/83	
		Working Prototype	Design Verification	Field Review	Field Test	
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	5 Ea. Gage	10	N.A.	
4	M/1100 Restyle	1	5 Ea. Gage	10	10	
5	Low Priced M/700	1	5 Ea. Cal.	10	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	5	10	N.A.	
10	Model Seven New Caliber	1	5	N.A.	N.A.	
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. Caliber	5 Ea. Caliber	10 Any Cal. Mix	10 Any Cal Mix.	
15	Choke Tubes	1 Set	TBD	10	10 Sets	
16	New Auto/Pump Shotgun	5 Ea.	50 Auto-10 Pump	10 Ea.	10 Ea.	
17	REFAS	5	50	10	TBD	
18	HIPEX	5	50	10	10	
19	Orifice Selector	5 Ea. Ga.	25	10	10	
20	All 3" Chamber	TBD	TBD	10	10	
21	New Cheap Shotgun	5	50	10	10	
22	New Slug Barrel	5 Ea. Gage	25 Ea. Gage	10	10	
23						
24						
25	M/7400 Carbine	1 Ea. Caliber	10 Ea. Caliber	10	10	
26	M/7600 Carbine	1 Ea. Caliber	5 Ea. Caliber	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	10	

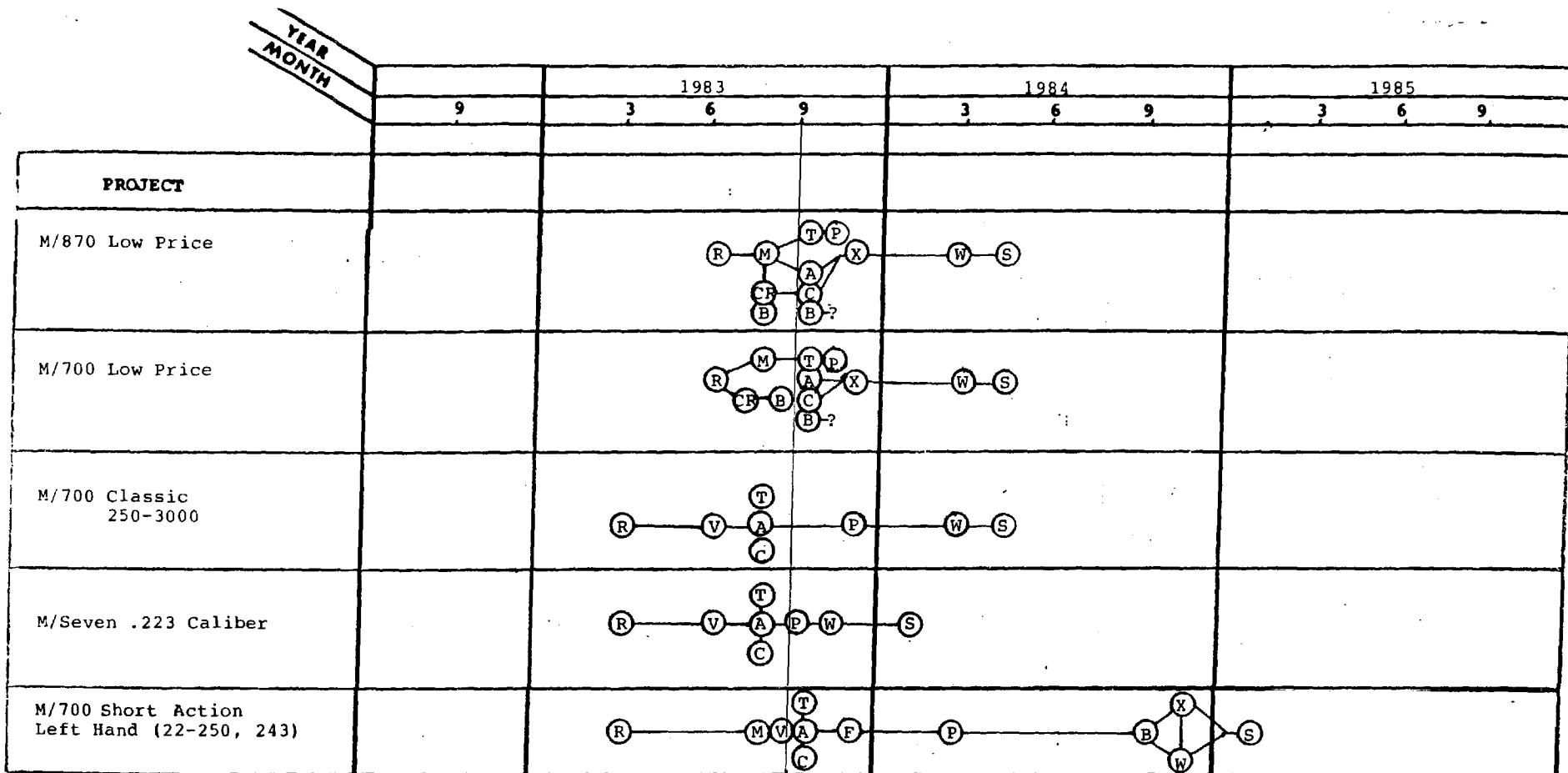
YEAR MONTH	1983				1984				1985			
	9	3	6	9	3	6	9		3	6	9	
PROJECT												
M/870 12 Ga. Special Field		R	M	V	T	B	P	X	W	S		
				CF	A	C						
M/870 20 Ga. Special Field		R	M	V	T	B	P	X	W	S		
				CF	A	C						
3" Chamber for M/870 Pump Action		R	M	V	P	X						
				T								
				A								
M/700 Lightweight		R	M	V	A	F	F <sub>2</sub>	P	F <sub>3</sub>	B	W	S
			CF	C	T						X	
M/870 Restyle		R	M	V	A	F	F <sub>2</sub>	P	B	W	S	
				CF	C	T				X		

R - Model Requirements  
M - Working Prototype Models  
CR - Cost Request  
P - Trial and Pilot  
P<sub>1</sub> - Part I - Trial and Pilot  
P<sub>2</sub> - Part II- Trial and Pilot  
A - Product Acceptance

B - Catalog  
V - Design Verification Testing  
C - Cost (Economics)  
T - Design Transmittal  
W - Warehouse  
S - Ship  
X - Announce

F - Field Test  
F<sub>t</sub> - Completion of Field Test  
E<sub>1</sub> - Eng. Prototype (First)  
E<sub>2</sub> - Eng. Prototype (Second)  
E<sub>t</sub> - Engineering Test  
P<sub>t</sub> - Pilot Test





R - Model Requirements  
 M - Working Prototype Models  
 CR - Cost Request  
 P - Trial and Pilot  
 P<sub>1</sub> - Part I - Trial and Pilot  
 P<sub>2</sub> - Part II- Trial and Pilot  
 A - Product Acceptance

B - Catalog  
 V - Design Verification Testing  
 C - Cost (Economics)  
 T - Design Transmittal  
 W - Warehouse  
 S - Ship  
 X - Announce

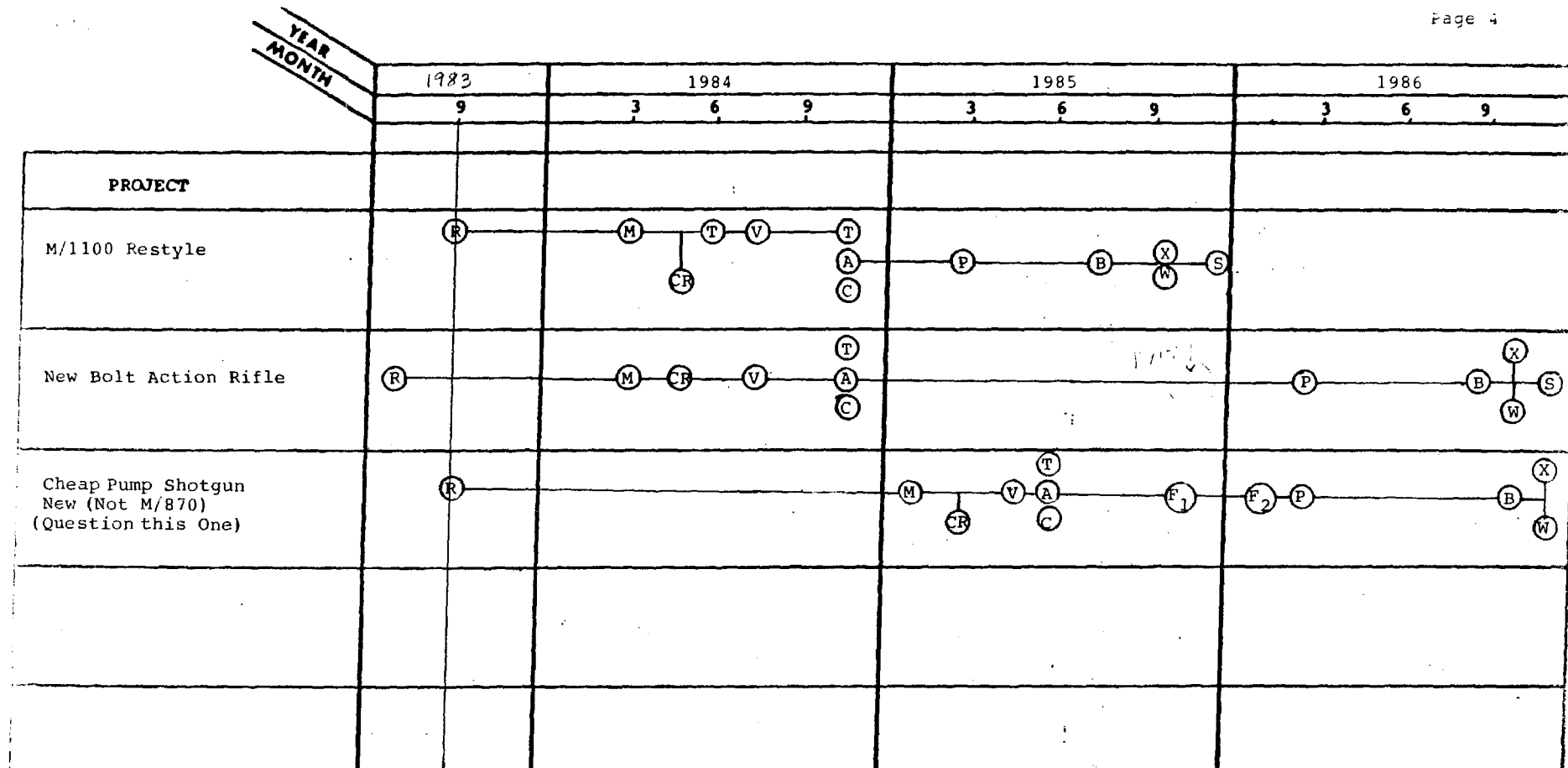
F - Field Test  
 F<sub>t</sub> - Completion of Field Test  
 E<sub>1</sub> - Eng. Prototype (First)  
 E<sub>2</sub> - Eng. Prototype (Second)  
 E<sub>t</sub> - Engineering Test  
 P<sub>t</sub> - Pilot Test

YEAR MONTH	1983				1984			1985		
	9	3	6	9	3	6	9	3	6	9
PROJECT										
M/870 - M/1100 Waterfowl				(R) — (M) — (V) — (T)                  CF A F <sub>1</sub> C   C	— (F <sub>2</sub> ) — (P) — (B) — (X)					(S)
M/870 - M/1100 Deer Guns				(R) — (M) — (T)             Y A F <sub>1</sub> CR C	— (P) — (B) — (X)					(S)
M/1100 Low Price				(R) — (M) — (T)             CF A F <sub>1</sub> V   C	— (P) — (B) — (X)					(S)
Orifice Selector Choke Tubes				(R) — (M) — (V) — (T)        CF A C	— (P) — (B) — (X)					(S)

R - Model Requirements  
 M - Working Prototype Models  
 CR - Cost Request  
 P - Trial and Pilot  
 P<sub>1</sub> - Part I - Trial and Pilot  
 P<sub>2</sub> - Part II- Trial and Pilot  
 A - Product Acceptance

B - Catalog  
 V - Design Verification Testing  
 C - Cost (Economics)  
 T - Design Transmittal  
 W - Warehouse  
 S - Ship  
 X - Announce

F - Field Test  
 F<sub>t</sub> - Completion of Field Test  
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R - Model Requirements  
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 E<sub>2</sub> - Eng. Prototype (Second)  
 E<sub>t</sub> - Engineering Test  
 P<sub>t</sub> - Pilot Test

*Bower*FIREARMS RESEARCH PROGRAMSIN ORDER OF PRIORITYI. NEW PRODUCTS & PROCESSES

<u>Program Name (Introduction years)</u>	<u>1984</u> <u>Ass No. of</u> <u>Signed Exempts</u>
1. New Low-Cost <del>800,000</del> <i>Autoloader / Pump</i> Shotgun (85-86)	3.0
2. New Concept Shotgun Family (88)	3.5
3. New Bolt Action Rifle (87-88)	1.5
4. Model 700 Lightweight (85)	0.1
5. Injection Molding Metals & Ceramics	3.3
6. Shotgun Choke Tubes (86)	0.2
7. Cut Checkering Alternative Systems (84)	1.9
8. Model 1100 Restyle (86)	0.3
9. Model 870/1100 Waterfowl (85)	0.1
10. Low Priced 1100 (Birch Stock etc.) (85)	0.1
	<u>14.0</u>

II. Discretionary Research

- |   |     |
|---|-----|
| • Basic Firearms Systems  | 2.0 |
| • Electronics, High Velocity Center Fire Slug/Barrel Improvements, etc. | 3.0 |

DISCONTINUED AND/OR UNMANNED PROGRAMS

IN ORDER OF PRIORITY

- Auto Test & Inspect
- .338 Win. Mag for Classic
- Inexpensive Rim Fire Autoloader
- Four Slide Tooling Development
- Form Rolling
- Auto Sanding
- New Coatings
- Alternative Materials

ATTACHMENT II

RD-66 REV. 6-78

## REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

xc: C. A. Riley  
W. H. Forson

August 4, 1983

Remington

RECEIVED

TO: C. B. WORKMAN

FROM: T. W. RAWSON *[Signature]*

SUBJECT: CONFIRMATION OF PHONE CONVERSATION AUGUST 3, 1983  
ON MARKETING PRIORITY OF FIREARMS PROJECTS

In summary, Marketing is not able to combine technical and non-technical category work into a single prioritized list. We view the non-technical type of product innovation as necessary to capitalize on short term market opportunities. Such products are the result of customer demand therefore, needed quickly but because they are innovative of existing product, should not require long term sophisticated engineering effort. It is these products which make Remington appear innovative, responsive and provide income to keep things moving while the more expensive longer lead time significant engineering concepts become reality.

Your effort to differentiate and treat these ideas equally but separately is very much appreciated. Following is a "top of the head" priority per our conversation.

As also discussed we have more ideas for the "low technical" list which we'd like to discuss when appropriate.

Non-Technical Projects

1. M/700 LWT *Complete in '83*
2. M/870 Restyle *Complete in '83*
3. M/1100 Restyle
4. M/870 Waterfowl
5. M/1100 Waterfowl
6. M/700 Classic 338 Win. Mag.
7. Low priced M/1100
8. M/870 Comp. Trap set  
(new stock & 16 yd. barrel)

Significant Engineering Projects

1. Choke tubes (screw in)
2. 3" chamber all models
- 2a. Orifice selector
3. New auto/pump shotgun
4. New cheap shotgun (Mossberg)
5. New bolt action
6. New rim fire auto (also for Mag.)
7. New slug barrel
8. REFUS/HYPEX
9. XP100

TWR:daf

REMINGTON ARMS CO.  
RECEIVED

AUG 8 1983

FIREARMS RESEARCH DIVISION

FIREARMS RESEARCH DIVISIONOrigination Date Jan '84

Update(s) \_\_\_\_\_

Project Title: Bolt Action Rifle Development Program

Project No.: C-5000

Objective: To design a new concept Bolt Action Rifle with new Stock design, new receiver design, bolt lock, new extractor, new rotary type magazine box and fire control with block trigger/sear design, new barrel finish. Replacement for our M/700 BDL.

Commitment: The planned announcement is 1988 with Warehouse in November 1987.

- o Prototype models complete by July, 1984
- o Tests of prototypes complete by Sept., 1984
- o Verification of testing and design by Dec. 1984
- o Transmit to the plant by June 1985

Personnel Assigned: 2.5 Man Years

F.E. Martin - Design  
R.S. Murphy - Project Leader/Designer  
A.R. Eddy - Designer  
New Engineer/Transfer

Budget: Operating Expenses \$ 350M (including testing)  
Research Capital Project/Expenses \$ N/A

## Uncertainties:

- o Can a rotary box magazine be developed for cost and function
- o Can production polish a octagon type receiver, bolt plug, barrel, etc.
- o Can Production process Bolt Assembly for new extractor
- o Can Production process extractor

FIREARMS RESEARCH DIVISION

<u>Program Steps and Timing</u>	<u>Responsibility</u>	<u>Completion Date</u>
	J. BOWER	
o Investigate the design	R.S. Murphy	Complete
o Set Up Prototypes	R.S. Murphy	July '84
o Fabricate models for test		
6 samples - 10-06 to start	R.S. Murphy	July '84
o Design verification testing	R.S. Murphy	Sept. '84
o Redesign and build Prototypes	R.S. Murphy	Sept. '84
o Retest	R.S. Murphy	Feb. '85
o Transmit to Production	R.S. Murphy	Jun. '85



RD-49-P.

**REMINGTON ARMS COMPANY, INC.**

INTER-DEPARTMENTAL CORRESPONDENCE

*Remington*



*PETERS*



xc: File-Development  
Schedule

"CONFINE YOUR LETTER TO ONE SUBJECT ONLY" \_\_\_\_\_

May 21, 1985

TO: W.H. Coleman, II

FROM: J.W. Bower

UPDATE - DEVELOPMENT SCHEDULE ITEMS

1. Model 1100 Functional Improvements (1987)

Improvement items planned for 1987 introduction are:

- o automatically compensating gas system
- o stainless steel magazine tube
- o 2-piece firing pin retracting spring
- o thicker extractor
- o special field type magazine cap detent system.

Refining of the pressure vent gas system is continuing. Positioning of a tab over the bottom of the spring has greatly reduced the tendency of the spring to go out of position during recoil. The location and height of tabs to limit spring opening are being determined.

Barrel supports separated from the tube during preliminary testing of the stainless steel magazine tube. Projection welding of the barrel support created a heat-effected zone which is unacceptable with stainless steel. New receiver assemblies have been built by brazing the barrel support in place. Brazing does not create a detrimental heat-effected zone.

Initial testing of the 2-piece firing pin retracting spring and the thicker extractor showed no parts breakage in 2,000 rounds. Testing of control guns resulted in breakage of both parts at lower round levels.

Initial testing of a stiffer carrier did not show a significant reduction in feeding malfunctions. Further development work is called for. This item will not be included in the 1987 package.

Preliminary drawings have been given to Process Engineering for estimating. A formal transmittal is expected by September 1.

2. Model 1100 Restyle (2Q86)

Specifications include:

- o cut checkered stock and fore-end
- o 30-gloss wood finish
- o elimination of rollmarked scroll on receiver and bolt
- o 2-piece butt plate
- o Bradley front sight
- o elimination of white-line spacers.

A parts list and drawings package has been transmitted to Production.

3. New Concept Shotgun (TBD)

Development of a fire control is progressing. One bread board model has been demonstrated. A second concept will be breadboarded in June. Potential locking systems are being sketched around the fire control concepts.

4. Choke Tubes (1986)

Research received eight Model 870 barrel assemblies on May 21. This is a preliminary sample in preparation for the Trial and Pilot verification of the Model 870 Restyle. Preliminary measurements have started. Testing for pattern, point of impact, and rate of turnout should be complete the week of May 27.

5. Model 870 Functional Improvements (1987)

Improvements being considered are:

- o a new ejector system
- o new shell latches
- o a one-piece action bar
- o a thicker extractor
- o a 2-piece firing pin retractor spring.

The new ejector would fit into a dovetail slot milled in the inside of the receiver. It eliminates the rivets which currently protrude through the sidewall of the receiver. These rivets are visually objectionable and very costly to repair. Preliminary tests have been completed with very good results. Endurance life of the Delrin base was satisfactory and the malfunction rate was superior to control guns.

Preliminary testing of a shorter shell latch proved unsatisfactory. Under investigation are new methods of retaining the shorter latch, and improved staking of the current latch.

Sample one-piece action bars will be in test in early June.

The design of the thicker extractor and 2-piece firing pin retractor spring will be similar to what is being used on the Model 1100 Functional Improvement program.

Preliminary drawings will be given to P.E. & C. in early June for start of the estimating procedure.

6. Model 870 Restyle (12 Ga.-2Q86)

Specifications include:

- o choke tubed barrels (3" chamber)
- o cut checkered stock and fore-end
- o 30-gloss wood finish
- o elimination of white-line spacers
- o Bradley front sight
- o new recoil pad.

A parts list and drawings package for the 12 gage has been transmitted to Production. Trial and pilot verification is expected in June.

7. Model 870 Restyle (20, 28, .410 Ga. - 1988)

Specifications are similar to the 12 gage, with choke tubes available in the 20 gage. This item has been delayed until 1988, consistent with the delay of the 12 gage to a mid-year introduction.

8. Model 700 Mountain Rifle (1986)

The Mountain Rifle is similar to the BDL except for a new stock and lightweight barrel contour. It will be offered in .270, .280, and 30-06 calibers.

The trial and pilot sample is expected in Research in mid-June.

9. New Bolt Action Rifle

This rifle has been designed as a replacement for the Model 700. Technical improvements include:

- o an improved fire control containing:
  - preset engagement and overtravel
  - customer adjustable trigger pull to a safe lower limit
  - steel trigger and sear
- o a safety that blocks both the trigger and sear

- o a bolt lock which allows the customer to unload the gun with the safety on
- o a fully enclosed claw-type extractor
- o a fully enclosed bolt plug
- o reduced lock time
- o Remington scope mounts
- o a detachable magazine box.

Marketing has completed initial focus panels to guide the design evolution.

Revisions to the fire control are in the final design stage. Additional prototypes will be ready for development testing this summer.

10. Ducks Unlimited

Development of both the Model 1100 and Model 700 are complete and the items are in production.

11. Model 700 Classic-350 Rem. Mag. (1985)

Research has just received the trial and pilot verification sample.

12. Model 870 Special Purpose Magnum (1985)

A design change has been requested to eliminate chrome plate from the chamber. Sample barrel assemblies should be available by May 28.

13. Model 700 Varmint - 6mm (1986)

The parts list and model drawings are complete.

14. Model 870 and Model 1100 Special Purpose Deer Gun

The parts list and model drawings package will be transmitted in early June.

15. Sportsman 78 - .223 Cal. (1986)

A parts list and drawings package has been given to P.E. & C.

16. Addition of Sights to Model 700 BDL-6mm, 308, 243 (1986)

A new, one-piece, front sight has been decided on. This metal injection molded sight cannot be ready for 1986 introduction. For 1986, the current powder metal ramp and sight will be used.

Model drawings will be transmitted in June.

17. Model 700 Classic - 264 Win. Mag. (2Q86)

Model drawings are available for this limited edition offering.

18. Model 700 BDL - .338 Win. Mag. (1987)

Research work on this item will start later in the year.

19. Model 700 Short Action Left Hand (1987)

Model drawings are available.

20. Sportsman 78 w/Custom Checkering (1987)

Research work on this item will start later in the year.

21. XP-100 - .223 Cal. (1987)

Research work on this item will start later in the year.

22. Kevlar Stocks (1987)

These stocks will be sourced from Brown Precision. Initial offerings, in small quantities, will be made through the Custom Shop in 1986. Kevlar stocks will be a catalogued item in 1987.

23. International Over and Under (TBD)

A consultant's contract is in place with Phil Haskell. Haskell will visit Ilion shortly to begin the design investigation of the FIAS guns in Research. FIAS has notified Remington of design changes to the guns previously delivered.

24. Model 7400 Functional Improvements (TBD)

Research work on this item has been stopped due to higher priorities.

25. Parker Shotgun (TBD)

Several alterations have been investigated as alternatives for an acceptable fire control, including two versions of the Miller trigger, a Briley design, and an adaptation of the Model 3200 fire control. The 3200 fire control has been selected for further work. Engineering and design contractors are being contacted who can complete the work of fitting the 3200 components into the Parker frame. Completion of the fire control design may be achieved by the end of 1985.

JWB:sps

LIMITED DISTRIBUTION

March 21, 1985

TO: J.W. Bower  
T.C. DouglasD.S. Findlay  
R.S. MurphyK.C. Rowlands  
FileFIREARMS DEVELOPMENTResponsibility1. M/1100 Functional Improvements-(1986 Introduction)

Orders have been placed with Connecticut Spring for both dog-leg and straight springs. Delivery is expected by March 29. Douglas

6150 material has been rolled to .034 and .031 in. thickness. Springs will be fabricated in the Model Shop by March 29. Douglas

Spring retainers need to be designed. Information is required on the height of the tabs and whether a tab is to be added to the bottom. Douglas

Six barrel assemblies are due by April 5 for dog-leg springs and by April 12 for straight springs. Douglas

Design of the fore-end assembly is due by March 22. Douglas

Testing is in progress with 20 test guns and 10 control guns containing: Douglas

- o stiffer carriers
- o stainless steel magazine tubes
- o thicker extractors
- o Special Field type magazine spring detents
- o 2-piece firing pin retractor spring.

Control guns are at 10,000 rounds total (4 at 2,000, 2 at 1,000). Part breakages number 12: Douglas

- o 5 FE supports
- o 2 breech bolts
- o 1 each -
  - extractor
  - firing spring retractor spring
  - barrel guide stud
  - bent link
  - piston/seal

Responsibility

M/1100 Functional Improvements - cont'd.

Improvement guns are at 12,100 rounds total (1 at 2,400, 3 at 2,000, 1 at 1,700, 2 at 1,000). Part breakages number 24:

Douglas

- o 5 interceptor latch retainers (same gun)
- o 4 fore-end supports
- o 3 barrel guide studs
- o 3 fore-ends
- o 2 barrel supports
- o 2 triggers
- o 2 pistons/seals
- o 1 each -
  - feed latch
  - interceptor latch retainer
  - carrier latch.

The malfunction rate for carriers shows two separate universes - one very good and one very bad. We need to resolve the differences.

Rowlands

Two barrel supports have separated from the stainless tube at the braze. Fred Schmidt has been asked to investigate.

Douglas

Locking blocks have been machined to various heights to determine the practicality of selective assembly.

Douglas

Bruce Bydal has made recommendations for changing locking block camming surfaces to further smooth the action.

Douglas

Disconnecter angle changes are in the Test Lab.

Douglas

2. M/1100 Restyle

Research has provided P.E. & C. with parts lists and a drawings package for the 12 gauge Model 1100 Restyle, now scheduled for 1986 introduction.

Douglas

3. New Bolt Action Rifle

A matrix is being developed of sear-trigger engagement angles, sear and trigger weight, trigger pull weight, and jar-off drop height.

Murphy



Responsibility

4. Choke Tubes

Drawings for full, improved cylinder, and modified have been transmitted to production. Specifications on tubing are required. Findlay

Additional testing needs to be scheduled: Douglas

- o effect of patterns as tubes loosen
- o skeet, improved modified
- o endurance testing
- o Twenty-gauge tubes

One lug is breaking off the powder metal wrench. P/M is to alter tooling by 3/31. Findlay

Is a wrench with three lugs rather than four acceptable? Findlay

5. M/870 Restyle - 20 Gauge

All drawings are complete except for choke tubes. Findlay

6. M/870 - Fail to Eject

Prototype flexi-tab carriers, with changes to minimize the chance of a fail to eject, are in the Test Lab. Findlay

7. M/870 Functional Improvements

Prototype ejectors are in the Test Lab for evaluation. Douglas

A prototype short shell latch has been made. Douglas

Other items being considered include:

- o a one piece action bar
- o a Model 1100 Restyle
- o a hammer block added to the slide
- o locking block camming improvements.

A schedule is being developed. Douglas

Responsibility

8. Model 700 Varmint - 6MM

Introduction is scheduled for 1986. A transmittal is required. Findlay

9. Models 870-1100 Special Purpose Deer Gun

This offering, scheduled for 1986 introduction, will be similar to the Special Purpose Magnum except a standard deer gun barrel. Does the barrel need to be chrome plated? A transmittal is required. Findlay

10. Model 700 BDL - .338 Cal.

This rifle is scheduled for 1987 introduction. Douglas

11. Sportsman 78 - .223 Cal.

This rifle is scheduled for 1986 introduction. A transmittal is required. Findlay

12. Model 700 Short Action Left Hands

These rifles are scheduled for 1987 introduction. Findlay

13. Sportsman 78 w/Custom Checkering.

Custom checkering will be offered in 1987. Findlay

14. XP-100 - .223

The .221 Fireball will be obsoleted and replaced with the .223 caliber. Introduction is scheduled for 1987. Douglas

15. Add Sights to Model 700

Marketing has requested that iron sights be reinstated on the Model 700 - .243 and .308 calibers, ADL and BDL. A new front sight has been proposed. Marketing needs to approve. Findlay

16. High Velocity Limited Range Development.

Test barrels have been purchased. Ammunition is required. Murphy

JWB:sps

Date: 6/3/83

Copies: \_\_\_\_\_

Distribute: \_\_\_\_\_

Circulate To:

- 1) ~~R. E. Fielitz~~
- 2) ~~C. B. Workman~~
- 3) ~~J. W. Bower~~
- 4) ~~D. S. Findlay~~
- 5) ~~J. G. Hutton~~
- 6) ~~C. Lall~~
- 7) ~~I. S. Martin~~

8) ~~\_\_\_\_\_~~

*Joyce*

Comments: Development Schedule  
File

Return To: T. L. Capeletti

## REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE



*Capaletti*  
*Master*  
*Brooke*

*Clark Workman*  
cc: D. M. Condon  
G. L. Ehrens  
*R. E. Fielitz*  
E. Hooton  
W. H. Forson  
T. W. Rawson  
R. E. Schrader  
W. J. Weeks

Bridgeport, CT  
April 25, 1983

REMINGTON ARMS CO.  
RECEIVED

TO: C. A. RILEY  
FROM: J. H. CHAMBERS *JHC*  
SUBJECT: QUALITY TRACKING STUDY - WAVE I  
FINAL REPORT

MAY 2 1983

FIREARMS RESEARCH DIVISION

Final results confirm the preliminary results discussed in my memo dated March 23, 1983. While the preliminary results addressed all models evaluated on a total Remington basis, the present analysis will deal with total Remington as well as an evaluation of quality by model.

In December 1982, 2,100 questionnaires (see attached) were mailed out to recent Remington gun buyers (obtained from the Owner Card Study) for the purpose of determining their overall satisfaction with the gun they bought. Of the 2,100 questionnaires sent out, 1,241 (59%) were returned completed.

This study involved seven Remington models (M/1100, M/870, M/700, M/788, M/Four/7400, M/Six/7600, M/552). Three hundred questionnaires were mailed to the buyers of each model. The cards were "aged" one year in order to give the buyers a chance to fire their gun.

#### Conclusion

After more than a year of ownership and usage, Remington gun buyers still feel very positive toward the Remington model they purchased. This is indicated by the fact that 87% were "extremely/very satisfied" with their gun after firing and by the fact that 96% would recommend their Remington model to a friend.

However, a sizeable segment (13%) did express some degree of dissatisfaction with their Remington (somewhat satisfied, somewhat dissatisfied and very dissatisfied combined). Remington autoloaders (M/1100, M/Four/7400, and M/552) tend to generate higher dissatisfaction levels than other models.

C. A. Riley

-2-

April 25, 1983

A noticeable percentage (6%) indicated they needed their gun repaired due to some manufacturing defect (the most serious problem being "jamming"). Again, Remington autoloaders were more in need of repair work than other models.

### Findings

- o The buyers in this study were asked to rate the Remington gun they bought on a satisfaction scale ranging from extremely satisfied to very dissatisfied (see questionnaire attached). Nine out of ten (92% before firing; 87% after firing) indicate they were either extremely or very satisfied, when the ratings of all models are compiled (see Exhibit 1).
- o However, there is a sizeable group of buyers (13%) who indicate some degree of dissatisfaction (somewhat satisfied, somewhat dissatisfied and very dissatisfied combined) (see Exhibit 1).
- o Overall satisfaction by model (see Exhibit 2), in the form of the weighted mean scores, indicates the the lowest satisfaction levels exist with Remington autoloaders (M/1100-2.09, M/Four/7400-1.99 and M/551-1.84). The guns with the highest scores are the M/700 (2.32) and the M/Six/7600 (2.32).
- o Remington buyers find "Accuracy" (95% very important) and "Action smoothness" (93%) the two most important areas (see Exhibit 3).
- o Ratings on characteristics by model (% Extremely Satisfied) indicates that the M/788 generates the most satisfaction on Accuracy (65%) and the M/552 the least (38%). In terms of Action Smoothness, the M/Six/7600 elicits the most satisfaction (50%) with the M/788 the least (26%) (see Exhibit 4 for the ratings of all models evaluated by characteristic).
- o When asked what, if anything, they liked about their gun, responses for all buyers range over a number of areas such as Product Quality (31%), Handling (24%) and Looks/Appearance (23%) (see Exhibit 5).
- o When asked what, if anything, they disliked about their gun, buyers make (at low levels) Product Quality comments (15%), particularly "jamming" (4%) and Product Feature comments (24%), particularly "too heavy" (6%) (see Exhibit 6).
- o Eight percent (8%) of all buyers surveyed indicate they had some repair work done to their gun (see Exhibit 5).

C. A. Riley

-3-

April 22, 1983

- o An examination of the reasons for "repair" work, however, indicate that 2% of the guns were returned to a gunsmith for modifications (trigger modification, addition of recoil pad, etc.) while 6% had actual mechanical or "cosmetic" problems stemming from manufacturing defects. The most serious functional problem evolved around "jamming". Broken/Cracked fore-ends was the most serious "cosmetic" problem. (See Exhibit 8.)
- o By model, the incidence of indicated repair work is highest with Remington autoloaders (M/1100, M/Four/7400, and M/552). The model with the lowest incidence of indicated repair work is the M/870 (see Exhibit 9).
- o When asked if they would recommend their model to a friend, 96% say "yes"; when asked if they would recommend a Remington gun to a friend, 99% say "yes" (see Exhibit 10).
- o The model least likely to be recommended to a friend is the M/552, followed closely by the M/Four/7400 (see Exhibit 11).

JHC:hm  
Attach.

OVERALL SATISFACTION WITH MODEL BOUGHT

	BEFORE FIRING (1,238)	AFTER FIRING (1,201)
EXTREMELY SATISFIED (+3)	41%	43%
	92%	87%
VERY SATISFIED (+2)	51	44
SOMEWHAT SATISFIED (+1)	7	7
	9	13
SOMEWHAT DISSATISFIED (-1)	2	4
VERY DISSATISFIED (-2)	*	2
TOTAL	100	100
WEIGHTED MEAN	2.28	2.16

\* LESS THAN .5%

OVERALL SATISFACTION WITH MODEL BOUGHTAFTER FIRING

	<u>Total</u>	<u>M/1100</u>	<u>M/870</u>	<u>M/700</u>	<u>M/Four/7400</u>	<u>M/Six/7600</u>	<u>M/788</u>	<u>M/552</u>
(Base)	(1,201)	(158)	(168)	(161)	(184)	(181)	(174)	(175)
Extremely Satisfied (+3)	43%	44%	45%	45%	43%	50%	41%	32%
Very Satisfied (+2)	44	41	45	47	39	38	52	49
Somewhat Satisfied (+1)	7	7	5	6	8	10	6	8
Somewhat Dissatisfied (-1)	4	6	4	1	6	*	1	6
Very Dissatisfied (-2)	2	2	1	1	4	2	-	5
TOTAL	100%	100%	100%	100%	100%	100%	100%	100%
Weighted mean	2.16 **	2.09	2.25	2.32	1.99	2.32	2.31	1.84

\*Less than .5%

\*\*Extremely Satisfied weighted 3, Very Satisfied 2, Somewhat Satisfied 1, Somewhat Dissatisfied -1, Very Dissatisfied -2.

JHChambers/hm  
4/19/83



RATINGS ON SPECIFIC CHARACTERISTICS

<u>CHARACTERISTIC</u>	<u>% EXTREMELY SATISFIED</u>	<u>% VERY SATISFIED</u>	<u>% EXTREMELY AND VERY</u>	<u>% VERY IMPORTANT</u>
ACCURACY	48	40	88	95
ACTION SMOOTHNESS	40	40	80	93
OVERALL QUALITY/WORKMANSHIP	44	44	88	92
ACTION STRENGTH	44	47	91	89
FEEL OF GUN	52	41	93	87
EASE OF HANDLING	47	44	91	84
EASE OF SAFETY OPERATION	43	39	82	81
TRIGGER	35	49	84	79
WOOD-TO-METAL FIT	32	50	82	78
A GOOD VALUE	47	40	87	70
LOCATION OF SAFETY	46	37	83	70
WOOD QUALITY	44	44	88	68
METAL BLUING	34	52	86	66
WOOD FINISH	44	39	83	64
METAL FINISH	34	55	89	62
WEIGHT	34	46	80	60
APPEARANCE/STYLING	50	41	91	55
AMOUNT OF RECOIL	45	45	90	49

## RATING ON CHARACTERISTICS BY MODEL

% EXTREMELY SATISFIED

	Total	M/1100	M/870	M/700	M/Four/7400	M/Six/7600	M/788	M/552
Accuracy	48%	47%	46%	50%	46%	44%	65%	38%
Action Smoothness	40	39	43	42	41	50	26	36
Overall Quality/ Workmanship	44	41	54	49	47	48	35	37
Action Strength	44	44	50	56	43	39	44	34
Feel of Gun	52	51	54	53	55	59	45	45
Ease of Handling	47	50	45	45	45	56	42	49
Ease of Safety Operation	43	42	43	48	42	50	32	42
Trigger	35	37	36	32	33	36	36	32
Wood-to-Metal Fit	32	33	30	35	41	34	25	27
A Good Value	47	49	46	47	45	44	58	39
Location of Safety	46	45	43	54	47	50	36	45
Wood Quality	44	43	43	49	53	54	59	44
Metal Bluing	34	35	33	40	40	39	26	41
Wood Finish	44	47	43	50	52	53	19	43
Metal Finish	34	36	31	39	38	41	25	43
Weight	34	36	31	26	31	45	30	41
Appearance/Styling	50	53	48	55	54	61	28	48
Amount of Recoil	45	57	36	33	48	40	48	54

JHK Chambers/hm  
4/19/83

788 - A "good value" in spite of ~~most~~ least satisfaction  
 700-788 - Disparity in "Location of Safety"  
 700 - weight - Lightest Rifle - ???  
 700 - Trigger - ??  
 788 - wood quality

LIKES

	<u>TOTAL</u>
(BASE)	(1,241)
<u>LIKED SOMETHING (NET)</u>	<u>84%</u>
<u>PRODUCT QUALITY (NET)</u>	<u>31%</u>
ACCURATE GUN/ACCURACY	20
RELIABLE/WON'T FAIL	5
EXCELLENT/GOOD QUALITY	4
GOOD WORKMANSHIP	4
<u>HANDLING (NET)</u>	<u>24</u>
LIKE THE WAY IT HANDLES	12
GOOD FEEL/LIKE THE FEEL	8
<u>LOOKS/APPEARANCE (NET)</u>	<u>23</u>
LOOKS/APPEARANCE	12
STYLE	5
DESIGN/STOCK DESIGN	3
FINISH	5
<u>FIRING (NET)</u>	<u>17</u>
SMOOTH ACTION	5
THE ACTION (GEN'L)	4
LESS RECOIL	3
THE RECOIL	2
<u>PRODUCT FEATURES -</u>	<u>20</u>
THE WEIGHT	4
LIGHT WEIGHT	3
LIKE NOTHING	*
NO ANSWER	16
TOTAL	100

\* LESS THAN .5%

DISLIKES

	<u>TOTAL</u>
(BASE)	(1,241)
<u>DISLIKED SOMETHING (NET)</u>	60%
<u>PRODUCT QUALITY (NET)</u>	15
GUN JAMS WHEN LOADING/FIRING	(4)
WOOD TO METAL FIT	3
SHELLS DON'T EJECT PROPERLY	2
STOCK CRACKED	2
GUN IS NOT ACCURATE	2
<u>LOOKS/APPEARANCE (NET)</u>	10
PREFER OIL FINISH	(4)
DON'T LIKE FINISH	2
SCRATCHES/MARKS ON BARREL	2
<u>PRODUCT FEATURES</u>	24
TOO HEAVY	(6)
SAFETY LOCATION	(5)
SAFETY (GEN'L)	4
<u>PRICE (NET)</u>	1
<u>HANDLING (NET)</u>	1
<u>FIRING (NET)</u>	10
TRIGGER SHOULD BE ADJUSTABLE	3
TRIGGER PULL (GEN'L)	1
TRIGGER PULL TOO HARD	1
<u>SIGHT/AIMING (NET)</u>	5
DON'T LIKE SIGHTS	2
DISLIKED NOTHING	15
NO ANSWER	25
TOTAL	100

EXHIBIT 7INCIDENCE OF REPAIR WORK

	<u>TOTAL</u>
(Base)	(1,178)
NO. HAVE NOT HAD THE GUN REPAIRED	92%
YES. HAD THE GUN REPAIRED	<u>8</u>
TOTAL	100

REASONS FOR REPAIR WORK

	<u>Total</u> (97)	
<u>Functional Problems</u>	<u>54%</u>	(4% of Total)
Jamming	15	
Ejection/Extraction	7	
Failure to Feed	2	
Replacing Firing Pin/ Bent Firing Pin	2	
Misfires	2	
Clip Insertion/Seating	3	
Magazine Screw	3	
Stiff/Hard Action	2	
All Other	18	
 <u>Cosmetic Problems</u>	 <u>18</u>	 (2% of Total)
Broken/Cracked Fore-end	6	
Cracked Butt Stock	4	
Poor Bluing	4	
All Other	4	
 <u>Modifications</u>	 <u>25</u>	 (2% of Total)
Trigger Modified/Reworked	6	
Short/Adjust Stock	3	
Added Sling	6	
Added Recoil Pad	4	
Added Scope	4	
All Other	8	
 <u>Cannot Be Determined</u>	 <u>3</u>	
 Total	 100%	

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4/22/83

INCIDENCE OF REPAIR WORK BY MODEL

	<u>Total</u>	<u>M/1100</u>	<u>M/870</u>	<u>M/700</u>	<u>M/Four/7400</u>	<u>M/Six/7600</u>	<u>M/788</u>	<u>M/552</u>
(Base)	(1 178)	(159)	(164)	(159)	(179)	(182)	(170)	(172)
No, have not had the gun repaired	92%	89%	95%	94%	89%	93%	94%	89%
Yes, had the gun repaired	8	11	5	6	11	7	6	11
Total	100%	100%	100%	100%	100%	100%	100%	100%

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4/19/83

EXHIBIT 10PERCENT WHO WOULD RECOMMEND MODEL  
BOUGHT TO A FRIEND

	<u>TOTAL</u>
(BASE)	(1,176)
YES, WOULD RECOMMEND THIS MODEL TO A FRIEND	96%
NO, WOULD NOT RECOMMEND THIS MODEL TO A FRIEND	<u>4</u>
TOTAL	100

PERCENT WHO WOULD RECOMMEND  
A REMINGTON GUN TO A FRIEND

	<u>TOTAL</u>
(BASE)	(1,181)
YES, WOULD RECOMMEND A REMINGTON GUN TO FRIEND	99%
NO, WOULD NOT RECOMMEND A REMINGTON GUN TO A FRIEND	1
TOTAL	100



PERCENT WHO WOULD RECOMMEND MODEL BOUGHT TO A FRIEND

	<u>Total</u>	<u>M/1100</u>	<u>M/870</u>	<u>M/700</u>	<u>M/Four/7400</u>	<u>M/Six/7600</u>	<u>M/788</u>	<u>M/552</u>
(Base)	(1,176)	(154)	(165)	(156)	(182)	(176)	(174)	(169)
Yes, would recommend this model to a friend	96%	96%	98%	98%	93%	94%	98%	92%
No, would not recom- mend this model to a friend	<u>4</u>	<u>4</u>	<u>2</u>	<u>2</u>	<u>7</u>	<u>6</u>	<u>2</u>	<u>8</u>
Total	100%	100%	100%	100%	100%	100%	100%	100%

PERCENT WHO WOULD RECOMMEND A REMINGTON TO A FRIEND

	<u>Total</u>	<u>M/1100</u>	<u>M/870</u>	<u>M/700</u>	<u>M/Four/7400</u>	<u>M/Six/7600</u>	<u>M/788</u>	<u>M/552</u>
(Base)	(1,181)	(158)	(165)	(157)	(182)	(178)	(174)	(167)
Yes, would recommend a Remington gun to a friend	99%	97%	99%	99%	100%	99%	100%	98%
No, would not recom- mend a Remington gun to a friend	<u>1</u>	<u>3</u>	<u>1</u>	<u>1</u>	<u>-</u>	<u>1</u>	<u>-</u>	<u>2</u>
Total	100%	100%	100%	100%	100%	100%	100%	100%

JHChambers/hm  
4/19/83



Dear Remington Gun Owner:

Remington Arms Company wishes to thank you for your recent purchase of a new Remington shoulder arm. At Remington Arms Company, we are constantly striving to provide you with the finest quality shoulder arms possible. One way in which we achieve this is by listening to people who have bought and used our products.

Please take the time to complete the following questionnaire since your comments are considered extremely valuable. Furthermore, please be as candid as possible since we need to know your true feelings in order to offer you the best products. When finished, insert the questionnaire in the stamped return envelope and deposit in a mail box.

Our records indicate that you purchased approximately one year ago a new

Remington Model  
Serial #

1. Do you still own this Remington shoulder arm?

Yes ☐ - 1

No ☐ - 2

(Please complete the questionnaire  
even if you no longer own this gun.)

2. How satisfied were you with the gun initially, before you fired it?

Extremely  
Satisfied

☐ -1

Very  
Satisfied

☐ -2

Somewhat  
Satisfied

☐ -3

Somewhat  
Dissatisfied

☐ -4

Very  
Dissatisfied

☐ -5

3. Have you fired this gun yet?

Yes ☐ - 1

No ☐ - 2

(If no, do not continue; however, please return the questionnaire.)

4. How satisfied are you with this gun now, after you've fired it?

Extremely  
Satisfied

Very  
Satisfied

Somewhat  
Satisfied

Somewhat  
Dissatisfied

Very  
Dissatisfied

☐ -1

☐ -2

☐ -3

☐ -4

☐ -5

5. Approximately how many cartridges or shells have you shot through this gun? (If you no longer own the gun, please estimate the number of cartridges or shells fired through it before you disposed of it.)

1 - 20 ☐ - 1

101 - 120 ☐ - 6

21 - 40 ☐ - 2

121 - 140 ☐ - 7

41 - 60 ☐ - 3

141 - 160 ☐ - 8

61 - 80 ☐ - 4

161 - 180 ☐ - 9

81 - 100 ☐ - 5

181 & Over ☐ - 0

6. How many times have you taken this gun out to shoot?

1 - 5 ☐ - 1

16 - 20 ☐ - 4

6 - 10 ☐ - 2

21 - 25 ☐ - 5

11 - 15 ☐ - 3

26 & Over ☐ - 6

7a. Did you buy this gun for hunting only, target shooting only, or both?

Hunting Only ☐ - 1

Target Shooting Only ☐ - 2 (If Target Shooting Only skip to Q 8.)

Both ☐ - 3

7b. How many times have you been out hunting with this gun?

1 - 5 ☐ - 1

16 - 20 ☐ - 4

6 - 10 ☐ - 2

21 - 25 ☐ - 5

11 - 15 ☐ - 3

26 & Over ☐ - 6

8. Under 8A below please indicate how satisfied you are with this gun for each area listed.

Under 8B below please indicate those areas that are very important, somewhat important or not important to you on this model.

## 8A. LEVEL OF SATISFACTION

## 8B. DEGREE OF IMPORTANCE

	Extremely Satisfied	Very Satisfied	Somewhat Satisfied	Somewhat Dissatisfied	Very Dissatisfied	Very Important	Somewhat Important	Not Important
a. Metal Finishing	<input type="checkbox"/> -1	<input type="checkbox"/> -2	<input type="checkbox"/> -3	<input type="checkbox"/> -4	<input type="checkbox"/> -5	<input type="checkbox"/> -6	<input type="checkbox"/> -7	<input type="checkbox"/> -8
b. Metal Blueing	<input type="checkbox"/> -1	<input type="checkbox"/> -2	<input type="checkbox"/> -3	<input type="checkbox"/> -4	<input type="checkbox"/> -5	<input type="checkbox"/> -6	<input type="checkbox"/> -7	<input type="checkbox"/> -8
c. Wood Quality	<input type="checkbox"/> -1	<input type="checkbox"/> -2	<input type="checkbox"/> -3	<input type="checkbox"/> -4	<input type="checkbox"/> -5	<input type="checkbox"/> -6	<input type="checkbox"/> -7	<input type="checkbox"/> -8
d. Wood Finish	<input type="checkbox"/> -1	<input type="checkbox"/> -2	<input type="checkbox"/> -3	<input type="checkbox"/> -4	<input type="checkbox"/> -5	<input type="checkbox"/> -6	<input type="checkbox"/> -7	<input type="checkbox"/> -8
e. Wood-to-Metal Fit	<input type="checkbox"/> -1	<input type="checkbox"/> -2	<input type="checkbox"/> -3	<input type="checkbox"/> -4	<input type="checkbox"/> -5	<input type="checkbox"/> -6	<input type="checkbox"/> -7	<input type="checkbox"/> -8
f. Action Smoothness	<input type="checkbox"/> -1	<input type="checkbox"/> -2	<input type="checkbox"/> -3	<input type="checkbox"/> -4	<input type="checkbox"/> -5	<input type="checkbox"/> -6	<input type="checkbox"/> -7	<input type="checkbox"/> -8
g. Action Strength	<input type="checkbox"/> -1	<input type="checkbox"/> -2	<input type="checkbox"/> -3	<input type="checkbox"/> -4	<input type="checkbox"/> -5	<input type="checkbox"/> -6	<input type="checkbox"/> -7	<input type="checkbox"/> -8
h. Location of Safety	<input type="checkbox"/> -1	<input type="checkbox"/> -2	<input type="checkbox"/> -3	<input type="checkbox"/> -4	<input type="checkbox"/> -5	<input type="checkbox"/> -6	<input type="checkbox"/> -7	<input type="checkbox"/> -8
i. Ease of Safety Operation	<input type="checkbox"/> -1	<input type="checkbox"/> -2	<input type="checkbox"/> -3	<input type="checkbox"/> -4	<input type="checkbox"/> -5	<input type="checkbox"/> -6	<input type="checkbox"/> -7	<input type="checkbox"/> -8
j. Accuracy	<input type="checkbox"/> -1	<input type="checkbox"/> -2	<input type="checkbox"/> -3	<input type="checkbox"/> -4	<input type="checkbox"/> -5	<input type="checkbox"/> -6	<input type="checkbox"/> -7	<input type="checkbox"/> -8
k. Trigger	<input type="checkbox"/> -1	<input type="checkbox"/> -2	<input type="checkbox"/> -3	<input type="checkbox"/> -4	<input type="checkbox"/> -5	<input type="checkbox"/> -6	<input type="checkbox"/> -7	<input type="checkbox"/> -8
l. Feel of Gun	<input type="checkbox"/> -1	<input type="checkbox"/> -2	<input type="checkbox"/> -3	<input type="checkbox"/> -4	<input type="checkbox"/> -5	<input type="checkbox"/> -6	<input type="checkbox"/> -7	<input type="checkbox"/> -8
m. Ease of Handling	<input type="checkbox"/> -1	<input type="checkbox"/> -2	<input type="checkbox"/> -3	<input type="checkbox"/> -4	<input type="checkbox"/> -5	<input type="checkbox"/> -6	<input type="checkbox"/> -7	<input type="checkbox"/> -8
n. A good value	<input type="checkbox"/> -1	<input type="checkbox"/> -2	<input type="checkbox"/> -3	<input type="checkbox"/> -4	<input type="checkbox"/> -5	<input type="checkbox"/> -6	<input type="checkbox"/> -7	<input type="checkbox"/> -8
o. Appearance/Styling	<input type="checkbox"/> -1	<input type="checkbox"/> -2	<input type="checkbox"/> -3	<input type="checkbox"/> -4	<input type="checkbox"/> -5	<input type="checkbox"/> -6	<input type="checkbox"/> -7	<input type="checkbox"/> -8
p. Amount of Recoil	<input type="checkbox"/> -1	<input type="checkbox"/> -2	<input type="checkbox"/> -3	<input type="checkbox"/> -4	<input type="checkbox"/> -5	<input type="checkbox"/> -6	<input type="checkbox"/> -7	<input type="checkbox"/> -8
q. Weight	<input type="checkbox"/> -1	<input type="checkbox"/> -2	<input type="checkbox"/> -3	<input type="checkbox"/> -4	<input type="checkbox"/> -5	<input type="checkbox"/> -6	<input type="checkbox"/> -7	<input type="checkbox"/> -8
r. Overall Quality/ Workmanship	<input type="checkbox"/> -1	<input type="checkbox"/> -2	<input type="checkbox"/> -3	<input type="checkbox"/> -4	<input type="checkbox"/> -5	<input type="checkbox"/> -6	<input type="checkbox"/> -7	<input type="checkbox"/> -8

9. What, if anything, do you particularly like about this gun?

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10. What, if anything, do you particularly dislike about this gun?

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11a. Have you had this gun repaired by the factory or a local gunsmith?

Yes ☐ - 1  
 No ☐ - 2 (Skip to Q14.)

11b. Where was the gun serviced?

Factory ☐ - 1  
 Remington Recommended Gunsmith ☐ - 2  
 Other Gunsmith ☐ - 3

12. What type of repair work was performed on your gun?

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13. How satisfied were you with this repair work?

<u>Extremely</u> <u>Satisfied</u>	<u>Very</u> <u>Satisfied</u>	<u>Somewhat</u> <u>Satisfied</u>	<u>Somewhat</u> <u>Dissatisfied</u>	<u>Very</u> <u>Dissatisfied</u>
<input type="checkbox"/> -1	<input type="checkbox"/> -2	<input type="checkbox"/> -3	<input type="checkbox"/> -4	<input type="checkbox"/> -5

14. Would you recommend this model to a friend?

Yes ☐ - 1  
 No ☐ - 2

15. Would you recommend a Remington gun to a friend?

Yes ☐ - 1  
 No ☐ - 2

TE	SEPT 1980	26.6	1125.00	NONE	ADDED TO LINE	16.
1	(1)	(1)	(1)	NONE	ADDED TO LINE	17.
	DEC 1980	(1)	(1)	NONE	ADDED TO LINE	
181	DEC 1981	(1)	(1)	NONE	ADDED TO LINE	18.
	(1)	(1)	(1)	NONE	ADDED TO LINE	
81 (3)	(1)	(1)	(1)	NONE	ADDED TO LINE	19.
81 (3)	(1)	(1)	(1)	NONE	ADDED TO LINE	20.

DATE	QUANTITY	UNIT PRICE	TOTAL PRICE	REMARKS	ADDED TO LINE	LINE
SEPT 1980	26.6	1125.00			ADDED TO LINE	16.
(1)	(1)	(1)			ADDED TO LINE	17.
DEC 1980	(1)	(1)			ADDED TO LINE	18.
(1)	(1)	(1)			ADDED TO LINE	19.
(1)	(1)	(1)			ADDED TO LINE	20.
81 (3)	(1)	(1)			ADDED TO LINE	
81 (3)	(1)	(1)			ADDED TO LINE	