

Really

By Steven Matthews

Building an AR from Scratch

Want an AR-15 with your name as the manufacturer? Now you can have one with the receiver kit offered by JPFO. With careful work, it is the basis for a useful rifle.

Building your own has become all part of the fun for black rifle fans. With JPFO's receiver kit, you can stamp your own name on your gun.

The AR-15 is now entering its golden years. It has been with us for almost 50 years in one form or another. Over these five decades it has been modified, modernized and in the last few years extensively customized. What started out as a basic infantry rifle has morphed into a platform that can support a vast array of accessories.

As a man who appreciates basic functionality and simplicity I find all these gizmos and gadgets to be distractions from the rifle's basic function. Of course my opinion is in the minority today, as evidenced by the overwhelming abundance of AR-15 accessories available.

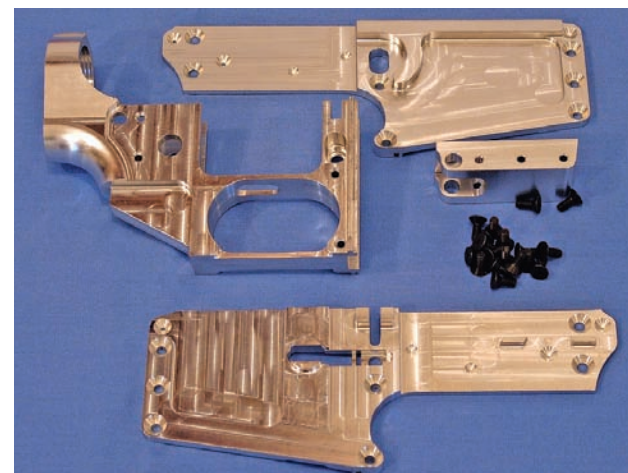
A quick look through the pages of SGN will show the accessory aftermarket is booming, so I was skeptical when the editor asked me to test a new AR-15 component. My first thought was "what are they going to hang on this gun now!" Fortunately, as I read further, I found it was not an accessory but a new kind of receiver, intended to be assembled and finished by the home gunsmith.

The gun rights organization JPFO (Jews for the Preservation of Firearms Ownership) will be marketing this new design. Unlike a conventional one-piece receiver, it features two sideplates that connect to two center sections with screws.

By drilling and tapping several holes, the home builder can complete a functional AR-15 receiver. The manufacturer, KT Ordnance, has taken the AR-15 receiver design and split it into four interlocking pieces that are held together with 14 high-strength screws. The sideplates are machined from 6061 T6 aluminum as are the center sections.

The sections interlock with tongue and grooves and only use the screws to hold the pieces in location. The machining appears to be top notch on the one I received. The four pieces replicate the general appearance of a standard receiver.

Everything you would find on a regular receiver is there, it's just been split into four subassemblies. Since the pieces are not "complete" they are not considered to be a firearm by BATFE



The JPFO receiver is made in four pieces. Screws and tongue-in-groove construction hold everything together. Tapping several 6/40 size holes is required.

The Legal Issues of Home Building Firearms

In March and May of this year SGN published a two-part article I wrote on home building a Sten semi-auto Carbine. In many emails from readers I was asked the same question over and over, "is this legal?" Since this article involves "making" a firearm I thought I would address the issue here. Under BATFE regulations it is completely legal for an individual to make their own firearm as long as certain rules are observed.

Individuals may make a firearm (rifle, pistol or shotgun) for personal use, The "personal use" issue is the key here. You cannot make it for resale as manufacturing for resale requires a manufacturing license and the payment of a federal excise tax of 11%.

There are no provisions for individuals to pay this tax, even if you wanted to. This more or less means that any gun you make is yours for life unless some provisions of firearms law is changed in the future. With so many doing home building I expect some rule changes in the future but can't speculate if they will be more or less favorable to the home builder.

Home built guns are not required to be marked as to manufacturer's name, address and serial number but

BATFE "highly recommends" marking them. This is just a good "cover your butt" procedure since it can prevent problems when dealing with law enforcement officers you may encounter while shooting. This is especially important on politically incorrect guns that seem to draw extra scrutiny!

Most law enforcement officers are not knowledgeable on firearms law and will only know you are in possession of an "untraceable gun." Save yourself potential problems and mark your creations. Name (business or personal), address and a serial number of your choice is all you need.

Of course there are other rules that apply. Full-autos are restricted to those holding special licenses. Rifles must have barrels at least 16 inches long and an overall length of 26 inches. Any semi-auto must not be capable of being "readily convertible" to full auto, which is especially important when choosing your parts when building an AR-15.

Always use AR-15 specific components in an AR project, never use M16 parts in the fire control group.

The BATFE has a website (www.atf.treas.gov) with extensive information and can answer many more questions you may have.

SGN



A quality tap and die set such as this Brownells set will ease the building process. Avoid the low-cost and low-quality imported sets if you want quality tools.

rules until the unit is assembled and finished by drilling and tapping the necessary holes.

It can be purchased by anyone without the usual FFL paperwork hassles and delivered right to the door. This is not intended to be a way to "beat the system" when buying an AR-15 but rather a unique way of building your own rifle.

Any criminal would be more inclined to break in and steal an AR-15 than spend the time and effort required to complete this unit. If you have some basic metalworking skills and tools, this is a very easy project. I would estimate about a three-hour build time excluding finishing.

The process requires tapping 14 6/40 size holes and accurately drilling about 10 other holes of various sizes. Taps, files, Allen wrenches, drill bits and a drill are about all that is needed, but the more tools you have, the easier it is to build. Final contouring of the receiver can be done by hand with files but a Dremel Moto-Tool will really help here.

Since this receiver comes with an instructional DVD, I will just cover some of the highlights of the build process. The DVD makes a big deal out of how easy it can be built and how some hole locations are not all that critical, but I personally recommend locating the holes as accurately as possible.

Some of the recommended hole locating procedures on the DVD made me cringe since I am a skilled machinist and am used

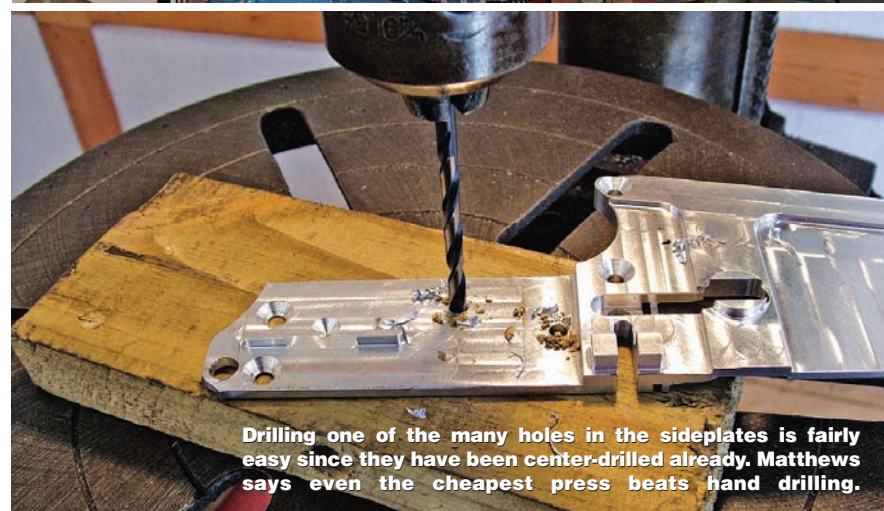
to locating holes accurately rather than "just drill the hole about in the center" as instructed in a couple parts of the DVD.

This receiver is accurately machined, and the same accuracy should be observed by the builder completing the project. Attention to detail will make the difference between having a fine-looking receiver or one that looks like "Bubba the Gun Butcher" built it.

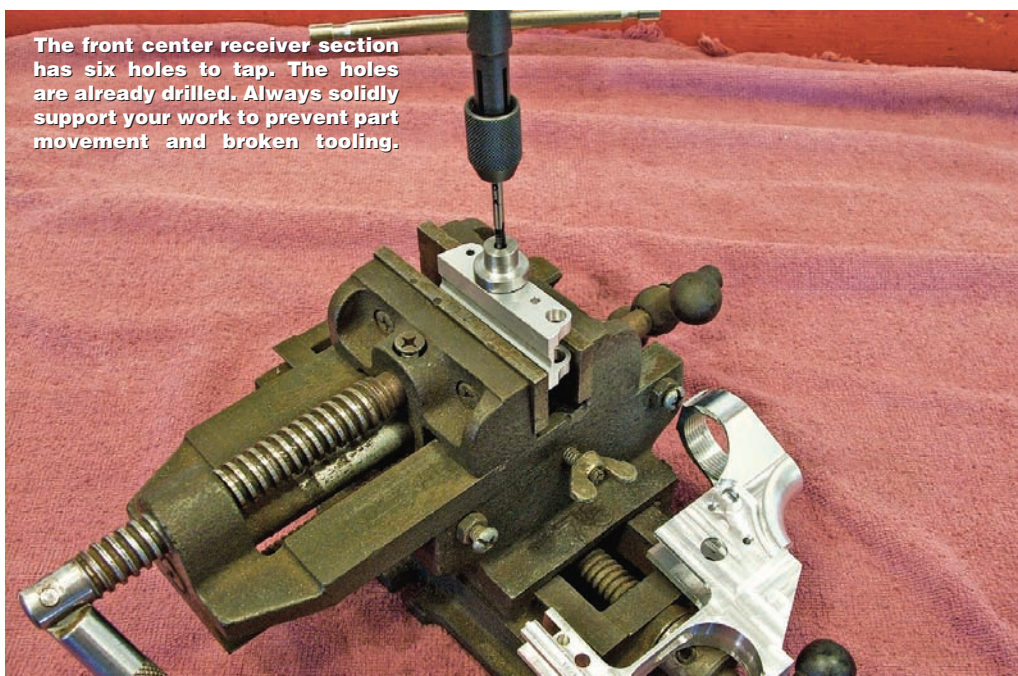
The first recommended procedure is to deburr all the sharp edges. The pieces come straight out of the CNC machining center and can be quite sharp. I used files and a Dremel tool to clean up the sharp edges. Your hands will thank you.

Next comes tapping 14 small 6/40 holes. This is a very small tap and great care must be taken to pre-

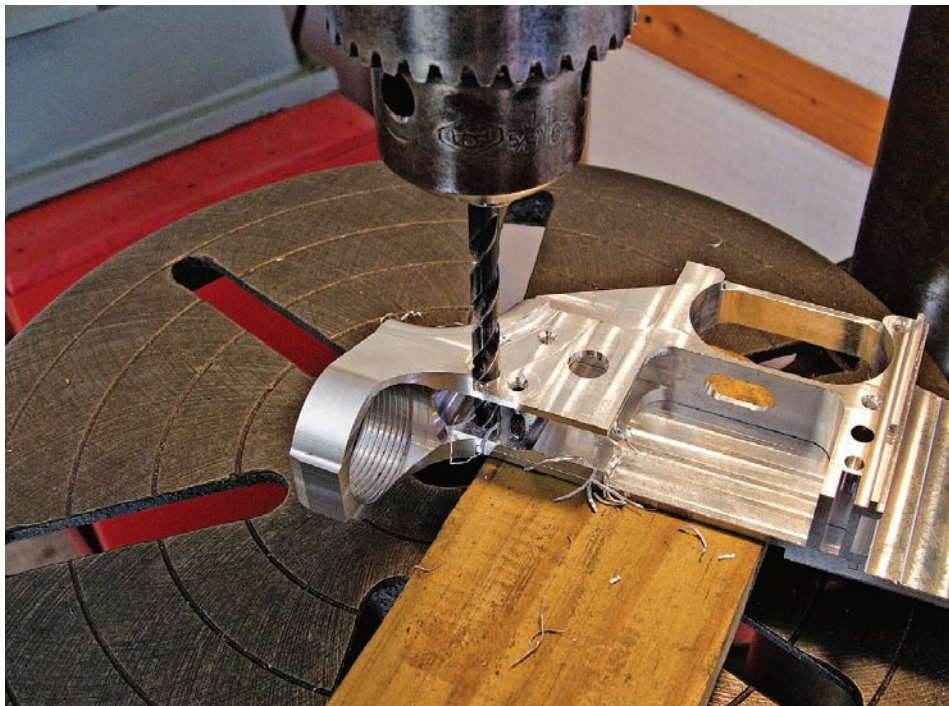
vent breaking one in the hole. Taps this small are *extremely difficult* to remove if you break one off. Sometimes they can't be removed at all, and this will really mess up your project.



Drilling one of the many holes in the sideplates is fairly easy since they have been center-drilled already. Matthews says even the cheapest press beats hand drilling.



The front center receiver section has six holes to tap. The holes are already drilled. Always solidly support your work to prevent part movement and broken tooling.



Drilling for the takedown pins requires precise location to insure easy assembly. Drilling off center will cause binding when you assemble upper to lower.



Tapping the larger 1/4" hole is much less stressful than the small, easy-to-break 6/40 tap holes. Even so, use plenty of lube and proper tapping technique here.

Plenty of lubricant, straight tapping and frequent chip removal will prevent breaking. Don't say I didn't warn you!! There are six holes in the front spacer block and eight holes in the rear receiver section. They are spot-drilled so you don't have to determine their location. Use a tapping guide to help get them straight.

Once these holes are tapped several holes need to be drilled to locate the various detents and operating pins. Some of these are spot-drilled and others will have to be located by the builder. The DVD tells where and what size holes to drill. Although the DVD says you can drill the holes with a hand drill, I recommend against it. Unless you are extremely skilled, you cannot drill accurately by hand. Even a cheap \$50 import drill press is better than hand drilling.

Some of the pin holes you will be drilling are for the hammer and trigger pins, bolt hold-open pin, front and rear takedown pins and safety lever. Several spring detent holes need to be drilled, including front and rear takedown pin detents, safety lever detent and buffer detent. A hole must also be drilled and tapped for the pistol grip to be attached.

After all these holes are completed all that remains is to assemble the four pieces. You simply slide the parts together and while holding everything in alignment, insert and tighten the screws. The flat head design of the screws will help align the parts, but some hand alignment may be needed. I recommend lightly screwing this together and checking that everything lines up properly before tightening the screws down tight.

Once everything is aligned and tightened, remove one screw at a time, coat each with thread locker, and then reinstall and tighten. Be sure not to tighten too tight and strip the threads; alu-

minum doesn't take much overtightening. Doing only one screw at a time will help keep things aligned.

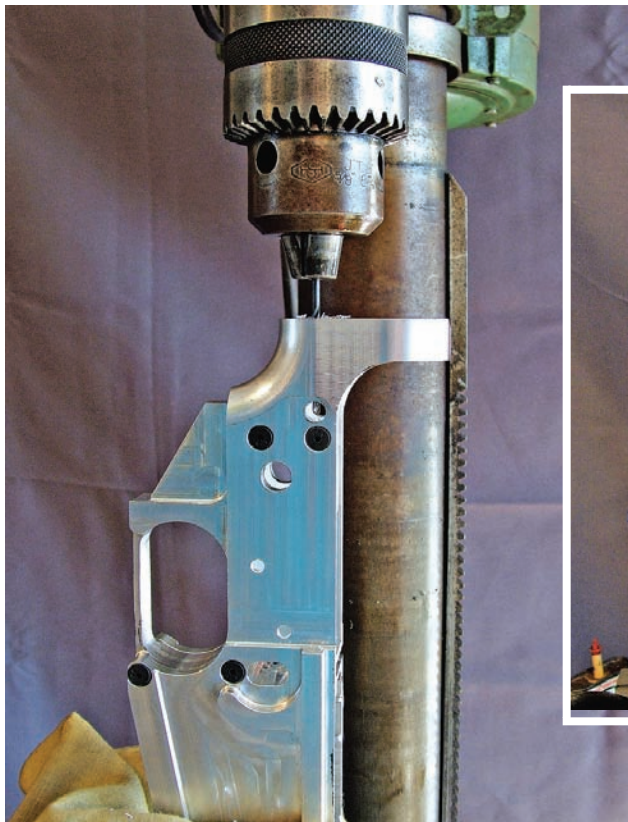
At this point, you have created a firearm and it is subject to all regulations that are applicable to any other gun. Whether you made it or someone manufactured it doesn't matter; it is a firearm now. More on BATFE regulations can be found in the sidebar. Although homemade guns are not specifically required by BATFE regulations to be marked, the agency "highly recommends" the firearm be marked as to who made it, where it was made and have applied a self-assigned serial number.

The name can be your personal name or your business name if you have one. For a serial number I generally use the date the gun was made.

Now that the receiver is more or less completed you have to decide how you are going to finish it. It can be left as is, or you can round off the edges to obtain a smoother contour, it's your call. As far as the actual finish goes, you have several options. It can be left "in the white" or colored just about any color you want by anodizing or applying a sprayed on finish.

I chose to use LCW DuraCoat for a finish. I used #6 Parker for a charcoal gray color with satin black highlights on several items. Although not contrasting greatly in color, it does have a pleasing appearance. I have previously written on the use of this

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Drilling the takedown pin detent requires good alignment to prevent missing the center of the pin hole. The pistol grip screw has to be drilled at the correct angle.



Once assembled, the left side of the JPFO unit looks almost like a conventional AR-15 receiver, with the obvious exception of the holes for the six retaining screws.

Vendor/SGN Mini Spotlight/Road Trip



PRECISION REFLEX INC.

Precision Reflex Inc. of New Bremen, Ohio is a maker of "premium" AR-15 components. They also make scope mounts and rings for various types of firearms.



High tech CNC machining centers insure PRI build quality. This rack of approximately 100 carbon fiber handguards represents over \$30,000 worth of product!

When one starts writing for a national gun magazine certain doors are opened. One door that was recently opened for me was the door to Precision Reflex Inc. of New Bremen, Ohio. When PRI offered their products for this article they also extended an invitation to visit their manufacturing facility and see how they make their unique products. Since I am only about an hour from their location and am the kind that really enjoys seeing how things are made I jumped at the chance to visit their facility. Upon arrival I was met by company president N. David Dunlap. I was given a brief history of PRI and then given a tour of the manufacturing complex. I was especially impressed with Dunlap's firearms knowledge, he is an avid shooter with a shooter's perspective not just an executive running a company. PRI opened in 1979 and by the mid 1980s was manufacturing its current line of scope rings and mounts. Over the following years their product line expanded to include an extensive selection of AR-15/M16 acces-


sories. These include carbon fiber forearms, flip up sights, charging handles, carry handles, gas tubes, barrels, magazines, tools, complete upper receiver assemblies, and many other parts. They also offer many accessories for other rifles and shotguns.

PRI products can best be described as "premium" products. While many manufacturers make products that are "just good enough" PRI strives to make theirs to the highest standards. This results in a higher priced product but there are many who want the best rather than the cheapest. While their primary market is the firearms using professional such as police, military, and security services, common hobbyist's are coming to appreciate the extra quality found in professional grade products. PRI's facility contains several CNC machining centers plus many more common metal working machines.

High tech CNC machining centers do the most demanding and precise work while the less demanding jobs are performed by the more common machines such as mills and drill

presses. Their facility also houses firearms testing facilities to test their products.

While many of their products are made from steel and aluminum they also work with carbon fiber composites. Carbon fiber is a composite of strands of carbon filament and a bonding agent that when cured creates an incredibly strong and light material. It is rather expensive and also difficult to machine but it has qualities such as low rates of heat transfer that compensate for the extra cost. It also offers a very "high tech" look.

During my tour of their manufacturing facility I was very impressed with their operation and skilled employees. They take great pride in producing parts that exceed the need. If you are the type of consumer that wants a premium product then you should take a look at PRI's product line. You may pay a little more but you get more with a PRI product. They can be contacted at Precision Reflex Inc., 710 Streine Dr., Dept. SGN, New Bremen, Ohio, 45869, 419-629-2603, www.pri-mounts.com 

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finishing procedure (March 20, 2005) if you want to read about the easy application of this fine firearms finish.

A receiver doesn't evaluate well without being assembled into a complete functional gun. Several SGN advertisers were contacted and asked if they would be interested in supplying materials so that the JPFO receiver could be assembled into a complete gun.

Since some of the proceeds from JPFO's sales of this item are going towards protecting firearms owner rights, several vendors offered parts. They realized that by supporting gun owner rights they are also supporting their own business futures. It's unusual for one company to support the review of another's product so be sure you consider these companies when you are buying AR-15 parts and accessories. By supporting JPFO they are helping to support your rights to own and use firearms.

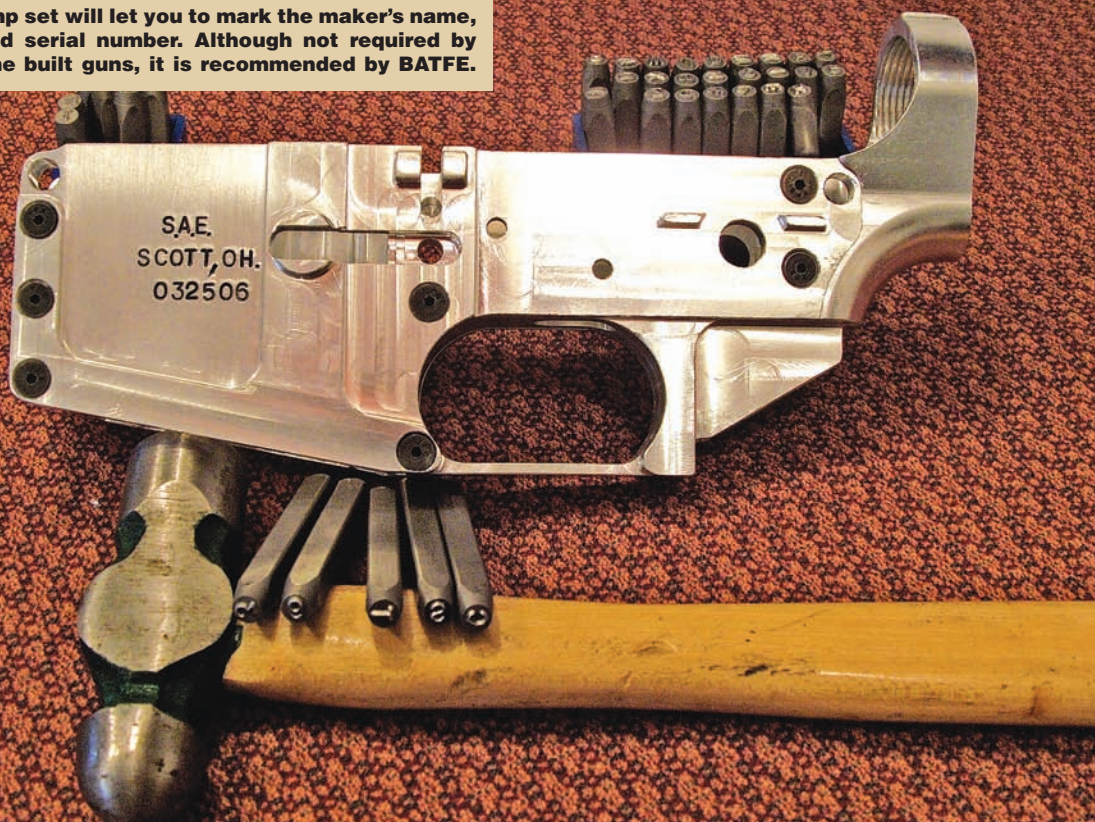
Suppliers for this story in addition to JPFO are Ace Ltd, Brownells, Inc., CTK Precision, Falcon Industries, J&T Distributing, Lauer Custom Weaponry, Lewis Machine and Tool, Model 1 Sales, Precision Reflex Inc. and Smith Enterprises.

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The receiver comes right off the machine tool, so corners should be radiused with a file or power tool to remove sharp edges that will not hold a finish well.

A steel stamp set will let you to mark the maker's name, address, and serial number. Although not required by law for home built guns, it is recommended by BATFE.



Who or What is JPFO?

You may have noticed that this modular receiver is available through an organization known as JPFO. If you are an observant SGN reader you may have seen their segments on firearms rights. JPFO is a gun rights/gun lobbying organization dedicated to protecting an individual's rights to keep and bear arms. They are especially dedicated to exposing and preventing abuses by the BATFE. Although not usually associated with selling a product they are marketing this modular receiver that is built by KT Ordnance. A certain percentage of the selling price will go to support their fight for your gun rights. Besides getting a good and unique AR-15 receiver you will be supporting on of the most dedicated and uncompromising gun rights organizations. While some gun lobby groups are soft on their support of military style firearms JPFO is not afraid to take on some of the more politically incorrect types of gun issues. They are a no nonsense, tell it like it is group.

At the time this article was written the cost for the modular AR-15 receiver was \$195 which includes shipping and the instructional DVD. For more info contact JPFO Inc., P.O. Box 270143, Dept SGN, Hartford, WI, 53027, Ph. 262-673-9745 / 800-869-1884, www.jpfo.org

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The first thing I needed was a complete upper receiver assembly with bolt and carrier. Model 1 Sales supplied an excellent 16-inch carbine flat-top upper receiver assembly complete with bolt, carrier, and Badger charging handle.

I have used Model 1 parts in the past and have always been pleased with them. One notable feature of this upper was the excellent finish of the parts, colors all matched and the machin-

ing was excellent. Some AR-15 parts suppliers just throw a bunch of parts together from any manufacturer who offers them the best price and pay no attention to quality. This Model 1 assembly looked to be a well built item.

I installed an M4-7 heavy duty collapsible buttstocks from Ace, Ltd. This stock features seven positions and has extra reinforcing in the buffer tube to increase strength. It also has a strengthened locking collar to increase rigidity. I have used a lot of shorty stocks of dubious quality over the years, and was glad to see that someone has made efforts to improve the marginal strength of the collapsible stock design. This stock set is much stronger than a standard type but only costs a little more.

Smith Enterprises supplied their excellent Vortex Flash Eliminator. This is an

improved and updated variation of the old GI 3 prong design that was noted for its good flash suppression characteristics.

Quality internal components need to be installed in a lower receiver. For the last few years (long before I wrote for SGN) I have used nothing but J&T lower internal parts when I have built AR-15s. I have always had good luck with their parts: they have always been well machined and worked without any hand-fitting as some others have needed.

The only part of the J&T lower parts set I didn't use was the pistol grip. For that I got one of Falcon Industries' Ergo-Grips. This grip is ergonomically designed to offer a better grip than the GI type, plus the material used for the grip is not as slippery. They also supplied one of their vertical forearm grips that attaches to the rails on the handguards.

Since this upper was a flat-top, it came without sights. The flat-top design allows a multitude of sight options. For the conventional sights, two suppliers offered their products. For the rear Lewis Machine and Tool supplied its detachable rear sight. This is nothing more than a standard AR-15 rear sight in a detachable format that allows removal and reinstallation without disturbing the adjustments. It is very well made and worthy of consideration on any flat-top project.

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Matthews says spraying with Lauer DuraCoat is easy for the hobby gunsmith with minimal equipment. An inexpensive airbrush or automotive touch-up gun can be used.



Once sprayed and cured, DuraCoat is an attractive and durable finish. Material cost for this finish was only about \$25, and it offers both beauty and protection.



The CTK P3 is especially useful for the AR-15 owner, as it can be used both as a shooting rest and as a gun vise for building, modification, repairs and cleaning.



One of the benefits of using a flat-top upper like this Model 1 Sales receiver is its ability to accept various sighting options. You can go optical or conventional.

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For the front sight, I used a PRI Flip Up Front Sight. This sight can best be described as a premium sight. It consists of a stan-

when the barrel was so hot you couldn't touch it. Any one who does high volume shooting will appreciate this forearm.

dard AR-15 post but it is housed in a globe housing similar to the sights found on HK rifles.

PRI also sent one of its high tech Gen. III carbon fiber handguards. These are made from a carbon fiber composite as used in high-tech aircraft such as stealth fighters and the space shuttle. It is somewhat expensive but does an excellent job of restricting heat flow into the handguards during fast firing.

Anyone who has ever dumped a couple of 30-round magazines as fast as he can will attest to how hot an AR-15 can get. I tested this out by doing just that and was amazed at how cool the handguard was even

Brownells provided its 30-round AR-15 magazines. These are GI spec with the desirable green followers. When used during testing they worked flawlessly, what more can you ask of a magazine!

I wanted a low maintenance finish. Even though the parts on this project were excellently finished already (except the new modular receiver) I wanted a unique look to the gun rather than a traditional black oxide finish.

I contacted Lauer Custom Weaponry and obtained some of their DuraCoat firearms finish. This is one of the most popular spray-on finishes available to the home gun builder today. It is easily applied with a minimum of equipment. I choose #6 Parker which is a dark gray color but they offer dozens of colors to choose from.

Before assembling the gun, I coated the upper and lower and let it cure for a couple days.

One last item for this article was not a gun part but was used in the assembly and accuracy testing of the project. CTK Precision sent its P3 Ultimate Gun Rest and Vise Combo. This dual purpose tool is a gun rest for shooting plus it has a vise option for holding your gun during cleaning or repairing.

This is a very helpful item, as it sure beats rolling your gun around on the bench when working on it.

Assembling an AR-15 is a very easy project and there are many resources in print and online to help you do it. I installed

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The PRI carbon fiber handguards and flip up sight are just two of the premium AR-15 accessories offered by PRI.



The original barrel nut must be replaced with PRI's special barrel nut to install the carbon fiber handguard. There's no substitute for the right tool here.



Here it is, completed and ready for test firing. The JPFO receiver and all the custom accessories give the gun a look considerably different than the classic AR-15.

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the lower receiver parts, and as I expected, required no hand fitting. The Falcon Ergo grip installs just like a GI model but it does have an extension at the top that slides up around the rear of the receiver.

The Ace stock set installs similar to the GI style but has a unique locking collar that is clamped into place rather than the simple threaded ring found on the GI model. It does seem to add strength as the manufacturer claims.

Now that the lower is done its time to complete the upper. The Model 1 Sales upper was completely assembled and headspaced. The heavy profile 16-inch barrel was made by E.R.Shaw, a well-known barrel maker and SGN advertiser. The Badger charging handle features an extended release lever to ease operation.

To assemble the new PRI carbon fiber handguard and flip up sight some disassembly is required. The original barrel nut and front sight base need to be removed and replaced with PRI's special barrel nut and gas block, which is part of the flip-up sight. A barrel nut removal tool is required, you can't use channel locks or pipe wrenches without messing it up so don't try till you have the correct tool, which can be bought for less than \$10.

Remove the sight base and the old barrel nut and replace it with PRI's nut and handguard collar. Torque it down and align the gas tube holes, then assemble the old gas tube to the new gas block/sight base as instructed. Slide on the handguard and sight base, because it's easier to do it together rather than trying to slide the gas tube through the barrel nut after the handguard is

installed. Once the gas tube is through the barrel nut, tighten the collar to secure the handguard.

The handguard can be oriented several ways depending on your preferences. Position the gas block/sight base over the gas port in the barrel and clamp it in place. Check to make sure the sight is perfectly straight up. If not, readjust. If you find your sights to be far off center, the base can be moved slightly to correct it.

I finished this part of the project off by installing the Ergo vertical grip.

Once your sight and handguards are installed, the Vortex flash suppressor can be installed. It just screws on. You can use a lock washer to help hold it in place or use a good high temp thread locker. Moving to the rear of the upper assembly, it's time to attach the LMT rear sight. It goes on just like a common Weaver type scope ring on the flat-top upper.

The big selling point of flat-top uppers is their versatility. They can mount just about any type of sight you want as long as it will attach to the base. Just for the fun of it, I bought a cheap (less than \$30) red dot sight to try out. I don't expect high quality for 30 bucks, I just wanted to see what you can get for \$30!

Now that the upper and lower assemblies are complete, it's time to mate them. The JPFO modular receiver and the Model 1 Sales upper fit together very tightly. This is good, as it allows for hand fitting to get the tightest lockup between the two halves. Its better to hand fit the upper and lower together than to have parts made so sloppy that they will fit any combination out there. A little filing and sanding will allow for a precise fit.

Once assembled, this gun has a unique appearance. It's definitely an AR-15, but the receiver gives it a rather angular look. It stands out from the regular AR-15s. This should appeal to those

who want something just a little different from the rest of the crowd.

Looking good means nothing if it doesn't perform. Fortunately this gun looked good and ran good also. It's not unusual for a new gun to need some break-in before it will run reliably, but that was not the case here. This gun ran flawlessly from round one. No failures of any kind. I don't know if it's luck, skill or the fact that I've been using quality parts, but the last couple AR-15s I've built have worked 100% from the beginning, and that is the way I like it.

Accuracy was pretty decent also but publishing deadlines kept me from doing an in-depth accuracy test with several types of ammo. Generally, heavyweight 16-inch barrels from good makers shoot pretty well, thanks to their increased stiffness over the more flexible standard barrels.

I also found that the claims by PRI concerning the coolness of their handguards to be true. After dumping a couple of rapid fire magazines the barrel was extremely hot but the handguards cool. The Ergo vertical grip was something I didn't know if I would like, but once I got used to it I found it to be comfortable.

All in all I was impressed with the performance of the JPFO/KT Ordnance receiver as well as the other parts in the package. It was easy to build and performed as well as any conventional AR-15 receiver. The fact that it can be delivered to your door without going through a FFL dealer is a big plus, and not just for those who prefer not to notify the government they own guns.

In my area of northwest Ohio, there are no dealers selling AR-15 receivers for the hobbyist who wants to build his own. They are more than happy to sell you a complete gun for about \$1,000, but have no interest in selling a low-profit receiver. Every time I have wanted an AR-15 receiver, I have had to drive a long way to a large gun show to buy it, so this is a viable option to those of us in rural areas.

Unique looks, good performance, delivery to your door, and supporting firearms rights are all good reasons to consider this unique product. The JPFO/KT Ordnance receiver is available from JPFO for \$195, shipping included.

Give it a try, you might like it, I did!

SGN

Editor's Note

As this issue went to press, BATFE agents raided KT Ordnance, which manufactures the JPFO AR receiver. While details at press time are sketchy, it appears that the agency has reversed its previous opinion that the receiver is a non-firearm. The implications of this are disturbing on a variety of levels. While the case proceeds, JPFO will not be taking orders for receivers.



Matthews was pleased that his newly assembled JPFO receiver-based AR-15 preformed flawlessly. Using high quality parts goes along way in promoting reliability.

Sources

JPFO: P.O. Box 270143, Dept. SGN, Hartford, Wis. 53027, 262-673-9745, www.jpfo.org

Ace Ltd: Box 191, Dept. SGN, Chicago Park, Calif. 95712, 530-346-2492, www.riflestocks.com

Brownells: 200 S. Front St., Dept. SGN, Montezuma, Iowa 50171, 800-741-0015, www.brownells.com

CTK Precision: E5861 Herzberg Rd., Dept. SGN, Marion, Wis. 54950, 715-754-2891, www.cktprecision.com

Falcon Industries: Box 1690, Dept. SGN, Edgewood N.M., 87015, 505-281-3783, www.ergogrips.net

J&T Distributing: Box 430, Dept. SGN, Winchester, Ky. 40392, 859-745-1757, www.jtdistributing.com

Lauer Custom Weaponry: 3601 129th St., Dept. SGN, Chippewa Falls, Wis. 54729, 800-830-6677, www.lauerweaponry.com

Lewis Machine and Tool: 1305 West 11th St., Dept. SGN, Milan, Ill. 61264, 309-787-7151, www.lewismachine.net

Model 1 Sales: Box 569, Dept. SGN, Whitewright, Texas 75491, 903-546-2087, www.model1sales.com

Precision Reflex Inc.: 710 Streine Dr., Dept. SGN, New Bremen, Ohio, 45869, 419-629-2603, www.pri-mounts.com

Smith Enterprises: 1701 West 10th St., Ste 14, Dept. SGN, Tempe, Ariz. 85281, 480-964-1818, www.smithenterprise.com