

Cloning Your Favorite Rocket

By James Gartrell

Most Born-Again-Rocketeers (“BARs”) usually end up wanting that first rocket they built, or the rocket they wanted to build but couldn’t afford or just never did before it went out-of-production (“OOP”). Several years ago, it was very difficult to recreate your favorite rocket unless you were extremely resourceful. That isn’t the case any more. The BARs’ desires has led to a whole cottage industry of various vendors who have made cloning your rocket much easier. Well, at least for the Centuri and Estes fan. Let’s face it, though. Cloning your favorite rocket isn’t easy, whether it’s an Estes kit or an old Rock-A-Chute kit. It is going to take some significant time and effort. Thankfully, there are a few vendors who have done all the cloning for you, and all you have to do is buy their kit. Semroc probably has the largest selection of OOP classic kits available, but there are some others. The Cloning Kit Manufacturers list attached provides a list of the current vendors I am aware of who supply clones of OOP kits. You will see many of the vendors duplicated on the other lists I have attached. Fortunately, many of the vendors that provide the clone kits also provide parts! What do you do, though, when one of these vendors doesn’t have your kit? Well, you are now faced with the same dilemma many BARs faced several years ago for just about any kit they wanted. You’re going to have to find the parts on your own. Hopefully, this paper will help you along your way, and find you grinning like the Cheshire cat over that set of parts that, with a little glue and a little effort, will soon transform into that favorite rocket. Most of my discussion will focus on Estes, because that is my personal focus, but the process is similar in cloning other rockets, only you use the resources available for your particular manufacturer.

The first decision you have to make is whether you are willing to use non-original parts, original parts from a different period than your rocket originated, or original period parts. Of course, there are original kits that can still be found on eBay if you’re willing to pay the price. Some of the rare and popular kits can cost in the hundreds or even thousands of dollars, though. Regardless, our focus here assumes you have made the decision to clone your rocket. Besides, don’t you want to be able to fly that old rocket without worrying if you lose it! As it turns out, that desire probably influences your first decision. The more you want to be able to fly your rocket without worrying about whether you lose it, the more likely you will decide to use non-original parts. So, let’s assume you have decided to use non-original parts.

Before we can go get your non-original parts, though, now comes your next dilemma, and it applies whether you are using non-original or original parts. How do you know what parts you need? What were the dimensions of that old kit? Well, you are so lucky! The Cloning Resources listing I have attached provides the web addresses of sites that have resources that will allow you to at least approximate the part sizes, if not specifically identify what you need. What you don’t find on one site you may find on another.

Number one on the list is Ye Olde Rocket Shoppe (“YORS”). Scott Hansen’s site is probably the most useful site you can visit today. Besides having a lot of rocket plans,

there are a number of cloning aids there and also links to decals and other manufacturers who provide specialty parts for cloning. You will definitely want to download John Brohm's Estes Nose Cone and Body Tube listings (more about those later). However, Sven Knudson (Ninfinger) and Jim Zalewski (JimZ Rocket Plans) were names that every BAR soon came to know and their sites are still very well used. Their respective web sites were the first web sites to provide a plethora of scans of the old rocketry product catalogs and construction plans, notably Estes and Centuri but others as well.

Sven focused on the old catalogs and Jim mainly provided construction plans. Both were well visited by the BAR who wanted to clone their favorite rocket. However, Sven's site, while quickly updated, only provided approximations of the parts by comparing the noted dimensions and measuring the relative sizes of the parts of the rocket shown in the catalog listing. There was one spectacular cloning gem on his site, though – the Estes 1974 Custom Parts Catalog (“Parts Catalog”). It listed most of the parts that were included in all of the Estes kits up to that time with their dimensions. Did I mention that you should download the Parts Catalog? Yes, download the Parts Catalog. It includes important dimensions for both body tubes and nose cones, as well as many other parts. In this resource you will be able to identify the diameters of most of Estes' tubes, along with other important information such as nose cone shoulder lengths, tube wall thickness, and much much more. Now you only need to know the part number used in the original kit and you would have your specific part dimensions to order from one of the vendors. That's where Jim's site came into play. You could get the part number from the kit plans on Jim's site and then find the part in the Parts Catalog. Voila! Instant kit parts. Jim's site also included the Parts Catalog (within the book icon on his site), so unless you just wanted to drool over the catalogs or your particular kit wasn't on his site, Jim's site was the place to be. Unfortunately, Jim was notoriously slow about updating his site and there were a lot more kits out there than Jim provided. That's when YORS came in. Even though Jim seems to be putting a little more attention to his web site, YORS soon took over as the premier cloning site. As I noted earlier, though, Jim and Sven's sites are still very useful. Many of the really old Centuri and Estes kit plans are only available on JimZ's site.

I still visit Sven's site, one because I have such a bad memory but there's a lot more there than just rocket catalogs. What do you mean, bad memory? Here's the scenario: I loved this old rocket. I can still see it in my mind. What was the name of that kit? Hmmm. Based upon my age at the time, it should have been around 1972-75. Go peruse the catalogs for that time frame and maybe I'll see it. If I'm lucky, it'll be there. Now, go find that rocket plan. Well, that's the scenario, at least. If you don't find it, maybe you'll see something else you'd like to build! It works a lot easier, though, if you know who the manufacturer was and what the kit name was. If you know that, then you can go to YORS and find when the kit was manufactured using the Centuri and Estes Kit directories, then go to Sven's site and go directly to the catalog year to view the rocket. Scott even has an online version you can bookmark in your favorite web pages that automatically links you to the sites that have the plans for the kits. What a deal! Don't go into these sites without DSL or cable Internet, though, unless you're willing to wait a long time. Naturally, they are very graphically intense. Heck, go ahead and spend the extra \$20 or so a month for

the DSL. You'll be glad you did. It certainly makes the rocketry experience on the Internet much more pleasurable. Anyway, now that we have our parts list complete, let's go find those parts.

You really are a lucky person. The lists today are much more plentiful than they used to be. The Clone Parts Vendor listing attached provides the available parts vendors. Semroc provides a lot of both Estes and Centuri parts; however, Semroc is more oriented towards Centuri parts while BMS is more oriented towards Estes parts. Also, click on the Classics link on Semroc's site and he has a lot of the kit parts referenced to the parts on his site, so you can basically order the parts for a kit directly from his site. Pretty cool! He has promised to keep the number of parts growing, too. Before Semroc, finding Centuri parts was very difficult. Decals are very important for finishing out your clone, too, so the available decal vendors are listed, including Bel, Inc. Their decal paper is, in my opinion, the best decal paper available if you want to make your own decals using an inkjet printer (which is what I have – if you have an ALPS printer, lucky you!). Once your image has been prepared, just print it out on the decal paper, let it dry for a couple of hours and then spray a couple of light coats of Krylon Clear spray to seal the ink. Making your own decals is an art and will take some practice to get right. Once you master it, though, you will be able to create some beautiful decals. Also, I've listed the Alumilite casting kit. Like making decals, this takes practice, but it's a useful resource. Naturally, you need an original part to clone with the Alumilite kit, but then you can save that part to build the original for display and then fly the clone! OK, speaking of original parts, now let's talk about cloning with original parts. Yeah, it's still cloning even if you're assembling original parts. It's only original if you build the kit. However, who's going to know but you.

OK, now let's work on that decision for using original parts to build our kit. If you aren't worried about using parts from the original period, all you need is a good stock of original parts from the particular manufacturer. Obviously, that is much easier if you're cloning an Estes or Custom kit. It is much more difficult, otherwise, since most of the other kit manufacturers are no longer in business. eBay or Rocketry Online Auctions will be the source for most of your older parts. Barring a huge parts listing on one of the sites, you will probably want to use one of the old tricks of the trade, kit-bashing. If you're careful with the kits you get, you'll come out with a lot less cost than buying an original kit. For example, the Estes Mini-Brute Beta has the nose cone and two of the pod tubes that were included in the early Mars Snooper kit, plus you can cut a little off the body tube and you'll have the upper tube. The Estes Laser Torpedo, the old Battlestar Galactica kit, includes both the upper and lower body tubes of the Mars Snooper, and you don't have to cut a thing! Also, the nose cone in the Estes Mosquito is the same as the rear pod cone of the Mars Snooper. These kits are available for a fraction of the cost of an original Mars Snooper kit, and can be found much more frequently. The trick is to secure them at a cost that will be less than the cost of the one Mars Snooper kit. Considering, the Mars Snooper will usually cost you over \$100, it isn't that hard to do. Regardless of your decision to use period parts or not, you will find John Brohm's nose cone and body tube reference listings a very useful aid in securing your original Estes parts. With these, you will be able to identify all of the kits that have the parts you need. Amazingly, there are a

number of current Estes kits that still use some of the old part sizes. For other manufacturers, you'll need to build your own database using available rocket plans. If you do, send it to Scott Hansen, please! There are two additional resources that will aid in securing original period parts. These are the kit directories on YORS site identified in the earlier listing and

Mike Maurer's Estes Trivia site:

(<http://web.archive.org/web/20050619081405/http://www.model-rockets.com/estes.htm>).

John Brohm's listings help you identify the kits that have the parts you need for your kit, but you will need to limit it to kits of specific periods if you want to be sure you get the specific period part. The kit directory will help you identify when each rocket was available. With that information you can then home in on which kit will have the available period parts. The Estes trivia site helps you do this, as it identifies the time frames of the different hangtags included on the kits. Let's say you want to clone the Astron Farside using original period parts. Looking at the Estes Kit Directory we find that it was available from 1963 through 1980, another kit that can cost you around \$100 or more to buy an original. OK, that's a wide range of years. Still, that may limit some of the kits that we can use that are included in John's listing. For example, the Estes Starship Enterprise actually includes two of the BT-50H included in the Farside kit. Unfortunately, looking at the kit directory, we find that the kit didn't get released until 1975. That means we can't use that part unless we are building a 1975-79 Farside. Now, looking at the Estes trivia site we find some important information that will help us identify which specific kits will have the parts we need. First, we note that Estes merged with Damon in the latter part of 1969, which indicates we will need to buy pre-Damon kits if we want to be sure we have original parts for the 1963-69 Farside. These will have the yellow hangtags (or no hangtag at all!) and the old Estes logo, not the Damon logo. For a 1970 Farside, we will need the kits with the old red, white, and blue hangtags, often referred to as the "Countdown" hangtags because, tada, there is a countdown included on it! OK, you should get the idea by now. Oh, one other important note. Estes didn't change its parts that frequently, so the period limitations often aren't that critical. John Brohm, Mack Yocum or Buzz McDermott can tell you when the parts changed. That will give you a larger period range when you're looking for parts. Don't ask me. Remember, my memory isn't that good!

Well, that's it. It's certainly not a complete list, but it's certainly a better start than I had when I got back into rocketry. Don't forget the last aid in cloning your favorite rocket, your rocket buddies. Many BARs have already gone through the cloning stage and can often provide a wealth of information to assist you. Plus, they usually like doing that! Heck, we all like to see folks bringing out some old classic rocket to fly. OK, now get that rocket ready for entry into the DARS Annual Classic Kit Contest that Gary Briggs puts on each year. Most importantly, though, have fun!!

Clone Kit Manufacturers

Semroc - <http://www.semroc.com>

Carl McLawhorn sells many Centuri clones and maintains an extremely high quality. I have heard, though, that his kits aren't exact replicas. You may want to verify that with Carl before you purchase a particular kit. I doubt very seriously that they are that different, if it's true. They sure "look" like the real thing! Also, parts for several Estes and other manufacturer's kits may be ordered using the Classics link on his website.

Balsa Machining Service - <http://www.balsamachining.com/>

Bill Saindon sells only three clones of Estes kits: the Gyroc (for \$10!), Astron Cobra (one of my favorites) and Mars Snooper. You have to download the instructions from JimZ's site, but I have heard that these are great kits. BMS is probably more widely known for the availability of the nose cones you need for your favorite clone. If he doesn't stock it, you can still provide the dimensions and he will make it. The price is much higher than an in stock cone, but reasonable. Bill has a lot more parts, too. If you're cloning an Estes rocket, I think it is your best place to shop. I have ordered a lot from Bill, and his stuff is usually of the highest quality.

Caveman Rocketry - <http://www.cavemanrocketry.nl/webstore/>

They have a clone of the Estes Goblin. You have to buy it from the Netherlands, though!

Cloning References

Ye Olde Rocket Shoppe - <http://www.rocketshoppe.com/>

Scott Hansen bills his site as "Your One-stop BAR Shoppe." That is so true. It really is the center for the cloning community. As with anything, some obscure things can still be found outside his site, but if most of what you'll need isn't specifically included on his site he usually has a link to it. While you can spend a month going through everything in his site, below are some specific links to must haves:

- http://www.rocketshoppe.com/kit_lists.htm
- The above link takes you to the page with the links for the online and pdf files of the Estes and Centuri kit lists. These files tell you when a particular kit was available.
- <http://www.rocketshoppe.com/tips.htm>
- This link takes you to the page with the links for a whole plethora of cloning aids. You will definitely want to download John Brohm's body tube and nose cone references at a minimum. These are a must have for any cloner. Fred Talasco of Excelsior Rocketry has also put up a chart for cloning Canarocs, too.

- <http://www.oldrocketplans.com/>
- Ye olde rocket plans! You will spend a lot of time here. The page is very easily arranged with a list of links down the left side of the page to focus on the particular manufacturer you want.
- http://www.rocketshoppe.com/bar_links.htm
- This page has links to all of the other major cloning references, such as Ninfinger and JimZ Rocket Plan sites, along with other notables such as Doug Holverson's Centuri Memories, A. Shasta's Rocket Plans, among many others. It also has links to most of the cloning suppliers, although the link to the Totally Tubular web page isn't up to date.

Ninfinger - <http://www.ninfinger.org/>

Sven Knudson's site. The model rocket page is what folks usually link to, but I provided the home page because his other links are very interesting also. Below is the link to the Estes 1974 Custom Parts Catalog:

http://www.ninfinger.org/~sven/rockets/custom_estes/custom_estes.html

For Centuri, the references are much more vague, although I haven't really focused on cloning the Centuri kits. Until Semroc came along, the best source for parts information I have found is in the catalogs. Below is a link to the Parts page of the 1975 Centuri catalog. It lists the lengths for a number of Centuri parts and has pictures of the parts, and if you click on the link to the previous page at the bottom you can find a listing of the inner and outer diameters of the Centuri tubes:

<http://www.ninfinger.org/~sven/rockets/catalogs/centuri75/75cen26.html>

JimZ Rocket Plans - <http://www.dars.org/jimz/rp00.htm>

If you notice in the link, DARS host, Tony Reynold's site, hosts Jim Zalewski's site. Very interesting trivia, but it doesn't help you clone a rocket! Here you can find the plans for all of the old Estes "K" kits, plus Centuri, MPC, MRC and others.

RMR - <http://www.ibiblio.org/pub/archives/rec.models.rockets/PLANS/>

An old newsgroup that has been archived, this site still has a wealth of info developed by old rocketeers in the early BAR days. Delete the PLANS/ from the URL and you'll be at the root directory where you can search more than just the plans. There is a lot of model rocket history in there if you want to spend the time.

Semroc - <http://www.semroc.com/Store/scripts/ClassicKits.asp>

The Classics link on Carl's site is a must visit for the cloner. He has really taken a lot of the research effort out. Just scroll down the list of classic kits (from a huge selection of manufacturers) or use the "find" feature on your browser to find the kit you're interested in, then click on the link on the left of the page. A lot of the parts references are there, with the capability of ordering them direct from the page. Voila! Instant clone! If you don't find all the parts there that you need, ask. Carl has some excellent fin sets and decals that aren't necessarily listed on his site, but you just have to ask. With the volume of kits he sells, the parts for the clones aren't as frequently updated.

Balsa Machining Services (BMS) – <http://www.balsamachining.com/CONES.htm>

This is the link to the BMS “in stock” cones. Sort of like Semroc’s Classic page, Bill has made ordering the cones for your classic Estes kit very easy. The description of his parts identifies the particular kit that you want, such as Spaceman for the Astron Spaceman rocket, Goblin, etc, and then click on Buy to add it to your shopping cart. Fantastic!

Centuri Memories – <http://members.cox.net/retrojayrocket/index1.html>

You can’t link to any specific page in Doug Holverson’s site, but navigate down the left bar and you’ll find a handy reference that lists Estes parts that will substitute for Centuri parts. A lot of Centuri memories are there, too. Duh!

Essence’s Model Rocketry Reviews - <http://www.rocketreviews.com/>

Nick’s site has a lot of reviews of various rockets. For example, Drew Tomko has a review of the Centuri Black Widow where he lists all of the parts used he ordered from Semroc to build his clone. It’s a good example of being able to find someone who has already been there and done that, with step-by-step instructions on building your clone. It’s a very nice looking clone, too! Another super example is Larry Zeilman’s review of his clone of the Centuri E.S.S. Raven. In that review he reveals Moldin’ Oldies nose cones (also listed on YORS). At least there will be a name of someone you can probably reach. If you contact Nick, I’m sure he will let the reviewer know you want to contact him and provide your email. I can’t remember for certain, but I think that’s how I got into contact with old DARS rocketeer, Stuart Powley! You should see his review of Der Screamin’ Red Max. He even created his own decals for the rocket, including a very cool Screaminverkins decal that goes alongside the whistle tubes on the rocket, a take-off from the Estes Motorverkins decal that goes at the base of the rocket. Too cool!

Yahoo OldRockets Group - <http://groups.yahoo.com/group/OldRockets/>

A great group of old rocketeers frequent this list, and they love your questions about cloning the old rockets. There’s usually someone who can answer your question, but you’ll probably have to wade through a lot of replies that are just chatter that results from your question posed. You also have to deal with those who just reply to any post to talk about anything. It can be a pain, but if you stick with it you can find out a lot of info, eventually, and sometimes very quickly.

Ye Olde Rocket Forum - <http://forums.rocketshoppe.com/>

Another link from the YORS site, it is a frequent haunt of old rocketeers. There’s a lot of stuff already there to aid you, and if you can’t find it, ask a question!

Rocketry Online - <http://www.rocketryonline.com/>

This is another great resource, but it’s so huge that it’s difficult to find something specific to what you want to know. Still, it’s a super resource and shouldn’t be left out of any list.

Clone Parts Vendors

Semroc – again

He has a wealth of nose cones, body tubes, and other parts to use for your Estes and Centuri clones, plus others. Since he has cloned the Estes S1B, he has the BT-3 tubes available. Those used to be hard to come by. I think the first ones I bought were from my first order with Totally Tubular. Now, I think they're widely available.

BMS – again

While BMS focuses on the clones for your Estes nose cones, he has a wealth of other tubes and parts available.

Uncle Mike's Rocket Shack - <http://www.unclemikesrocketshack.com/>

I think his balsa cones are from BMS, but he carries some of the Estes plastic nose cones, too. You can still find some of the plastic cones, even locally. Last time I was in HobbyTown USA, the Dallas store, they had several packages of the Estes plastic nose cone packages.

Totally Tubular - <http://www.wooshrocketry.org/misc/tt.htm>

Jim Fackert has notoriety for being slow and some folks have complained that they've never gotten their order from him. I haven't had that experience in the two orders I have placed with him.

JimZ Rocket Plans – again.

I think he will still sell decals. You may have to wait a while for them, as Jim also has notoriety for being slow at most everything. He's a great guy, though. I ordered a lot of decals from him long ago, and I think I remember that he was not very communicative and a little slow. I was in no hurry at the time, though, so it didn't seem to be much of a problem. I did start to worry a little after a couple of months.

Moldin' Oldies - <http://moldinoldies.rocketshoppe.com/>

Lots of plastic parts. I've ordered several cones from him. As a matter of fact, if you ask him, I think I have the record for the largest order! He is probably best known for his clone of the Interceptor parts. They are a thing of beauty!

Arley's Spaced Out Rocketry - <http://arley.rocketshoppe.com/>

I haven't heard much about his stuff. He's only begun to recently sell resin casts of the Canaroc Starfighter Scorpion, but also offers the nozzle unit for the Estes Space Transporter America. Both of these rockets are very cool, though!

Tango Papa Decals - <http://www.tangopapadecals.com/>

Tom Prestia provides a wealth of high quality decals. They are really thin, though. That is both good and bad. Good, because they lay down nicely and look like they're painted on, but bad because they will easily tear if you're not careful. Definitely use some dishwashing detergent in your bowl of water to help them slide. Make sure they slide

well from the decal paper and put them on very close to where you want them, because you don't want to slide them around very much at all.

Excelsior Rocketry – <http://towrowrow.tripod.com/excelsiorrocketry/>

Fred Talasco's decals are also very nice, and he has a lot of fun extras there as well, like his Goony kits. His decals take a little more preparation, though. Check with him first to be sure you will have the necessary prep materials when his decals arrive.

Bel, Inc. - <http://www.beldecal.com/>

They have a host of decal papers. Scroll down the left side to view the various types. They have decal paper for both inkjet and laser printers. I've used the inkjet decal paper for quite a while. It works great in my HP-932C printer. Don't use too much ink. Put the setting on normal, and don't use the blackest black when making your black decals. I don't think the paper can absorb that much ink, so it just sits on top of the decal and cracks as the upper ink level dries at a different rate than the ink in the lower level. My theory at least.

Alumilite Casting Sets - <http://www.alumilite.com/checkout/index.php?cPath=25>

Check out their site for some valuable resin casting info. This can get pretty expensive, but I've seen some of the stuff Royce Frankum has done with the Alumilite Super Casting Kit and it is great. I think you can find the sets locally for about \$60-\$100. I got a couple of the sets at Hobby Lobby, but you should be able to find them at HobbyTown USA or other fine hobby shops as well.