SCOPE INSTRUCTIONS

OPERATION, FUNCTION AND CARE OF YOUR







Redfield

GUN SIGHT CO.

1315 SO. CLARKSON ST., DENVER, COLO. 80210

IMPORTANT: INSTRUCTIONS AND WARRANTY
DO NOT LOSE

IMPORTANT! This is your Redfield Warranty. It is your assurance of satisfaction as well as a reflection of our confidence in the superiority of this instrument. Record the details of your purchase below and retain with other records of value. To activate this Warranty, please complete the Registration Card provided at the back of this instruction booklet.



Redfield Rifle Scopes are fully guaranteed to be free of defects in materials or workmanship. The original registered owner of a Redfield Scope is entitled to normal repair or replacement without charge provided that factory examination (1) discloses defects in material or workmanship, or (2) that scope has not been subjected to abuse, or (3) that scope has not been repaired or disassembled by other than Redfield Factory Technicians. If such examination does disclose evidence of (2) or (3), repairs will be made with a nominal charge for parts and labor.

Redfield Gun Sight Co.



In Canada, Authorized Depots:

- 1. Western Scope Service, 1328 17th Avenue S.W., Calgary, Alberta
- 2. J. J. Bosma, 1418 Commercial Drive, Vancouver, B.C.

Your Personal Record of Purchase

(Important if scope is lost or stolen)

Serial No.:		_
Power & Reticle:		_
Price:	Date:	_
Dealer Name:		_
Doslar Address.		

CONTENTS

THE OPERATION, FUNCTION AND CARE OF YOUR REDFIELD SCOPE

Mounts	
How to Focus 2	
Reticle Center and Mount Alignment 2	
Scope Specifications 4	
How to Zero your Redfield Scope 6	
Elevation and Windage Adjustments 6	
To Reset Windage and Elevation Dials	
Notes on Parallax 8	
How to Care for your Redfield Scope 8	
THE INSIDE STORY OF YOUR REDFIELD SCOPE	
The Optical System11	
Resolving Power11	
Lenses	
Lens Surfaces are Coated12	
Eye Relief12	
Exit Pupil12	
Field of View12	
Reticle and Parallax13	
Reticle Adjustment and Centering14	
Variable Scope Power Change14	
Variable Scope Reticle Magnification15	
Variable Scope Reticle Centering15	
Using the Accu-Range Variable15	
Anti-Fogging16	
Exterior Finishes	
Warranty Registration Card Back Covers	

THE CARE AND OPERATION OF YOUR REDFIELD SCOPE SELECTION OF PROPER MOUNT

Your Redfield Scope deserves a mount that will complement its rugged beauty and precise craftsmanship. Because a scope-rifle combination is no better than its mount, you should further consider your own *needs* when choosing a mount. Above all else, your mount should be guaranteed not to shoot loose.

Choose Redfield, and you have such a guarantee.

HOW TO FOCUS

It is vitally important that your Redfield scope be focused to your eye. This is accomplished by adjusting the eyepiece until the reticle (Crosshair. Post and Crosshair, or Dot) is out of focus. When focusing a variable, do so at highest power setting of scope. No need to worry about accidentally removing the eyepiece. All Redfield scopes (with 1" tubes) are now equipped with Non-Removable evenieces, for your protection. Point the scope at a bright background and rapidly adjust the eyepiece clockwise until the reticle appears sharp and clear to the hasty glance. (Quick glances simulate actual field shooting. Slow study of crosshair allows your eye to adjust, which is not possible under field conditions.) LOCK THE EYEPIECE IN FOCUS WITH KNURLED LOCKING RING. DON'T PERMIT ANYONE TO CHANGE THIS EYEPIECE POSITION. The reticle of your scope is now in focus for your eye, and should not need to be focused again.

RECTICLE CENTER AND MOUNT ALIGNMENT

Scopes leave the factory with reticle adjustments optically and mechanically centered to insure full travel in windage and elevation. (You can check this yourself by placing your Redfield scope on a solid V-block with the center of the reticle sighted on a suitable object. If centered, the reticle will remain on the object as you slowly rotate the scope. If not centered, the reticle will move in a slight circle in relation to the object, and you can correct the situation while scope is in V-block by using the windage and/or elevation adjustments in scope turrets.) When centering is completed, place scope in mount, and check the MOUNT alignment. In bolt action rifles, bore sighting is the best way to check-in other types, close range (10 to 25 vards) firing is perhaps the best way to align your mount, unless a collimator is available to you. A gross misalignment in a mount with respect to the bore usually can be corrected through the use of shims. (Generally, .001" shim adjusts bullet impact about .7" at 100 yards.) However, IF YOU HAVE ANY DOUBT, don't hesitate to consult a competent gunsmith. Before tightening the mount rings on the scope tube, position your scope for proper eye relief with eye piece at least two inches from your eye or glasses, to prevent injury from recoil when shooting from odd and awkward hunting positions. The mount rings must allow the scope to be positioned at the proper eye relief distance. (The 2" minimum eye relief applies to all Redfield scopes except the Front-IER, which has an extended eye relief of 6" to 10".) IT IS FUR-THER NECESSARY TO MAINTAIN AT LEAST 1/16" CLEAR TUBE BETWEEN THE TURRET AND NEAREST MOUNTING RING, AND ALSO 1/16" BETWEEN VARI-ABLE'S POWER SELECTOR RING AND REAR MOUNTING RING.

Redfield Scope Specifications

				1" TUBE	DIAMETE	R SCOPE	S			3/" TUB	E DIAM.	SCOPES
		Variable		Variable		FIXED POWER SCOPES					1000	
	Including A	Accu® Range	Including A	ccu® Range		1' Tub	e Diameter N	asters	Front	IER's % Sportsters		
100000	AT 2X	AT 7X	AT 3X	AT 9X	1" Tube 2% X	1' Tube 4X	1" Tube 6X	1" Tube 12X	1" Tube 2X	% Tube	%" Tube 2% X	1/4" Tube
Actual Magnification	2.3X	7X	3.3X	9.1X	2% X	4X	6X	12X	2X	2.3X	2.8X	3.9X
Clear aperture of object lens	34.8mm	34.8mm	38.6mm	38.6mm	22mm	34.8mm	41mm	43mm	24.0mm	24.2mm	24.2mm	24.2mm
Exit Pupil	13.5mm	4.5mm	12.6mm	4.3mm	8mm	7.8mm	6.8mm	3.7mm	12mm	10.2mm	5.9mm	5.2mm
Relative brightness	182	20	159	19	64	61	46.7	13.7	144	100	34.8	27
Field of view at 100 yards	44'	16'	37.5'	12.5'	42.5'	31'	20'	10'	30'	18'	31.5'	24.5'
Eye relief	214"-31/2"	21/4 "-31/2"	214"-31/2"	2% "-31/2"	21/4 "-31/4"	214"-31/2"	214"-31/2"	214 - 31/2	6"-10"	6"-9"	214 *-31/4 *	21/4"-31/4"
Overall length focused to infinity	11%	11%	12%	121/4	10%	1111/12	137/32	14%*	11.4"	101/4	91/4	91/2
Diameter of tube	1"	1*	1"	1.	1"	1"	1*	1"	1"	.75*	.75*	.75*
Outside diameter of object end	1.563*	1.563"	1.820"	1.820"	1.000"	1.563*	1.825*	1.91*	1.175*	1.100*	1.100*	1.100*
Outside diameter of eyepiece	1.495*	1.495"	1.495*	1.495"	1.495"	1.495"	1.495"	1.495*	1.495*	1.150*	1.150*	1.150*
Weight	11.5 oz.	11.5 oz.	12.5 oz.	12.5 oz.	8 oz.	9.75 oz.	11.25 oz.	13.5 oz.	8.5 oz.	6 oz.	6.25 oz.	6.25 oz.
Internal adjustment graduation in minutes (inches at 100 yd.)	1"	i*	1/2"	1/2"	1"	1"	1/4.	¼°	1"	11/2"	1½*	11/2"
Max. Elev. & Windage Adjustment	60"	60"	40"	40"	130*	60"	48"	48"	72*	44"	38"	44"
Reticle Adjustment					11	TERNAL SUI	PER ACCURA	E				
Minimum reticle adjustment	10.00				1/4 MINUTE	200			1/2 MINUTE		34 MINUTE	
Finish		ANODIZED, VIRTUALLY UNSCRATCHABLE					ANODIZED					
Mount Rings		Any 1' ring type mount—Standard height rings (for most rifles) Medium or High or High					JR-IERor BBL Base & Upper Ring Mount Any 34" ring mount or special for dovetail .22's					
STANDARD RETICLES	Crosshair	rs HCH, MCH,	FCH, PCH an	d 4P CCH	Crosshair (CH) or Post w/Crosshair (PCH) 4P-CCH				CH PCH			
\$10.00 Extra Charge Reticles	Dot 3"	Dot 1'	Dot 3"	Dot 1"	Dot 1",2",3", 4" or 5"	Dot 1".2" 3". 4"	Dot 1" 2". 3"	Dot 1/2"	7 3 3	NOT AVAILABLE		LE
Crosshair Heavy (HCH) covers Medium (MCH) at 100 yds. Fine (FCH)	1.50*	.50"	1.5° 1.0° .75°	.50° .33° .25°	1.34"	.92"	.31*	5 1	1.50*	1.00*	1.00*	1.00*
Top of Post covers at 100 yds.	1.80"	.60"	1.20"	.40*	2.68*	1.84*	1.22*		1.84"	2.00*	2.00*	2.00*
Top of Post above Horiz. Crosswire.	1.80*	.60*	1.20*	.40*	1.50*	1.50*	1.00*		1.50"	1.50*	1.50*	1.50*

Choice of Redfield Reticles

- NOTE: We recommend the HCH "Heavy Cross Hair" or the MCH for big-game or all-purpose uses. While fine reticles look good in the store we caution you that they aren't as "seeable" in dawn or dusk "trophy" light.

4P CCH

Very fine crosshairs at center for pinpoint accuracy in good light. plus thin posts for centering your eye in the dullest of light.

CROSSHAIR

Standard sight reference reticle See scope spec, chart for availabilities.

POST WITH CROSSHAIR

For early dawn and late dusk shots. Top of post extends above horizontal cross wire.

DOT

For the shooter who prefers a dot as a sight reference point.

ACCU*-RANGE

Has two range-finder reticles at top that represent 18" measure-







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ORDER NO. 150100	PRICE \$1.00	SCI Ka-

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New Lens Cover Idea!

Your Redfield Scope comes secured in the package by plastic end supports for safety in shipping. When you remove the scope from the supports, save the lens cover.

Stotted tab allows connecting by the rubber band furnished. You might like to order extra sets.

Simply use order number.

For a higher quality set of Lens Covers. we still carry Ka-ram-ba, Storm King and Storm Queen Lens Covers.

- -Long

SCOPE COVER 6x or 3x-9x Var.

4x or 2x-7x Var.

2%x-1* Tube

2x Frontier % " Tube

21/4 x or 4x Sportster

Lens Cover Band-Short

SCOPE COV	ER	NO.	PRICE
Ka-ram-ba	6x or 3x-9x Var.	150009	\$3.2
	4x or 2x-7x Var.	150008	
	2½x-1* Tube	150007	*
	2x-Frontier 1*	150015	140
	2x-Frontier 1/4"	150010	-
Storm King	6x or 3x-9x Var.	150006	\$2.95
	4x or 2x-7x Var.	150005	42.00
	2%x-1" Tube	150004	
	2x-Frontier 1*	150014	

Storm Queen 6x or 3x-9x Var.

\$2.50 4x or 2x-7x Var. 150002 2%-1" Tube 2x Frontier-1" 150013 2x Frontier-1/4" 150011

150003

HOW TO ZERO YOUR REDFIELD SCOPE

No two people hold a rifle the same, use exactly the same type cartridge, or shoot under the same kind of conditions; and no two people sight a rifle scope in the same manner. To be certain YOUR scoped rifle will be as precisely accurate as possible, YOU must test fire it and make the final scope adjustments. (NOTE: Zero a Redfield Variable at the highest power setting.) Your rifle should be shot from a well-padded rest, under calm wind conditions, resting forearm, NOT barrel, on pad. Shoot first at a target at least 2 feet square and approximately 25 yards distant. Fire three shots. Then, make adjustments in the scope so that the center of each group is within 1 inch of the point of aim. You can now shoot at 100 yards, repeating successive three-shot groups with further successive minor adjustments. It is highly desirable to know the bullet trajectory (path) of your caliber and load, and decide on a "zero" point best for this trajectory and your type of hunting. For example, it's common to zero a deer hunting 30-06 at about 3" high at 100 yds. so it will hit on center at 200 yds. and thus be effective at any range from point blank to about 250 yds. It should be remembered that rifles will change point of impact, from month to month and year to year. Your rifle should be checked before each hunting trip. Something else to remember: a bullet crosses the line of aim twice: near the muzzle and again, at a much greater distance. This fact enables you to make excellent shortdistance shots, as well as long shots. (Point of aim is identical at 25 yds. and again at a point around 200 vds.)

ELEVATION AND WINDAGE ADJUSTMENTS

6

Removal of the threaded weatherproof caps ex-

poses the adjustments which can be operated with a thin coin or key. Top turret for vertical adjustment - side turret for horizontal adjustment. The Redfield 12x has positive click adjustments. Comes with two knurled turret knobs at no extra cost. Ridge in turret knob screwattaches to slot in dial face. Turret caps need not be used when knobs are removed, for turrets are sealed against dust and moisture. Turning the adjusting screw in the marked direction (UP and RIGHT) alters your point of impact in that same direction on the target. The graduations engraved on the dials are: 1" Tube 23/4 x; 4x; 2x-7x Variable; 1" Tube 2x FrontIER — 1MOA (Minute of Angle): 1" Tube 6x; 3x-9x Variable; 12x — 1/2 MOA (1/4" clicks on 12x): 34" Tube FrontIER; 234x and 4x Sportster -11/2 MOA ... Accu-Range feature does not change the graduations in the Variables. (1 minute, frequently expressed as 1" is approximately 1 inch at 100 yards, 2 inches at 200 vards, etc.) IMPORTANT! DO NOT MOVE ADJUSTMENTS BEYOND POINT WHERE IT PRODUCES RETICLE MOVEMENT AS THEY CAN BE MOVED COMPLETELY OUT OF SPINDLE.

TO RESET WINDAGE AND ELEVATION DIALS

After zeroing your scope, depress the rim of the graduated scale with both thumbs simultaneously and rotate to "0". This will not change the elevation and windage adjustments, but merely permits the dial to read "0" after your rifle is zeroed in, enabling subsequent minor adjustments to be made more easily from this zero. This feature is not available in the FrontIER, Sportster or 12x scopes.

NOTES ON PARALLAX

A scope has "parallax" when the reticle is not on the exact same plane as the image of your target. Never check for parallax through transparent lens caps or through a windowpane. Any rifle scope is free of parallax at one specific distance. The 23/4X, 4X, 6X, and all VARI-ABLES are adjusted parallax-free at approximately 100 yards, the FrontIER and Sportster scopes at 80 yards. The 12x features a third turret which adjusts parallax for ranges of 75 to 600 yards. To change parallax setting, simply depress the turret with a coin and rotate until reference line coincides with the scale on the dial. A positive detent system guards against accidental change from bump or recoil. At distances other than such settings ANY scope will exhibit a small amount of parallax - too small, however, to be a signficant factor in hunting. Redfield has a positive means for adjusting parallax. Special factory tools are required. Owners desiring different parallax settings should send their scopes to Redfield for FREE adjustments. REPEAT: DIS-ASSEMBLY OF YOUR SCOPE BY OTHER THAN RED-FIELD GUN SIGHT CO. VOIDS THE WARRANTY.

HOW TO CARE FOR YOUR REDFIELD SCOPE

You are to be congratulated for selecting a Redfield rifle scope. It is identical to the Redfield scopes selected by many of the nation's foremost marksmen and hunting experts. It is manufactured with painstaking care by expert craftsmen, and although rugged and durable, it should be accorded the same reasonable care you'd give any other precision optical instrument. For example, all Redfield 1"tubes feature

famed virtually unscratchable Tuf Coat® finish (3/4" tubes are anodized) but reasonable care will help protect the surface. Avoid dropping your scope or striking it with another object. When not in use, lenses should be protected with caps. The eyepiece and turret caps should be kept tight at all times. Your Redfield Sportster, while suitable for mounting on a .22 caliber rifle, is made with all the quality that goes into other Redfield scopes and will stand up under the recoil of heavy caliber shooting. For your protection, all Redfield scopes with 1" tubes (1963 and later) are equipped with Non-Removable evenieces. DO NOT ATTEMPT TO REMOVE THE EYEPIECE UNDER ANY CONDI-TION. Disassembly of the scope by other than our own factory personnel VOIDS THE RED-FIELD WARRANTY. Read your Redfield Warranty on the inner front cover of this booklet. BE SURE TO FILL IN THE WARRANTY REGISTRATION CARD ON BACK COVER AND MAIL IT IMMEDIATELY.

LENS PROTECTION

Your Redfield scope comes to you secured in the package by unique vinyl end supports. Both supports incorporate protective lens covers (a rubber connector is also included). Covers should be used whenever your Redfield scope is not actually in use (see page 5 for more information).

REDFIELD SCOPES are patented under one or more of the following U.S. patents and OTHER PATENTS PENDING: Pat. No. 2,625,742; 2,955,512; 2,780,941; 2,909,838; 2,858,732; 2,948,188; 2,997,916; 3,161,716.



Here's the Inside Story of Your REDFIELD SCOPE

including Glossary of Scope Terms

We feel you should know what a scope really is, and careful reading of this somewhat technical section will clarify the "mysteries" of a scope. The cutaway drawing above is the Redfield Variable, which serves to illustrate the basic characteristics of a scope.

THE OPTICAL SYSTEM of scope and eye consists of an objective lens which produces an image of the target at focal plane "A", this image being upside down and backward. The erector system "looks at" this image and produces another image partially magnified at point "B" right side up and corrected as to left and right (an actual image of the target). The eyepiece lenses are similar to a magnifying glass in your hand and "look at" and magnify the corrected image at point "B". Your eye itself is the final part of the system.

RESOLVING POWER is the eye's ability to distinguish detail in ideal light conditions. It's difficult and unusual for the average unaided eye to distinguish anything less than about 1 inch detail at 100 yards. Magnification, combined with good design of optics, permits resolution of this 1 inch divided by the magnification. Thus, you should see ¼ inch detail with a 4X scope, ¼ inch with a 6X, etc.

LENSES are precision ground with rare-earth compounds from the most ideal optical blanks. The reason why most lenses are doublets (with a third lens in the eyepiece) is that single lenses separate the various colors comprising "light" which result in "flares" of color at the edges of the image. The extra lenses compensate for and eliminate this as well as balance out any other imperfections (called aberrations) to give you a clear, bright picture. Doublets are cemented together with the finest synthetic cements. Lenses are mounted against precision-surfaced mount shoulders and are hermetically sealed.

LENS SURFACES ARE COATED with a hard film of magnesium fluoride for maximum light transmission. With uncoated lenses, about 45% of the light entering the scope is lost. Proper coating increases the transmission to 86% plusthe maximum that's practical in a hunting scope. EYE RELIEF is the distance from the eveniece end of the scope to your eye. Except for the Front-IER Series which has an eve relief of approximately 6", a minimum eye relief of 2" to 3" is recommended for varied and sometimes awkward shooting positions and also to prevent a heavy recoil shot slamming the scope back to your forehead. Because of the extended Eve Relief of the Front-IER you are able to see around and through the tube, allowing for faster sighting.

EXIT PUPIL is the bundle of light rays passing through your scope into your eye in normal shooting position. You can check its size and make comparisons between scopes by holding the scope at arm's length and noting the size of the pencil of light which comes through the eyepiece. The size (in mm) of the exit pupil in most scopes is approximately the clear diameter of the objective (in mm) divided by the scope's true power. It is important to have an exit pupil LARGER than the approximate 5 mm pupil diameter of the human eye at dawn or dusk light, for you would otherwise get the maximum benefit of your scope ONLY if your eye were EXACTLY aligned on the scope's axis, a rare eye position in normal field shooting.

FIELD OF VIEW is the diameter of the picture you see through a scope, usually expressed as "feet at 100 yards". Generally, the higher the power, the smaller the field. While a wide field may help

12

locate moving game, there are practical limits. The widest fields are most frequently achieved at the expense of other desirable characteristics, including eye-relief and clarity to the edge of the field.



RETICLE AND PARALLAX: The reticle may be located at the image plane of either the objective or the eyepiece. A reticle can be mounted in

When target is viewed from distance, (usually 100 yards), for which scope is set to be free from parallax, the pupil of the eye may be placed anywhere in the eyepiece and without parallax.



At distance other than that set for freedom from parallax, a negligible amount of parallax exists. Example: If eye pupil is moved to left side of eyepiece, target will seem to shift also.



As in illustration at right, if eye is moved to right side of eyepiece, target image will appear to have moved right. Adjustment of scope will move impact point slightly right.

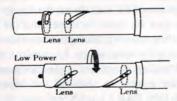


space (such as a crosshair stretched across a reticle mount) which does not reduce light transmission; or it may be on a coated glass plate, adding 2 more air-glass surfaces which reduces light transmission by about 3%. PARALLAX is a condition wherein the reticle center does not lie exactly on the image plane. Parallax can be seen by observing the reticle center while moving the eye from side to side behind a stationary scope focused on a small object. Parallax is present if the eye movement causes the reticle to shift off the object. See NOTES ON PARALLAX on page 7.

RETICLE ADJUSTMENT & CENTERING: As in a shock-proof watch mechanism, very accurate and rugged windage and elevation adjustment mechanism can be housed inside a scope. Extremely precise tolerances are necessary to assure bullet impact change exactly as you want and only as you want when making adjustments. For a reticle to appear constantly centered in an internally adjustable scope, it must either move with the erector tube or be located at the theoretical pivot point of such erector tube movement. To determine whether a reticle will always appear centered, adjust either the windage or elevation to the extreme—then look at it.

variable scope power change is accomplished by axial movement of the erector lenses to increase or decrease magnification of the image they "look at" on the objective image plane. Such erector movement must be precise for keeping the "target" constantly in clear focus. This axial movement is within the same erector tube which also moves pivotally for windage and elevation adjustments, but the axial movement is usually transmitted from an external power selection ring.

As power selector ring is turned...lenses move closer together or further apart changing their relationships and enlarging or reducing sight picture.



VARIABLE SCOPE RETICLE MAGNIFICATION: Most variable manufacturers put the reticle on the objective focal plane, which produces magnification of the reticle along with the "target" image, because the magnifying erector movement is behind the reticle. A Redfield reticle in the eyepiece image plane stays the same while the image magnifies, causing the reticle to cover less target as power increases.

VARIABLE SCOPE RETICLE CENTERING: In a variable without centered reticle, a small "off-center" may not be noticeable at low power. But as power is increased and field narrows, a disconcerting illusion occurs—the reticle seems to move farther off center. A centered reticle eliminates this difficulty.

USING THE ACCU-RANGE VARIABLE: The Accu-Range Variable Scope is an exclusive Redfield development, designed to take the guesswork out of your medium and long range shots. Accu-Range is based on the known fact that the average deer-size animal measures approximately 18" from shoulder to brisket. Simply fit that 18" vital zone between the horizontal reference lines at the top of the sight picture by turning Power Selector Ring. The bottom figure visible on the scale is your yardage!



The entire Accu-Range operation takes only split seconds. As an optional "speeding up" feature, a detachable turning knob is supplied

with each Variable: Simply remove filler plug and screw in knob.

To take greatest possible advantage of Accu-Range, we suggest you set up a ballistic chart showing drop at various ranges for your own particular cartridge and load preference and keep it handy (perhaps taped on stock of your rifle).

Through practice and familiarization, the Accu-Range will serve you under a variety of shooting conditions.

Accu-Range does not affect a hunter's ability to shoot fast when necessary, for the regular non-magnifying, centered reticle is always ready for instant use.

ANTI-FOGGING is inherent in every good scope. It requires the following: sealing of lenses, sealing of all metal joints, neoprene O-rings and gaskets, and assembly under hospital-clean, controlled atmospheric conditions, with super dry air filling as a further precaution. Now, as an added safety feature, Redfield equips all 1" tube scopes (1963 and later) with a Non-Removable eyepiece.

exterior finishes look somewhat similar on all new scopes in a store, but your scope will be exposed to some rough field conditions. The Tuf-Coat® finish on all Redfield Scopes with 1" tube is virtually unscratchable—will keep your scope attractive throughout its life.



REDFIELD GUN SIGHT COMPANY

1315 So. Clarkson • Denver, Colo. 80210



Congratulations

You have fitted your favorite rifle with the finest scope available at any price...



Now...may we suggest that you complement this handsome combination with the famous Redfield Mount that gunsmiths recommend?...See reverse side of this page.