

THE MAGAZINE FOR FULL AUTO ENTHUSIASTS • Vol. 8 No. 8 • January 1995 • \$5 U.S. \$6 Can.

Machine Gun News

Focus On:

The M42 “Gustav” 20mm

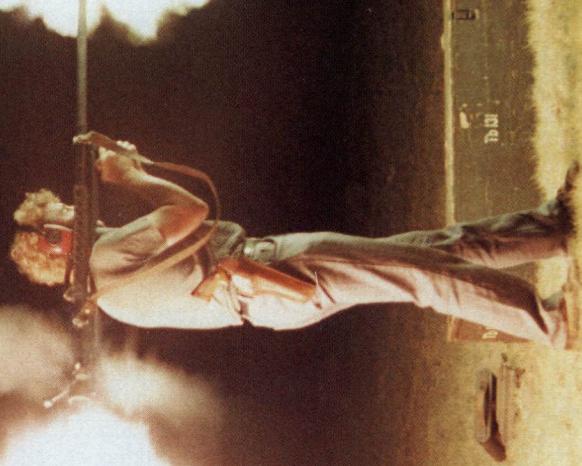
Recoilless Rifle

■ **Swiss Silencer Technology**

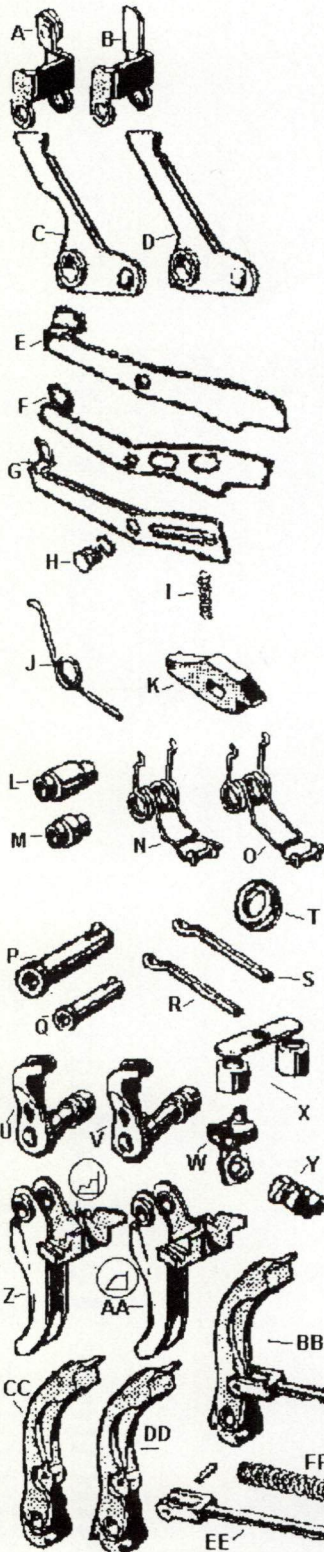
■ **Accurizing the Ruger 10/22**

■ **SACO Defense’s M60E4**

■ **Home Parkerizing**



LMO PARTS



ASSORTED NEAT PARTS

1918 BAR leather vehicle case. Pre-WWII, I've only seen this one!..... \$ 375.
 STEN MKII parts set..... \$ 125.
 Madsen M-50 parts set..... \$ 195.
 1918/A2 BAR stock-this is a rare one-English Para troopers skeletonized buttstock.
 Only one..... \$ 350.
 German WWII 82mm mortar bipod assbly, have 1..... \$ 225.
 U.S 81mm bipod assbly-for the M-29, finned bbl..... \$ 275.
 Mortar sights 60mm, new..... \$ 95.
 Soviet RPG-18 (their LAW tube) inert, real neat..... \$ 295.
 German Armbrust, (their LAW style launcher, one..... \$ 375.
 Yugo M-57 Like RPG, inrt..... \$ 375.

HK NEEDS

A. Roller Catch..... \$ 28.
 B. Friction Catch..... 25.
 C. Roller Trip..... 18.
 D. Friction Trip..... 22.
 E. G-3/91 Ejector..... 25.
 F. 33/93 Ejector..... 35.
 G. MP5/94 Ejector..... 45.
 H. Ejector Axle..... 8.
 I. Ejector Spring..... 5.
 J. Trigger Spring..... 7.
 K. Primary Sear..... 15.
 L. Distance Sleeve-MG..... 8.
 M. Distance Sleeve-SA..... 12.
 N. Elbow Spring-SA..... 8.
 O. Elbow Spring-MG..... 6.
 P. Butt/forestock pin..... 8.
 Q. Trigger group pin..... 6.
 R. MP5/94 Ejector Spring..... 8.
 S. G3/91/33/93 Ejector Spring..... 5.
 T. Nylon Guide Ring..... 4.
 U. Selector, Mtl Housing..... 28.
 V. Selector, Plstc Hsng..... 45.
 W. Flapper mag Release..... 38.
 X. Locking Roller SET..... 22.
 Y. Extractor..... 28.
 Z. Trigger-MG..... 45.
 AA. Trigger-SA..... 22.
 BB. MH Hammer w/Shank..... 55.
 CC. Hammer, Semi-auto..... 15.
 DD. Hammer, MG..... 45.
 EE. Pressure Shank..... 18.
 FF. Pressure Shank Spring..... 9.

BARRELS:



BREN BARRELS: .303, exc. to new

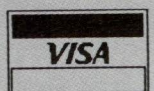
MK I's are exc..... \$ 125.
 new..... \$ 175.
 MK II's are exc..... \$ 115.
 new..... \$ 155.
 AM-180 bbl..22 full length..... \$ 165.
 Steyr AUG 20" (green)..... \$ 395.
 Steyr AUG 24" Hbbl w/bipod..... \$ 895.
 M-60 E-3, Military, exc..... \$ 475.
 M-60 E-3 RIA set-up, new..... \$ 450.
 Beretta PM12S/12 9mm bbl..... \$ 195.
 Hotchkiss Universal 9mm..... \$ 50.
 9mm blanks, 5-9", per inch..... \$ 1.
 MG/08-15, 8mm..... \$ 75.
 1919A4 .30-06, new in wrap..... \$ 85.
 M-60, standard, used, bipod..... \$ 195.

MAGAZINES—ALL IN STOCK AT LMO:

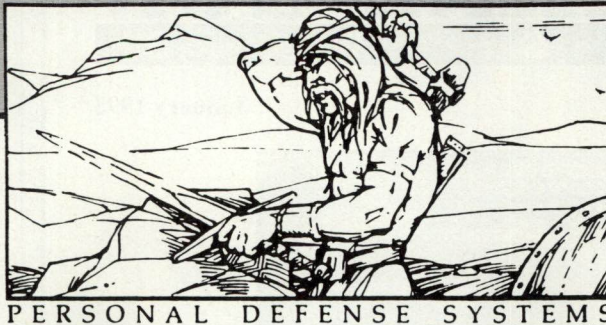
Magazine	Quantity	Price Ea.
MP-28-II 20-rd, nice	2	\$ 45.
MP-5 30-rd straight	3	45.
AR-7 15-rd .22 cal.	2	45.
Lewis 47-rd pan. used	1	75.
Colt 9mm 32-rd, exc.	2	65.
MK760 9mm, new	2	65.
Port Said, 9mm	2	65.
Madsen M-50, 9mm, new	5	55.
Madsen LMG 7mm	1	80.
Beretta 12S, 32-rd	3	85.
Beretta AR-70 30-rd	5	195.
Walter MPL, 30-rd	2	65.
Steyr AUG, 30-rd	8	65.
Steyr AUG, 42-rd	8	85.
Thompson 30-rd	10	22.
Thompson 50-rd drum, AO	2	175.
Galil, .223, 50-rd	5	125.
AK .223, 30-rd	2	35.
Johnson 1941, .30-06	3	45.
Chauchat 8mmL	6	18.
Reising 50, 20-rd	3	65.
Czech VZ-52LMG 30-rd	1	75.
Neuhausen 50-rd 9mm	8	22.
MAC-10, .45 cal., new	22	45.
M-11 9mm Zytel 32-rd	18	35.
Bren .303, 12/case	3cs	145.
Uzi 32-rd, original	11	45.
Uzi .45 cal.	1	65.
Steyr MPi-81, 32-rd	2	45.
M-16 .22 kit, Ciener, 30	2	65.
Hotchkiss Universal	25	25.
AR-15/M16, U.S. used 30	15	15.
AR-15/M16, U.S. used 30	10	15.
M3 Greasegun mags, new in the wrap 30-rd .45 cal.,		25.
	5 @	22.
	10 @	20.
	30 @	18.
	50 @	15.
	100 left	\$1200/all



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Brokered Weapons for Sale:

MG027. Bushmaster Pistol .223
MG057. PAWS ZX-5 like new reg. rec.
MG058. Owen MK 1/42 Pre-86 DS
MG060. 1914 BSA Lewis good shooter
MG062. American Arms AR-180 M2
MG064. Soviet PPSH41 w/orig. drum
MG581. MP-42 WWII German DeWatt
MG066. M2 Pistol U.S. Carbine mint
MG067. M78 Valmet like new qualified
MG069. Beretta 38/42 reparked
MG071. FN Model D real nice Pre-86 DS
MG072. Johnson 1941 exc. .30-06
MG073. Savage .30-06 Model 1918 Pre-86
MG084. S&H Arms Ingram 6 in 9mm
MG089. Mauser 1932 Schnellfeuer Pre-86
MG091. Celco 7.62 AK47 org. Chinese
MG582. WWII Jap 99 DeWatt 99% finish
MG583. 1921 Colt 45 DeWatt
MG107. S&W Model 76 like new
MG111. M60 Post-86 Rock ls.
MG584. WWII German MG42 DeWatt
MG123. RPB Mfg. 9mm MAC 10 NIB
MG126. RPB Mfg. M11 in .380 cal. NIB
MG173. H&R M16A1 reweld U.S. markings
MG203. Micro UZI bolt gun like new
MG209. Belgium FN-30 is a C&R gun
MG588. Ramo 1919A4 w/accessories
MG589. Reising Model 50, real good
MG243. FN FAL .308 vg Pre-86 DS
MG244. FN .308 G1 NIB Pre-86 DS
MG251. I.O.G. 9mm MP-2 mint condition

MG252. Interarms Pre-86 DS 9mm UZI
MG258. Sendra XM15E2 heavy barrel
MG265. Thompson M1 Mint piece
MG277. Armalite AR-180, exc. reg. rec.
MG278. Valmet M78 exc.+ w/bipod
MG594. Ruger AC556 vg. to exc. cond.
MG303. S&W 76 W/MK bbl. & grips
MG315. H&R M50 Reising 85% condition
MG322. Colt 1919A4 95% Prototype
MG430. Steyr MPI-81 exc. Post-86

RECENT ARRIVALS: Striker—Streetsweeper —USAS-12

MG457. Colt AR-15 reg. rec. as New
MG460. HK33E in .223 Pre-86 DS
MG462. Finland Suomi exc. refinished
MG476. S&H Mfg. FN-C w/Balylock spr.
MG475. Nessa Browning 1918A2, Pre-86
MG474. Catco 1919A6, only 1000-rds.
MG490. SWD M11A1 in 380 reg. rec. NIB
MG637. Beretta AR-70 reg. rec. mint
MG650. HK33A3 Pre-86 DS exc. cond.
MG654. UZI Pre-86 DS vg. cond.
MG656. S&H Arms MP5A3 like new
MG657. M3 grease gun Post-86
MG658. Colt M16A1 exc. w/extras
MG659. MAC 10 RPB orig. PS. frame
MG660. HK21 done by Vollmer reg. rec.
MG661. Swedish K Pre-86 DS mint
MG600. HK51 by Vollmer NIB
MG520. FNC reg. rec. NIB

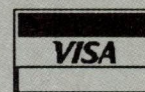
MG522. FNC Paratrooper folder
MG534. HK MP5A3 reg. rec. NIB
MG541. HK53k NIB reg. Sear
MG549. HKG3 Good Cond. reg. rec.
MG602. HK33 w/ folding or full stk.
MG605. MP5K SD by Fleming vg. cond.
MG606. HKG3 reg. rec. exc.+
MG610. Qualified Steyr Aug 20" green
MG613. AOW Hurley M1A1 exc. cond.
MG616. IMI 9mm UZI Pre-86 DS
MG622. Walther MPL vg+ Pre-86
MG619. MP5A3 new sear gun w/extras
MG551. FN Fal .308 NIB reg. rec.
MG555. Galil ARM 372 Good reg. rec.
MG561. MPI-69 Pre-86 DS good
MG601. HKG3 reg. rec. full stk.
MG579. Colt Thompson 1921/28 95%
MG580. H&R Pistol 12 ga. New RR 9" bbl.
SBS09. Cruso W 12 ga. by Charlie Erb
MG602. HK33 w/folding or full stk.
MG606. HKG3 reg. rec. exc.+
MG610. Qualified Steyr Aug 20" green
MG613. AOW Hurley M1A1 exc. cond
MG622. Walther MPL vg+ Pre-86
MG619. MP5A3 New Sear gun w/extras
MG627. DLO 1919A4, only 2000-rds. fired
MG629. Cobray M11 NIB
MG630. AR-15/M16 reg. Colt Upper (HTA)
MG631. Thompson 1921, neat shape
MG632. UZI 9mm, Group Inds. NIB
MG633. Madsen M50 transferable

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All weapons preinspected before final transfer from L.M.O.

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MACHINE GUN NEWS

THE MAGAZINE FOR FULL-AUTO ENTHUSIASTS

Volume 8 Number 8

January 1995



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On the Cover: Robert fires his M42 recoilless rifle during a night shoot. Photo by Carl Silver

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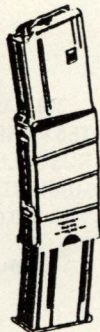
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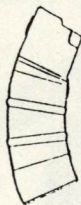
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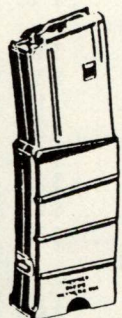
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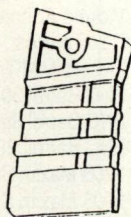
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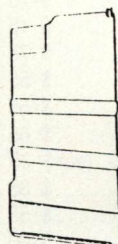
AR-15
STD. 30 RND



AR-15
STD. 20 RND



H&K-91/G3
STD. 20 RND



M-14
STD. 20 RND

AR-180 AVAIL (STD. 30/RND)
FN-FAL AVAIL (STD. 20/RND)
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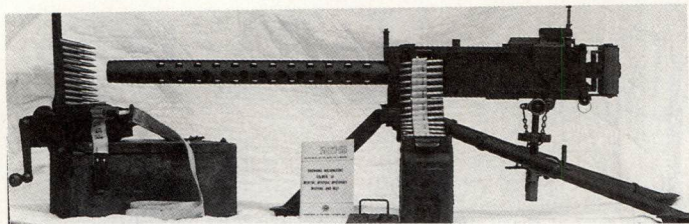
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M3A1	\$ 185
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MAT 49	\$ 200
MAS 38	\$ 200
Italian WWII Breda Model 30 6.5	\$ 550
Beretta Model 38/44	\$ 135
MAG 58	\$4500
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Madsen Model 46, 30-06	\$ 225
FND BAR .308	\$ 625
1928A1 Thompson U.S., G.I.	\$ 450
1928A1 Thompson w/Finned Barrel & Lyman sight U.S., G.I.	\$ 575
1928A1 Bolt Compl. U.S., G.I., N.O.S.	\$ 150
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PPSh41 w/stick mags	\$ 285
MG3 .308 Rheinmetall complete	\$1500
ZK383 excellent cond.	\$ 250
Swedish K	\$ 250
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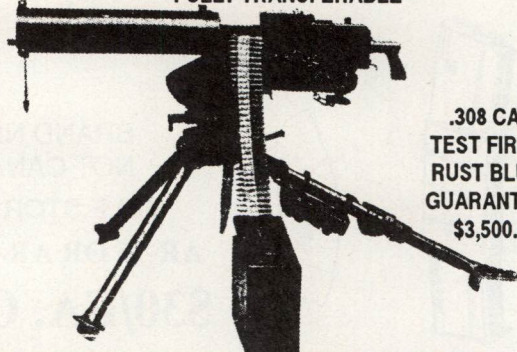
U.S. 60mm inert
HE mortar round
Comp. w/fins
Exc. Cond.
\$12.50 + shipping



Magazines

MPK-L 40 Rd. Mag	\$ 50
ERMA EMP 30 rd.	\$ 35
MAC-10 9mm 40 rd. Steel Mag	\$ 50
M-3 US .45 cal.	\$ 12
1918A2 BAR New in Wrap	\$ 10
Swedish K/Port Said 30 rd.	\$ 55
Madsen 30-06 30 rd. Mag 5-each in original carrying can	\$ 75
FND BAR 30-06	\$ 15
L2A1 30 rd. Unissued Cond	\$ 75
MP41 32 rd. Mint Cond	\$ 55
MP38/40 Flat Side Mag	\$ 55
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PPS43 Mags 30 rd.	(ea) \$ 35
PPSh41 Mags 30 rd.	\$ 35
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B	\$ 30
	10/\$250
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	10/\$500
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MG3 100 rd. Assault Box	\$ 100
MG3 Complete Bolt	\$ 400
MG3/42 .308 barrel	\$ 250
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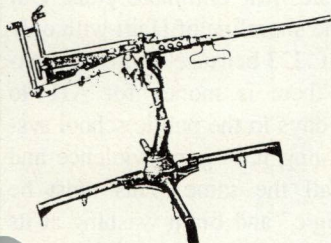
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.308 Chrome-Lined Barrel & Bolt Comp.
Set for Pre-Determined Head Space
.308 Only Feed Tray, New Cond.
.308 Complete Feed Slide Assembly
.308 Hard Chromed Reduced Orifice Booster Cone

U.S.G.I. M63 AA MOUNT

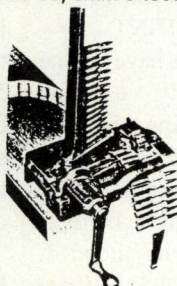
Not cut, in very good cond. Comp.
w/Ammo tray



\$825.00

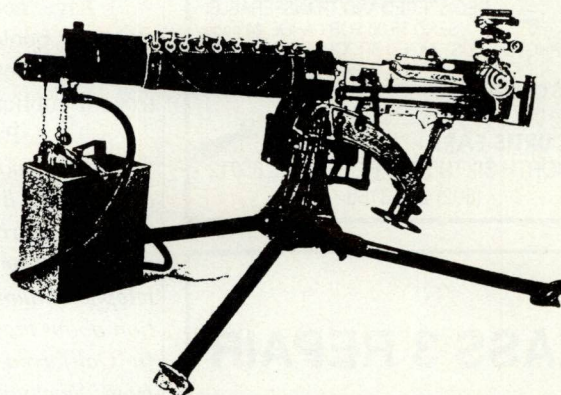
U.S.G.I. MOD. 1918

Belt Loading Machine Modified to use
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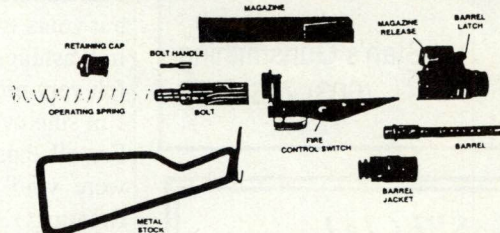
1914 VICKERS WATER COOLED MACHINE GUN



Fully Transferable, Comp. w/Water Can & Hose,
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w/Canvas Cover

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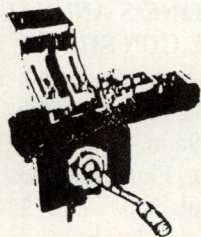
ORIGINAL WWII BRITISH STEN MKII & III PARTS SETS



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**MG34
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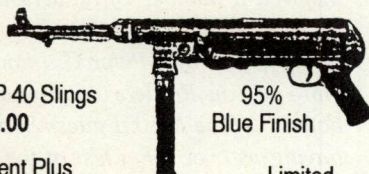
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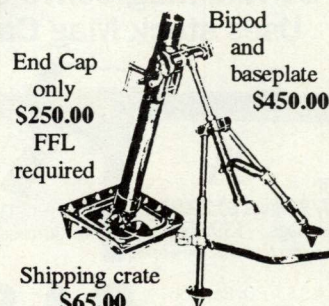
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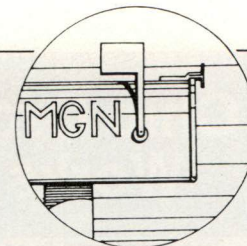
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Incoming



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I have not found MGN at any gun shops or bookstores. I was told that the BATF watches the people who subscribe to your publication.

P.A. California

Editor's note: Unlike other magazines, our mailing list is strictly confidential to protect the privacy of our subscribers. We do not rent or give out names, addresses, telephone numbers, or any other information about the identity of our subscribers. In California, MGN can be purchased from Survival Books, 11106 Magnolia Blvd., North Hollywood, CA 91601.

D.C. DISAPPOINTMENT

First let me say that you have a fine magazine. There are actually very few publications that I enjoy reading anymore, but yours is at the top. Regarding the rally in Washington, D.C. on 14 August 1994, I felt very proud and patriotic to be there as I'm sure everyone else did who attended. For all those who didn't attend, "Where were you!" If not to stand up for our firearms rights, how about our human rights! The rights for our children in the future. While I was happy with the public support that attended, I was very disappointed that so many other firearms owners didn't show. For those that didn't, I hope that your conscience doesn't bother you, too much!

P.F.

"A CONTEST GOT PUPILS THINKING ABOUT THE EVIL OF GUNS."

Recently I was told that the Philadelphia Office of ATF was visiting inner city schools to talk about guns and how evil they were! I thought, no way would our tax money be used to visit schools to alter opinions on gun ownership. Well I went to the library to check it out and here are some highlights from the *Philadelphia Inquirer* dated June 29, 1994, outlining the ATF program. "About 50 Clymer students from the third through fifth grades had submitted posters and essays on violence. The contest was sponsored by the school and the Philadelphia Field Division of the Bureau of Alcohol, Tobacco, and Firearms." "At yesterday's assembly, five poster and five essay finalists received

certificates from the ATF. The two winners in each category toured ATF headquarters in Washington on Monday. During their tour, the four students read their essays and showed their posters to John Magaw, the bureau's director." "Guns have become common. Drugs have become common," said Principal Naomi Booker. "...they should not be in our everyday lives."

So much for the NRA-sponsored EDDIE EAGLE program for children in gun safety...it has been replaced by an ATF program which equates guns with violence. The logic is, if you want to eliminate violence, just eliminate guns. Our troops hit the shoreline of Haiti with only 50 rounds of .223 because of military cut-backs, but there is money for ATF to spend their days in the public school systems explaining how guns, violence and drugs are all the same. This must be "Liberal Logic" and brain washing at its best!!! Welcome to the Clinton Administration.

Bill C.

ST. VALENTINE'S ANNUAL MACHINE GUN SHOOT

There will be a machine gun shoot and gun show held February 10th, 11th, and 12th from 9a.m.-7p.m. in (Levy County) Williston, Florida. Prizes! 200 tables available at \$50 each. 24-hour armed security. Firing line spots are free of charge. \$6.00 per day entry fee. Children under 12 get in free. R.V. parking available but no hookups. Ear protection required. Take U.S. 27 to Williston and follow signs to Horsemans Park. For more information call (904) 347-4480, (904) 347-0475 or fax (904) 347-6722.

THE KOKALIS PROJECT:

The interview with Peter Kokalis has inspired a number of readers to write to MGN. I am amazed how many of them are really happy with Peter G. I had expected more of you Rafficarians to come to the defense of the M60. I guess Saco Defense having us over for a test of the M60E4 a good consolation. These developments lead one to the conclusion that Peter was correct in his assessment of the problems with the M60 GPMG. The very fact that so

many of the changes to the "60" made by Saco were listed by Peter in his tirade, attest to his accurate diagnosis. (Yes, that did hurt.) Following are a sample of letters we have received.....

BUTT RECOVERY

I'm enclosing a band-aid of the appropriate size to help in your butt's recovery from the Kokalis Interview. That and an inflatable toilet seat, and you shouldn't be in too much pain! C.U in the Boonies!

Whit

TO THE KOKALIS PROJECT:

FANTASTIC! Your interview with Peter Kokalis was a real treat! The man deserves God-like stature among all true MGNers!

My only gripe with Mr. Kokalis is that he hasn't published all his past SOF technical articles in a well-indexed reference book. How about it Peter? How much longer do we have to wait for the gospel to come out in hardcover?

Sincerely,
Raul M.

TO THE KOKALIS PROJECT:

Dear Peter,

I thought the interview was great. Even though I live in California, I still enjoy looking at pictures of machine guns. I love shoot and as far as I know can still collect semi-automatic firearms. I would really love to hear your opinion of the Mini-14 as an assault weapon. In trying to learn from your experiences (I myself have never been in a stress situation, let alone a firefight), I could see that the magazine would be difficult to insert and probably eject maybe a few other things. I know you're busy and will probably get a lot of letters, so don't feel you have to write.

Here's hoping you do
Evan S.

TO THE KOKALIS PROJECT:

Although I'm not much into belt feds, the interview with Peter Kokalis was superb. Everything I read that comes out of that guy's head is a learning experience for me. I could not agree with him more strongly that our privately owned, full auto weapons are not just noise-making toys but serious instruments of war meant to be studied and trained with as such. But, live and let live.

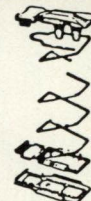
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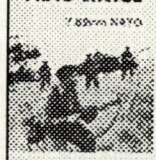
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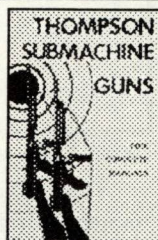
Designed for the Marines in World War II, the Reising was innovative and it fired the powerful .45 cartridge. Unfortunately, the design was not suited to the jungle environment that it was to be used in and it eventually found its way into the hands of war plant guards and the police. This book combines the rare original H&R factory manual with the military tech. manual. This is a must have book. Approx. 75 pp., 6"x9", photos, illus., softcover.

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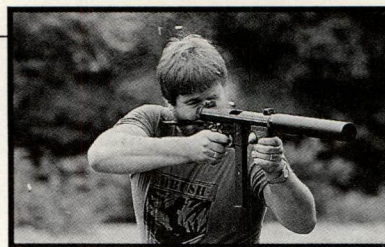
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Raffica

by DAN SHEA



"The concessions of the weak are concessions of fear" —Edmund Burke

"I have but one lamp by which my feet are guided, and that is the lamp of experience. I know no way of judging of the future, but by the past" —Patrick Henry

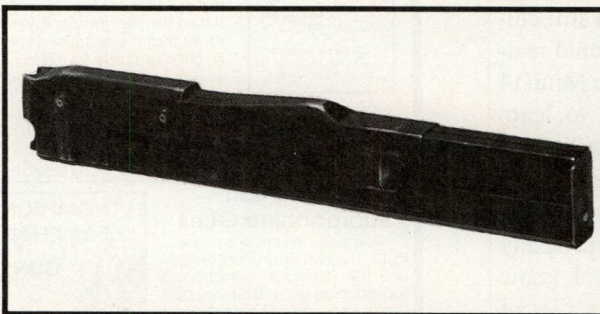
One simple paragraph from the soap box:

Pro-Second Amendment Rights' candidates have swept into power. President Clinton and his socialists cannot stand in the way of the voice of the American people. We have it made. Not! Republicans have a long history of gaining power and then compromising themselves out of using it in the way the voters intended them to. We all worked damn hard to get these people in office. Don't let them rest for a minute, guys. As soon as the liberals start saying how "mean" the new policies are, we will be compromised again—unless our new group of public servants get it through their heads—we mean what we're saying. Get off of our backs, now. At every level. Hands off of our firearms—start punishing criminals. Send them a letter a week, or fax them every time you see something in the paper that indicates a lack of resolve. We can still continue losing, even when we should be gaining and overturning the bogus laws that have been pressed upon us.

Rafficians lost a friend this fall. Class 3 dealer and Patriot Bill Williamson passed away 17 November 1994, after a long illness, and was buried 20 November. Bill was a Vietnam Veteran, and I shall always remember him as he was at the Vietnam Veteran's Memorial when Bill Clinton went to speak there on Memorial Day in the first year of his Presidency. There was one voice that rang out true and clear above the rest of us, as we protested Clinton's insulting presence. That voice was Bill Williamson's. He was active in Vietnam Veteran's of America, an active participant at the Rolling Thunder POW-MIA rallies in Washington D.C., and a long time Class 3 dealer. His display at Knob Creek was always a big draw, in the 30-foot military trailer he used at shows. Bill is survived by his wife, Samantha. He can be remembered by donations to George F. Semick Chapter

272, Vietnam Veterans of America, P.O. Box 171, Greenville, NC 27835. Here's to you, Bill, and those just like you, too damn few that there are.

Here's one for all of you M11, 9mm shooters. Murray Urbach (214) 864-0848 has come up with a Slow-Fire bolt. "Raffica" tried one out...the effective rate of fire was reduced from 1250 rpm to 930 rpm, using D&S 147 gr. FMJ 9mm (rate of fire was recorded with a PACT meter). Murray has a number of other products, including some MP-5, 3-lug barrel variants and Glock pistol caliber conversions. "Raffica" recommends this unit for those who want to turn a bullet hose into a more reasonably-controllable machine gun. "Raffica" received the info and Urbach unit from Gary Said of Action Hobbies (3414 Green Hill Rd., Arlington, TX 76014, (817) 468-8398). So, if you are interested, give them a buzz.



January 1995 Mystery Photo

Here is our Mystery photo for this month—a rather unusual magazine, don't cha think? You will need some real knowledge for this one....

MYSTERY PHOTO CORRESPONDENCE

MPA The mystery photos appearing on page 12 of the November 1994 issue of *MGN* appear to be the top and left side view of a bolt for the U.S. M3 Browning aircraft machine gun. This gun was the end result of development during WWII of a 1200 +/- rpm rate-of-fire gun for use in aircraft. Many modifications of the basic caliber .50 M2 gun, designed to increase to rate of fire while not sacrificing reliability, were tried with varying results. Finally, in April 1944, the T25E3 was standardized as the M3 gun.

Can you imagine a .50 running like a

MAC11?? A powered turret with two of these must have been something to see! I have a couple of these bolts in my parts department, in case anyone wants one.

Jon Carter

MPA The mystery photo in the November '94 *MGN* issue is an M3, .50 caliber Browning MG bolt, that is stripped of all goodies (parts).

It is set up to feed from left to right. It is milled with lightening holes for faster operation than the standard M2 bolt, and from my experimentation, will only operate (keep in time) with the special back plate and dry (spring loaded only) barrel extension buffer assembly.

There is much more I could tell about its operation, but you know all that already.

As Arms Curator for the Oregon Air and Space Museum, in Eugene, OR, I have acquired two (demilled) M3s for our beautiful F-86 Sabre, parked next to our F-4 Phantom.

I need the donation of one more, to complete the port gun bay, for best display.

We will pay shipping costs, and accept one in any condition, placing the donor's name on the weapon (if he or she so desires), and return up to a \$3500 tax write-off receipt for such, depending upon its condition.

If you can pass this info on, we would appreciate it greatly.

Chad Eugene Long,
Farm Ordnance"
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P.S. M3s were designed mainly for aircraft wing or fuselage mounting and generally contained a dispersal barrel (the bullets spread out instead of direct line of fire) and make really crappy, not very fun .50s to fire. Many parts lend themselves to use in the M2, but you need a hell of a lot of mechanical know how and time experimenting with the effort. "Buy a g M2" is my recommendation.

MPA Your mystery photo is a .50 caliber M3 Browning stripped bolt. While on the subject, is there any objection to using a

complete M3, .50 caliber bolt assembly in an M2 .50 receiver? Would this batter the buffer assembly to pieces? I'm aware that M3, .50 bolt parts will fit the M3 bolt, I know complete assemblies will fit the M2 receiver. What about using a complete M3 top cover assembly on an M2 receiver?

Ed Rydberg

Break out the RKI awards.....

Q I would like to remove the barrel bearing from a Swedish K Model 45 B cut front receiver. I want to save both the barrel bearing and the front part of the cut receiver. From what I know, the barrel bearing is "furnace brazed" to the receiver. No silver braze material is visible on the barrel bearing area. If I have to heat this up to melt the silver solder, what temperature should the oven be set for? I hope a regular kitchen oven is adequate. Or, should I use a torch?

J. R.

A Most people turn that receiver remnant off with a lathe. Some are pinned on, some welded. If it is the type that is silver soldered, you will have to heat it to 1600-1800 degrees F. I don't know if your stove goes that high.... If it does, you will see the solder start to "ooze" when it reaches temp.

This is not a job for "lay folks." A machine shop is a necessity for a safe, reasonable job.

Q I want to remove the barrel from a PPSH-41 SMG. How do I do it? It looks like the barrel and barrel bearing are riveted in place. There are three rivet heads, one on each side of the receiver and one on top. If I grind or mill off the rivet heads, can the shanks of the rivets be punched out with a hammer and a pin punch? Or, would I need an arbor press to take them out?

After I install the new barrel, how do I reinstall the rivets? Are the rivet shanks a slip fit in the holes, and are the rivet heads then mashed down for permanent assembly? Landies does not sell rivets for the PPSH-41. Where do I find them and what type and size should I ask for?

During WWII, the Germans captured huge quantities of PPSH-41s. Some were converted to 9mm Parabellum. Was this accomplished purely with a barrel substitution or did they also substitute the MP-40 mag and modify other parts?

J.R.

You've got to be more specific. What is the manufacture of the PPSH-41. There were a lot of manufacturers in different countries, and they used methods from gas welding, to riveting, to pinning, to pressing for barrel installation. Many times the pins

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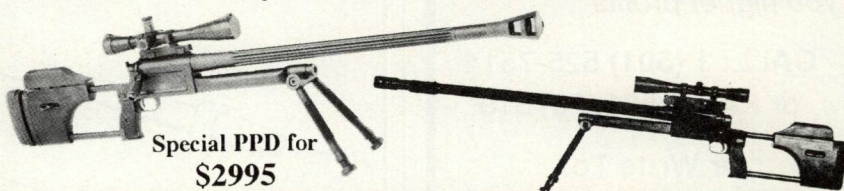
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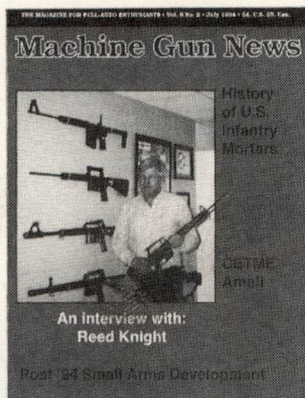
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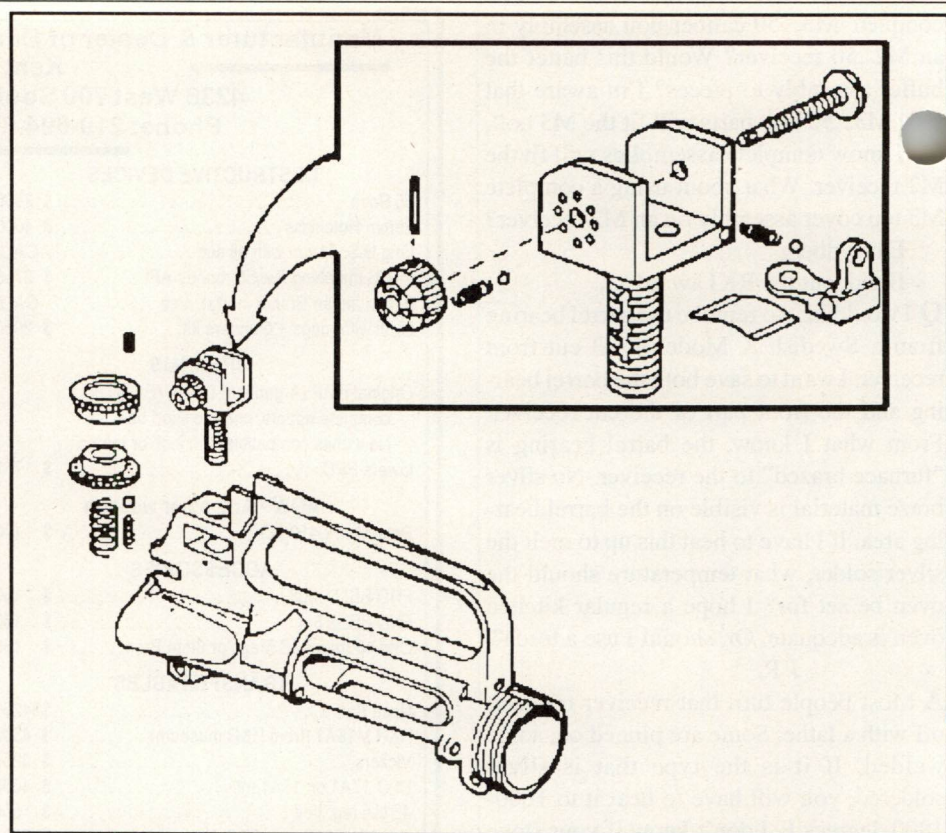
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for barrel installation. Many times the pins can't be seen without close examination. If the rivets are the method, you should be able to grind them off, then drive them out with a punch or the arbor press you referred to. This may not be the only method used. Once you free the barrel of those types of devices, the barrel should press out to the rear.

The 9mm conversion is fairly easy, the bolt face has enough bulk to expand the cartridge size from the 7.62 patron. The barrel needs changing, and the magazines should work.

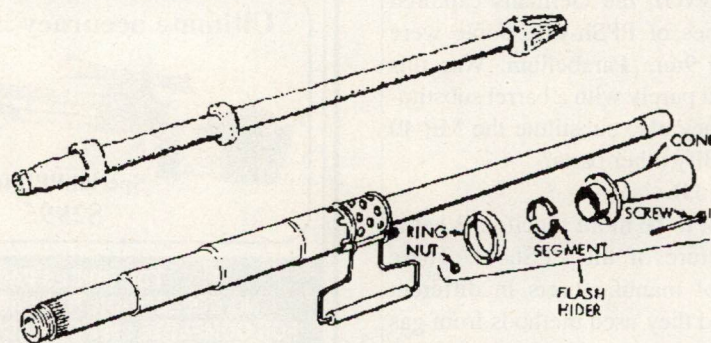
Q I have disassembled the rear sight on my M16 A2. I hate to admit it, but I can't get it back together so that it works. I don't know if I am missing parts—my manuals don't break it down that far. Can you give me a list of parts?

(Too embarrassed to write or give a name—this was from a phone call)

A The first A2 that I ever got my hands on, I immediately disassembled. (Of course, when I pulled the sight up, I still remember the clatter and sproing of things that I wasn't familiar with hitting the floor. You are not the first to go through this, believe me. The best that I can do is show you the parts breakdown, and point out that the sight unit itself "floats" on a spring and ball bearing underneath, and another one to the front. Good luck to you....

Q I ordered a .50 caliber barrel from a friend out west who said he had a pile of them. I wanted to use it in building a .50 caliber sniper rifle. When it came in, I was kind of confused. It has a four-prong flash hider and is a lot shorter than I expected. Is

M85-M2HB barrel comparison



this the "lightweight," .50 caliber barrel that I have heard about?

Jake

The barrel you have is an M-85, .50 caliber barrel from the M-85 tank machine gun. The M85 is a completely different gun from the M2-HB but uses the same ammunition. The M-85 has a dual rate of fire, 450/900 rpm, compared to the M2HB's 500 rpm. Both barrels have eight grooves with a right-hand twist of 1 in 15". I was talking with Stan Andrews about the differences in making a rifle out of these two barrels, and he made several points. First, they lock up differently—the M2 is threaded in, the M-85 uses a half twist. Second, the M-85 has some large stops on it that must be milled off or incorporated in the design.

The M-85 barrel is 4" shorter than the M2 but much lighter. Accuracy should be about the same. Try and remember that, although the C.U.P. (Copper Units of Pressure) ratings for the .50 BMG round appear to be lower than even a .30-06, the danger is in the VOLUME of propellant that is accelerating in the .50 caliber. It is close to a hand grenade in comparison. This will be happening a few inches from you or your customer's face. You want this done correctly. If you are unsure of yourself, get some more info before you play with this.

Q Hi Dan! Thanks for publishing my short speech. (I got a "bunch" of E-mail on it. I added one line, right after the "Friends & fellow Texans." I said, "Welcome to YOUR capital" to remind the folks of how the power was supposed to flow. They liked that.

The deal ended up being even more fun than we tried for; it happened thusly...

I went up to the microphone to open the ball game. Texas uses State Troopers for Capitol police these days, and there were maybe four or five standing around. When their captain saw me going up to the microphone, he got on the horn, and around the side of the Capitol comes a reinforced platoon of around 40 troopers. The troopers march up and do a smart right-face between the podium and the crowd for intimidation factor. Well, they sure picked the wrong group of boys and girls to intimidate. I had the distinct pleasure of being not 20 feet behind them when I got to watch the ass- of their britches pucker up in unison, and their feet come about a foot off the ground. Seems the troopers hadn't been exposed to real artillery before! With monumental effort, I got off the podium without rolling down the steps, but I

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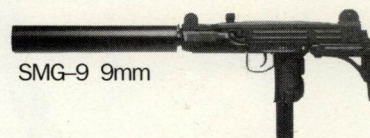
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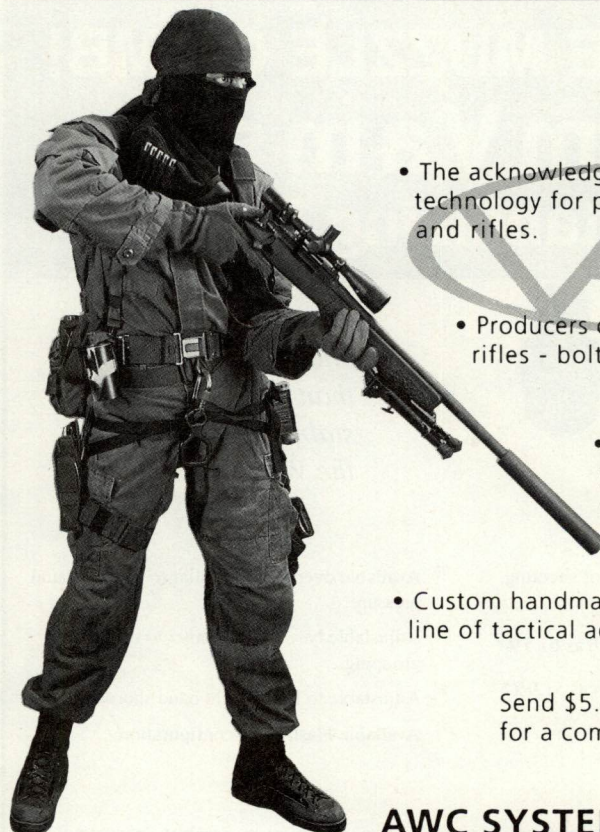
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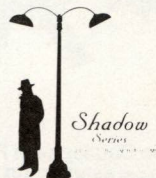


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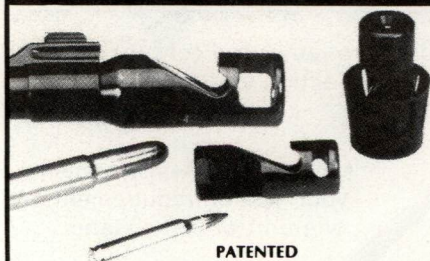
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couldn't help laughing in their faces. Boy! Were we "intimidated!" The afternoon went downhill for 'em from there.

Thankfully, they couldn't haul us off (they really didn't like my gun), and we fired seven volleys with two six-pounders. Kilt a pigeon at about 65 yds (not a mark on him), but Maque went down and collected it before the troopers noticed.

If you read *SOF*, and they publish some pictures of the 3rd Btn., Texas Light Infantry Militia, I'm the guy with the shotgun. They gave us the option of being photogenic or not, but I figured, by now, "What the Hell?" Fate seems to be pranking with life again (get used to it!).

If you're ever near the Austin area, c'mon by my place in Bastrop Co. (about 45 min. out of Austin), and do some shootin'. I've got some (pedigreed, of course) toys, and a 125 m range in the yard with steel reactive targets. And some cold ones for when we're through. Sometimes there's deer on the range, and they're in season (so I have some good sausage, too!).

Well, Dan, the Governess didn't listen. The State Senators and Representatives didn't listen. The Congressmen didn't listen. Who does that leave?

Whit Pvt.
3rd. Btn.

Texas Light Infantry Militia

A I hate to be a spoilsport because I love to see the abusers of power have their little worlds shattered, but couldn't you have found some way to have the troopers join you in touching off the cannon? Flies and honey, guys and things that go boom. It's been my experience that the boys in blue are stand-up Americans. Many of the Rallies for Firearms Rights were organized by street level patrolmen! I imagine the individuals that were on duty there were pumped up with "what a bunch of wackos you gun nuts were" before they got there. I'll bet that 90% of them had the uneasy feeling that their supervisors were talking about the troopers themselves! Regarding your Governess, Ann Richards was defeated in the recent election, with the sweeping out of the anti-Constitutionalists. The message here is "You won't listen to us? Get replaced." We need to keep their attention. Shake 'em up, Whit. And, leave the pigeons alone. Imagine the mess if "friends of the earthworm" get a line on a new sport of "Cannons and Pigeons."

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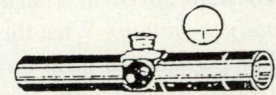
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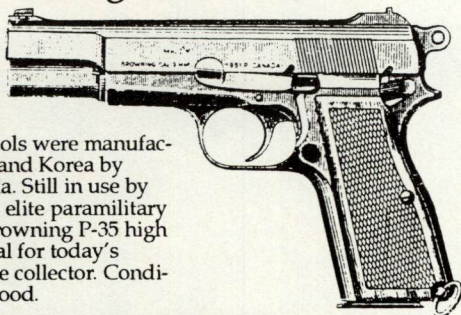


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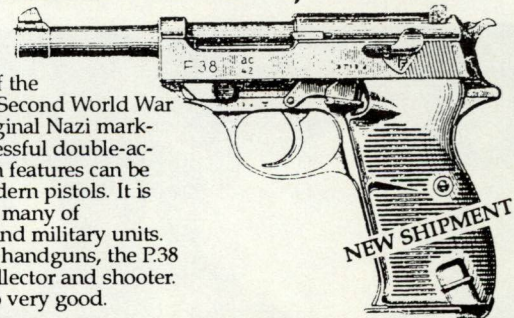
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FOCUS ON:

THE M42 "GUSTAV" 20MM RECOILLESS RIFLE

by CARL SILVER

Welcome back to *Focus On*: In April I attended a "shoot" west of Flagstaff, Arizona and had the opportunity to play with a different kind of firearm: a Swedish 20mm M42 recoilless rifle. This issue's cover picture shows Robert, the owner of this gun, firing after dark with all of the illumination provided by the firing of the rifle.

HOW IT WORKS

The principle behind the operation of the recoilless rifles' operation was first stated by Sir Isaac Newtons (1642 - 1727) **First Law:** *If the resultant force acting on a particle is zero, the particle will remain at rest (if originally at rest) or will move with constant speed in a straight line (if originally in motion).* What this means is if you direct a force to push on the back of the rifle that is equal to the recoil force, the rifle will not move.

HISTORY

The first recoilless rifles were developed by Commander Davis, an American Naval officer. In 1910 he designed a gun

with the chamber between two barrels. Upon firing, it shot a shell out of the front barrel and a balance weight to the rear. Since both projectiles weighed the same and were shot at the same velocity, they recoiled equally and canceled each other out. This arrangement was later adapted for mounting on WW I aircraft. The largest Davis fired a 12 pound shell, but it was not practical for ground use, and the design was dropped after 1918.

Krupp, the German armaments company, developed a recoilless rifle that directed a stream of gas out of the back of the gun to counteract the recoil from the projectile in 1940. Their goal was to develop a lightweight form of artillery to arm their airborne troops. The special plastic based cartridge had the primer ignition system located on the side of the rifle. When fired, the plastic base blew out of the bottom of the cartridge, allowing the gases to escape out the rear. Both the 75mm and 105mm versions were revealed when the *Fallschirmjäger* (airborne) attacked Crete

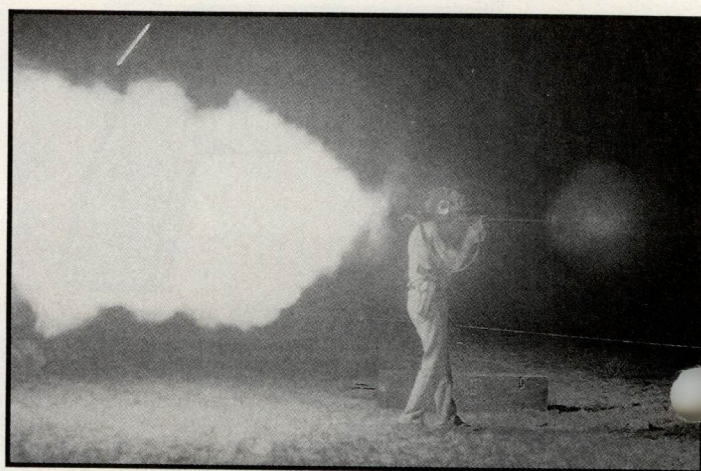
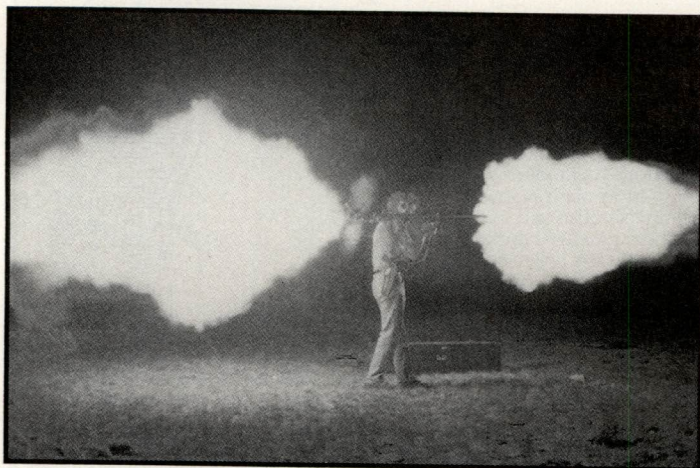
in 1941.

The British, surprised by the recoilless rifles' performance in Crete, began to work on their own designs. Their rifles worked differently. The gun chamber was perforated and surrounded by a second chamber that led back to jets next to the breech. The cartridge case was also perforated, with these holes closed off by a thin metal sheet.

When the round was fired, the metal sheet ruptured, allowing gas to pass into the outer chamber and through the rear jets. The British developed these guns in both 3.45 inch and 3.7 inch calibers. These rifles are called "Burney" guns, after their inventor Sir Denis Burney.

Sweden was actually the first country to get a recoilless rifle in service. The Russians used some form of recoilless gun in 1938 during the Winter War against the Finns, but very little is known about this gun. The Swedes started the design of a light, portable rifle in the summer of 1940 and developed the smallest production recoilless rifle: the 20mm M42. The only problem was that by the time it was introduced, tank armor was thicker than the little 20mm could defeat. They were later issued to the Swedish Home Guard. The Swedes also developed the 37mm M43, the 55mm M43 and the 105mm M45. One of the more interesting applications was the 105mm M47 Salvo Cannon M47 that consisted of a cluster of 20 105mm recoilless rifles mounted on a 5 ton Volvo truck chassis! (Perhaps the *original* yuppie assault vehicle.)

The United States also developed several recoilless rifles in 57mm, 75mm and 106mm. The calibers were chosen because of the availability of projectiles designed for existing guns. These were very suc-



Comparison of flame signatures between original factory load (1) and the handloaded round. (Note the reduction in the amount of flame coming from the muzzle with the handload and the gas leakage at the breech.)

cessful weapons, with the 75mm used extensively in Korea.

POST WAR HISTORY

The M42s were imported into the U.S. in 1946 and sold through the mail by surplus dealers. The price was about \$200, with APT ammunition selling for \$2 per round. The CIA started buying M42s from the retail market in 1960. It is reported that one of the merchant vessels that was blown up at the Bay of Pigs (see *History* at end of article) invasion was carrying a hold full of M42s and ammo.

TECHNICAL DESCRIPTION

The M42 is classified by GCA-68 as a Destructive Device (DD). It is 5 1/2 feet long and weighs 22 pounds (unloaded). The breech block swings to the side for loading. The adjustable iron sights are accurate out to 300 yards with a maximum range of 3 1/2 miles. The 4 3/4 ounce armor piercing projectile leaves the gun at 2750 feet per second and can defeat 2 inches of armor at 100 yards.

The gun came packed in a sturdy wooden crate (see cover picture). Inside the crate was an armorer's kit, complete with tools and replacement parts (see MORE CUSTOM PARTS).

AMMUNITION

Original ammunition has become rare enough to be collectable. This has driven the price into the \$75 to \$100 per round range (and you thought shooting a Browning .50 was expensive!). Much of the original ammo that is available suffers from misfires, or even more exciting, *twenty-second* hangfires. Robert sought the only solution: handloading. This was not as simple as picking up the phone and ordering a Dillon 1050. The dies were custom ordered from Dangerous Dave at The Old Western Scrounger (see references), and everything else was new territory.

An original round was carefully disassembled and the propellants removed. The small ignition charge was inside a silk bag. The bulk of the propellant was formed in flat, thin strips that looked like beef jerky. The powder-burning characteristics were analyzed by a friend at an ammunition manufacturer (the names are deleted to protect the guilty) who recommended a substitute load. The hand load is a triplex charge that uses 10 grains (7000 grains = 1 lb) of blackpowder to light-off 125 grains of a smokeless powder. This in turn fires up another 1400 grains of another smokeless powder! (The powder types are deleted to protect the foolish.) The total

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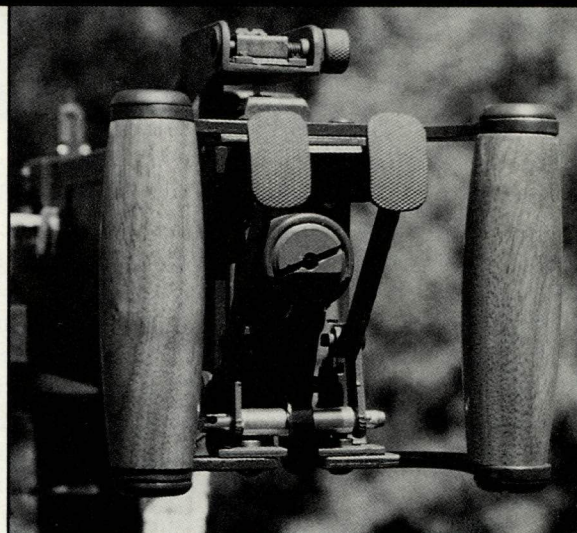
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propellant weight equals 1535 grains, over 3 1/2 ounces! For readers that are not familiar with powder weights, Table 1 lists some typical calibers/charges and number of rounds per pound of powder.

RELOADING COMPONENTS

Robert designed and had machined custom primer pockets (picture 6) to adapt standard small rifle primers to the 20mm case. Replacement phenolic blow-out disks were fabricated and new disk gas seals were stamped from sheet brass.

The "factory" round contained the ignition charge in a thick, silk bag. For the handload, the propellants are weighed and loaded into "peds" (short, nylon "socks" used in shoe stores). This pre-packaging facilitates field reloading.

The original projectiles were Armor Piercing with Tracer (APT) that weighed an average of 2066 grains (4.72 ounces). Surplus 20mm Vulcan practice projectiles are used for the reloads. These projectiles

TABLE 1		
Cartridge	Typical Powder Weight (gn)	# of Rounds/ Pound of Powder
9 mm NATO	7	1000
5.56 mm NATO	25	280
7.62 mm NATO	45	155
.50 BMG	235	29
20 mm Gustav	1535	4

weigh 2004 grains, have an aluminum nose, steel core and a copper driving band.

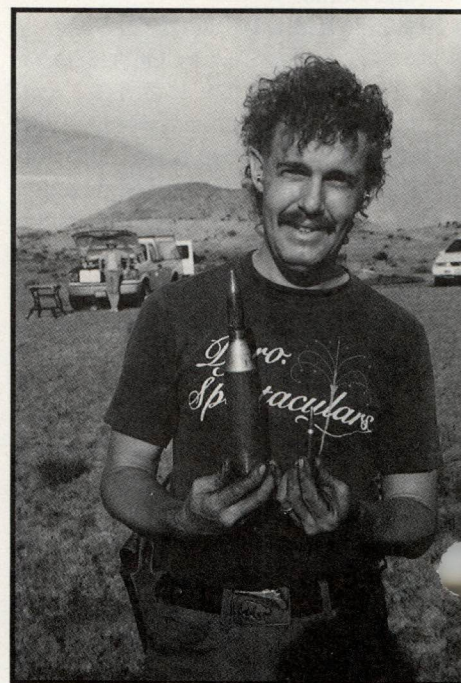
The reloading press was fabricated by Robert using angle iron, steel channel and a K-Mart 8 ton hydraulic jack. The working pressure of this round is 35 - 37,000 pounds per square inch (psi), which allows about 10 reloads per case before splits or flame cutting make them unusable.

MORE CUSTOM PARTS

One of the effects of the gas produced from over 1500 grains of propellant is gas erosion. The push from the gas increases as the gun parts that control the gas flow erode. Eventually, the rifle will jump forward from the increased flow. The gun "consumables" and their service life (number of rounds before replacement) are: flame guides (50 rounds, picture 3), recoil plates (20 rounds, picture 4) and firing pin blocks (as required). Since Robert wanted to shoot this beast on a regular basis, he had spares machined for each of these components.

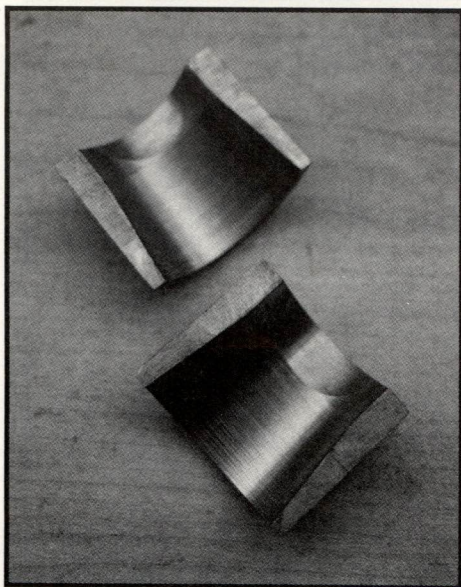
BACKBLAST

Everyone is familiar with the basic

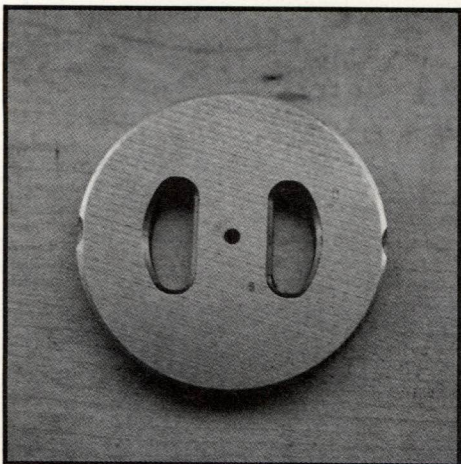


Cartridge Size Comparison: 20mm Gustav (on left), 7.62 NATO (on right)

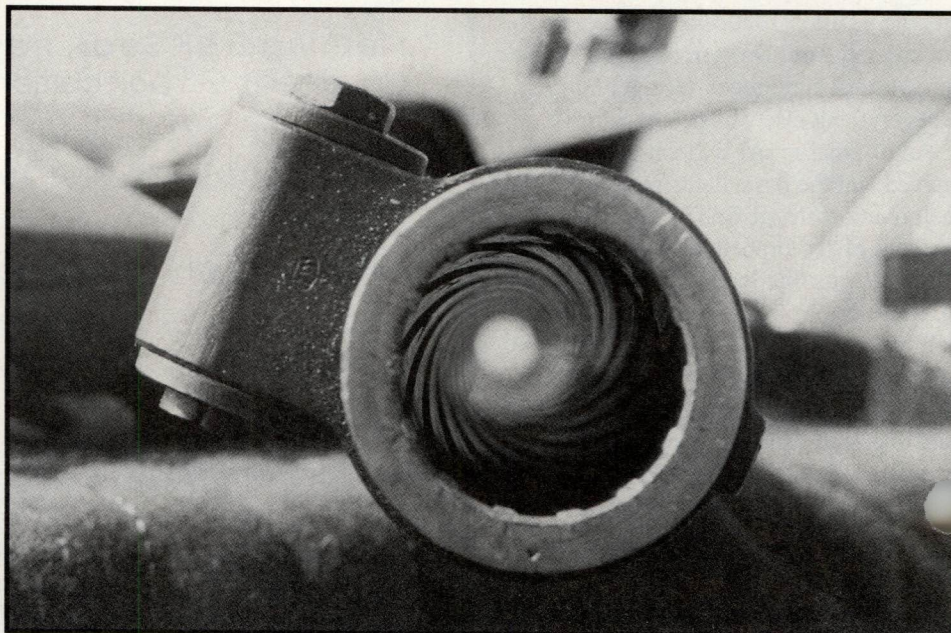
safety rule: "Keep the muzzle pointed in a safe direction." With this firearm, the rule



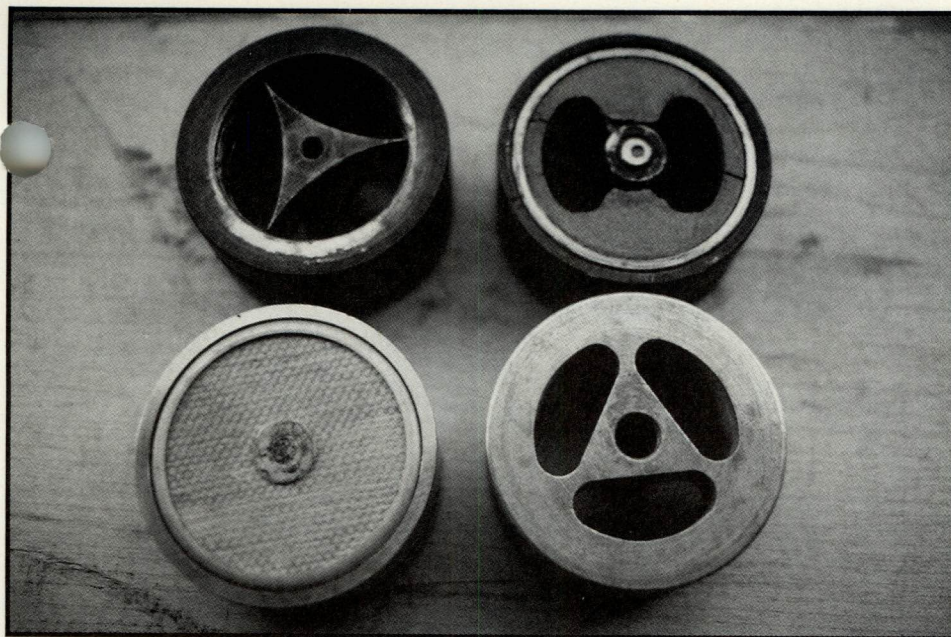
Picture 3. New Flame Guides.



Picture 4. New Recoil Plate.



Picture 5. The view into the muzzle



Picture 6. (Clockwise, starting from Top Left): TL: Original Primer Pocket assembly (front). TR: Original Primer Pocket assembly (rear) with expended primer and blown out phenolic disk. BR: New, custom primer pocket adapter (front). BL: Custom primer pocket adapter (rear) with phenolic disk, brass sealing ring and small rifle primer.

is to keep **both** ends of this gun pointed in a safe direction when there is a round in the chamber. The backblast is fierce and kicks up small rocks and dirt 30 feet behind the gun. The flame alone could ruin your day.

SHOOTING THE M42

After watching several shots and almost being knocked over by the concussion, I did not know what to expect as the shooter. I anticipated the blast to be similar to the effect of standing between the muzzles of two Browning .50s, something that

is not all that pleasant. The actual firing was anti-climatic. The same principle that cancels the recoil forces also almost eliminates any muzzle blast or concussion.

M42 OWNERS CLUB

Robert would like to correspond with other owners of M42s and other recoilless rifles. He has collected and manufactured a good spare parts inventory and has developed reliable handloads that duplicate the ballistics of the original round.

History review

Bay of Pigs: a bay on the south coast of Cuba, about 100 miles southeast of Havana. On 17 April 1961, 1300 Cuban refugees trained in Central America by the CIA attempted to "remove" Fidel Castro. Transported by merchant vessels and escorted by U.S. Navy destroyers, These freedom fighters hit the beach without the U.S. air cover that was promised them. (This was pulled by President Kennedy at the last minute.) Final tally when the shooting ended on 19 April: 90 dead, the balance were taken as prisoners. MGN

Sources:

Robert H.

PO Box 302

Phoenix, AZ, 85001

*Parts, Reloading information,
Owners Club*

Dangerous Dave

The Old Western Scrounger

12924 Highway A-12

Montague, CA, 96064

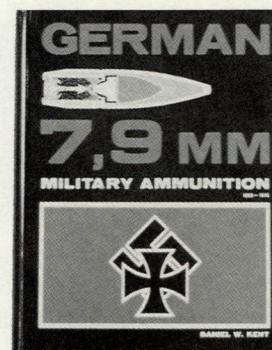
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Correction:

In last month's *Focus On*: The sentence reading, "Never be aggressive in both **engaging** and **releasing** the trigger." Should have read, "Always be aggressive in both **engaging** and **releasing** the trigger."

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Swiss Developments in Silencer Technology by Brügger & Thomet Feinmechanik

by IVO STURZENEGGER

Brügger & Thomet is a young and innovative company located not far from Berne, Switzerland, that manufactures high quality sound suppressors for small arms. Although this market seemed to be saturated, B&T managed to enter it a few years ago and to hold a firm position by offering new product designs. So what is the secret of Brügger & Thomet silencers?

IMPULSE SILENCER

Most of today's service pistols are based on the Browning system. In other words, after each shot, the barrel unlocks the slide to allow recoil operation. If a silencer is secured to the barrel, its weight and the pressure of gases, pushing the silencer and the barrel forward, will tend to prevent proper semi-auto action. In order to allow normal semi-auto action, some manufacturers use a weaker recoil spring. However, this solution is not totally reliable and might cause malfunction of the feeding system.

Brügger & Thomet engineers overcame these problems with an Impulse



The SIG P.228 with an Impulse I silencer.

silencer that optimizes use of gas pressure in the silencer. It features a small spring-mounted chamber in the first part of the silencer and a conventional expansion chamber in the second part. The spring-mounted chamber will be pressed forward by the emerging gas and strongly pushed back by the spring toward the barrel once the gas wave passes over. This strong recoil acts as muzzle impulse and actuates the recoil of the slide. Three variants of the Impulse silencer are available:

—The **IMPULS-I** is the simplest and the most compact. It will require routine maintenance by an armorer every 1000 shots.

—The **IMPULS-II** uses the same principle, but the impulse system is located in a separate chamber that can be rotated. By rotating the impulse chamber 90 degrees,

the spring-mounted impulse system will be locked in place. There will be no recoil of the spring-mounted chamber and the breech will stay locked. The mechanical noise of the moving slide will then



The famous Glock 17 pistol with an impulse silencer from Brügger & Thomet. It is the first silencer which works 100% reliable on this unique pistol.

be eliminated. The pistol works then on bolt-action and the shooter has to pull the slide to reload. The shooter can select between blowback and bolt action, within seconds, without causing additional stress to the pistol.

—The **IMPULS-III** is basically similar to the IMPULS-II but uses a rubber disc package at its business end for further sound reduction.

Extensive testing has shown that the Impulse silencer will work with all popular semi-auto pistols like Glock 17, SIG P-226 and P.228, Browning HP and Beretta 92. By the way, the B&T silencer is the only one that will work with one hundred percent reliability with the Glock 17 pistol. With the Glock 17, noise reduction will be roughly 27dB. If the silencer is set for bolt-action, the noise reduction will be 31dB. Those values can even be improved by filling the first part of the silencer with grease.

SQUARE ULTRA

COMPACT (SUC) SILENCER

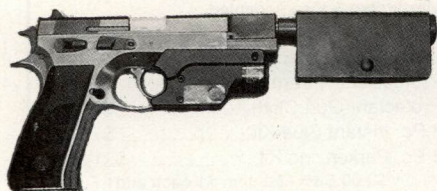
Brügger & Thomet also developed a small size, lightweight silencer featuring an eccentric pattern that will allow the use of the pistol standard sights. Due to the small volume of the expansion chamber, the *Square Ultra Compact (SUC)* uses rubber discs to slow down the expanding hot gases. The use of rubber discs will affect, however, the accuracy of the weapon at distances over 15m. In order to keep the same sound-suppressing level, the discs have to be replaced every 30-50 shots.

INTEGRAL SYSTEMS

B&T manufactures a full range of integrally-silenced weapons ranging from full auto submachine guns (SMG) to big bore bolt-action rifles. Kits can be sup-



The world famous H&K MP5 submachine gun with a removable quick-mount system silencer.



Swiss Sphinx 9mm pistol with an ultracompact silencer and a laser sight mount.



SIG 550 assault rifle with the high precision silencer and an aimpoint sight.

plied for converting Heckler & Koch MP5 and MP5K submachine guns to MP5SD (MP5KSD). These kits use B&T silencers and H&K parts (such as handguard and locking pieces). The B&T suppressed SMG looks virtually identical to the original H&K. However, the sound level is reduced by 28dB, that is about 1.5 times quieter than the original weapon. The B&T silencer can also be adapted to the original MP5SD. Other integrally-suppressed SMGs include the new Chilean 9mm SAF that is internationally marketed by FAMAE with the B&T silencer. The FAMAE is based upon the SIG 540 assault rifle and chambered for the 9mm Para cartridge.

DETACHABLE SILENCERS

A wide range of detachable silencers are offered that will suit any particular type of weapon as required by the customer. B&T produces a High Precision Silencer (HPS) designed for the Swiss Army SIG 550 assault rifle but can be adapted to virtually any assault rifle. It was not primarily

developed for tactical use but as an answer to the new Swiss regulations to reduce environmental disturbances around shooting ranges. In order to keep the same ballistic performances and the same accuracy up to 300m distance, the silencer has been designed for use with supersonic ammunition. Hence, the muzzle blast will be suppressed, while the supersonic crack of the bullet will still be heard. The silencer is secured to the weapon within seconds by a mandrel. B&T also produces tactical suppressors featuring a universal mount to suit assault rifles using the standard NATO 22mm flash eliminator (e.g. M16, Steyr AUG, IMI Galil, SIG-540/550, etc.). It uses a precision mandrel that will secure the silencer firmly and safely to the muzzle brake/flash suppressor. Unlike similar devices, the B&T silencer will be in exact alignment of the barrel, thus providing equal gas distribution in the silencer.

A snap-on silencer for the standard H&K MP5 SMG is also available. It can be

instantly mounted and locks on the standard three lugs of the barrel without requiring any modification of the weapon. Brügger & Thomet silencers are a good example of Swiss traditional quality and reliability (at a competitive price).

Extensive use of state-of-the-art computer-controlled machine tools guarantees high quality machined parts. B&T silencers will meet the toughest quality requirements. For instance, metal deflector of the silencers are not stamped, as usual in most silencers, but carefully machined and chrome plated, thus providing better performance, easier maintenance, and improved durability. Housings are made of anodized aluminum but can be made of steel upon request. MGN

Dealers and Importers may contact:

Brügger & Thomet Feinmechanik

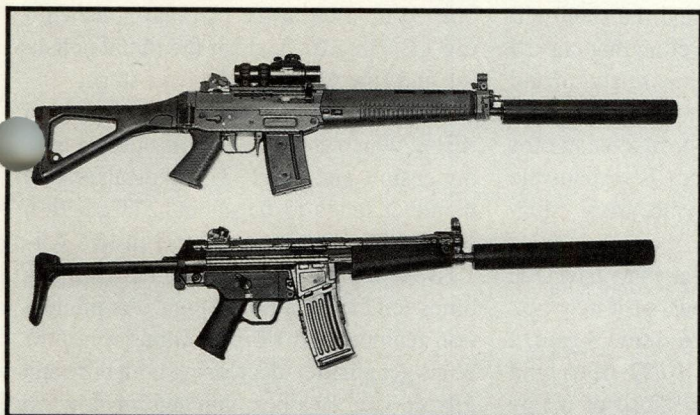
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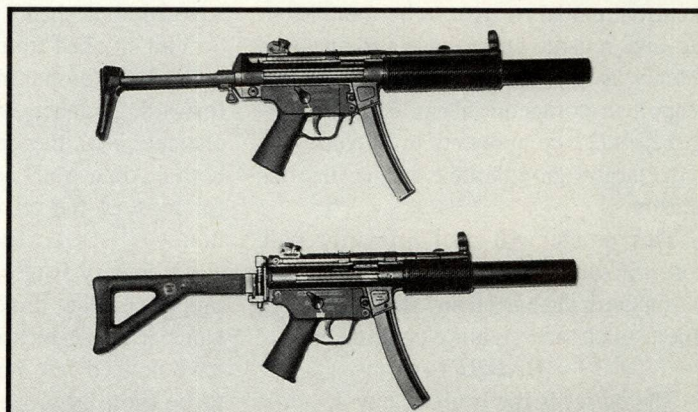
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FAX (0041) 33 549 758



The SIG 550 short commando assault rifle (top) and the H&K 53 submachine gun (both .223 caliber) with the removable silencer from Brügger and Thomet.



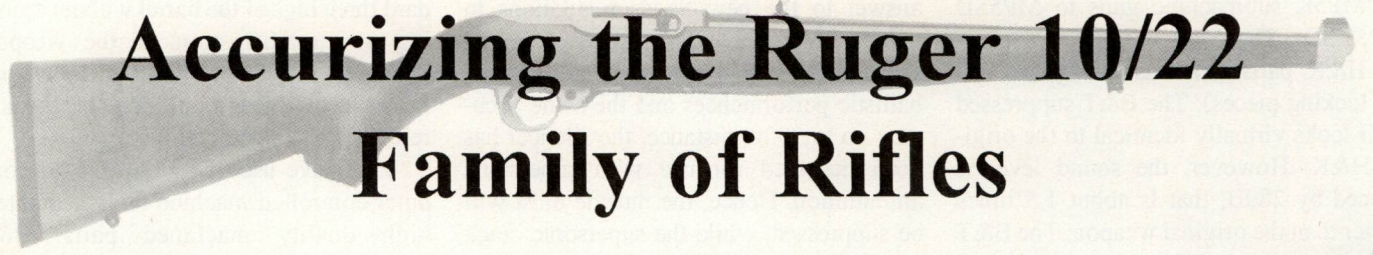
H&K MP5 series with integrated silencers. The MP5SD (top) is identical to the original MP5SD, but it has a Brügger & Thomet silencer system with a sound reduction of about 28dB. The picture below shows an MP5K with an integrated silencer and folding stock.



The picture shows (top) the SIG carbine model of the assault rifle 90 (Model 551) and (below) the custom made Brügger and Thomet submachine gun version of the SIG 551 carbine. All models are in .223 NATO. The federal police of the Canton Geneve is already interested in this SMG version of the SIG 551.



The picture shows the three SIG assault rifles 90. (Top to bottom): -short submachine gun version made by Brügger and Thomet; the dimensions are similar to the MP5, -short version (carbine made by SIG), -normal version with the bipod made by SIG for the Swiss Armed Forces.



Accurizing the Ruger 10/22 Family of Rifles

by MARK WHITE

This article is a follow-up and companion piece to that published in *MGN* (Nov. '93) which dealt with improving reliability and function in Ruger's 10/22 rifle. In recent years, competitions like the Chevy Truck Challenge have tremendously improved the popularity of this particular rifle. Its handiness, shootability, and modularity have all combined to push it to the top, where it now stands as the industry standard for competition. In turn, its popularity may have prompted Ruger to increase quality to some degree, as current models appear to be more accurate and reliable than those produced as recently as two years ago. The use of this weapon in competition has caused aftermarket 10/22 components to become one of the largest growth areas in the firearms industry.

This article will deal primarily with those factors affecting 10/22 accuracy, starting with the barrel, and then moving to action, stock, and sighting equipment.

BARREL

The barrel is the heart of any accurate delivery system, and all portions of it must be right in order for consistent shot placement to take place. Let us start at the rear and work forward.

Simply put, the chamber should be loose at the rear and tight at the front. As each new cartridge is stripped from its magazine, it needs to be elevated about five-sixteenths of an inch from its former position. As the feed lips in the magazine hold said cartridge for some time during its forward and upward travel, there is a time when the rear of the case is restrained from upward travel by those feed lips, while the bullet and the forward portion of the case are trying to enter the chamber. Something has to give, and it won't be either the magazine or the barrel's chamber. Often the nose of the soft lead bullet will have been somewhat deformed by striking the rear of the barrel in an effort to find its way into

the chamber. The rear of the bullet will often be bent in the case as it tries to travel this curved route, deforming the skirt. Some of both of these deformities will be ironed out when the bullet takes to the rifling, but not all. Cycle a 10/22's action slowly by hand, and tap the bolt slowly forward with a small mallet to get an idea of just what takes place. Eject the chambered shell and examine it. Usually the side of the lead bullet will have been scraped by the bolt when its mate above was being chambered. The tip will also have been mashed a bit, and the shell will be a bit crooked from traveling that curved path. While proper magazine selection and forward guidance is part of the story, a chamber with the optimal dimensions for both feeding AND accuracy is responsible for most of the reliability/accuracy equation.

A factory Ruger barrel may have the proper chamber dimensions, or it may not. Here, it is the luck of the draw. Again, I have noticed that current 10/22 rifles tend to be more accurate than those of a few years ago.

Since the 10/22 has risen to become the stock choice for competition shooting, much effort has been directed towards developing the optimal chamber for it. Several tooling manufacturers have developed chambering reamers that combine easy feeding with a gentle, but tighter throat. Brownells sells a .22 LR "Bentz" semi-auto match reamer with a 1 1/2 degree throat angle specifically designed for match ammo in semi-auto guns.

Again, the optimal chamber will be sloppy at the rear, with a short throat that starts to engrave the rifling on the bullet as the cartridge is chambered. Using the proper reamer with plenty of cutting oil is the first step towards getting the optimal chamber. Of course, such a chamber must be cut on a new barrel blank or on one which has been set back a bit — something

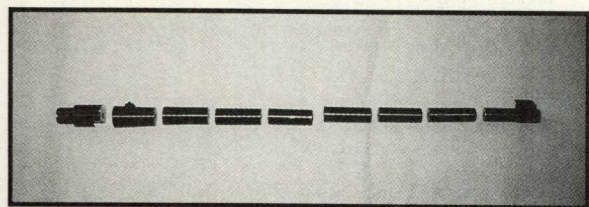
difficult to do on the 10/22 because of the way in which the retraction slot has been cut in the barrel. If a stock barrel is cut back, then the aluminum lug in the lower receiver must also be cut back to match. Not only is this difficult, it also negates replacing stock or aftermarket barrels in the modified receiver. Once the chamber has been reamed, a little lapping and polishing will remove tool marks and blemishes in the chamber and throat so lead accumulation is less likely to occur. A barrel which is already chambered can be opened up a bit at the rear and polished. I use J.B. Bore Cleaner for the initial polishing and fine rouge for the final stage.

Moving down the barrel, we come to rifling which should have the optimal bore dimension and twist. The typical groove diameter tends to be about .223", with a twist of from 1 turn in 13" to 1 in 18". A 1-16 twist tends to be most common. Ruger's bores tend to be a little bigger. As production reamers and rifling buttons wear, the bores get smaller, decreasing both bore and groove size. Reamers jam and break when they get dull and are often tossed out before they get greatly undersized. Rifling buttons, however, can still be used in a smaller state. The bottom line is that bores can range in size from .218" to .227", with .223" being considered optimal. Much of the accuracy search through varying lots and brands of ammo has to do with the proper match of bullet hardness and diameter to a particular barrel's bore size and rifling style. As a rule, the well lubricated, soft lead .22 bullets do not cause significant bore wear. Throat wear and erosion after 50,000 rounds may be a factor, but normally bore wear will not. Heavily used bolt-action target rifles are often cut back a mere 1/8" and rechambered to restore accuracy lost through throat erosion. Of course, .22 full auto fire heats a barrel more rapidly, and shooting through a hot barrel will result in much more rapid throat

erosion.

Bore straightness and barrel concentricity are very important to accuracy, especially during rapid fire. A crooked barrel is often capable of one or two moderately accurate shots, but as things heat up, the thinner side of a barrel's wall will expand more rapidly, walking the shots away from the thinner section. I have chopped quite a number of barrels in half and noticed that well over 70% of them did not have the bore concentric with the outer diameter of the barrel. While some are true, most are from 1/8" to 3/16" out, usually in the center (or about 9" from the breech). In most instances, when I build a firearm I will cut a barrel back and lathe-turn and recontour it between centers to obtain the greatest degree of accuracy. Legalities and papering aside, a good length appears to be from twelve to fourteen inches. If the rifle in question is full auto, it is classified as a machine gun and may have a barrel of any length. A short barrel in a rifle must be classified as a short-barreled rifle, with the appropriate \$200 tax stamp, hence many are inclined to stick to 16 1/4". Just out of curiosity, I chopped a standard Ruger 10/22 barrel in roughly 2" increments and took velocity using high speed Winchester Wildcat .22 ammo. Results are listed below:

Barrel Length	Velocity (feet per second)
18 1/2"	1,229
16"	1,226
14"	1,212
12"	1,197
10"	1,175
8"	1,152
6"	1,088
4"	1,004
2"	794



Sectioned 10/22 barrel.

much run out of steam by 10" or 12" in the 10/22.

Looking at the numbers, we see a steady decline in velocity, with the only significant accelerated loss between 4" and 2". Velocity levels were what I would consider acceptable up to about 10".

Readers familiar with .22 velocities may note that the numbers are about 75 FPS slower than normal. This is primarily due to the 10/22's long, sloppy chamber, which keeps breech pressures low by allowing the .22 caliber bullet to completely exit the cartridge before it hits the throat. The lower pressure allows less powder to burn and lowers efficiency. After testing the 10/22 barrel all the way down to 2", I also tested a 10" and 11" 77/22 (bolt action) barrel, which had chambers so tight that the cartridges had to be forced in the last 1/8". It was obvious that the lead of each bullet was engraving or engaging the lands of the rifling. The 10" and 11" barrels averaged 1,253 and 1,263 FPS respectively — a bit faster than the 18" 10/22 barrel. The 77/22's barrel averaged 78 FPS faster than the 10/22's equivalent 10" barrel. A year or two ago I tested some high-speed ammo in the 10/22 and 77/22, finding the latter to be 75 FPS faster. I felt that was due to the locked breech but now feel it was totally due to the tighter chamber. By the way, the same ammo (at 60 degrees F) averaged 1,246 FPS out of a 26" Remington target barrel, thus dispelling the old myth that an ultra long barrel provides the greatest amount of velocity.

I also had on hand a compact Beretta Model 21A pistol with a 2 3/8" barrel. It averaged 1,116 FPS, roughly equivalent to what would have been a Ruger 10/22 barrel 7" long. It obviously is possible to get fairly impressive performance by tweaking chamber dimension and bore diameter in a short barrel.

With regard to accuracy in factory barrels—some are excellent, some are fair, and some are poor. Again, it is the luck of the draw. In my experience, it is possible to make a fair

barrel shoot a little better, but I have never been able to do anything with a poor one. Often, poor barrels have poor chambers, out-of-spec bores, crooked bores, or scrubbed bores. On occasion, I have spent

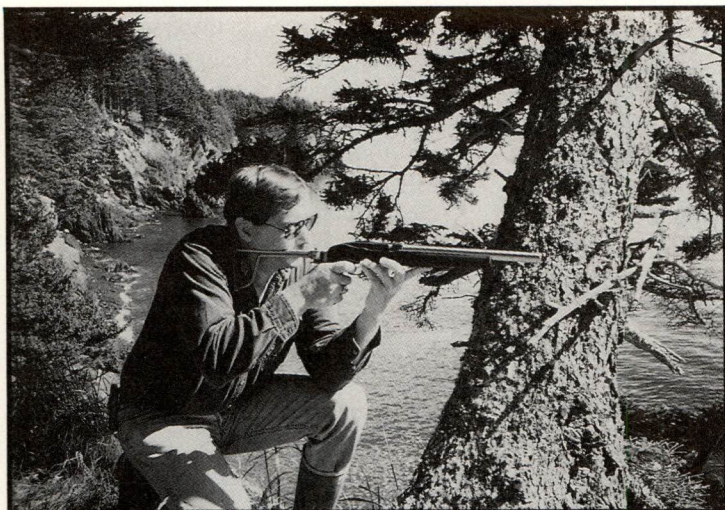
considerable time with these sows ears, all to no avail. Before I suppress or chop a barrel these days, I put it into a good action and fire five shots on paper. If something is wrong it shows up right away, and I discard that barrel.

Over the past 10 years, a number of innovative manufacturers have come on the scene, supplying aftermarket, match-grade barrels for the 10/22. They start with air gauged, premium barrels that have been carefully bored, reamed, rifled, and straightened. These blanks have been properly turned between centers using multiple light cuts so as to not deform the metal. They are then carefully chambered with a short, tapered, optimal reamer, cut to length, and carefully crowned. There is no magic to the operation—just patient, careful knowledge, and craftsmanship. Clark makes one such barrel (blued or stainless) profiled to a standard contour that will drop into a standard stock and action. Clark and others also make a straight match barrel with no taper (about .927" O.D.) that will fit a standard action but will require bedding to fit the stock. I think very highly of Clark, Shilen, D & J Custom, and Volquartsen. Their barrels tend to be carefully crafted and consistently accurate. Their short chambers will also build higher pressures and give that extra 75 FPS that the factory Ruger barrels will not. Unless you really want the shiny look of stainless steel, stick with regular blued steel for gun barrel. It cuts more crisply, and thus tends to be more accurate than stainless. I don't think much of a muzzle brake on a .22, but those can be bought as well. The heavier straight barrel swings better, and that tends to make the arm more accurate offhand. When we started to make up the muzzle can/barrel units, we found that the added weight helped considerably when shooting action targets offhand. There was little added benefit on the bench, but in the field, the little bit of weight on the end really helped.

I have heard of a few instances where blued or stainless match blanks were purchased for use in suppressed 10/22's. They typically did not work out and were not worth the extra expense. They were less accurate and far more expensive than a factory barrel conversion. In my experience, an accurate blued factory barrel will make an accurate suppressed rifle.

The last thing that a bullet touches on the way out is the muzzle crown. This must be made perfectly in order to function per-

Note that there is statistically very little velocity loss between an 18 1/2" and a 12" 10/22 barrel. As with most calibers, much of the action happens very early in the firing cycle. The expanding gas has pretty



Shooting short-barreled 10/22 on deserted Aleutian island.

fectly. One thing that will mess up accuracy is cleaning a rifle from the muzzle. On all of the 10/22's I build, I drill a hole in the rear of the receiver (about 1/4" or a little less will do) in line with the bore. That allows cleaning from the rear. Each cleaning patch makes a one-way trip from breech to muzzle. Upon exiting the muzzle, I remove the patch and carefully withdraw the rod. To repeat, I would never clean any .22 rifle from the muzzle, as that would surely damage either the fragile muzzle crown or the delicate lands near the muzzle.

A lubricated .22 bullet will carry enough wax or grease for a short 16" or 18" barrel. On longer barrels, the bullets will begin to run dry and coat the lands with lead. Target shooters with 24" barrels often have to clean the lead out of the last 8" to 10" of barrel because of this phenomenon.

The so-called "muzzle star" occurs because the soft lead bullet begins to slip a bit as it starts down the bore and is forced to spin. Gas will then blow past each non-driving side of each land. As the bullet reaches the muzzle, these gas jets (usually six, or one for each land) will blow a mixture of lube and lead across the face of the muzzle. Wipe it off with a hard cloth, and the star will soon appear to build up again. If the crown is not perfect, the gas jets will be uneven, and parts of the star may be thicker than others when examined under a strong hand lens. This can be a useful tool when trying to determine the cause for a lack of accuracy. A poor crown may have an indentation or bump, which strikes each bullet on the way out, causing it to wobble. It sometimes happens that the face of the barrel was not square with the bore when

the crown was cut, and this will cause the crown to be tipped, releasing more gas on one side than on the other as the bullet exits. This will also cause the projectiles to tip and wobble at the critical instant of departure.

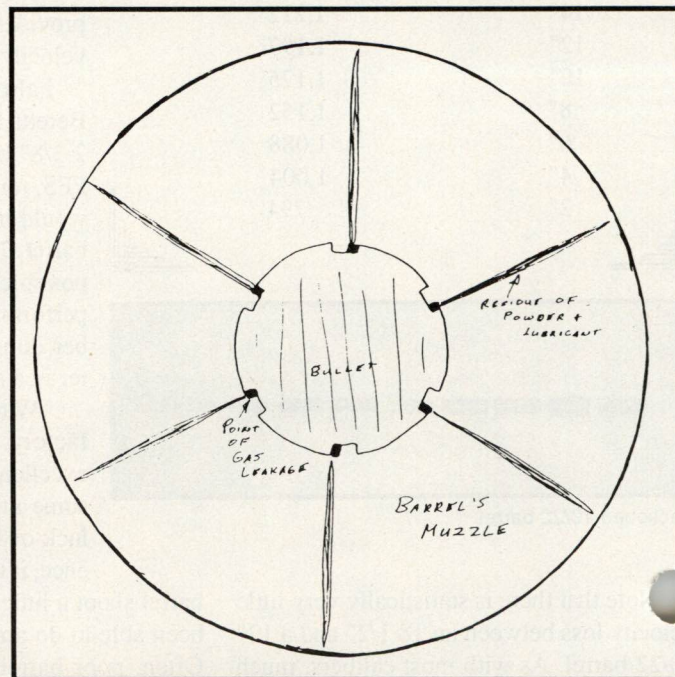
Most barrels whip and vibrate when they are fired, and this is a detriment to accu-

accuracy. The stock answer for this is to use a heavy barrel. A different system I have used for twenty years involves tensioning a rifled barrel inside a tube. In essence, the system involves a tube of steel with machined ends. This tube slips over a barrel with a groove carefully machined near the breech to receive the tube. The barrel's muzzle end is threaded and a machined nut is used to draw the barrel in tension, leaving the tube in compression. When properly set up, a typical rifle barrel will have roughly 1,000 pounds of tension, permanently pulling it straight as a string. While the heavy barrel system may be described as passive, the tensioned barrel is more akin to a live or active system. The advantages of the tensioning are lighter weight, increased rigidity, a tendency not to walk shots as the system heats up, and a light "choke" where the 60 degree threads of the tensioning nut squeeze the muzzle of the barrel inwards. The advantage of the passive system is that the greater weight dampens shooter-induced oscillations to a greater degree. The tensioned barrel is used with great success by Smith & Wesson in their 422 series of pistols and by Dan Wesson Arms in most of their revolvers. It is not much used in suppressed arms but in my opinion should be.

ACTION

The stock 10/22 action usually suffers from a heavy trigger, induced by lawsuit happy litigation specialists. Although I would like to mention a great deal about trigger work, I will limit my depth in order to protect *MGN* from the aforementioned litigators.

The standard 10/22's trigger can be had with a pull of 17 pounds and up, which in my opinion is detrimental to accuracy. One must be careful in reducing the pull, as making it too sensitive may allow the hammer to follow the bolt forward, resulting in full auto fire which will not stop until the magazine is empty. If your arm already has a full auto trigger pak, you should look to the manufacturer of that pak for guidance. One must be especially careful to ensure that the safety still functions after a trigger job. In some light trigger situations, the gun will fire by itself as soon as the safety is released or if it is jostled. I recommend that trigger work be performed by a competent gunsmith or one of the many firms specializing in the 10/22. An aftermarket drop in hammer (Volquartsen is the most common) has a limited sear engagement and carefully stoned sear surfaces, and it is one of the easiest and safest ways to improve the trigger. Because of the slamming that the semi-auto action takes, and because of the way the modular pieces are held together, the 10/22 can be a very difficult piece to do a superb trigger job on without being unsafe.



Drawing of muzzle star phenomenon.

SAFE CARRY

The SAFEST WAY TO STORE OR TRANSPORT THE 10/22 IS WITH THE BOLT LOCKED OPEN. Take the time to learn and become proficient with the device under the magazine which controls this function. It is not easy to learn but is well worth the effort. When the bolt is locked open the rifle will not fire, and its condition (loaded or unloaded) is easily ascertained. Also, if the weapon is suppressed, the open bolt will allow air circulation to aid in the removal of condensed water inside the suppressor.

One of the weaknesses of the 10/22 action is that the three main retention pins are prone to falling out when the stock is removed. The easiest cure for this is the use of a couple strips of Scotch tape to cover the pins on each side of the action. Use the more modern, semi-transparent tape, as it is more easily removed when the need arises.

While most traditional actions are joined to their barrels with coaxial threads, the 10/22's breech is turned to a stub about 5/8" in diameter and 3/4" long. This stub fits into a socket in the cast aluminum action, and is held there with a small V-block barrel retainer and two small Allen cap screws. The novel method of barrel attachment is both a blessing and a curse. On one hand, barrel removal is both quick and easy. On the other hand, the system attaches to only one side of the barrel, and some feel that it lacks rigidity. I have disassembled many 10/22's fresh from the factory. I have never found a firearm that had both of its barrel retention screws properly tightened. Often one screw will be finger tight, while the other will need four to five full turns to bring it into engagement.

One solution to the problem of rigidity must be undertaken only after the firearm has been set up and found satisfactory in every other way. That solution is to bond barrel and action together with an epoxy, such as Brownell's Acraglas Gel. To proceed, remove the barrel from the action and degrease both the barrel and the socket in the action with a paper towel and acetone. Be neat, as acetone may damage the paint finish on the action. Using a cotton cloth, apply axle grease or unsalted lard to the face of the bolt, the barrel's chamber and extractor groove, any screws and threads, and the barrel retainer. Thoroughly mix and apply a small amount of the Acraglas Gel to the barrel stub and

that portion of the action socket that will bind against the barrel. Assemble the components and snug up the Allen cap screws. Cycle the bolt and make sure that the extractor lines up properly, and that the barrel's front sight is vertical. If all is well, you may tighten the screws. Make sure that both have equal tension. **DO NOT OVERTIGHTEN OR YOU WILL SPLIT THE BARREL RETAINER.** Lock the bolt open and clean up excess Acraglas with a paper towel. Acetone will help, but remember that it may damage the action's finish, so be careful. Place the action upside down until the epoxy sets. Clean the grease out of the barrel and test fire to make sure that all is well.

Much time has been spent on action work in the previous article on the 10/22, so this section will be fairly brief. Most suppressed 10/22 barrels have been ported at 4", hence there is often difficulty with cycling. The most important area to polish is the forward face of the hammer. I usually hit this area with a few longitudinal strokes on a piece of 180 grit sandpaper, followed with a brief pass using jeweler's rouge on a buffing wheel.

There are a number of aftermarket 10/22 magazines available. I have had the best luck with factory magazines, but they are limited to 10 shots. Experiment and see what works best for you. Butler Creek's 25-round magazines seem to be the longest lasting and most reliable.

SIGHT SYSTEMS

The factory open sights may work for very young eyes, but for anyone past thirty they are poor indeed. For those who must have iron sights, the existing front sight might be OK, but the rear sight has to go. Either fold it down and leave it, or hammer it out with a punch and replace it with a glued in filler piece from Brownells. An acceptable rear sight would be the Williams receiver sight WGRS-RU-22, with either a large peep or the WGRS Ghost Ring Aperture. Call numbers from Brownells for these would be 962-100-022 for the sight base, and 962-100-901 for the Ghost Ring Aperture. The Ghost Ring is very fast for snap shooting and surprisingly accurate in skilled hands.

On occasion I have made a rear aperture out of a small piece of 1/16" by 3/4" flat iron bent into an "L" shape and screwed into the two forward scope mounting holes. The initial location of the aperture was made with an educated guess, and final adjustment was made with a

small round file. It won't work properly unless blackened with marker or spray paint. The sight is simple and rugged, but takes time to tune.

A fixed four or six power scope with duplex reticle seems to be the standard for most casual shooters and hunters. Those in competition seem to prefer the glowing red dot set in a one-inch optical sight. Very large diameter optical sights are available, but they don't seem any better than the one-inch red dot. Don't use the battery powered scope for hunting unless you are equipped with spare batteries. As far as brands are concerned, Tasco makes very bright optics for very little money. Burris and Leopold are more expensive, and perhaps better, but I haven't noticed any difference. When you pay more money, you will get better quality in the midranges. Near the top of the scale, quality increases with more money, but not at the same rate.

I always prefer a fixed power scope over a variable. The fixed is usually tougher, and there is less to go wrong.

With each 10/22 comes an aluminum scope base with a 3/8" dovetail. Unfortunately, the slamming bolt of the rifle usually batters these loose in short order. A stouter 1" Weaver base can be had, and when this is combined with full sized 1" rings, the combination will more effectively handle the hammering abuse that the system takes. The Weaver base should be both screwed and glued to the tip of the receiver with Acraglas Gel. The rings should then be securely fastened and glued to the base. The rings themselves may be fastened to the scope without adhesive and with less tension, as there is much more surface area here. The rings are unlikely to allow the scope or optical sight to move. The scope itself may fail or become obsolete, and one may thus need to remove it later. I'll say that one more time: **DO NOT BOND THE SCOPE TO ITS RINGS.** One other thing—take care that the vertical crosshair is vertical on the rifle. This is best accomplished by holding the rifle lightly in a vise and leveling the piece with a small hand level held to one of the open scope rings. The crosshair can then be aligned with a vertical doorframe, etc., and the rings tightened to fix it in position.

Some competition shooters are unhappy with the flexibility of the 10/22's barrel/action joint and prefer that the scope be mounted to the barrel. Again, the aftermarket manufacturers responded, and it is now possible to get a rail which mounts to the

barrel and cantilevers over the action. The scope can thus be mounted over the receiver, yet still be attached to a barrel which (we hope) is more rigid. I must apologize for the excessive mention of Brownells as a source. There are other sources, but only Brownells offers almost everything that a gunsmith needs. Their prices are a little high, but they stock almost everything and their service is excellent.

STOCKS

In 1964 the first 10/22 stocks were meant to be inexpensive and rugged. My chief quarrel with the cheaper stocks center around the slick plastic buttplate and the barrel band. Now, thirty years later, the higher grades sport flexible rubber butt pads, good walnut and fancy laminated hardwood in colors. Since the barrel band has been dropped from all but the economy grades, barrels may now be full floated. The next is a small thing, but worthy of mention — many firearms are stored in a closet or leaned up against a wall. A rifle with a grippy rubber pad will stay put. A similar rifle with a slick plastic pad will be forever skidding around and falling flat on the floor. This will do little good for an optical sight.

Skidding aside, the stock with a rubber

butt pad settles securely onto the shoulder, adding considerably to the inherent accuracy of the weapon. I spent an evening in the extensive gun room of a friend's house a few months ago. We spent upwards of five hours shouldering all manner of expensive rifles from different periods and continents. At the end of it all, nothing fit either of us as well as a Ruger 77/22 and a deluxe 10/22 he had recently acquired.

All wooden stocks are subject to warping due to moisture variations and changing stresses in the wood. My feeling is that most accurate rifles should have their actions and about one inch of the breech end of the barrel bedded in plastic.

The typical bedding procedure will run as follows: All holes and relief cuts in the 10/22's action should be filled with oil-based modeling clay. If this is not done properly, the barreled action will be held in the stock permanently. The action then cannot be removed without a fight, and that fight may involve splitting the stock to free the metal. Since the 10/22's action needs to be cleaned often, it **MUST** be removable.

Another bit of modeling clay may be used to dam up the area about an inch ahead of the barrel retention block. The

lower part of the barrel and action must be coated with a release agent. I usually use axle grease or lard, but Brownells sells an agent that probably works better. Use your fingers and make sure all holes and threads and surfaces are thoroughly covered with a thin layer. There are three bedding compounds available: 1. Brownells Acraglas Gel—expensive, reliable, fairly strong, slow setting, stable, and quite permanent. 2. Bondo—cheap, available almost everywhere, very fast setting, will not run, not exceptionally strong, adequate for low stress areas. 3. Marinotex—a steel-filled epoxy, medium priced, fast setting, very strong, will not run in most situations, stable, and adequate for high stress areas. I recently did a bedding job with a can of Marinotex that had been lying around for over twenty years. By the way, all three bedding compounds are moisture and temperature stable. For a .22 caliber quick and dirty job, I would use Bondo. In a quality application I would use Acraglas Gel. On a magnum rifle I would use Marinotex.

Make a practice dry run with the stocked action, snugging up the single screw and making sure the grease and modeling clay will keep out all the unwanted bedding compound. Don't forget to lay a piece of Saran Wrap or very thin plastic down before fitting the barreled action into the stock. You don't want to contaminate the wood with release agent. Take the barreled action out, mix the Acraglas Gel, and smear it into the forward part of the action area and under the 1" of barrel in the stock. A small amount under the rear of the action will also be helpful, but don't overdo it here. Insert the action into the stock and snug the single action screw up. Be careful not to get it too tight. You don't want to spring the barrel upwards, or the scope may not be able to zero on the target. Remove any excess that squeezes out with paper towels. Let the firearm set a few hours until the epoxy has kicked. Try to take the action out of the stock before the epoxy reaches full strength. Once the stock and barrel are separated from each other, it is time to free float the barrel. The barrel channel should be opened up so that no part of the barrel touches wood. It would be nice to have at least 1/16" of space all around the barrel. Use very coarse, aggressive sandpaper wrapped around a wooden dowel of the appropriate size. One of a set of deep sockets would also give an appropriate shape to use behind the sandpaper. A dollar bill or

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slip of paper should easily move between the barrel and the wood stock. When all is well, seal the raw wood with epoxy (more Acraglas) or varnish. Clean all the grease clay from the action, and the job is done.

AFTERMARKET STOCKS

There are more vendors of 10/22 stocks than for any other component. On the low end, there are plastic folding and plastic fixed stocks. On the high end, there are light, rigid fiberglass, wood, and laminated wood stocks in plain, fancy, and exotic configurations. The least expensive come with both standard contour and .925 straight (no) taper barrel groove. Since most suppressors come with a full 1" diameter tube, almost all of the stocks will need to have an extra .070" to .1" hogged out before the tube will fit.

Let's start with folders. Ram Line makes a very light weight folder with a plastic hinge. Unfortunately the stock's hinge is neither rigid, nor will it stand up to abuse. Many end up broken, and few dealers will stock them because of this. Butler Creek and Choate both make heavier plastic folders with a cast/stamped steel hinge that is both tough and rock steady. I personally like the design of the Butler Creek a little more, but both are tough and quite serviceable. The really nice thing about the folding stocks is that you can push a button, collapse the butt, and lose 9" in overall length. A stainless 10/22 could be SBR papered, fitted with a 10" stainless barrel, and a stainless Butler Creek folding stock. The length of the folded firearm would be about 18", which would fit nicely in a backpack or kayak. Loaded with CCI Stingers or Small Game Bullets, it would make a wonderful survival gun for a light airplane. Fitted with good iron sights or a compact scope, it would be easily capable of one-shot hits on rabbits or ptarmigan out to 100 yards.

A few general comments about fixed stocks and their fitting may be in order. Starting at the rear, most buttplates are set perpendicularly to the axis of the bore. If one shoulders a firearm very lightly, he will notice that the toe of the buttplate will touch flesh, while the upper part of the buttplate will be from 2" to 3" away. To fit more properly, the butt should actually be at an angle about 30 degrees from perpendicular. In the past, I have done this for a few customers, and they liked the fit better. Some stockmakers are slowly turning in this direction, but old traditions die

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slowly.

Most stocks have a "pull" (distance from butt to trigger) of about 14" long. Jeff Cooper, who ran rifle classes at his ranch for many years, found that his clients generally performed better with rifles cut to a shorter 12 1/2" pull. Most (but not all) people feel more comfortable with a shorter pull and a somewhat angled buttplate.

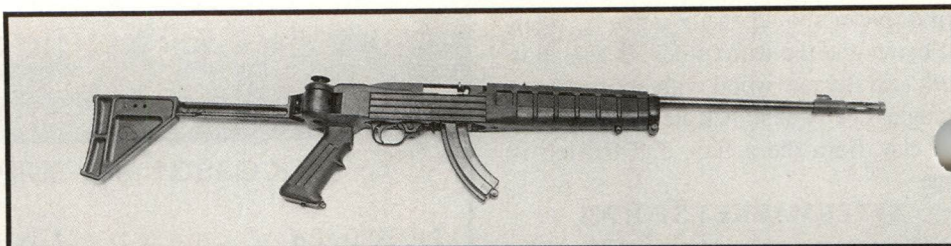
Another of Cooper's precepts is the occasional need for great speed in bringing an arm to bear. In his rifle course, considerable emphasis was directed towards a single aimed shot, delivered in a very rapid fashion. The moment of decision having been reached, the rifle is quickly brought to the shoulder, the sights are aligned, and the trigger is pressed, all in one smooth, swift motion. With practice it can all happen in less than a second, with surprising accuracy. Short-stocked rifles with angled butts work much better for this sort of thing, as they tend not to catch on clothing, backpack straps, etc. The snap shot is a technique of considerable use to both the enforcement and hunting community. With the fast handling 10/22, practice in this technique is both effective and affordable. The factory 10/22 stock has a low comb or cheek rest designed to fit all sizes of people and low mounted open sights. When used with a scope, that comb is a bit low for an optimal fit. Many of the aftermarket stocks have a raised comb in order to fit better with optical sighting.

For those who do a lot of shooting from a prone position, a bench, or a blind, a bipod is a useful accessory. Several brands and styles are available. Some mount to a sling stud on the forearm. Some attach to the forearm with screws. I do not recommend those which attach directly to the barrel, as they may effect accuracy in a sporadic way.

The following is a sampling of stocks available through Brownells. Many more are available through other vendors and manufacturers. I cannot emphasize enough the value of being able to handle and fire a rifle equipped with the stock you are interested in before settling on a purchase.

Bell & Carson—Standard fiberglass, graphite, and Kevlar. The standard stock appears to duplicate the shape of Ruger's economy stock, complete with barrel band. Thumbhole, Premier Price about \$100, and \$240, respectively.

Brown Precision Team Challenger Stock—All fiberglass, about 1 1/2 pounds, high comb, full forearm. For heavy bar-



The Ruger 10/22 rifle with ventilated handguard, muzzle brake, snap mag release, and folding stock. Available from Ram-Line.

reled guns. Finish, fit and rigidity—very good. Color—gray. Price about \$360.00

Butler Creek—Molded, black synthetic polymer with a longer pull. For factory barrel only. Finish and rigidity—fair. Price about \$100.

Ram Line—Injection molded, fiberglass reinforced plastic. Color—black. Textured finish. Weight—about 1 1/2 pounds. Fair fit and rigidity. Price about \$60.

Turner Custom Competition—laminated hardwood in two possible color combinations. For heavy barrel. Radical. Weight—2 1/2 pounds. Average pull, high comb. Fit and finish very good. Exotic, but functional. Price about \$240.

Volquartsen Thumbhole—Fiberglass, in black, red, blue or green. For heavy barrel. High comb. Fit, finish and rigidity very good, although I do not like the thin grip for the strong hand. Weight—about 2 pounds. Price about \$230.

Zero, Inc.—Makes three stocks of interest to 10/22 owners. I will describe each in turn. All are made of contrasting layers of maple laminations.

Standard—Similar to factory, but with angled rubber buttplate. Factory or heavy barrel. Fit—very good. Finish—excellent. Weight—over 2 1/2 pounds. Colors—black/brown, red/white/blue, or gray/brown/green. Very striking. Price about \$200.

Standard Thumbhole—Laminated in three color combinations, RH only, heavy barrel contour. Fit, style, and finish—excellent. Weight—2 3/4 pounds. Price about \$235. This stock is well designed, comfortable, and handsome. A reasonable compromise between unusual and outrageous. Expensive, but probably a very good value overall.

Target Thumbhole—RH only. Available in three different color combinations. Exotic. Weight—3 pounds. Long pull. High comb. Fit and finish—excellent. Price about \$250. A good, accurate comfortable stock, but a bit extreme.

AMMO MATCHING

With regard to ammunition, there is much which can be done by simply selecting the most appropriate brand and lots of .22 LR ammo for your particular firearm and situation.

If cost is the only consideration, it is a simple matter to check prices and go with what is least expensive. Often, chain stores like Costco, Sam's, Sears, Wal-Mart, etc., will advertise and sell promotional ammo at bargain prices. Buy a little and try it. If it works well, go back and buy a lot. One of the current best deals has been Baikal .22 LR ammo. Baikal Junior Steel works for some firearms with strong strikers and powerful extraction systems. Unfortunately, the tougher steel cases suffer from ignition and extraction difficulties. Baikal Junior Brass is available for very little money, and it appears to work fine in almost any firearm. Although it tends to be dirty, its price and consistency make it a bargain.

Many suppressed 10/22 shooters are interested in very high levels of silence. Since the inexpensive Jr. Brass ammo is normally subsonic, it is unusually quiet. It is also quite accurate. Recent tests with a highly refined target rifle showed Jr. Brass capable of 1.2", 10-shot groups at 100 yards. Both Winchester and Remington offer subsonic hollowpoint ammo at a reasonable price. There are finally enough suppressed shooters in the arena that large manufacturers are offering ammo to fill their needs.

THE SONIC PHENOMENON

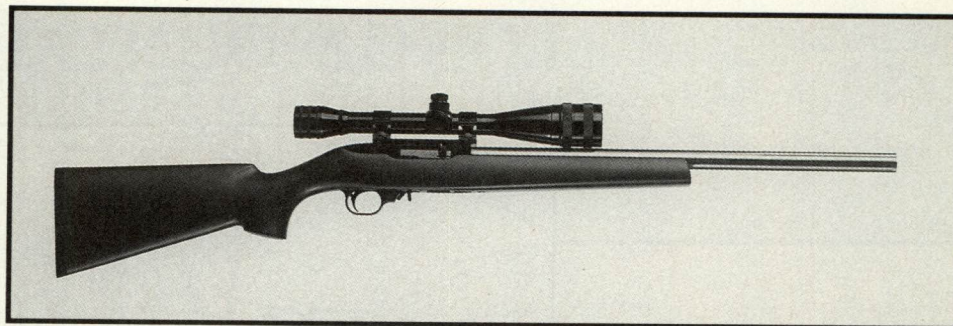
For those who came in recently, it needs to be mentioned that the speed of sound in air at sea level is roughly 1,140 FPS. Depending on air density and temperature it can sometimes be a little more or a little less. Two things happen at that speed that are worthy of our attention. The first is the phenomenon of ballistic crack. A projectile exceeding the speed of sound will generate a substantial sound of its own as it travels through the air. A projectile, fired at a subsonic speed from a suppressed rifle, will make a barely audible hissing or

whizzing sound as it moves along. An otherwise identical supersonic projectile will deliver a loud "crack" as it moves along, breaking the sound barrier. The famous American test pilot Chuck Yeager noted a considerable amount of buffeting and aircraft instability as he pushed through the sound barrier. To a lesser extent, this instability also affects rifle bullets as they move along at what is termed transonic velocity. The way to avoid this is to either keep bullets below, or well above the speed of sound. A check of most successful .22 LR target ammunition will show an average velocity of about 1,050 FPS.

If ultimate accuracy is a concern, the proper match of .22 ammo to your particular rifle will be an important link in the equation. Usually, one will buy just one box of a number of different lots and brands of .22 ammo. Some stocking dealers will occasionally offer a deal on "sampler" assortments of ammo to help their customers find the best ammo for their particular firearm. Most of those enthusiasts I know will try a sampling of twenty or more variations at one sitting.

The sampling exercise is often conducted as follows: each box in the assortment of ammo is labeled with a number, 1 through 20, and a series of targets is likewise numbered with a felt tip marker. Some people use small targets in clusters of five. Others use 16" x 24" sheets of white poster board with square, black target pasters placed and numbered at selected intervals. The target is stapled to a stand 50 yards away from a sturdy bench rest. Five shots of each variation are carefully discharged at each numbered target. Here is where someone with experience and skill on a bench rest will prove valuable. After the targets are shot, they are retrieved for examination. Many groupings will be found to be excessively large, and their corresponding lot numbers will be immediately excluded from consideration. Usually, four or five groups will be found notably smaller than the others, and a second set of five shots each will be fired to determine which variations hold the most promise. The second round is often a duplication and verification of the first, and notes of the ammo's performance are made for future reference. Suitable quantities are then purchased for future use, with the least expensive, adequate performers being the most likely candidates.

Most, if not all, target grade .22 LR ammo carries a soft, 40-grain lead projectile,



The Ruger 10/22 "Custom Team Challenger" available from Brown Precision.

tile, backed with about 1.4 grains of fast burning propellant. Typically, this particular ammo expands the projectile more completely in a chamber, and exits the muzzle around 1,050 FPS. The so-called high speed ammo carries a slower burning 2 grains of powder behind a somewhat harder, 40 grain solid or 36 grain hollowpoint bullet, which exits around 1,250 FPS. This ammo almost always breaks the sound barrier and is typically the most plentiful in the U.S. Most promo ammo is of the high speed, transonic variety.

Both CCI and Remington make what is termed hyper-velocity ammo. In the case of CCI, their Stinger ammo carries a 32 grain hollowpoint projectile behind about 3 1/2 grains of powder. Stingers reach a velocity of 1,600 FPS in most barrels. Remington makes a 33 grain hollowpoint called the Yellow Jacket, which is good for about 1,500 FPS. Both of these ammo variations make substantially more noise and are often preferred by .22 machine gunners because of that factor. Many small game hunters also prefer them because the lighter, higher velocity projectiles supposedly expand better.

The Federal Cartridge Co. has spent much research money on target-grade ammo, and many of their .22 target offerings are quite accurate. Both CCI and Remington have experimented extensively with many different variations of bullet shapes and powder combinations. CCI's Small Game Bullet has an unusually hard, flat-nosed projectile which exits around 1,260 FPS and penetrates deeply. It is the current choice for defensive .22 ammo used in rifle or pistol. Remington's 36 grain Viper truncated cone solid, with an exit velocity of about 1,400 FPS, has some similarities to the SGB and may also work well for that defensive role. MGN

Author Mark White is owner of Sound Technology which specializes in sound suppressors. (205) 664-5860.

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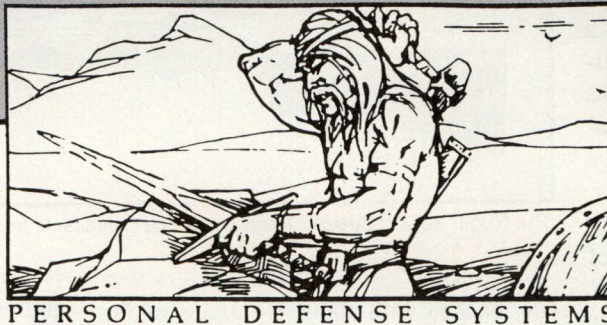
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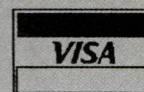
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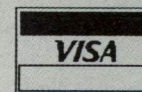
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THE M60E4

(The response of Saco Defense)

by DAN SHEA

Faithful followers of MGN are aware that there are a number of advocates of the M60 GPMG on the staff here, as well as many of the readers, both professional and collector. It has always been a "hot spot" in our conversations when the "Pig" is brought up. Witness the explosive interview with Peter G. Kokalis, Soldier of Fortune magazine's Technical Editor. All of Peter's experience has him condemning the '60. Your faithful correspondent is still getting rabies shots. I had been aware for some time that the military contractor had a new model coming out that had supposedly solved the very real problems with the gun (many of them pointed out by Peter in the interview). You can imagine my surprise and pleasure when the President of Saco Defense Bruce Makas, extended the invitation to MGN to have us come test the "new" model. Would I be interested in coming out to their plant and reviewing the gun? Have you ever seen a seagull on a french fry?

I called Stan Andrews up and asked if he wanted to travel over and try out the M60 E4.... He was out the door and halfway to his car when he realized the meeting was two weeks away.

Marc Desrochers is the Program Manager for the M60E4 project. We interviewed him extensively for the inside info on ALL of the modifications and changes to the gun. Marc was extremely well versed in all aspects of the '60: historical, technical, mechanical, etc. He gave us a complete tour of Saco's facility and a thorough briefing on the M60E4, as well as a chance to test fire it....

MGN: I can't tell you how much I have been looking forward to this....

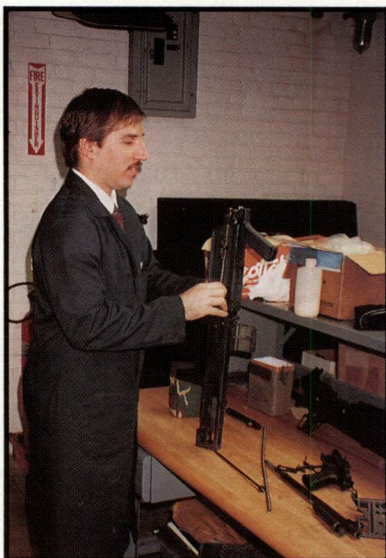
MARC: Our pleasure. Bruce Makas, the President of Saco Defense is an MGN reader, and he wants the E4 to get a close look and a fair shake.

MGN (Stan): (going over to the displayed M60) This is the E4 here?

MARC: Here's the newest variation—the completed E4.

MGN: Beautiful. Where can we start...

MARC: Let me give you a little background on the M60. The weapon was originally designed by the government at Springfield Arsenal. Basically they



Marc Desrochers, M60E4 Program Manager, reassembles the E4. (Hanger on table is the E3 model, not for this gun.)



built it themselves for a year or two, then they transitioned everything to Saco Defense (which was Maremont Corp. at the time). They transitioned tools, equipment, the know-how, and essentially almost all of the production guns have come out of Saco Defense/Maremont. I don't know if there are any existing out there from Springfield. In the early 80's was when we introduced the E3 machine gun. George Curtis used to be the engineer here at Saco on that program. We were looking for an answer to the Army's need for a new small arms weapon. We came up with the E3. It was designed to be a light assault weapon that would give you more firepower than a SAW in terms of the caliber, yet would still be about similar in weight as the SAW. The advertised weight was 19.5 lbs with the longer barrel.

MGN: That was during the competition for the Squad Automatic Weapon that the M249 was in?

MARC: It was really our answer to that requirement. I don't know if the Army ever really looked at the E3. I think they did. The Marines and the Navy eventually picked up the E3, as well as the Air Force. The Army decided to go with the SAW. The Army decision to go with the SAW meant that they were going to phase out all of the M60s and replace them with SAWs, and that's the way they progressed up until the beginning of this year (1994). They had previously backed off and said, "Well, in certain applications we'll keep the M60." Earlier this year at the Commanders Conference at Fort Benning they decided they needed to retain a medium machine gun in the infantry, a 7.62mm machine gun.

MGN: They were finding that the M249 didn't fulfill some of the roles that they were looking for?

MARC: It didn't fulfill some of the infantry roles, based on experience in the recent conflicts from Panama to Desert Storm to Bosnia.

MGN: Would that be more related to accuracy or effect at longer distance?

MARC: I believe what they were relating it to was the capability of the ammunition in terms of armor penetration or just penetration of hard targets, vehicles, soldiers behind berms, that sort of thing. The 7.62 has it all over the .223. The other thing that was happening behind the scenes is that as they were starting to get more and more SAWs out in the field, and the soldiers were getting used to them, negative word was getting out. They'd go to a division and say, "Ok, it's time to give up your M60; here's your new SAWs." They were getting resistance. Soldiers saying, "Hey, we NEED this gun for the environment we're operating in." The infantry school started to take notice and say, we need to retain a medium machine gun. So there is a new requirement for the

Army.

MGN: You're saying that the professionals, that have the guns in the field, were hesitant to give up their M60 because they knew what the gun could do for them and they were hesitant about what the M-249 could do.

MARC: That's correct, and they had experiences with both guns. It wasn't that they wanted to keep the M60; they wanted to keep a 7.62 machine gun. That's where the infantry school came up with this whole concept of having a shoot-off between the E4 and the M240G. Both of those guns offer the Army an opportunity to upgrade existing assets. In today's budget environment, the Army doesn't want to pick up completely new guns. They're more interested in being able to upgrade their existing assets. That's why the E-4 is looked at as being a conversion kit.

MGN: Upgrading to the E4 would be something that could only be done on the existing E3s, or could it be done on the M60s also?

MARC: Either one. With the Army, it would be from an existing M60 that we'd upgrade.

MGN (Stan): Some of the earlier M60s had problems: rivets getting loose and that type of thing...

MARC: In the earlier M60s, there was a problem where the rivets that hold the rails to the actual receiver block itself would loosen. That problem has been solved by simply going to a body-bound rivet. The body-bound rivets have been tested and the receivers last well in excess of 100,000 rounds. I couldn't tell you what year that was actually phased in. I suspect it was in the early 80's, maybe even late 70s. All production guns get the body-bound rivets. The army has a depot where they overhaul guns. They actually go in and put the new body-bound rivets into the older guns. It's a very easy thing to tell when you look at the receiver which rivet it has. I've been to a number of gun inventory locations here and abroad and almost without fail, if you go in and look at which receivers have loose rivets, it's always, always the ones with the old style (but not the body-bound riveted).

MGN: You can tell the new style because you have rivet heads that stick out on the side of the trunion area rather than milled flush like the earlier ones were.



Note the body-bound rivet heads protruding from the receiver side, under the rear sight.

MARC: Exactly. There are a couple of other fixes that we came up with on the receiver during the days of the E3. The longer ejection port helps get the cases out reliably, and we've added a little hole up forward on the guide tube to assemble the forearm and bipods on the E3 and the E4's. Those changes are now put into all receivers whether it be an M60 (which we still make) or E3 or E4.

MGN: Let's start at the front...

MARC: OK. The E3 had a very small flash hider. As a matter of fact, in this brochure that I have of the E4, it still had the old E3 flash hider. This one is a fairly recent development. The problems with the E3 and the M60 and with most flash hidiers is that they have enough flash, that if you're using night vision devices of any sort, you end up getting blooming in your night vision device. The Army and most armed forces have been operating at night with infra-red devices, and we felt it was critical to get the flash down. This sort of an open-prong design is the most efficient way that we know of to reduce flash. We almost eliminate it.

MGN: There's no slot in the top of it or the bottom, so it seems to be keeping all your flash out to the sides.

MARC: Yes, but it almost eliminates the flash. We've done some photographic work at night with these things on the range—ten round bursts with each of the various flash suppressors on the M60, the E3, and the E4, and it varies slightly depending on the length of your barrel. The one I have here is a short barrel. With this one you do still get some flash, but it's significantly reduced. On the longer barrel, there is essentially no flash that you can see in the pictures. The other benefit of this design is that you no longer kick up dust. If you've ever been firing a machine gun in a sandy environment, you'll find that you can't see your target after the first ten rounds are out. This design is much, much more efficient. We've fired it out in the desert, having swept the sand nice and neat ahead of time, and it just doesn't disturb the dirt at all.



Stan Andrewski fires the M60E4. Note brass in the air, and the almost total lack of muzzle flash!

MGN: That "dust cloud" is another signature that gets ignored. It can mark your position as surely as any muzzle flash. Speaking of shooting in the desert, how is the M60 as far as lubrication? You must have done a lot of testing on it for the recent Gulf War.

MARC: Not really. The M60 has been type classified for a number of years and the Army has gone through and done a lot of that testing in the past. Most of the things that we've changed for the E4 have not been functional parts or the changes were not such that they would impact the gun's performance in a sandy or muddy environment, or other environmental condition. To be honest with you, we've done some environmental testing overseas recently and our gun was put up against about eleven other guns—different makes and varieties—and in the end there were only two guns, this one and another one that actually went through all the environmental testing in sand, mud, and water. There were only two guns that actually went through the whole test and didn't jam in any way, shape or form and the '60 was one of them. It is a very reliable system in various environmental conditions.

Every time we make a minor change in here, we evaluate what kind of impact it would have on environmental extremes. We don't always go do the field testing. To do the testing costs .50 cents a round and lots of times you're talking about 50 to 100,000 round tests. It doesn't always make sense to do that.

MGN: Is there a change in the barrel removal?

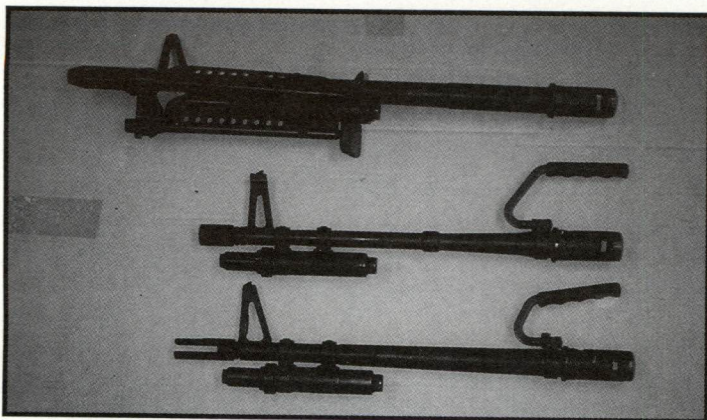
MARC: Not really. It changed from the M60 when we went to the E3. This is very similar to the E3 in that you simply charge the weapon, then use the barrel release. You have a quick change barrel with a handle, and you don't need a heat mitten. The bipods are now on the receiver, so the gun stands up during the barrel change. On an M60, it's going to flop around in the dirt and get dirt inside the gun. Now the operator can stay fairly low, put the barrel in and get back behind the gun. Also, the actual carrying handle for the gun is on the barrel now. Quick and easy. That change was on the E3.

MGN: I notice the handle is cocked forward somewhat.

MARC: Right. That's because of the center of mass of the gun. The angle makes it more comfortable to carry. It's also because we needed to clear this rear sight. On the E3, the handle came back further and would actually interfere with the sights so you had to have the sight down first. Typically, when the soldier is done firing and he wants to pick up his gun and run, he doesn't want to have this thing come up and hit the sights. Small detail, but those details are important to the guy in the field. We also found with some of the earlier E3 handle designs that the stop mechanism on the barrel release lever was on the weaker piece, and if somebody hit it hard enough, they could actually shear the pin. We put the stop mechanism up in the other, stronger part. The handle is going to be retained on the gun.

Let me get back in sequence...one of the things that is obvious here is that we have a different gas system. The gas system no longer requires lock wiring as did the M60—no gas cylinder plug to vibrate off. In addition to that, we have a reversible piston so the soldier can put it in either direction. (Dan and Stan start laughing) And this is something...

MGN: That's got to be the biggest problem that you run into out in the field.



Top to bottom: Standard M60 bbl, M60E3 lightweight bbl, new M60E4 bbl—note the split end flash suppressor and angle change of the carrying handle on the E4, as well as the gas piston modifications.

MARC: It's certainly what people complain the most about. It's understandable. This gas system is derived from the M60E3. It's almost identical to the E3 except there are a little bit larger rings

on it going onto the barrel. This whole barrel is a heavier wall barrel than what the E3 was. That's so you can have the same sustained fire rate as you do with an M60. Keep in mind there is nothing wrong with the E3 barrel. Some people will have you believe that the E3 barrel droops and melts and rounds come out the side but it takes anywhere from 900 to 1000 rounds linked continuously, pull that trigger and don't let off at all. After around 500 rounds it begins glowing red. That should be an indicator to slow down. Soldiers don't take that many rounds in the field, especially in the infantry. The way the Marine Corps stumbled across this was during training. They were firing over the heads of troops and somebody got a bit aggressive on the trigger. To my understanding, the soldier said, "Of course I was firing within the prescribed firing schedule." We replicated the tests here at Saco, and the Navy did also. We both found that it takes anywhere from 900 to 1000 rounds to have that droop happen. Unfortunately, because of that whole fiasco, the E3 lightweight barrels got a bad rap. I think they're still a great barrel for the right application... It keeps your gun lighter and still has very good effective firepower. I don't know what the sustained firing rate is on the SAW but my guess is the E3 lightweight barrel will easily match the SAW.

MGN: What's the recommended rate of sustained fire on this gun?

MARC: Saco goes by the Army prescribed rates. The army prescribed rate is a rapid fire rate that's 200 rounds per minute—change the barrel two minutes. The sustained fire rate is a 100 rounds per minute—change the barrel every ten minutes. If you do that you will never, never get in any problem whether it's the E3 or the M60 barrel. The criteria the Marine Corps had was they wanted a barrel that gives them the same sustained fire rate as the M60. They didn't care what that was; they didn't care what was in their operators manual. They said, "We perceive this as a problem and we want to have the same thing we had before." That's why we came up with the heavy barrel.

The reason we developed the short barrel, as the story goes, was the Navy, early on in the E3 program, came around with George Curtis and were out at the range with the E3. One of the Navy officials said, "Gees, if this thing was a little bit shorter, I could stick it under my coat." So George took the barrel, went to the engineering lab and cut it off and brought it back. He handed it back and said, "Here you go sir, try that out."

MGN: I had a friend who was just short enough that when he tried to jump with an M60 it got in the way (he loved the gun and wouldn't give it up).

MARC: Much of what you see on the E4 was the result of answering the mail from the Marine Corps. They said, "We need a heavier wall barrel, stronger bipods; they had a whole laundry list. We worked very closely with the Marine Corps for a year and a half to two years developing all these improvements—getting their blessing on them. We actually had kits in the field where they went out and gave them to the soldiers, who went out and trained and came back and told us, "OK, we like this, but this piece broke." We'd go back and perform some additional improvements. We finalized when they said, "Freeze the design, we like this, go with it." There were personnel changes in the Marine Corps, new people with new ideas came in and they pushed for the Marine Corps to go to the M240G when they found out that the Army had an excess stock of M240's. The new people who were

involved in the small arms program said they were experienced with the M240 from the coax position, and here's an opportunity to get all these M240s at no cost, brand new guns! "Our E3s are in terrible shape—they're old, they're beat up," they said. They did a comparison test. They tested our E3HB gun against the M240G. When they went into the test, all the 240s that they were going to get were brand new. The E3s were actually their used inventory with the upgrade, so our test had to include used guns. We went into the test at a significant disadvantage putting a used gun up against this brand new 240.

We found out after the test that not all of the E3s in the test were used guns. Half of them were new and half of them were used. The Marine Corps testers took the conglomeration of that new and used group and called that the results for the E3HB.

We were able to go back into the test report, take out all the data from the used guns, and look at what would have happened if the E3HB's were all new versus new 240's, and we actually did better on reliability. We did better on a number of things. There were ten categories and we did better in more than half of them. The others were about equal. None of that comes out because it's buried into a report this thick (holds hands about 6" apart). We have a copy of it, and the info is buried in there. Nobody wants to admit it because, everyone believes the 240 is better, it won the Marine Corps test. Nobody talks about the details of what went into the test. That's why I'm convinced that the Army's going to go with the M60E4 when they do their test next year. They're going to test new versus new.

MGN: A new test coming in '95?

MARC: The Army does. We started to work our way back and I kind of got distracted.

The other advantage I started to get into was the bipods. The E3 bipods were also mounted on the receiver but they were fairly lightweight, lacking strength. We've gotten reports of them coming back bent and broken. We came up with this design. It's actually

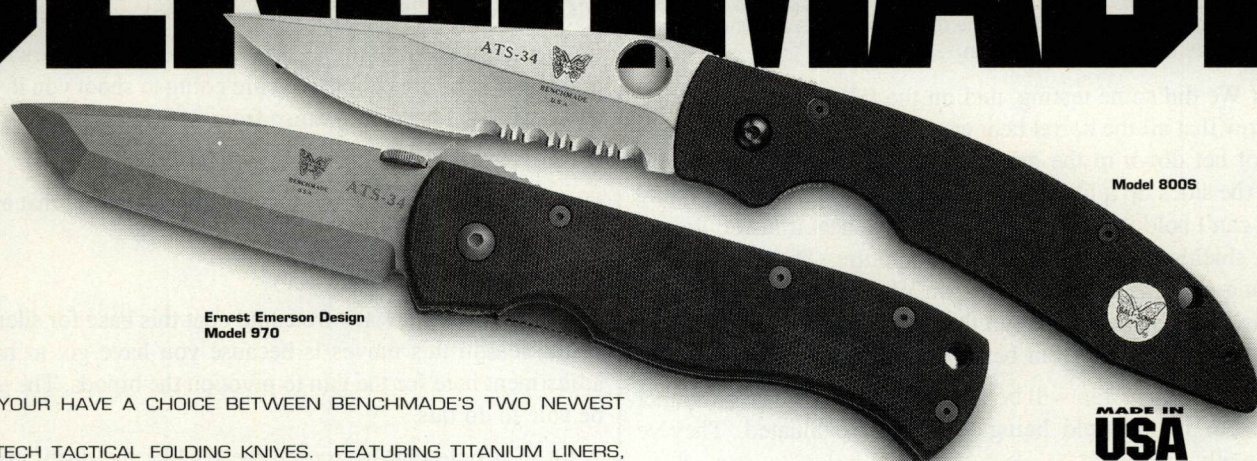
cheaper to make than the E3 it replaces, because it's simpler in design.—just a simple, tubular design. The additional advantage is it only takes one hand to deploy and to retract this bipod. With the M60 and the E3 can be retracted with one hand, but when you want to push them back in, you need one hand to hold the button and another hand to push the leg in. If some soldier is out there picking up his gun to run, he's going to have these bipods hanging out in mid-air. He's not going to take the time to push them in. These are quick and easy to operate. They fold just like the M60's did and they're much stronger than the E3's. They're as strong as or stronger than the M60 bipods.

Looking at the forearm, you need to have an open top design on



M60E3 flat bipod at the top, new M60E4 stronger, tubular design on the bottom.

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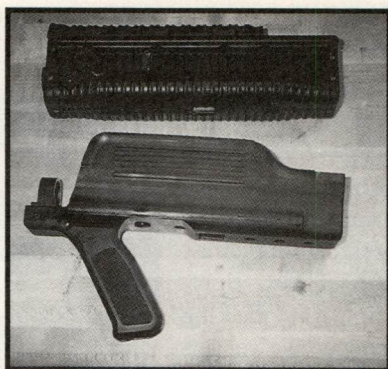
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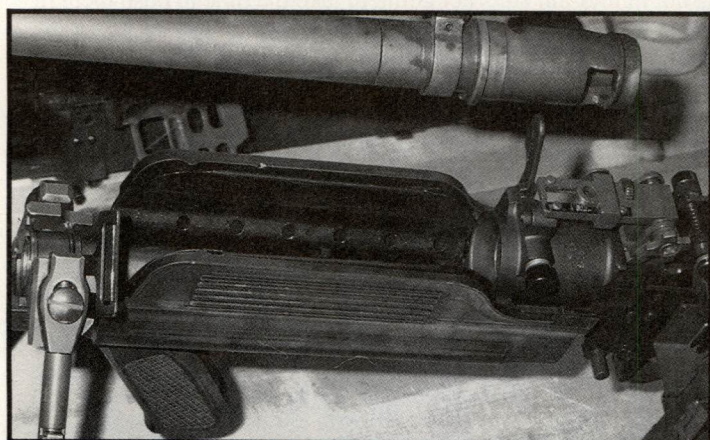
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the forearm in order to have a quick-change barrel. The E3 forearm design had a very low forearm, it is really called the heat shield, and it had a pistol grip on the front. A lot of the barrel was exposed. Soldiers would burn their hands on them. The Marine Corps said they need something that comes up higher and protects the user from the barrel. We came up with this design. Essentially if you grab the gun at any place where you're supposed to grab it, you are not going to burn yourself. There are always some hot parts existing on the weapon. The key was to be able to have the soldier pick up the gun and run with it without burning himself.

MGN: I note that the higher sides on the E4 forend make a nice channel for dropping the barrel into when you're in what might be termed a "high pucker factor" situation. You have to put a new barrel in it fast, and that design will guide the barrel in.



Top: Standard M60 forend. Bottom: New M60E4 model.



Quick changing a barrel on the E4. Note the heat shields and the natural channel to guide the barrel into position.

MARC: We did some testing, and on the E3 design the forearm was so low that all the barrel heat was dissipated quickly. It never really got hot down in the grip area. On the earlier designs, we brought the sides up a little higher. We did some firing and found that you can't hold it anymore because of the heat transfer. We put the heat shields inside, tested for temperature. Then we did the same thing with the old M60 forearm. We found that you have a better insulation with this design than you did with the M60. We wanted to at least be equal or better and we met that criteria.

The final forearm design will be glass filled. We've had a number of these out in the field being tested and evaluated. They've worked really well.

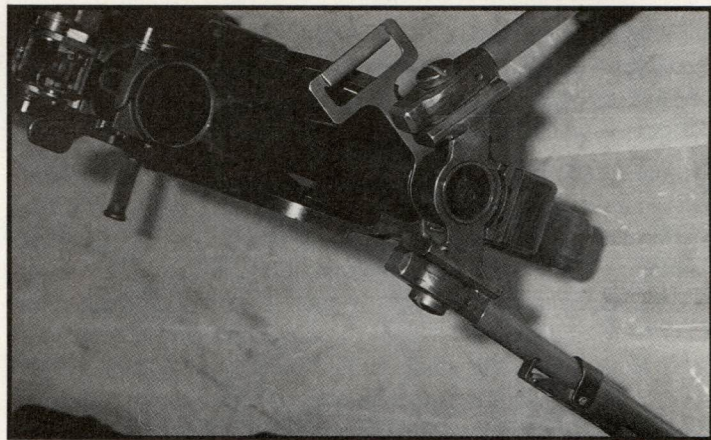
MGN: Your sling swivel is different also.

MARC: Yes, on the M60 the sling swivel was attached to the forearm...

MGN: And it broke off.

MARC: Yes, I've heard that. On the M60E3 the sling swivel was similar to what you see here, except this little loop would flop

over onto the barrel and melt your sling. We came up with this design here. This is an earlier prototype; our latest one looks almost identical to this but it's a little bit wider. It's a spring-tempered material and it's got a little dimple for strength. It's going to keep the sling from hitting on the barrel. We've been trying to keep ease of manufacturing in mind. It's a very simple one-piece stamping: simple, cost effective, does the job. We've got a really decent concurrent engineering group here at Saco and...



M60E4 bipod mount and new sling swivel design.

MGN: (Dan and Stan are moving the sling swivel) It's not too noisy... for somebody out in the bush they could always wrap that a little bit.

MARC: If you're good enough you've got the gun in the sling and aren't going to have that ting noise because you're going to have some tension on it. Without tension, then you might have sort of a rattle. Another feature is that you can only put it in one way. You can't get it in backwards. See how it leans back toward the operator. One more key point—it can't get in the way of the barrel. On the E3 it could. It has a stop to prevent it from getting in the way of the barrel change—no more slings coming around the wrong way.

MGN (Stan): What's the reason for this much movement?

(Dan): Let's keep it simple... If you have to go somewhere really quiet, and there are people who are going to shoot you if you make any noise, you need zero noise from a sling swivel....

(Stan): You don't want anything that rattles.

(Dan): It's like on the M16 swivels, the first thing that everybody did was tape them.

(Stan): You could change it by...

MARC: There are ways we could coat this base for silence... part of the reason this moves is because you have got to have some adjustment here for the gun to pivot on the bipods. The gun has to be able to do this.

A lot of people that have used the E3 like the pistol grip idea. It helps to get better control of the gun in the assault position. If you are firing off of the bipods, it probably doesn't make a whole lot of difference.

(Dan picks up the M60-E4 to test the front grip.) That weapon you're holding is 22 1/2 lbs less the scope, and less the ammo container.

MGN: It's a comfortable grip on the rear pistol grip. It's a nice

angle and the front grip has a nice angle too. The rear angle could still come up a little bit but...

MARC: You can fire that thing off the shoulder. It's really sweet.

STAN (Stan): The angle's nice on that front grip.

MGN: One of the things "The Interview with Peter Kokalis" concentrated on was how weapons designers should be paying attention to the way that people really are built, the way their hands are. The box magazine of course is a problem on the side but that's very difficult to defeat.

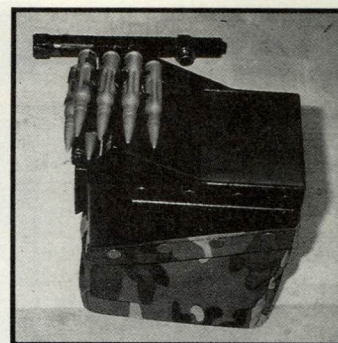
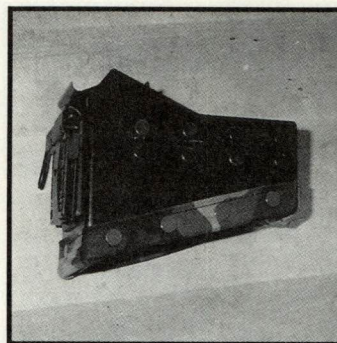
MARC: It is on this weapon. We've looked at trying to put it elsewhere. We are going to come up with a 50-round box which will keep it less obtrusive, but, depending on the role you are in, you may want to have that 100 rounds.

MGN: Yeah, the point of the exercise is to have firepower.

MARC: Look at the benefits of this design... when you're out in the field, ammo comes packed in that 100-round box. You drop the box in. It's also collapsible for storage. One of the really nice things is that when I go to load up, it's quiet. Try that with the SAW's plastic box. You hear an awful lot of rattling and everybody complains about this. Another benefit is the way you carry this magazine. You take the exact number of rounds that it takes to go from the box to the feed tray out, and lock them onto that clip lock. When you put the ammo container on the gun, pick it up, snap it in place, flip the cover up, and you've got the exact number of rounds you need to reach the feed position.

MGN (Stan): That's beautiful. That's a great improvement.

MARC: Obviously you guys have seen the bandoleer that's cur-



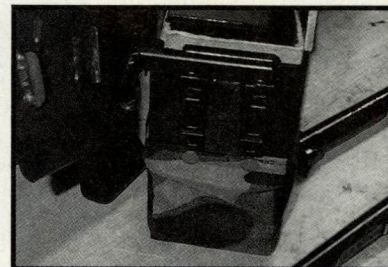
On left: M60E4 ammo container—folded up. On right: M60E4 ammo container with soft bottom. Note the exact number of rounds to reach the feeding position are locked into position on the top. Old M60 cloth bandoleer is next to it.

rently used on the M60. The ammo could fall outside. The ammo doesn't have any support.

MGN: The ones we have had were a green bag with a cardboard box in it.

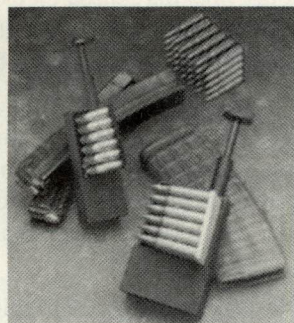
MARC: That's what the Army still uses. Those were the only options you had.

You can still use that on here with this bandoleer hanger. Note that the bandoleer hanger is not attached to the feed tray anymore. Keep in mind that this feed tray is a very delicate item. The retaining pawl location is very critical to the function of the gun. If you



V-shaped quick attach mechanism on the E4 ammo container and feed hanger.

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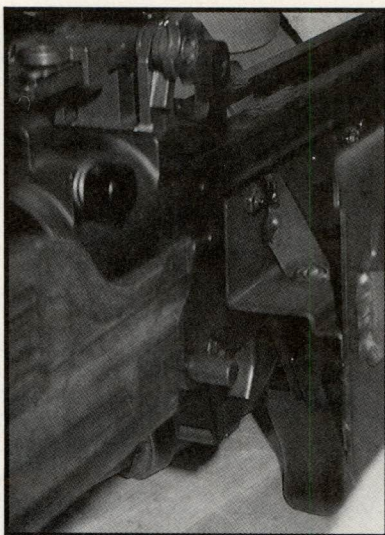
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hang that bandoleer hanger off there like it is on an M60 or E3 and that gun gets tossed into the back of a truck and gets hit with a sharp blow, this thing can bend, twist, break or whatever. If you don't know that it's bent, twisted or broken and you go to fire rounds, and this retaining pawl is dislocated by 50 thousandths or so, the gun jams. You don't know why it's jamming. By bolting the bandoleer hanger right to the receiver, you've eliminated that problem. It's a good solid mounting point.



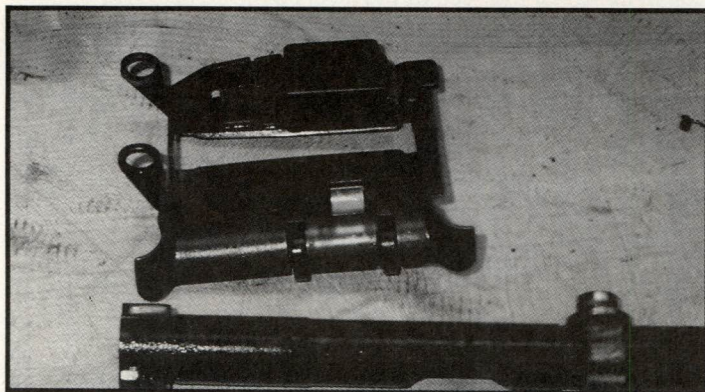
E4 feed hanger is bolted on the receiver.

You can quickly attach the ammo container easily at night. It's got a "V" channel that's easy to locate.

MGN: The link dispersion chute is different... the method of getting rid of links. Is that new on the E4 or is that on the E3 also?

MARC: This was changed over the years. It's on the E3 and some M60's. We install it on all models now.

MGN (Stan): Oh yeah! I see what you mean. Nice cartridge stop... it must really help the placement of the first round...



Feed tray with cartridge stop/link chute.

MGN (Dan): Most of the pieces that are in civilian ownership right now, and in the older military inventories, don't have this chute guide for the links.

MARK: You'll find that's related to some other changes in the way that the cover is designed. It's designed on average to overfeed the round. You always have to allow for wear, belt pull and stretch. If you overfeed too far and you don't have that kind of a stop, you don't have the round properly positioned for the bolt to pick it up every time. This adds again to the reliability.

Now that we've got the cover open, you need to be aware that we have changed some dimensional issues on the feed cam, the feed pawls and this retaining pawl, to get more belt pull. We've run some tests and we've tried varying the angles of the ammunition straight out, to the back, to the front, coming down, coming straight, all kinds of different variations. But the net effect of all of those tests are...

At this point the reader should go back to the beginning of this interview, and try to visualize some seagulls hot after a french fry....

MGN: (Dan, pouring over the top cover internals) Stan, the tension on that spring is a lot different. Feel it. Feel the tension there.

MGN (Stan): (Smiles at Marc) We're just looking.

MARC: You'll also find that this track is spring loaded so you can close the cover with the bolt in any position.

MGN (Dan): So the bolt cam connects in any position...

MGN (Stan): ...and ends the constant fight with knowing what the bolt position is when closing the top cover...

MARK: This re-engineering of the feed mechanism gives up to 50% improvement in belt pull. On average, you're going to find it's somewhere between 30-35%. This means a great improvement if you're out in an adverse environment. We had some Navy SEALs doing tests in the sand and they had belts laid out of 400 or 500 rounds across the sand, and they were pulling right into the gun. They thought it was great. It really is because the parts are interchangeable with the old ones! You can just switch them. They look and feel the same, and the cost is basically the same.

MGN: That's impressive because one of the biggest problems on a belt-fed weapon is the length of belt you're going to be able to pull up into the feed system.

MARC: We found it had nothing to do with not having enough energy in the operating group that was causing us the problem. It had to do with the dimensional overtravel that we had going over the retaining pawl and the failure to deliver the round all of the way into the feed position. It wasn't pulling the belt far enough to get over the retaining pawl. So we made a few dimensional adjustments and moved the retaining pawl up, changed the stroke, and without changing the accelerations or anything else in the bolt due to the piston or the op rod, we were able to get 35% belt pull improvement on average. We were really excited about that.

MGN: That's a major plus.

MARC: The real additional feature on the E4 is, if I put the bolt in the other sear notch, I can also close the cover and the weapon will still fire with no problem, which you can't do on an E3.

MGN: In the double sear notch that was introduced on the operating rod on the E3 model, if you had an E3 and you had it in the wrong sear notch when you cocked it back, you would not be able to close the cover.

MARC: Especially on a newer weapon. If you got an older weapon that was kind of worn in, it might cam it's way in, but it was not designed to and in many cases would not. Now it's designed to do that. We have a longer straight section to account for that.

MGN: You guys sure have been listening to what people have been saying.

MARC: We've been out in the field. I started in this business in '87, and one of the first things that we did was to go out and talk with the customers and ask "what's wrong?" They gave us an excellent. You've heard a lot of it from other people yourself. We've said, "Okay, we can fix that." It started with George Curtis. He did a lot of improvements on the E3 and it has culminated now with

the E4. I think we've really answered the mail as to what the problems have been with the gun. There are some limitations, I mean, if you're going to redesign everything then you're going to have a whole new gun. We want to be able to retro-fit existing assets—effectively—to give the soldier a better weapon.

The other point I wanted to make on the bandoleer hangers is that, even though this is bolted into the receiver, we're using holes that are already in the receiver—the same holes that we used on the "D" gun. Therefore, as a retrofit kit, nobody is out there drilling holes. It can be assembled in an armorer's shop, on his bench, with hand tools. So it's easy to do. In production, we would probably rivet this to the receiver as was done on the "D" gun. We've got a lot of rounds on some of these and they've stayed tight and worked real well. So we're happy with it.

The flat spring, that retains the pistol grip pins, has always been an issue on the M60s. This is a simple design improvement. There are a number of things that would cause it to come loose, one of which is improper assembly/disassembly. A lot of times when it won't come out they take a bigger hammer or something and jam it. Once you do that you've opened up the slot and then it won't hold no matter what you do. This new design comes out nice and simple the way I just showed you. It uses the same retaining mechanism as is used in the cover hinge pin.

MGN: It's got a captured pin in it.

MARC: Yep, captured pin. It's real quick and simple to put in the gun. While I've got this apart, I'll just show you the trigger assembly. This trigger assembly is the E3 trigger assembly essentially. It retains the same sear and all, but has an ambidextrous safety, and also has the winter trigger guard which you can release just like an M16 for use with winter mittens. It's also made of aluminum so it's lighter weight.

MGN: That grip retro-fits right into any 60?

MARC: That's correct.

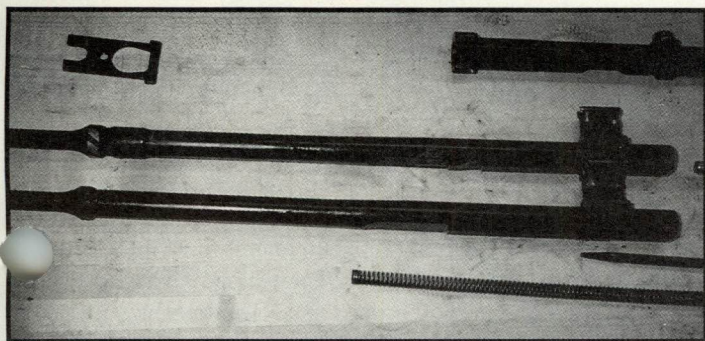
MGN (Stan): (Sotto voice) I want one. I want one. Dan, how can we get one of these kits...

MGN: M60 fanatics. How about any changes on your recoil mechanism?

MARC: The op-rod is standard E3, standard M60. Again that was one of the



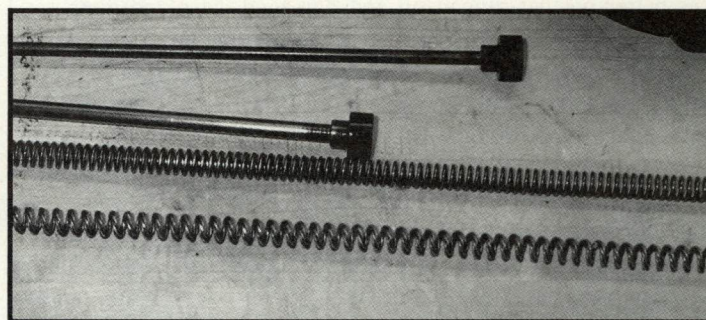
Top: M60 pistol grip/ trigger group with flat leaf spring that gets damaged. Bottom: M60E4 pistol grip/ trigger group with new flat spring, showing the capture pin. Note the slightly longer grip, and incline.



Top op-rod is the E4 dual notch, strengthened at the front, and heat treated at the bolt wear point.

items that was made common. We came up with a number of fixes during the E3 program that the Army said they wanted. We like the two-sear notch op-rod, and the idea that we've heat-treated the part of the rod that the bolt rides on and now it lasts so much longer. We thickened the section at the beginning of the op-rod and that prevents it from breaking. It's in the M60, the E3 and the E4. It's been around for a number of years. A lot of the older weapons that are in the field, even within the army units, still have the old op-rods. So they still break and they still get chewed up and that sort of thing.

MGN: How about the spring and spring guide.



Top: Old guide rod. Next: New, thicker one-piece guide rod. Next: New single-strand recoil spring. Bottom: Old multi-strand recoil spring.

MARC: Those have also been improved. I noticed in "The Interview" that Peter talked about a multi-strand spring. We now have a single strand spring, and it's been around for quite a while. This lasts longer and doesn't get the little flat spots. Well, it gets flat spots eventually, but it lasts a lot longer than the multi-strand spring. We've also got a one-piece, larger diameter spring guide, which lasts longer. The old style used to snap right off at the head. On the bolt, we've got a new extractor. It has at least twice the life it used to. The old ones used to fail (I'm doing these numbers from memory), somewhere on average of maybe 12-13,000 rounds. We've got some of these new extractors that went beyond 30,000 and still had no failures! We've significantly improved the extractor life. With the ejector spring, we went to multi-strand from a single strand spring, and that improved its life. We've got a new firing pin spring that we haven't introduced yet. But in our latest testing, it lasted twice as long as the old design. As you can see, we're continuously improving some of those parts to keep the weapon up to current technology.

MGN: Is your receiver lower channel treated differently than it was originally?

MARC: It's phosphate coated just like they've always been.

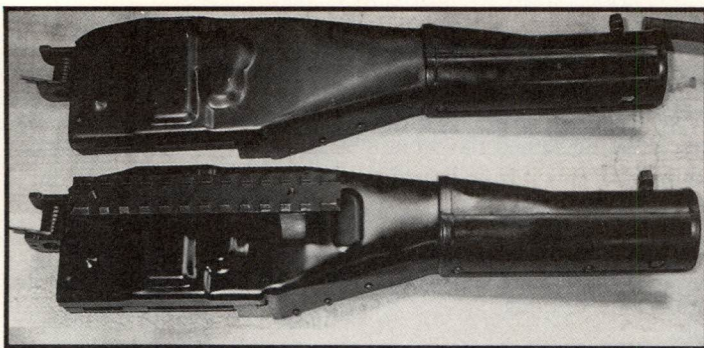
MGN: How about hardness of the metal.

MARC: No, that hasn't changed. Since the beginning it's been pretty much the same.

(Marc is assembling the pistol grip to the receiver) to put this back together, simply put the pin in, line that up, get a hold of the pin on the back side and you hear a snap.

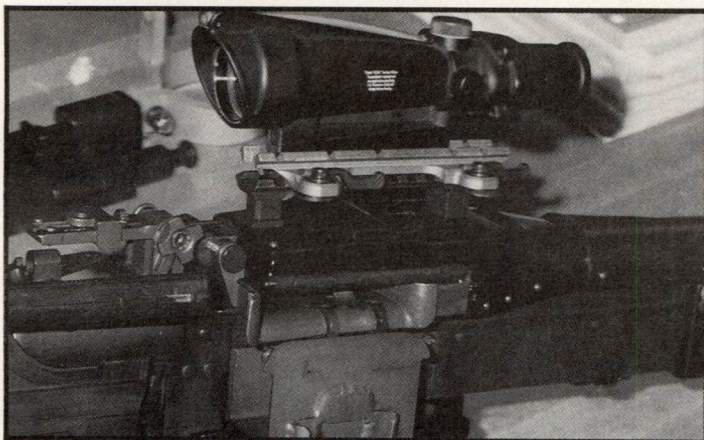
MGN: As the captured pin goes in. Beautiful.

MARC: Back to the top cover...note the Picatinny scope rail. The Army requires that you have a rail on your gun somewhere. What we've done is bolted it on. The rail is a fairly precise piece of equipment, and if you want to have repeatable bore sighting, these sur-



Top: Standard M60 top cover. Bottom: M60E4 cover with Picatinny rail.

faces better not get dinged up and damaged. Machine guns get tossed around. We felt by bolting it to the cover, if it does get damaged, it's going to be easy to replace without replacing a very expensive cover assembly. We bolted it in with lock-tight. If you need to take it out, you put a little heat on the bolts, and they come out. We've done lots of firing out in the field, and the soldiers have too (we've loaned some of these guns out to the 101st and 82nd). They just love this set-up. They can't believe that you can put a sight on here and get so much more accuracy. The real benefit is you've got a 3 1/2 power sight. When you're firing out to 900 or 1000 meters you can see where you're tracers are going and you can walk the fire right into where you want it.



M60E4 with Picatinny rail and Trijicon ACOG scope.

MGN: Is that the standard scope that you're representing with the gun? (Trijicon ACOG)

MARC: We don't have any official representation agreement with Trijicon. I personally like the sight, and we have been working with Trijicon. They supply us the sights and whenever we go out and do a demo, we've typically brought the Trijicon sight on the gun. We think it complements the weapon. It's a real good rugged sight, and there's no battery power required for the light source.

MGN: Trijicon has a lot of really nice designs. Will your rail accommodate almost any of the starlight or night-vision devices?

MARC: We've fired it with PVS-4's, we've fired it with thermals, and some of the day/night units. I think the Viper is the name brand of one of them. You can basically put anything you want on there. It's a universal rail. We use the Dis-con throw-lever system, which is a repeatable bore sight system. We do the gun, and we do an interface to whatever it is that the Army or the customer may want to use. The possibilities are endless.

We have two major improvements to the buttstock. One is weight. This buttstock weighs a pound less than the one on the M60. A pound is an awful lot on a machine gun like this. You really don't give up function; you still have the shoulder rest. The E3 never had the shoulder rest, but it does have the lightweight composite buttstock. The other big thing is that if you talk to anybody in the field about buttstocks on the M60, they'll say that the buttstocks fall off after a while. You've got a little

spring plunger in the back and the spring gets weak, the plunger gets worn, and eventually the thing will fall off on its own. The new one has the simplest of designs. We just put a little T-slot in the back of the buttstock. It's simple to make; it's a positive lock. It's not going to come apart. The capturing mechanism design has been in the field with the E3 and it's worked really well. We've lightened the weight, reduced the cost, and improved the reliability with a very simple device.

MGN: The buttstock removes just lifting the yoke.....

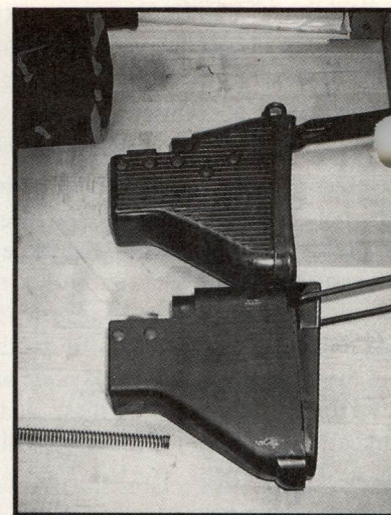
MARC: Exactly. And when you look at an M60 buttstock, it is supposed to be taken out by lifting the shoulder rest, pressing cleaning rod in the end, then pulling the buttstock off. Nobody anywhere that I've seen uses that method to take off a buttstock. They jiggle it, and fight with it until they get it. We've just made it a more natural process. Who's going to go find a cleaning rod part that he doesn't have in his pocket because he's running around in the jungle, right?

The biggest improvement over the E3 here is we've added a shoulder rest so that you don't lose any of the benefits that you had with the M60.

MGN: Have you changed the rate of fire?

MARC: Rate of fire is the same. We feel the rate of fire is a definite advantage on this gun. I get things from inventors from time to time saying that they just designed a new gun that is going to fire 5600 rounds per minute. Of course, you can still only carry so much ammo. If the rate of fire is 550 rpm, it's a good steady rate; good for a defensive position. It conserves ammunition yet lets you put enough lead out there that whatever is coming at you, you can suppress. You can do just as well with 500 rpm as 1000, and you get twice as much longevity of your ammo consumption. Read "We were soldiers once, and young" about Vietnam, and some of the encounters they had out there. When the guy ran out of ammo, that was it. The enemy was coming over the hill it was over. Well, if you're out there, and the pucker factor is coming into effect and you're shooting this gun in defensive role, a 1000 rpm gun, you are going to consume, on average, twice as much ammo as if you've got a 500-round gun. That means with 500 rounds, you get to live twice as long.

The other advantage is, our M60 has a 500 rpm rate combined



Top is old M60 buttstock. Bottom is new M60E4 buttstock.

with an internal hydraulic buffer. This means you have a very controllable weapon. Most of the other 7.62 machine guns don't have a hydraulic buffer system. They lose controllability. Combine that with a higher rate of fire, and the impulse (recoil) felt in your shoulder is tremendous. That gun is going to climb and come off target. The M60 can be accurately shoulder fired.

MGN (Stan): I've walked a standard M60 into a car at around 400 yards, from the shoulder.

MARC: And you can just keep holding it on target...it just keeps going.

MGN (Dan): (Sotto Voice) Kind of an Energizer Bunny of the machine gun world....

MGN (Stan): Have you ever fired an MG3?

MARC: No, we have an MG42 here. We haven't fired it. I haven't fired it.

MGN (Dan): There is a tremendous rate of fire on the MG42. It goes back to the German's theory of the "window of opportunity" that you must get as many bullets into it as fast as possible. The Germans analyzed film footage of an actual combat assault—soldiers coming at them.. What they ended up finding out was that the squads tended to all be up at once or leap frogging over each other, and there were frames of film that showed many more targets than others. For hit probability, it was important to get as many bullets into that "frame" or "opportunity" as possible. That's where the MG42 came up with that awful 1200 rpm.

MARC: In that kind of combat (such as WWII) when there were just big masses of your enemy coming over the hill, maybe that made more sense. It seems like in today's warfare, guerrilla warfare, looking at Vietnam, looking at most combat environments today including urban environments, that no longer is the way wars are fought. Again, if your going to take a defensive position and you've got a bunker full of ammo behind you, maybe the high rate of fire is not a bad solution. The M60E4 is meant to be a medium machine gun, which is an infantry gun and in that role, I think the 500 rounds per minute makes more sense.

MGN (Stan): A General Purpose Machine Gun.

Specifications

Caliber	7.62x51mm
Maximum Effective Range	1,100 meters (1,200 yards)
Maximum Range	3,725 meters (4,075 yards)
Muzzle Velocity	853m/s (2800 fps)
Rate of Fire	500-650 rounds per minute
Weight	
M60E4—LMG:	
(short barrel)	10.2kg (22.5 lbs)
(long barrel)	10.5kg (23.1 lbs)
(assault barrel)	9.9kg (21.3 lbs)
M60E4—Mounted	10.7kg (22.7 lbs)
M60E4—Coax	9.6kg (21.2 lbs)
Length	
M60E4—LMG	
(short barrel)	958mm (37.7 in)
(long barrel)	1077mm (42.4 in)
(assault barrel)	940mm (37.0 in)
M60E4—Mounted	1105mm (43.5 in)
M60E4—Coax	1074mm (42.3 in)
Width	
M60E4—LMG	120mm (4.8 in)
M60E4—Mounted	149mm (5.9 in)
M60E4—Coax	120mm (4.8 in)
Barrel Construction	Stellite®-lined, chrome-plated

MARC: GPMG. If you want a coax gun, to install a gun on a vehicle that's got an unlimited amount of ammo in there,...

MGN (Dan): Go up to the hyper cyclic and mini-gun styles.

MARC: Anti-aircraft, or if you've got fast moving targets, helicopters, certainly the higher rate of fire makes more sense.

MGN (Dan): The M60 is effective against the helicopter?

MARC: Against helicopters it is. But planes nowadays don't come to the point where you can reach them with a 7.62 caliber weapon.

MGN (Stan): No. They step back three or four miles, push a button and you're done.

MARC: Exactly. The General Purpose Machine Gun is not really intended for that threat. The M60 is made to fulfill a number of functions. One of it's best performances is in the forward assault—firing it from the shoulder or from hip.

MGN (Dan): That's one problem with the Browning 1919 series. You really cannot fire the gun from the shoulder. It's an emplaced gun. It is not something that you can realistically take on a forward assault and fire.

Major Improvements:

- Barrel
 - Thick-walled barrel for sustained firing.
 - Fail-safe reversible piston, positive-lock gas cylinder extension.
 - Barrel changing handle eliminates need for heat mitten.
- Lightweight, one-hand operated receiver mounted bipod eliminates the weight of a bipod on the spare barrel.
- Lightweight forearm/pistol grip for improved control and protection during firing.
- Feed cover eliminates charging jams and improves operator safety.
- Integrated fire control system bracket gives the weapon 24 hour capability (US Picatinny rail).
- Easy to attach/detach 50 and 100 round ammunition containers eliminate ammunition spills and jams due to dirty ammunition.
- Relocated ammunition container hanger prevents feed tray damage.
- Lightweight trigger assembly with ambidextrous safety switch and winter trigger guard allows gun to be fired with winter mittens.
- New flat spring on trigger assembly prevents accidental detachment of the assembly.
- Lightweight buttstock with hinged shoulder rest and improved buffer attachment mechanism provides for fail-safe attachment of the buttstock to the receiver.

Note: All major improvements do not apply to all M60E4 models due to their configurations.

MGN (Stan): The 1919A6 series is supposed to fulfill that role....

MARC: It's too big.

MGN (Stan): A heavy, uncomfortable gun to shoot. If you tried to shoot one off hand, oh, you could do it, but you're not very accurate.

MARC: We feel very strongly that the M60E4 meets all of the GPMG requirements and is very controllable to shoot, as well as being comfortable and natural to the operator.

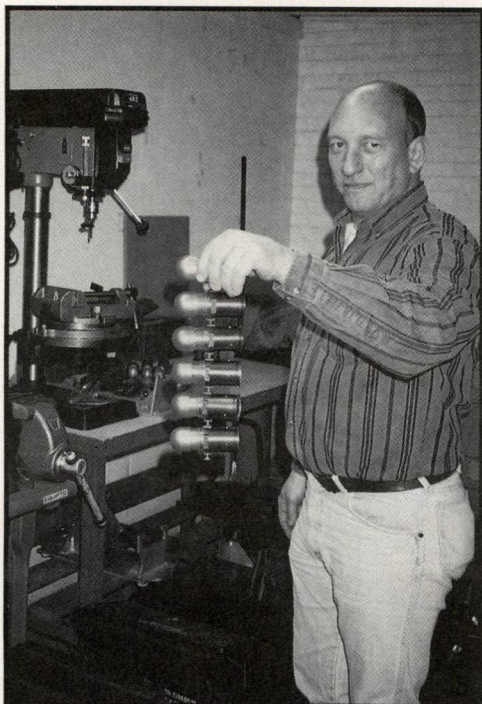
MGN (Dan): I find the FN-MAG to be awkward from the shoulder but haven't really had much time with them, other than on a mount...

MARC: How about we head out to the range before the range personnel take off?

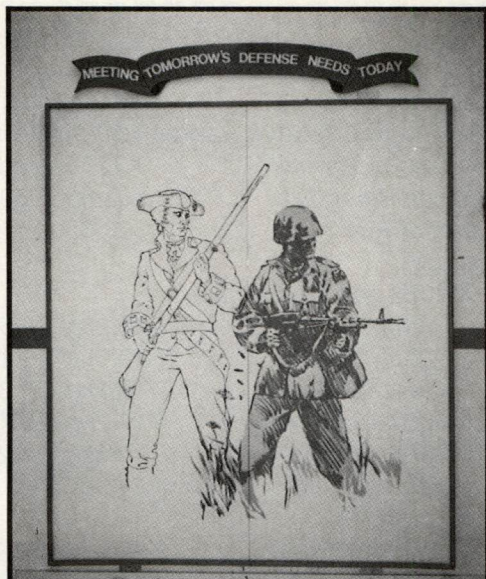
MGN (Dan and Stan): You want us to go shoot the E4? No problem, which way to the range....

SHORT REACTION TO THE FIRING:

The E4 was definitely a controllable machine gun. We did all firing (about one hundred rounds) from the shoulder, and kept the groups in a man-sized target. We were firing indoors in a darkened range, and the flash was negligible. The flash hider was truly amazing. Most of the characteristics of the M60, rate of fire, shouldering comfort, etc., were still there. At about four pounds less than the M60, with the E4 it was noticeably easier to maintain target acquisition. We were not able to



Stan makes a neat discovery while rooting through Saco's "back room." Nice gold cups, too bad they're dummies, right, Stan?



This mural greets the visitor to the manufacturing area.



A small section of the Saco Defense manufacturing area.



Pneumatic testing of the newly assembled machine gun breaks them in slow, and helps identify any fine tuning needed.

"ring it out" for a full field test, which would require several days and thousands of rounds. The firing was enough, however, to convince both Stan and I that Saco's new E4 model has addressed all of the negatives that the M60 and E3 models have exhibited. The only negative was that the ammunition feeding device does block your left elbow a little bit. It always has, and so does the feed device on every other belt-fed GPMG that is side fed—and the ones that feed from the bottom keep your profile way too high. The ammunition feeding device was truly a benefit. The rounds locked on the top flipped right over onto the feed tray, and the cartridges stop-positioned it exactly—no fumbling around! We both highly recommend any group that is evaluating GPMG's to take the time to try the E4 model of the M60. You will be impressed, for sure.

—Dan

Saco Defense does not deal with individual purchasers, only with government agencies. Please direct questions from individuals to:

Dan Shea, C/O MGN

PO Box 459

Lake Hamilton, AR 71951.

Government and related inquiries should be directed to:

Marc S. Desrochers

Program Manager M60

Saco Defense, Inc.

291 North St.

Saco, ME 04072-0890

Fax: (207) 283-1395

German WW1 120-round cloth ammunition belt with brass spacers. Well preserved in very good condition, quantity limited...\$100.00 (XM1026)

Interwar 250-round ALUMINUM belt developed for easy hand loading for use with the 08 Maxim, the .303 Vickers and 08/15 Maxim using the 08 feed pawl without finger guide. Works wonderful. (See Devil's Paintbrush, page 350, 2nd edition.)

Three belts.....\$35.00 (XM1000)

Similar Interwar belt to the Aluminum model but of steel construction, presumably for heavy duty use, scarce.....\$75.00 (XM1027)

German WW1 Steel ammunition Can (PATRONENKASTE 15). This model 1915 all steel 250-round can was the forerunner of the WW2 MG34 can commonly encountered. Very slightly different in construction to the WW2 can, this was the first 250-round steel can to be adopted by the Germans. WW1 production. Good/Very Good condition, empty can.

.....\$25.00 (XM1028)

German WW1 Water Can Model 1916. These are the original rectangular water cans that were designed to be the same size as the 1915 ammunition can for ease of carrying. Extremely difficult to find, complete with swivel water spout. (See Devil's Paintbrush, Page 196, 2nd edition.)

.....\$195.00 (XM1029)

German WW1 08/15 100-round Ammunition Drum (Trommel Patronenkasten 1916). These drums attached to the side bracket of the 08/15 to allow easy weapon maneuverability. German markings. Complete with reel, good to very good condition, very scarce. (See Devil's Paintbrush, page 166, 2nd edition.)

.....\$350.00 (XM1030)

German WW1 Maxim Barrel Carriers, made to carry either one or two barrels. Wartime issue was four barrels per gun so carriers were an essential accessory. Carriers came in all steel or in leather-covered wood and are offered in very good condition as follows:

Single barrel leather carrier.....\$125.00 (XM1031)

Single barrel steel carrier.....\$150.00 (XM1032)

Double barrel leather carrier.....\$150.00 (XM1017)

Double barrel steel carrier.....\$200.00 (XM1018)

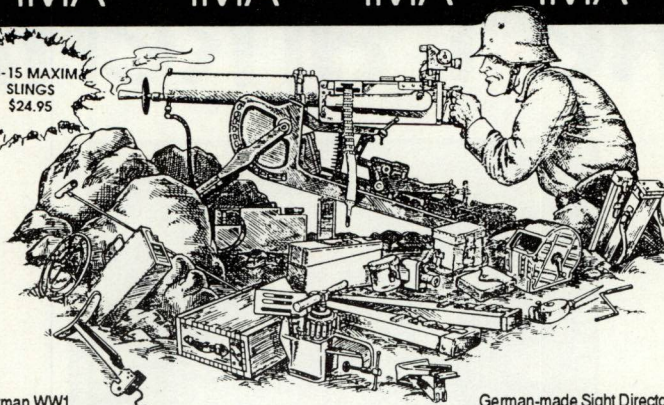
Note: The double barrel steel carrier is also fitted with a compartment to carry a cleaning rod (not present). (See Devil's Paintbrush, page 192, 2nd edition.)

German 08 Maxim barrels, 7.92mm, best grade, almost like new.....\$175.00 (XM1019)

Very good condition.....\$125.00 (XM1020)

Three for.....\$300.00 (XM1021)

08-15 MAXIM SLINGS \$24.95



German WW1 Maxim Blank Firing Attachment with soaking can. Very scarce and in excellent condition. (See Devil's Paintbrush, pages 193/4, 2nd edition.)

.....\$250.00 (XM1008)

We have a few Blank firing attachments NOT in cans at.....\$175.00 (XM1022)

German 08 Maxim Muzzle booster assembly with soaking can (optional circular flash shield not included), excellent condition. (See Devil's Paintbrush, pages 193/4, 2nd edition.)

.....\$250.00 (XM1009)

German 08 Maxim locks complete, serial numbered and proof marked in very good/excellent condition.....\$75.00 (XM1023)

We also have a few unnumbered Armourer's locks which were issued as replacements also in Very good/excellent condition, just perfect to complete your gun.....\$125.00 (XM1024)

German Maxim WW1 Optics direct fire sight made by Emil Busch of Rathenau, fully operational, complete in original leather case. (See Devil's Paintbrush, page 182, 2nd edition.) Very Good condition.....\$350.00 (XM1037)

German Maxim WW1 Optics direct fire sight made by Ernst Leitz of Wetzlar, fully operational, complete in original leather case. All these direct-fire optics sights were 2.5 power and officially designated "Zielfernrohr 12" commonly referred to as "ZF 12." (See Devil's Paintbrush, page 182, 2nd edition.) Very good condition, very few only, very rare model.....\$495.00 (XM1038)

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MP-34 STEYR SOLOTHURN

Original parts sets minus receiver. Comes with one magazine, sling, and stripper guide. Finely made and marked with German Waffenamts.....\$225.00 (GP3401)

Special selection kit.....\$250.00

I.M.A. ILLUSTRATED CATALOGUE SEND \$3.00

M18 Type Arty.

Scope for 57mm A.T.G. \$75.00 (WWII dated/British mfg.)

Sight Holder for M24/M24A1 Mount \$200.00

M-79 MOUNT \$2700.00 FOB MILLINGTON, NJ

QUANTITY MAGAZINE AND BELT SALE

Unissued post-war MP40 Magazines.....\$ 35.00 (XG4001)

Buy Five for.....\$100.00 (XG4004)

Or Buy Twenty for.....\$300.00 (XG4005)

French 7.5mm 24/29 LMG Box Magazines.....\$ 9.95 (XF1000)

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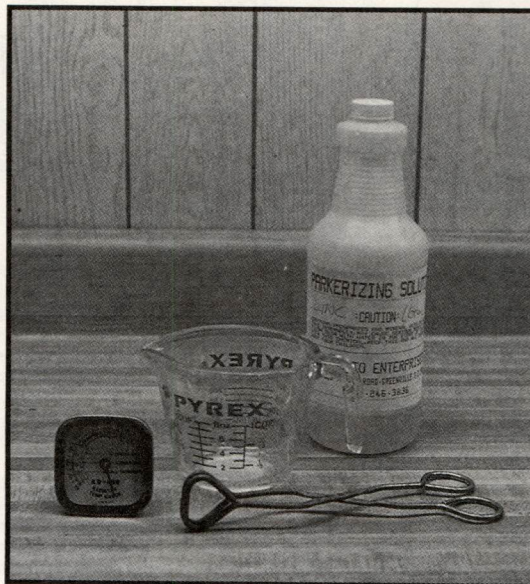
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Home Parkerizing



by FRANK IANNAMICO

“Necessity is the mother of invention” or as applied to my situation, “things to parkerize and no one willing to do it.” I had several Class 3 firearms with finishes that were worn or painted, and I had parts and magazines that needed refinishing. I thought finding someone local to redo them would not be a problem, so I decided to have them refinished. On several occasions I had taken my Class 3 arms to different gunsmiths to be parkerized. Well as I was to discover, this was not going to be easy. They would not do them while I waited. I was unwilling to leave them (its illegal unless you transfer the arm to the gunsmith), or they would not touch a machine gun. At that point I decided if I wanted my guns parkerized, I was going to have to do it myself.

Before I start into the actual process, I think it would be fitting to go into a little history about parkerizing. Prior to WWII, polished, blued firearms were the norm for the military. Late in WWI the military sought a more durable finish for its arms, and went to the parkerizing method. The procedure consisted of sandblasting the metal and immersing it into a chemical solution. The result was a finish that was durable, resisted rust by retaining minute oil particles, and the finish was non-reflec-

tive—all ideal for a military weapon. “Parkerizing” is a trade name of the Parker Rust Proof Company.

At the end of WWI, all weapons that were rebuilt by the U.S. military along with all WWII, new production weapons underwent the parkerizing process. The colors sometimes vary due to different arsenals and manufacturers doing the work. It has been said that the application of cosmoline will darken the color and give it that distinctive WWII green, although this may take a few years to accomplish.

The process is relatively easy and the results, as long as you are careful and follow the instructions, are excellent. There is a choice of two different colors: black (magnesium) and the military gray-green (zinc). I’ve found through some experimenting that if you, for example, parkerize something with the green first, then reparkerize it using the black solution, the green will turn a darker shade. This process may be useful to some who want a little more authenticity in their work. On original weapons, all of the part colors seldom matched. For example, the trigger or bolt would be a shade different. Again this is because of all the various contractors involved in wartime weapon production.

To get started you will need some easily obtained materials and supplies. First you will need the parkerizing chemicals. I got mine from Anthony Owens of Palmetto Enterprises. It comes as a liquid and in several sizes, the smallest being a quart. A quart will go a long way. The chemical is mixed with water at about 4 ounces of chemical to 1 gallon of water for the green. For the black, the mixing ratio is 14 ounces of chemical to 1 gallon of water. Although not absolutely necessary, I’ve always used bottled, distilled water for the process as a precaution against any contamination from the water. Next you will need some containers to heat the solution and be large enough to contain the firearm or parts you are going to parkerize. The containers must be stainless steel or heat proof glass such as Pyrex that is used for cooking. If you should “borrow” anything from your kitchen, DO NOT use it again for cooking any type food products. I use a three gallon stainless cooking pot that I purchased at a variety store. I use this pot for handguns or any parts that I can fit in it. An Uzi will fit very nicely also. For large projects I had a special 3.5 foot X 6 inch stainless container made. Very similar containers are sold by Brownells at a reasonable cost. I have a Pyrex measuring con-

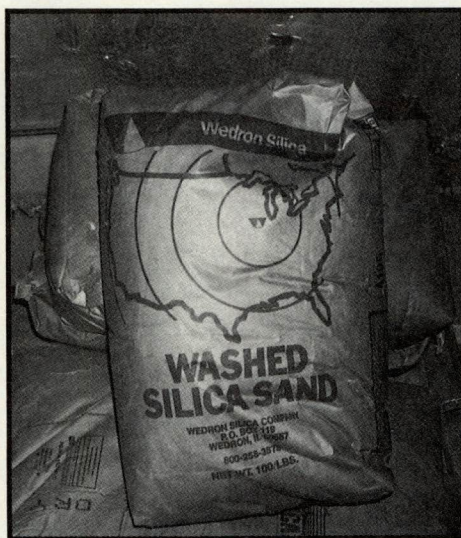
tainer that I use when measuring the chemical, and I also use it for very small parts. Another item you will need is a thermometer to measure the temperature of the solution. It must be heated to approximately 180 to 200 degrees Fahrenheit. An automotive radiator thermometer works fine. Next you will need a pair of steel tongs so you can handle the hot parts. A pair of rubber gloves also will be needed, as the chemicals may irritate your skin. Eye protection and perhaps an apron is also strongly recommended. The heat source is easy: the kitchen stove.

The next step is to completely disassemble the firearm you are going to refinish. Be sure to remove ALL pins and springs. If you do not, they may corrode. After the firearm has been disassembled, it needs to be degreased. Gunscrubber or Brakeleen, an automotive product that is used to clean brakes on automobiles, works well. The barrel of the gun should be tightly sealed or plugged to keep out sand or grit that will be used in the next step.

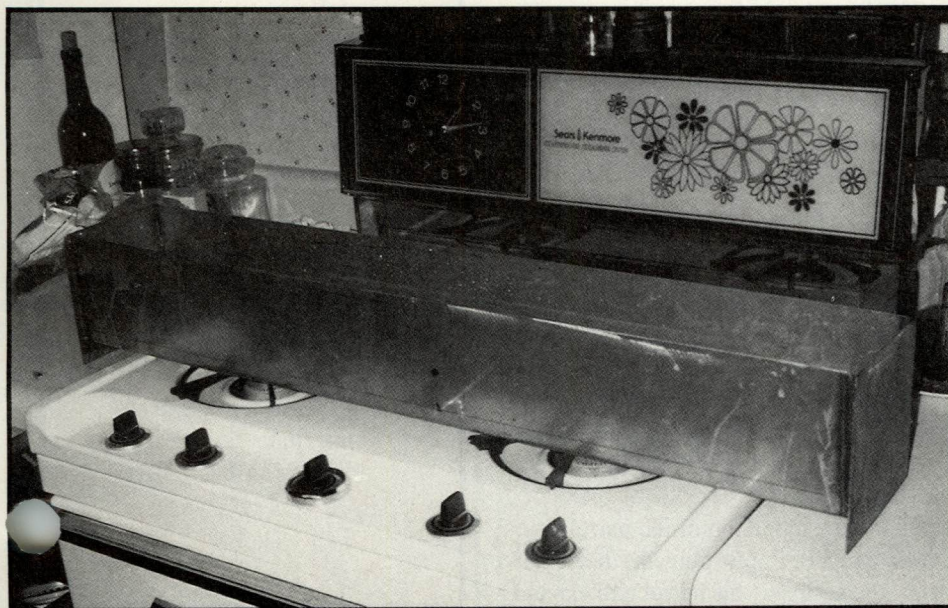
You will now need to have the parts or guns either sandblasted or glassbeaded to remove the old finish. Sandblasting will leave a rougher finish that will partially reveal a pitted or less-than-perfect surface. The sand used for blasting isn't like beach sand. The sand used is very fine. Be sure whoever does the work doesn't have the air pressure on the blasting equipment too high, or the surface may be rougher than you want. Most auto body repair shops have sandblasting equipment. The

other option is glassbeading. Instead of using sand, fine glass "beads" are utilized. They look a lot like sand. The finish will be very smooth, and the lettering on the gun will be virtually unaffected. Most automotive engine rebuilders have glassbeading equipment. When having your parts blasted, be sure there are no dark spots. The appearance of the items blasted will look like they are painted flat silver. After blasting, DO NOT TOUCH the parts with your hands—any oil or other contaminants may spot the finish. After blasting, it is advisable to parkerize the parts as soon as possible. One reason is the parts will start to rust after a few hours especially in humid areas.

Now at last you are ready for the final step. Start by mixing the chemical with the



The sand used is specially made for sand blasting, it's like a fine powder in consistency.



Stainless steel tank made at a fabricating shop. Note how it fits over two burners.

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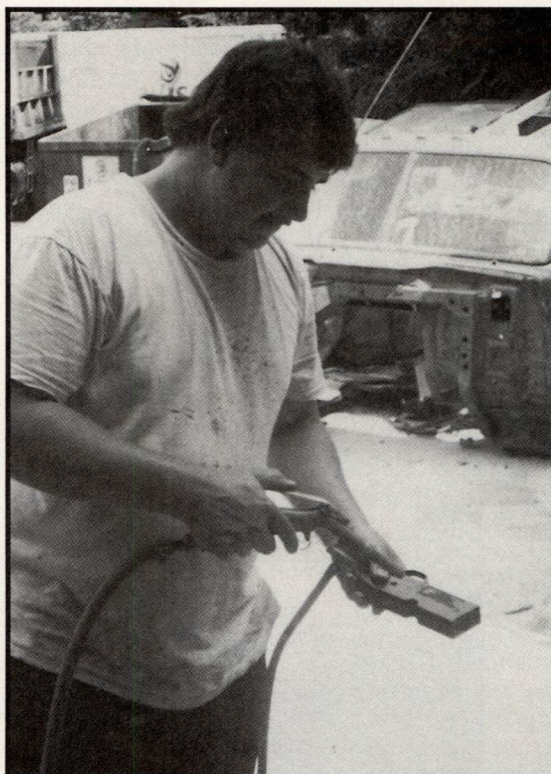
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Matt Kirsopp of Happy Wheels Auto Body prepares parts by sand blasting.

water using the correct amount for the color you are using. (Mixing instructions come with the chemicals.) Heat the solution to the proper temperature, and maintain it throughout the process. Carefully lower the parts in the solution using the tongs or by using a straightened coathanger as a hook. Try not to rub the parts against each other in the tank. After the parts have been immersed for 20 to 40 minutes, they are done and can now be removed. The parts will be hot, so be careful. The last step is to wipe the parts dry and then immediately spray them with oil or WD-40. Make sure that you spray all small holes and crevices to stop the process or corrosion will appear. Wipe off the excess oil then, using #000 fine steel wool, buff the parts. Reassemble and you're done. Keep a light film of oil on the assembled gun or parts. NOTE: To keep barrels free from the parkerizing chemicals you must use the following steps:

1. Plug one end of the barrel.
2. Heat some plain water to almost boiling temperature.
3. Carefully fill the bore with the hot water, be careful!
4. Plug the other end of the barrel.

You cannot simply plug the barrel. If you do, the air inside the barrel will expand when it is immersed in the hot solution, and the plugs will pop out. If you do acci-

dentally parkerize the inside of the barrel, don't worry. A few hundred rounds will wear the parkerizing off.

There are a few limitations what type of metals can be parkerized. Aluminum, stainless, plated or pot metal cannot be parkerized. So if you have an AR-15 or M16, you're out of luck. The solution will dissolve aluminum. Too bad because the black parkerizing looks just like the M16 finish.

One condition that affects the color is the hardness of the steel. If you are familiar with 1911 pistols, you will see that the area around the ejection port will appear darker. This is because this area has been hardened. The front of the slides also will appear darker for this reason. Although the parkerizing process may seem involved, it is actually very easy to get professional results. The materials you need are really not expensive. For less than the cost of having one

gun done professionally, you could do many guns yourself. The gray green solution can be reused several times. The black, however, cannot be reused once it has cooled. If you are afraid to try the process on your expensive machine gun, just try it on a piece of scrap metal first. After experimenting with the process, I think you will be surprised how easy it is.

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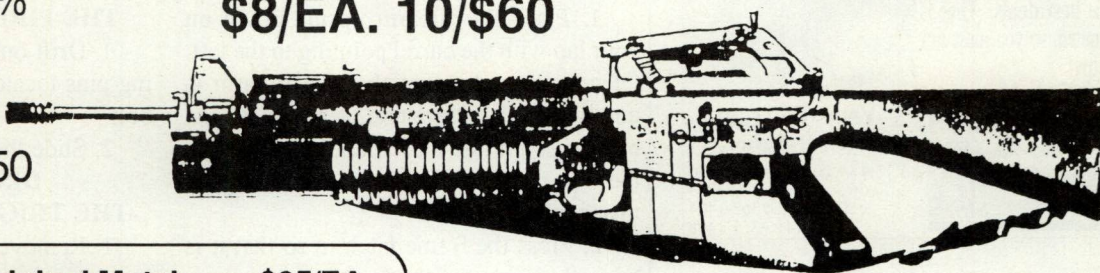
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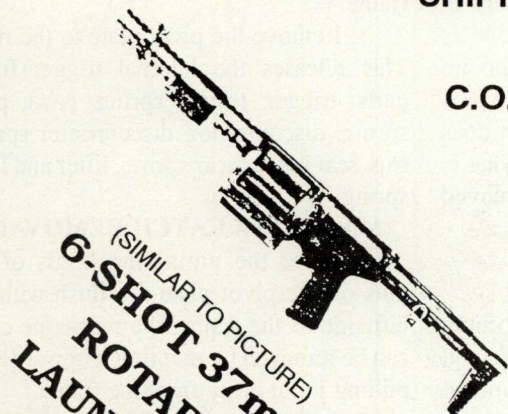
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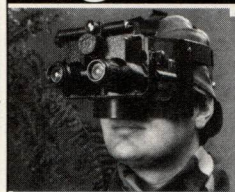


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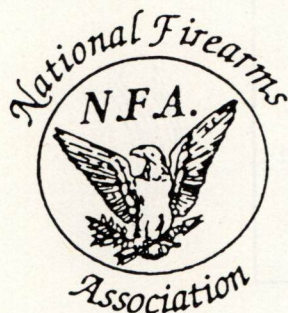


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Tinkering With Thompsons

by **JIM KLODZINSKI** of **GUNMACHINES**

Basic Reliability for the Semi-Auto Thompson Carbine, Part II.

In order to implement the basic reliability techniques for the semi-auto Thompson Carbine, it is necessary to be able to disassemble the firearm. Its disassembly is almost the same as the full auto version, and this "almost" is what can cause consternation unless you know the "secret."

A. TO REMOVE FRAME FROM RECEIVER:

1. Place the firearm upside down on your lap with the barrel pointing to the left. Of course, make sure that the firearm is empty and the magazine is removed; the bolt must first be closed and the safety in the "fire" position, that is pointing to toward the barrel.

2. Press the frame latch in so that it is beneath the rear of the frame.

3. With your left palm, tap the pistol grip to the rear, sliding the frame rearward until it is caught and held by the sear.

4. Press in the frame latch again with a thin bladed knife or screwdriver so that you can continue to move the frame rearward. This pressing down of the frame latch with a thin blade allows the frame latch to clear the sear so that the frame can be completely removed rearward. This step with a thin blade is not necessary in the full auto version, and unless one is aware of this little "secret," those who are schooled in the full auto disassembly procedure become frustrated because it does not become clearly apparent as to what is stopping the frame from being removed without some thought and analysis.

B. TO REMOVE THE BOLT FROM RECEIVER:

1. Press forward on the plate joining the two recoil spring guides at the rear, and with the receiver upside down, lift up and pull the entire bolt assembly free of the receiver.

2. The firing pin spring and guide may now be pulled out through the hole in the rear of the receiver.

3. Elevate the muzzle letting the bolt slide all the way to the rear of the receiver, moving the bolt back with the cocking handle if necessary.

4. Slide the cocking handle all the way to the rear and take it out through the large hole in the top of the receiver.

5. Turn the receiver upright and the bolt will now drop out.

REMOVAL OF THE FIRING PIN FROM BOLT:

1. Drift out the two tight-fitting retaining pins located in the square body of the bolt.

2. Slide the firing pin out to the rear.

DISASSEMBLY OF THE TRIGGER-FRAME GROUP:

1. Remove the Pivot Plate by first prying the spring leaf out from under the slotted end of the safety lever on the right side of the firearm. (When doing this, be careful not to scratch the finish on the side of the frame. Use a broad-bladed screwdriver with the head padded to be on the safe side.)

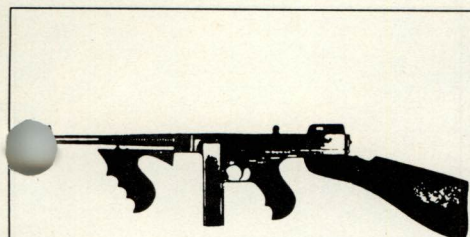
2. Then press the two heads of the pivot plate pins protruding from the left side of the frame into the frame so that the head of the pins are within the side of the frame.

3. Remove the pivot plate to the right. This releases the internal trigger frame parts: trigger, trigger spring, pawl, pawl spring, disconnecter, disconnecter spring, trip, sear block, sear spring, lifter and lifter spring.

MAGAZINE CATCH REMOVAL:

1. Once the protruding heads of the pins on the pivot plate are flush with the left side of the frame, the magazine catch can be removed by pivoting it upwards and pulling it out away from the frame.

Over the past few years I have been asked about the availability of printed information concerning the Thompson semi-auto carbine. The only information available in print that I am aware of is



Chapter 11 in the book, *The Gun That Made The Twenties Roar*, by Helmer. Chapter 11 was actually written by George C. Nonte, Jr. and is entitled "Thompsons, Trast and Today." (Editor's Note: Ira Trast owned Auto Ordnance Corp. when the semi-auto Thompson Carbine was developed in early 1970.) The chapter has 16 pages of text and photographs covering the history, operation, assembly and disassembly of the 1927 A1 and its variations. I recommend it.

Thoroughly clean and minutely inspect all of the internal trigger frame parts and the bolt assembly parts together with all of the springs. I recommend just soaking them all in a pan of Hoppes #9 for a while. After a thorough cleaning, inspect all of the parts for burrs or roughness, particularly any holes or recesses in parts that accommodate springs or another part. Smooth and polish all of the parts, particularly at the area where one part touches another part and the inside of any holes or recesses. Pay special attention to the firing pin and thoroughly clean the slot in the bolt in which it sits. Try to smooth and polish this slot also. Many of the reliability problems stem from rough firing pins and dirt or fouling in the firing pin slot.

Smooth and polish the inside sides of the trigger frame, the top of the trigger frame on which the bolt rides, and the inside top and sides of the receiver.

All of this may seem basic and obvious; nevertheless, it makes a world of difference in the reliable operation of the semi-auto and improves the trigger pull. The next article will deal in more detail concerning smoothing and polishing of parts and applying the 13 steps of the full auto Gunmachines Trouble-Shooting Manual to the semi-auto Thompson Carbine.

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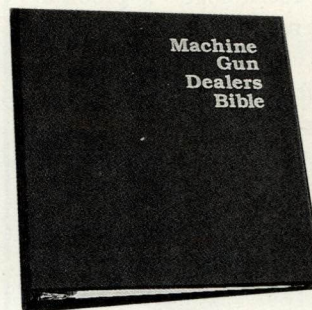
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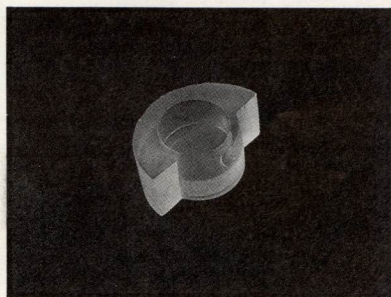
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by CHRIS A. CHOAT

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H&K ANNOUNCES THEIR .45 ACP USP

Heckler & Koch has just announced that it will introduce the .45 acp version of their USP pistol. While details of the new handgun are sketchy, it will be introduced at the 1995 SHOT SHOW in Las Vegas. MGN will be there to shoot and report on the new pistol. More on this after the show.

GUNNY SACK II BY DESANTIS

DeSantis Holster & Leather Goods, Inc., announces the release of its new "Gunny Sack II." The original DeSantis Gunny Sack was given the unique distinction of being the "most innovative design to come around in years." Now DeSantis adds a new zip to this famous pouch. Manufactured completely of durable nylon, the "Gunny Sack II"



has a zippered closure around the weapon compartment, which has a pull tab on both the right and left sides of the pouch to allow for easy opening. The Gunny Sack II has the DeSantis patented holster system allowing for either right or left side carry. The patented interchangeable holster system is available in two sizes, allowing it to fit a majority of handguns. The Gunny Sack II also incorporates two smaller zippered compartments for credentials, cuffs, spare magazine or personal items. It is available in black, royal blue, navy blue, forest green and burgundy as well as black and natural suede leather. For more information contact: DeSantis Holster & Leather Goods, Inc., P.O. Box 2039, New Hyde Park, NY 11040-0701. Phone: 1-516-354-8000.

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A new brass catcher has just been introduced and promises to be a boon for the machine gun shooter. The new catcher can be used with virtually any firearm from handguns to belt-feds. Called the Brass Net, this revolutionary device is durable, portable and very easy to set up and use. It features an aluminum tripod type folding frame and polypropylene netting which makes it light yet wind resistant. It folds down which allows it to be carried to the range easily. The new catcher deposits the shooter's brass right at its base for easy retrieval and it can be used indoors as well as at outdoor ranges. Although light and easily moved and set up, the Brass Net can be used with the violent ejecting firearms such as the H&K G-3. These are great for close quarters such as the firing line at Knob Creek. For more information or to place an order contact: Brass Net Corporation, 541 Fifth Avenue, McKeesport, PA 15132.

9MM SUBSONIC AMMUNITION FROM G&L ARMS

G&L Arms of Williamsburg, VA is now the exclusive distributor for a new 9mm ammo for suppressor uses. The remanufactured ammo uses 147 grain FMJ bullets loaded in once fired brass. The ammo is very reliable and is very quiet. (Author's note: I have tried this ammo and it is first rate. In my suppressed MP-5 it fired flawlessly with very little noise.) The ammo comes packed in 250 round bricks; four to a case. Price are \$47.50 per brick, or \$180.00 per case both plus shipping. G&L Arms also carries other ammunition for the shooting enthusiast. For more information or to place an order contact: George (Little Fat Guy) or Laurie (Little Fat Guy's Wife) Christy at G&L Arms, 6064 Mooretown Road, Williamsburg, VA 23188. Phone: 1-804-565-2820.

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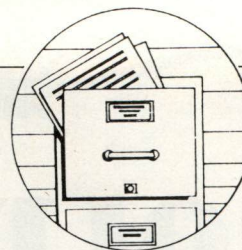
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The Forms

by DAN SHEA



The item of interest I am watching this month is a result of a recent Supreme Court decision: Judge Clarence Thomas for the majority. Liberals have been afraid of the Judge, with good reason. He is a proponent of "natural law," and constitutionality, not "judicial activism." I have mentioned the Staples Case before in this column because of the pertinence of this recent Supreme Court finding.

Staples is a man who owned an AR-15 semi-automatic rifle that was found to have some M16 parts in it, but it had not been altered to full automatic. There are five components (hammer, trigger, bolt carrier, disconnect and selector) in the AR-15 series that, if any one or more are replaced with the corresponding M16 components, you are considered by ATF to be in possession of an untaxed, unregistered machine gun. Mere possession of these M16 parts and an AR-15 is prosecuted as a felony! Installing them in an AR-15 will not result in a fully automatic firearm; it merely allows the hammer to follow the bolt carrier, resulting in a stoppage, light firing pin hit on what might have been the second shot fired with one trigger pull. A second shot might occur if the primer sits high in the primer pocket, or the firing pin is long—a very dangerous situation. Drilling the sear hole and installing the sear will make the AR-15 full automatic. Staples had not drilled the sear hole and did not have the sear. He had several M16 parts in his AR-15 and was arrested. His attorneys argued just about every way you can imagine, but he was convicted of owning an unregistered (untaxed) machine gun. The appeals courts upheld the conviction, until, surprisingly, the Supreme Court decided to hear it.

Judge Thomas' words were a clear slap at the way firearms regulations have been enforced. He said that the government must prove that Staples knowingly broke the law. Staples contended that he bought the gun second hand at a gun show. "It never worked," and he didn't know why. Thomas held that these laws are vague, and it is the responsibility of the government to prove

there was a violation. He has returned the burden of proof to the prosecution, where it belongs.

Why this is so important is the shifting of the Court's viewpoint. Those who follow constitutionality know that this was the correct decision, but decisions like this have been sadly lacking. ATF must now look at all of the cases that it pursues from a different angle, i.e., is the person that they are trying to arrest (and sometimes set up!) really aware that there is a violation? We may see a kinder, friendlier ATF! It would be from enlightened self-interest, I will admit. Government employees, under the Haynes ruling, are personally liable for their actions, and pursuing citizens on questionable, minor violations may be made to look unattractive to ATF agents. It would be nice to see their energies concentrated on criminals instead of harassing licensees over minor violations or entrapment.

On another note: I have been receiving some requests that I go over the licensing procedures, and the related transfer forms again. If you want this done, drop a note or fax to *MGN* and tell me what forms or procedures you would specifically like done in detail. I will start with whatever the readers appear to want.

Q Would putting a 93R front foregrip on a standard Beretta 92F make it an AOW? If so, what kind of paperwork would I need to construct it or would it have to be sent to a Class 2 manufacturer? Regarding the 15mm Steyr AMR anti-material rifle, where can I obtain any information about it? Is it available in the U.S. at this time?

I enjoy your magazine very much, but I would like to start seeing more articles on rare or bizarre items such as Stoner 63, 63A, HK 79 40mm grenade launchers, suppressed HK P9S systems as used by special forces, or the Walther WA 2000 system. How about some comparisons of suppressors between Knights Armament and AWC Systems Technology.

All in all, hats off to you as I look forward to my next issue!

P.F.

A The 92 pistol, with an added front grip, will be an AOW (Any Other Weapon). How it is registered is entirely up to you. If you are capable of doing this work yourself (it's not an easy thing; the trigger guard is different and must be replaced for a proper installation), you would file a Form 1 to manufacture a firearm prior to starting. You would pay the \$200 making tax, be fingerprinted, photographed, and get the required law enforcement signature. Once you receive the Form 1 back from NFA Branch in Washington, approved, then you may do the work. If you send it to a Class 2 manufacturer (I have seen Stan Andrews and Tim Bixler do this work; I am sure there are others), he will file a Form 2 to manufacture—no tax other than the FET—then complete the work. The newly registered AOW will be transferred back to you, by Form 3 tax exempt, if you are a Special Occupational Taxpayer (Class 3). Or, if you are an individual, it will have to be transferred to a Class 3 in your state, then on a Form 4 (\$200—tax, fingerprint, photographs, law enforcement signature) to you.

The Steyr 15mm is not available to the public that I am aware of. Remember, anything in the rifle category with a bore diameter over 1/2" is considered a Destructive Device, and can't be imported for private ownership. Converted to millimeters, that would be over 12.7mm (our .50 caliber). Then, there is the "sporting use" criteria that is being attached to all imports. I don't see it being available.

Regards your items of interest, we will continue to bring you varied and interesting articles. If you look through the list of subjects in the back issues of *MGN*, you will find that we have covered many of these topics, and they are available as back issues, or photocopies of back issues.

Q My question today relates to the fact that I have been a craftsman in two or three trades during my life. I've been a stock broker for a number of years and the holder of an FFL for ten years. Last year I decided to expand my status to Class 3 and have

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Greg Latka, President

3 licensed business. Most likely I would live in the next county which is named (strangely enough) St. Louis County but has no relationship with St. Louis which is it's own county. Will I be able to move my inventory back to Missouri? Also, will I need to change my license from Type 01 to a C&R license? I don't know how else to have these questions answered. Local law enforcement in that area is not cooperative at all in answering these types of questions, they would rather say no to all than possibly helping.

God bless Texas!!! When I lived in Missouri, I was a Type 01 dealer for many years and was always under the belief that we could never own a machine gun at all. When I relocated to the Houston area all it took was to go to my first gun show here and the new world of Title II weapons was shown to me. Now I worry about not being able to take my weapons (inventory) back to old St. Lou's and be able to keep this small, but fun and lucrative business.

Sincerely,

Mike L.

A The city of St. Louis restricts the ownership of all of the NFA firearms (letter from sheriff or chief law enforcement officer). Missouri itself allows the Class 3 dealers own all machine guns, short barreled shotguns and rifles, Any Other Weapons, and Destructive Devices. Silencers may only be transferred in to sell to law enforcement, and if you fail to make the sale, you are supposed to transfer it out. Individuals may own Title II firearms listed on the Curios and Relics list.

Q What is the purpose of Article 4, Sections 1 and 2 of the Constitution? "Full faith & credit shall be given in each state to the public acts...!" Is a license-to-carry permit a "public act?" Should your license-to-carry be given "full faith & credit?" "...citizens of each state shall be entitled to all privileges...in the several states!" If the Constitution is the supreme law of the land, why then are responsible Americans denied their rights, as enumerated under Article 4, Sections 1 and 2? Don't Americans have rights in other states?

Don S.

A Whew. Alright, I'll take a short stab at it. You are trying to understand why all states are not required to honor your state's permit to carry a firearm. This is not the Constitutional section that you should be looking at. If you are a purist about this—and you appear to be—the question is: "How can you license a Right?" The Supreme Court

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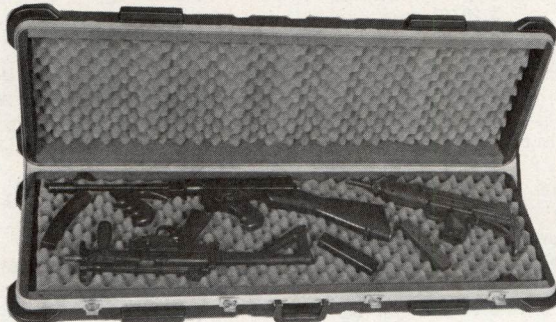
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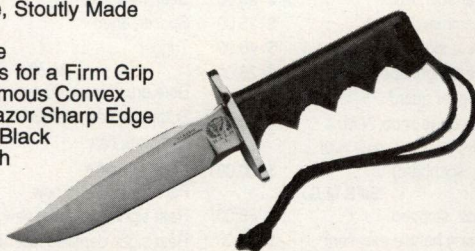
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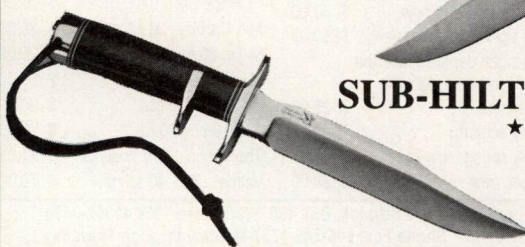


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has ruled that you cannot, in reference to the Right to Vote, the Right to Free Speech, etc. They are running like all Hell is on their heels from having to confront the Second Amendment and to rule on whether firearms ownership is a Right. We know it is, and they know it is. It is the ramifications of that eventual ruling that addresses your question. If it's a Right, it can't be licensed, even by State or local ordinance! "The Forms" has gone over the process by which the Federal Government usurps our Rights, many times. It is rooted in the Commerce Clause (import "bans" and restrictions, dealer licensing), or in the power to tax (NFA firearms, etc). As soon as the Court rules the Second Amendment a Right, all of the BS regulations fall. We need one firearms law; commit a violent crime with a firearm, go to jail for 20 years in addition to the punishment for the crime. Then you wouldn't have to worry about "carry permits."

Q Do complete parts kits reach jobbers with or without complete receivers? Complete I hope—my collection has stopped because I have not found a (DROR) Johnson MG or LMG available with a dummy or demil nonserviceable receiver.

a model inert receiver be obtained using my C&R license and a form? That seems long on effort with a non-gun job requirement. Your section has pointed up invaluable solutions more instances than one.

Chuck C.

A Most importers buy the firearms complete, then disassemble them either overseas, or in a Free Trade Zone that permits such manipulation. Once their Form 6's are approved, they import the parts. I have not seen DROR type parts in a long, long time. Receiver parts that were torched into three or more pieces, using an industrial torch head that removes and disperses more than 3/8" of metal, used to be approved for import as scrap. I do not believe that this is the case anymore. There are several importers who deal with Israel, who made the DROR model of the Johnson in small quantities. I think I would call Mark Dotten at I.M.A. (see his ad in MGN) or Cholly Steen at Sarco (908) 647-3800 and see if they have any DROR parts floating around.

After this month's (November 1994) "The Forms" column I'll bet you're getting a —load of these questions!

So, I'll just ask it! Do you need a \$320.20 for a short-barreled shotgun? The

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.308 Win: 168gr Hornady B.T.H.P.M.	(50 boxes of 20)	\$450.00	
.30-06: 168gr. Hornady B.T.H.P.M.	(50 boxes of 20)	\$450.00	
.50 B.M.G. 647gr. FMJ	100	\$300.00	
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reg's listed: machine guns, Destructive Devices, and short-barreled rifles. You asked the NFA Branch about suppressors and AOW's. These seem to miss the point on a legally registered short-barreled subgun.

Terrific columns, but I sure wish you guys would cover the left coast more. After all, we gave you Feinstein!...and Reagan!

And belt-feds might not "rule" if someone made a 200-round magazine for a MAC-10!

Sincerely,
 Bob

Once again, NFA has said that you don't need a Form 5320.20 to cross state lines for anything other than what is listed in the Law itself:

Title 18 USC, 922:

(a) It shall be unlawful:

(4) For any person, other than a licensed importer, licensed manufacturer, licensed dealer, or licensed collector, to transport in interstate or foreign commerce any Destructive Device, machine gun (as defined in section 5845 of the Internal Revenue Code of 1954), short barreled shotgun, or short barreled rifle, except as specifically authorized by the Secretary consistent with public safety and necessity.

Silencers (suppressors), and AOW's are the only NFA firearms that are exempt from the 5320.20 filing requirement.

I thank you for RR, who I wish would not let his handlers control him so rigidly, as he slips into the sunset of Alzheimer's. I have noted that he now makes "public announcements" that are 180 degrees from what this "great communicator" and staunch anti-communist once championed. Remember when America had a real President? I have been frustrated by his signing of the MG manufacturing ban, but attribute that to the fact that his advisers assured him that the Mclure Volkmer Law was a great stride forward for the gun owning public. We Class 3 enthusiasts are a minority, and that is easy to forget. You may keep Feinstein or flush her back into the socialist cesspool from which she slithered, for all that I care.

And Bob, you realize that you are effectively proposing a MAC "monopod"? I am not sure how I feel about that.

Questions to:

Dan Shea, c/o MGN

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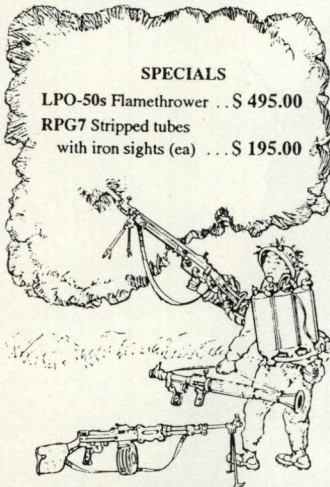
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Archive Photo of the Month

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LOCATION UNKNOWN, date circa 1935. This catalog sheet shows John Browning's outstanding "MA DEUCE" .50 caliber machine gun mounted for anti-aircraft use on a special multi-purpose commercial tripod. Note the AA sights strapped on the water cooling jacket. As can be determined from the type inset in the box at bottom, this was specially produced to assist sales to Latin American governments. Credit: COLT'S PATENT FIREARMS COMPANY/Author's collection Copyright © 1995 ROBERT BRUCE PHOTO. Editor's Note: Robert regrets that he cannot handle individual requests for photographs. However, publishers and documentary filmmakers, etc., are encouraged to contact him for information on use of archive images. Send a self-addressed stamped envelope and details on intended use to **ROBERT BRUCE PHOTO, P.O. Box 482 MGN, SANDSTON, VA 23150.**



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Barrel Removal
5. Model 28 to 21 Conversion & Vice-Versa
6. Firing the 1928 w/o a Blish Lock?!!
7. Playing w/Cycle Rates-Pt. 1 Intro
8. Playing w/Cycle Rates-Pt. 2 Friction
9. Playing w/Cycle Rates-Pt. 3
Ammunition & Springs
10. Playing w/Cycle Rates-Pt. 4 Weight
11. Playing w/Cycle Rates-Pt. 5 Additional
Observations on Cycle Rates
12. Playing w/Cycle Rates-Pt. 6 TSMG
Cycle Rates & the PAC MKIII Full-Auto
Timer
13. Further Reliability Notes: Bolt
Stem Aperture
14. The Thompson Models-Pt. 1,
Models 1921, 1927, 1928 & 1928A1
15. Thompson Models Pt. 2,
Models M1, M1A1
16. Further Reliability Notes: The Trip
17. Further Reliability Notes: Internal Springs
18. Magazine Loader for Thompson
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TSMG!
20. Gunmachines Combat
Competition TSMG-Pt. 1
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22. A Short Barreled Thompson
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24. Basic Reliability Problem: Models
1928, M1 & M1A1
25. Field Expedient Blish Lock
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Cleaning & a "Trigger-Job"
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32. Thompson Cracked Receivers-Pt. 1
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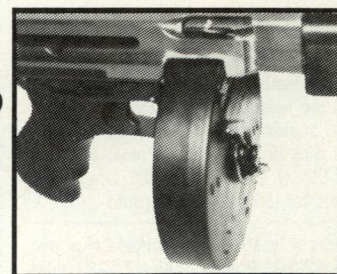
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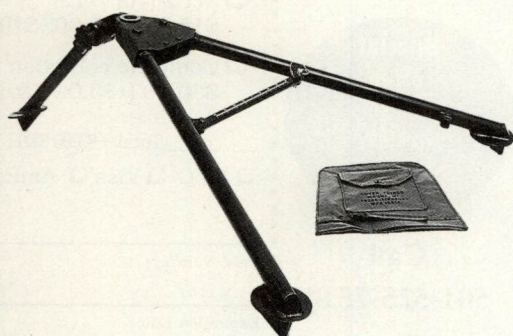
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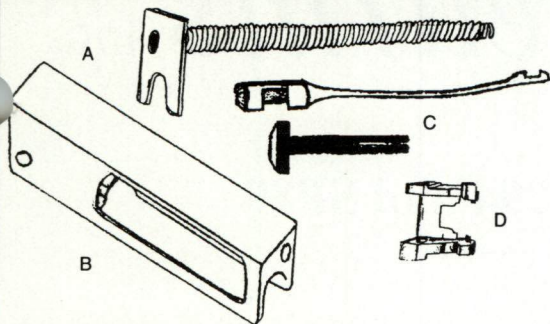
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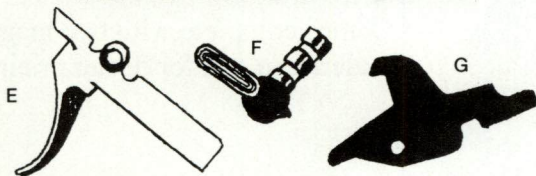
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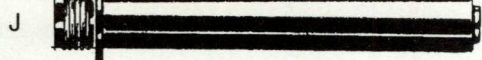


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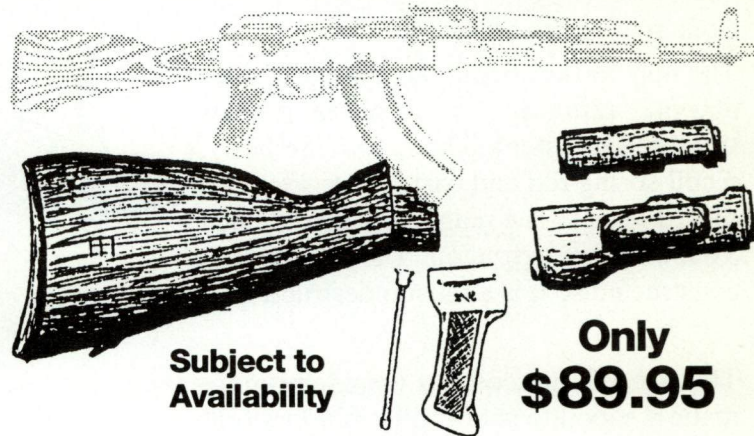


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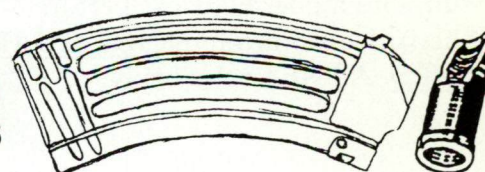
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