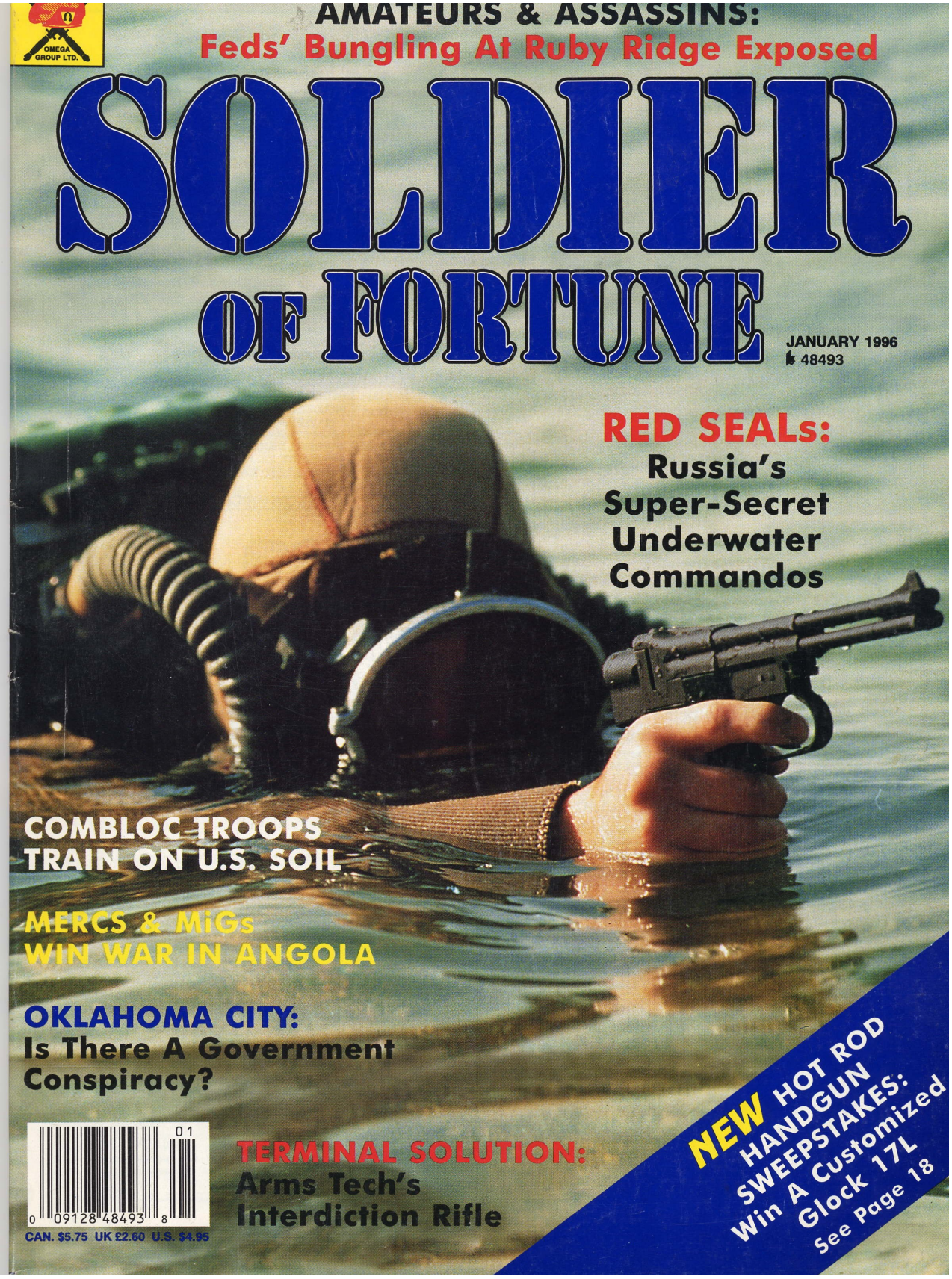
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TERMINAL

The debate between advocates of bolt-action sniper weapon systems and those who prefer highly tuned semiautomatic rifles continues without any end in sight. Turn-bolt enthusiasts insist that semiautomatic systems are just not capable of the accuracy required by the MENS (Mission Essential Need Statement) for extremely long-range shooting. Semiauto buffs maintain that they can come close to or match the accuracy of any bolt-action rifle and that on the battlefield rapid follow-up shots are required more often than not. In the United States, a semiautomatic sniping system almost always involves some version or another of the M14.

Heavy, match-grade barrels are installed completely free floating in a McMillan stock. Harris Model L Series S bipod is provided. A pivoting, or hinged, base type, it weighs only 14 ounces.

Semiauto sniper enthusiasts have been recently presented with an intriguing alternative to the M14/M21, one that has already sparked considerable interest in the special-operations community but is little known outside this exclusive loop. Arms Tech Ltd. (Dept. SOF, 5133 N. Central Ave., Phoenix, AZ 85012; fax: 602-225-9946) has developed a highly sophisticated sniper weapon system based on a heavily modified FN BAR semiautomatic sporting rifle. The initial offering, directed to the military and law-enforcement markets, is chambered for the .300 Winchester Magnum cartridge, which has recently been the subject of some controversy in military sniping circles. At some point in the future Arms Tech intends to offer what they call the "Super Match Interdiction Rifle" in .308 Winchester (7.62x51mm NATO) and .243 Winchester (a popular 6mm light deer rifle round which is nothing more or less than the .308 Winchester case necked down) as well.

The Super Match Interdiction Rifle weighs 13.25 pounds, empty. Overall length is 47 inches. Heavy, match-grade 416 stainless-steel barrels from three different makers are available: Schneider, Rock 5R and Douglas Airgage Premium. These 26-inch barrels add considerable weight to the system. All have six-groove rifling with a right-hand twist of one turn in 12 inches. They are all installed completely free floating in a McMillan synthetic stock and are threaded at the muzzle to accept a sound suppressor. The cap provided to protect the muzzle threads has a recessed crown and is machined to such close tolerance that the cap-to-barrel interface on *Soldier Of Fortune's* test specimen is almost invisible. Because these stainless-steel barrels are not as hard as the recessed bolt face, the locking lug recesses, integral on the FN factory barrels, have been replaced with a heat-treated, carbon-steel proprietary shank on the barrels used for the Super Match Interdiction Rifle. The stainless-steel barrels are blackened with a

Many believe that on the battlefield rapid follow-up shots are required more often than not. The semiautomatic, gas-operated Super Match Interdiction Rifle provides snipers with that capability.

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Text & Photos by Peter G. Kokalis

SOLUTION

chrome sulfide process by Robar (Dept. SOF, 21438 N. 7th Ave., Suite B, Phoenix, AZ 85027; phone: 602-581-2648, fax: 602-582-0059).

Also heavily modified with proprietary alterations, for which there are patents pending, is the original FN BAR action itself. The extraction system has been improved for increased strength and enhanced reliability. The means by which an operator can remove a loaded round from the chamber, awkward at best on the FN BAR, has been dramatically improved. To enhance cold weather operation, the bolt's retracting handle has been lengthened. The gas system has been significantly improved as well. The bolt is lapped for smoother operation and the trigger mechanism tuned to provide a somewhat lighter pull weight and crisper let-off. The magazine well's catch/release system (integral with a hinged floorplate attached to the steel receiver) was redesigned and is now similar to that of the Kalashnikov. The detachable box magazine holds three rounds, but a staggered-column 10-round magazine has reached prototype status and will go into production series shortly.

Stocked For Success

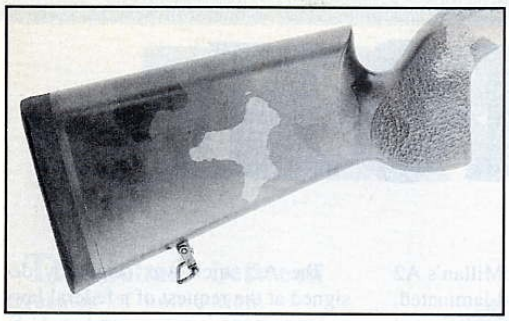
All of this rests in a slightly modified version of the famous McMillan (McMillan Fiberglass Stocks, Dept. SOF, 21421 N. 14th Ave., Suite B, Phoenix, AZ 85027; phone: 602-582-9635, fax: 602-581-3825) A2 stock. McMillan deepened the stock's belly to conform with the BAR receiver and reconfigured the tang area to match the BAR's receiver tang.

The outer shell of McMillan's A2 stock is made by a hand-laminated, pressure-cured process. It is laminated from about 130 pieces of 8-ounce fiberglass cloth, giving a finished shell-wall thickness of six to 12 layers. The thickness is greater in high-stress areas on the stock and less in other areas to reduce the overall weight. The interior is filled with different fiberglass compounds consisting of engineering-grade epoxy resins, chopped fiberglass strands, micro-balloons and other materials. No polyesters or phenolics (both less expensive than epoxy resins) are used. There are no hollow spaces. All of McMillan's tactical stocks are filled solid. Inletting for the barreled action is done on CNC machinery to tolerances approximating a 0.001-inch. This yields a completed stock that is stable in environmental conditions ranging from -60 degrees F to 240 degrees F and is totally water impervious. The rifle actions are bedded into the stock with a powdered metal-filled epoxy compound.

The A2 stock was originally designed at the request of a federal law-enforcement agency and a U.S. military organization. It represents a high point in the application of human engineering to stock design. Both the width of the forearm and the angle of the pistol grip (8-9 degrees off vertical) were determined by using experienced shooters pretending to hold a rifle in the prone position. Finishes available include black, gray and desert, woodland and urban camouflage patterns. The stock is equipped with QD-type sling swivels. This is the tactical rifle stock against which all pretenders must be measured. A Pachmayr Decelerator butt pad has been added to help counter the .300 Winchester Magnum's usually stout recoil.

Whenever possible, a sniper rifle should be fired from a bipod (although this is contrary to Marine Corps doctrine) behind cover and concealment. The Super Match Interdiction Rifle turned over to us for test and evaluation was equipped with a Harris (Har-

Super Match Interdiction Rifle provides accuracy potential that compares favorably with the best bolt-action sniper weapon systems and surprisingly mild perceived recoil for a caliber .300 Winchester Magnum rifle.



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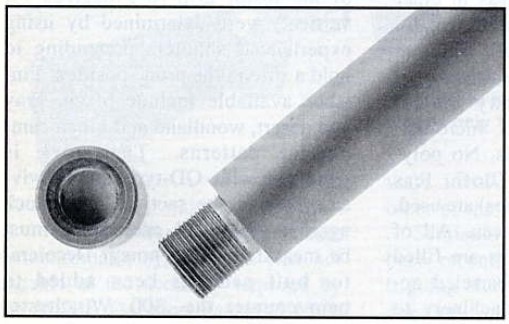


Super Match Interdiction Rifle barrels are threaded at the muzzle to accept a sound suppressor. The cap provided to protect the muzzle threads has a recessed crown.

ris Engineering Inc., Dept. SOF, P.O. Box 33, Barlow, KY 42024; phone: 502-334-3633, fax: 502-334-3000) Model L Series S bipod, which weighs 14 ounces. This is the pivoting, or hinged, base model.

The pivoting base provides the shooter with the ability to level the reticle pattern when firing from uneven terrain. The base can be rotated approximately 20 degrees in either direction. The legs, constructed from aluminum tubing, have a friction lock which permits adjustment of the command height (the distance from the bore's axis to the ground) from 9 to 13 inches. The Harris bipod is not an object of great beauty, but it works, is reasonably priced and provides a firm shooting platform.

One of the Super Match Interdiction Rifle's unique features is the Arms Tech Ltd. Omega scope mount. This two-piece, scope-to-rifle interface is made of aircraft aluminum (except for special applications, such as those involving the .50 cal. BMG round, when it is fabricated from steel). The upper portion of the mount dovetails longitudinally with the bottom section, which is attached to the receiver. The machining tolerance between the two surfaces is two-tenths of one thousandths of an inch. This permits the optical sights to be repeatedly removed and reinstalled without loss of zero. There is a single quick-release throw lever that locks the two sections in place. A notch on the throw lever engages a locking stud on the underside of the mount's lower section. The four scope rings are integral with the top portion of the mount to increase strength and stability. Numbers on the left side of the mount from -16 to +16 are in 1/8-inch increments and are used to predetermine the eye relief desired by the operator, who can instantly change between day and night optical devices. The Omega scope mount is also available for attachment to the Knight's Armament SR25 sniper rifle, M16A3 flat top and Remington 700 bolt-action. The upper section can be obtained to mate with the Leupold Mark 4 series scope, Litton's Ranger night vision scope and with a more generic Weaver-type base.

Magnum Size Controversy

Introduced in 1963 for their Model 70 bolt-action rifle, the .300 Winchester Magnum cartridge is at its best on the game fields against heavy animals, such as eland, kudu or gemsbuck, where heavy bullets are required at long ranges. In recent years it has been proposed as a countersniper round and a great deal of experimentation was conducted by certain special operations groups. Controversy has centered around the fact that no full metal jacket .30 caliber bullet is as yet available in the 190- to 220-grain weight category desired by long-range snipers. Sierra's 190-, 200- and 220-grain Matchking BTHP bullets can provide superb accuracy, but they are hollow points. Even though they were not designed to expand, there still remain proscrip-

Match Interdiction Rifle Specifications

Caliber:	.300 Winchester Magnum (also 7.62x51mm NATO and .243 Winchester).
Operation:	Gas operated. Locked breech with rotary bolt. Fires from the closed-bolt position.
Feed:	3- or 10-round, staggered-column, detachable box-type magazines.
Weight, empty:	13.25 pounds.
Length, overall:	47 inches.
Barrel length:	26 inches.
Barrel:	Heavy, match-grade blackened 416 stainless steel manufactured by Schneider, Rock or Douglas Airgage Premium. Six-groove with a right-hand twist of one turn in 12 inches. Muzzle cap with recessed crown to protect sound suppressor threads.
Sights:	Leupold Mark 4 M3-10X scope and Arms Tech Omega quick-release mount. All of the Leupold Mark 4 series and Litton's Ranger night-vision scopes also available.
Finish:	Robar's chrome sulfide stainless-steel blackening process.
Furniture:	Modified version of McMillan A2 synthetic stock.
Manufacturer:	Arms Tech Ltd., Dept. SOF, 5133 N. Central Avenue, Phoenix, AZ 85012; fax: 602-225-9946.
T&E summary:	Accuracy potential compares favorably with the best bolt-action sniper weapon systems. Surprisingly mild perceived recoil. Superb McMillan tactical stock. Leupold Mark 4 series scopes outperform all others. Deep cryogenic stress relief significantly extends barrel life.

tions against their use by the military. Others have complained that the perceived recoil generated by this round is beyond the tolerance of most soldiers and law-enforcement personnel when firing over extended periods of time. Most importantly, a number of sniping authorities, including retired USMC Lieutenant Colonel Norm Chandler of Iron Brigade Armory, have been outspoken in criticizing the barrel life obtained with this cartridge. Chandler and others maintain that the .300 Winchester Magnum is significantly overbore and that this results in a barrel life of only 1,000 to 1,200 rounds. This is in comparison to the 7.62x51mm NATO cartridge which commonly has a barrel life of 5,000 rounds and more.

However, this latter objection may soon prove to be a moot point at best, as a consequence of a process called deep cryogenic stress relief, which until recently was known only to precision high-power shooters. The accuracy potential of a rifle barrel is dependent, along with other factors, upon the concept of residual stress. These stresses are present in any piece of cast or forged steel and more are introduced when a barrel is machined, bored, formed and heat treated. As these stresses are uneven, when a barrel is heated or cooled it will warp off the bore's axis. This phenomenon, called "warping an arc" can significantly increase the group dispersion down range.

Relief of these stresses can take place if the barrel is brought to an equal

Continued on page 66

The Sniper's Optic

In the United States the Leupold (Leupold & Stevens, Dept. SOF, P.O. Box 688, Beaverton, OR 97075; phone: 503-646-9171, fax: 503-526-1475) Mark 4 series reigns supreme with police agencies and within the special-operations community. Justifiably so, as this is the flagship in Leupold's product line and represents the highest possible quality in a production-series optical sight.

All Mark 4 scopes feature 30mm diameter main tubes that are machined from a solid piece of 6061-T aircraft aluminum. A 30mm tube with one-eighth-inch wall thickness still has almost 30% more cross-sectional area inside the tube than most 1-inch tubes with their thinner walls. Once this additional area is available, the erector tube inside the scope body (which carries all lenses except the ocular and objective lenses) and its lenses can be increased in size to transmit more light and thus yield greater resolution and a brighter image. Furthermore, this heavy 30mm housing is more shock-resistant than any 1-inch tube.

All lenses are coated on all internal and external surfaces with Multicoat 4, Leupold's exclusive multicoating process. This, in addition to a computer-designed optical system, results in edge-to-edge sharpness, precise resolution, minimal distortion and optimum low-light visibility. All Mark 4 scopes are tested for water resistance in a reduced-pressure, hot-water immersion tank before leaving the factory and are completely waterproof.

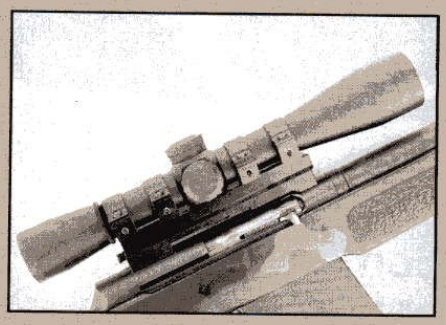
The Super Match Interdiction Rifle *SOF* tested was equipped with a Leupold Mark 4 M3-10X scope. This fixed 10-power scope had a 3/4-minute Mil Dot reticle pattern (Duplex and Target Dot reticle patterns are also available in the Mark 4 series).

Mil-dots were developed by the USMC in the late 1970s to assist Marine Corps snipers in estimating distances. It is now the standard reticle pattern with all branches of the U.S. armed forces. The term "mil-dot" comes from "mil" — a unit of angular measurement used in artillery and machine gunnery and equal to 1/6400 of a complete revolution — and the fact that the dots are spaced in 1-mil increments on the crosshairs. It should be made clear that the dots themselves are not measured in mil increments, but rather in increments of MOA. Premier Reticles (who make these reticles for Leupold & Stevens) uses wire (or "mechanical") crosshairs onto which the dots are applied wet. Because of this, the dots cannot be made circular and are thus oval-shaped (with the long axis oriented in the vertical position on the vertical crosshair and in the horizontal position on the horizontal crosshair). In this particular instance, the dots are actually a 1/4 mil in length (slightly longer than 3/4 MOA). In any event, the distance between the dots is 3/4 mil and the center-to-center distance between them is exactly 1 mil as is the distance from the top (or bottom) of one dot to the top (or bottom) of the dot above or below (or to the right or left). There are also four thick posts at the edges of the field of view.

The formula for using the mil-dot system:

$$\frac{\text{Height or width of target (in yards)} \times 1{,}000}{\text{Height or width of target (in mils)}} = \text{Distance (in yards)}$$

The Mark 4 M3-10X scope has an elevation adjustment system that is used as a BDC (Bullet Drop Compensator). The dial is calibrated for bullet drop increments from 100 to 1,000 meters in 100-meter increments, all in less than one complete revolution of the adjustment knob. Elevation adjustment resolution is in one-minute clicks on the Mark 4 M3-10X scope and in 1/4-minute clicks on the Mark 4 M1 scopes.



Leupold Mark 4 M3-10X scope attached to Super Match Interdiction Rifle by means of the sophisticated Arms Tech Ltd. Omega mount, which is machined to extremely close tolerances to permit repeated removal and reinstallation of optical sights without loss of zero.

BDC dials are provided with the Mark 4 M3-10X scope for the following bullets: Federal 308M with 168-grain Sierra BTHP; 7.62x51mm NATO M118 Match with 173-grain FMJ; 220-grain .300 Winchester Magnum; 180-grain .30-06; and 55-grain 5.56x45mm. The scope is also provided with a sunshade and Butler Creek flip-up lens covers.

Windage adjustments have 1/2-minute clicks. This adjustment dial can be reset to zero once the scope is sighted in on the rifle. There is a third adjustment knob on the left side of the Mark 4 series scopes. This is for eliminating parallax, and these scopes can

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TERMINAL SOLUTION

Continued from page 47

temperature — both surface and core — and then cycled through a wide range of temperatures. If the rate of temperature change is maintained at a slow enough pace, thermal compression and expansion occur evenly from the core to the surface and internal stresses are released, resulting in a homogeneously stabilized barrel. The process by which this is accomplished takes more than several days as the barrel is taken by precise computer control to -310 degrees F, held for up to 60 hours, then raised to 310 degrees F and slowly brought back to room temperature. Due to recent technical developments, the deep cryogenic tempering process is now relatively inexpensive (about $50 per barrel). Furthermore, modern computer control has brought the process to a consistency not possible in the past.

Barrels subjected to this process develop a more uniform, refined micro structure with far greater density as a consequence of carbide fillers precipitated during the process. These carbides fill interstices in the steel, leaving a much denser, more coherent structure with far greater wear resistance. Thus, in addition to increasing accuracy, deep cryogenic stress relief can provide barrels with an exceptional increase in durability, with barrel life extended by as much as 300%. All Super Match Interdiction Rifles feature barrels that have been subjected to deep cryogenic stress relief.

It obviously makes a difference as this semiautomatic system is capable of superb accuracy. While Arms Tech insists the rifle will shoot anywhere from 0.25 MOA to 0.75 MOA, the best group fired during *SOF*'s test and evaluation was 0.7 MOA and these were reloads assembled with Federal brass, IMR 4350 propellant and Finnish Lapua 190-grain BTHP bullets. Few bolt-action systems will provide better performance than this, especially with heat risers bouncing off the floor of the lower Sonoran desert in the middle of the summer.

Most surprising was the low perceived recoil generated by the Super Match Interdiction Rifle. It was not much more than that of 7.62x51mm

NATO sniper systems in the same weight class. Surely the McMillan stock and Pachmayr Decelerator butt pad are partially responsible for the diminished recoil. However, I believe that the rifle's gas system bleeds off excess gases that would otherwise magnify the recoil impulse. In any event, this is one .300 Winchester Magnum rifle that's a pleasure to shoot.

Much of our shooting and all of the velocity tests were conducted with Hornady factory ammunition loaded with a 190-grain Boat Tail Spire Point Interlock bullet (catalog #8220). Its average velocity was about 2,860 fps. No matter what some self-styled experts may say, this is not too slow for long-range work. Instrumentation for the velocity tests consisted of the excellent PACT (Practical Applied Computer Technologies Inc., P.O. Box 531525, Grand Prairie, TX 75053; phone: 800-722-8462) MkIV Championship Timer with its built-in chronographic mode, together with PACT Mk5 Professional Skyscreens. All shots were fired at a distance of 10 feet from the start screen and the ambient temperature at the time of *SOF*'s test and evaluation was 93 degrees F.

Special-operations units have already field-tested the Super Match Interdiction Rifle in combat environments and reportedly are pleased with its performance. Those concerned about accurately engaging rapidly moving, multiple targets at distances out to 1,000 meters will find that the Arms Tech Ltd. system meets these specifications and then some.

Method Of Operation

The Super Match Interdiction Rifle is gas-operated, locked-breech and fires from the closed-bolt position. It operates in exactly the same manner as the FN BAR sporting rifle of which it is a heavily modified version. After the bullet passes a gas port in the barrel, 9.25 inches from the chamber, expanding propellant gases move through the port into the gas cylinder where they impinge on the piston to unlock the action. The piston travels 0.59 inches and pushes the bolt carrier against the recoil spring by means of two side bars. When in battery, the multiple-lug rotary bolt is locked into recesses at the rear of the barrel.

To lock or unlock, the bolt must be rotated about 60 degrees, in this instance a longitudinal distance of 0.59 inches, the exact distance the bolt travels rearward. The bolt carrier continues rearward with enough momentum to extract and eject the empty case.

During the counter-recoil stroke, the bolt group strips the top round out of the magazine and chambers it as the bolt rotates into battery. Gas flow is regulated by a cap at the front end of the gas cylinder. Excess gas pressure is bled off between the forearm and the barrel. There is a hold-open mechanism that keeps the bolt group to the rear after the last shot has been fired.

The trigger housing contains the trigger, sear, disconnector, hammer and the accompanying springs. Unique to this rifle is the use of two hammer springs. When the trigger is pulled, the disconnector pushes the sear forward to drop the hammer on the spring-loaded firing pin. The hammer is recocked by the bolt group during the system's recoil stroke. At that time the disconnector is also disengaged from its bent on the sear.

There is a crossbolt-type safety at the rear of the trigger guard. Pushing the crossbolt to the right blocks the trigger. Pressing it to the left exposes a red ring and permits the rifle to be fired.

— P.G.K.

THE SNIPER'S OPTIC

Continued from page 47

be set parallax-free at any distance from 15 meters to infinity when the shooter is in the firing position. It has limiting stops with the two extreme positions symbolized by the infinity mark and the largest of a series of dots. Parallax occurs when the primary image of an objective lens does not coincide with the reticle.

The ocular can be focused by backing the eyepiece away from the lockring and then screwing it in or out until the reticle pattern is sharp and crisp. The M3 comes with screw-on caps for its three adjustment knobs, which have a lower profile than the large, over-sized so-called "ergonomic" knobs of the Mark 4 M1 (both fixed 10X or 16X magnifications are available) scopes. Optimum eye relief of the Mark 4 M3-10X is 3.4 inches. At 100 yards the field of view is 11 feet.

— P.G.K.

YOU BUY, I'LL FLY

Continued from page 35

Van Rooyen, a big, robust man, was in great pain but never uttered a sound throughout the attack and extraction. He was air-lifted back to South Africa within a few hours of being brought back to Saurimo. His leg was saved.

It is a primary, EO policy that the organization maintain a first-rate, casualty-evacuation program. Aircraft are on round-the-clock standby for this purpose in Angola and Sierra Leone.

Combat SAR

One of the most dramatic events of the last stage of the war was the shoot-down — probably by an SA-14 — in July 1994, of PC-7 pilot Lourens Bosch.

After the SAM found its mark, Bosch crash-landed his PC-7 in thick jungle, wrecking the small aircraft. He managed to navigate himself and his back-seater, an observer, through the bush back to the road, then me-