

*Cloning the Classics*

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# ***Cloning the Classics***

***-Or-***

***How to Build That Favorite Old Rocket  
Without Breaking the Bank***

**By**

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**NAR 13559**

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**NAR 78750**



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## What Is 'Cloning'?

- **Cloning is the art of building a replica (or near replica) of a commercially produced kit or rocket plan using current or custom made parts. The term 'clone' is (technically) incorrect. We don't build from a piece of the original. The term is in wide use in rocketry circles, though, so that is the term we will use.**
- **The term is typically limited to meaning replicas of out of production (OOP) kits.**
- **Once built, it is often impossible to tell a 'real' OOP rocket from a good clone.**

# Why Go to the Trouble of Building a Clone?

- A lot of great designs are OOP and hard to find.
- Buying an OOP kit to build can 'break the bank' – as some recent auction prices for sealed kits show:
  - *Centuri Taurus*: > \$85
  - *Centuri Space Shuttle*: > \$200
  - *Centuri Orion*: > \$250
  - *Centuri 1/45 Scale Little Joe II*: > \$600
  - *Plastic Parts for Estes Interceptor*: \$65 (\$150-175 for the kit)
  - *Estes Astron Gyroc*: > \$150
  - *Estes Astron Farside*: > \$150
  - *Estes Orbital Transport*: > \$250
  - *Estes Astron Cobra*: > \$300
  - *Estes SPEV*: > \$360
- Many paper parts and decals in old kits are unusable.
- Are you really going to fly and risk a multi-hundred dollar OOP kit?
- Building E2X and ARTF kits with pre-colored parts ~~has become~~ IS boring.
- We all like to relive our youth!

## Some Issues Making It Difficult To Clone Old Kits

- Despite the contents of the JimZ, Ryan McDaniel's and other web sites, there are still lots of old designs for which complete plans are not available.
- It can be hard to obtain a number of the old OOP kit parts, and reproducing them might be impractical.
- Decals can be difficult to duplicate, but that is getting easier as more small companies produce replicas.
- Construction from scratch is often much more challenging than building from a kit. Cloning some replicas may be beyond a given modeler's skill.

## The REAL Reasons to Clone



**I know where to find Lee Piester but.....**

## The REAL Reasons to Clone



Where are you going to find kits like these today?

## More Real Reasons To Clone



**Or these?**

## Cloning Is Like A Scale Model Project...

- **You are building a replica, in 1:1 scale, of another model rocket.**
- **You are scratch building instead of working from a kit.**
- **You have to make decisions and sometimes compromises as to the accuracy of your clone versus the prototype.**
- **You sometimes have to dig around and do a little research to get the data needed to accurately duplicate your prototype.**
- **Sometimes you just have to make custom parts.**





## It's Important to Know Your Parts - Estes

- **Estes has used several kit numbering schemes over the years. The original scheme had kit numbers as 'K-xx', where 'xx' was a number from 1 to 59. In 1974 Estes switched to a 4-digit number. K kits were renumbered from K-xx to 12xx where 'xx' was the same for both. You can tell a lot about a given Estes kit from its number, such as:**
  - *TD-xx – Original 13mm motor 'Mini Brute' line (later renumbered 08xx)*
  - *MK-x – Boxed Citation series kits (bagged versions had 06xx numbers)*
  - *08xx – are all 13mm motor kits*
  - *12xx – the original Estes kits to 1299, released in 1978*
  - *13xx – kits were released between 1978 - 1983*
  - *14xx – are all starter sets*
  - *19xx – kits were released from 1983 - 1988*
  - *20xx – kits were released from 1988 -1994*
- **You can get all the details on old Estes parts and part numbers from the 1974 Custom Parts Catalog, scanned and on the web at:**

**[http://www.ninfinger.org/~sven/rockets/custom\\_estes/custom\\_estes.html](http://www.ninfinger.org/~sven/rockets/custom_estes/custom_estes.html)**

# It's Important to Know Your Parts - Estes

<b>Current Estes Body Tube Availability</b>							
<b>Estes Original Designation</b>	<b>Body Tube I.D./O.D.</b>	<b>Estes Current Parts</b>	<b>Apogee Components</b>	<b>Advanced Rocketry Group</b>	<b>Vaughn Brothers</b>	<b>KosRox</b>	<b>Totally Tubular</b>
<b>BT-3</b>	<b>.349 / .375</b>	-	-	-	-	-	<b>T-3</b>
<b>BT-5</b>	<b>.515 / .541</b>	<b>BT-5</b>	<b>10062</b>	<b>BT-5E</b>	<b>BT-5</b>		<b>T-5</b>
<b>BT-20</b>	<b>.710 / .736</b>	<b>BT-20</b>	<b>10085</b>	-	<b>BT-20</b>	<b>BT-20</b>	<b>T-20</b>
<b>BT-30</b>	<b>.725 / .765</b>	-	-	<b>BT-30E</b>	-	-	<b>T-30</b>
<b>BT-48</b>	<b>.902 / .928</b>	-	-	-	-	-	-
<b>BT-50</b>	<b>.950 / .976</b>	<b>BT-50</b>	<b>10099</b>	<b>BT-50E</b>	<b>BT-50</b>	<b>BT-50</b>	<b>T-50</b>
<b>BT-51</b>	<b>.984 / 1.011</b>	-	-	-	-	<b>BT-51</b>	<b>T-50+</b>
<b>BT-52</b>	<b>.998 / 1.114</b>	-	-	-	-	-	-
<b>BT-55</b>	<b>1.283 / 1.325</b>	<b>BT-55</b>	-	<b>BT-55E</b>	<b>BT-55</b>	-	<b>T-55</b>
<b>BT-56</b>	<b>1.300 / 1.340</b>	-	-	-	-	-	<b>T-56</b>
<b>BT-58</b>	<b>1.498 / 1.540</b>	-	-	-	-	-	-
<b>BT-60</b>	<b>1.595 / 1.637</b>	<b>BT-60</b>	-	<b>BT-60E</b>	-	-	<b>T-60</b>
<b>BT-63</b>	<b>1.639 / 1.681</b>	-	-	-	-	-	-
<b>BT-70</b>	<b>2.175 / 2.217</b>	-	-	<b>BT-70E</b>	<b>BT-70</b>	<b>BT-70</b>	<b>T-70</b>
<b>BT-80</b>	<b>2.560 / 2.600</b>	<b>BT-80</b>	-	<b>BT-80E</b>	<b>BT-80</b>	-	<b>T-80</b>
<b>BT-100</b>	<b>3.702 / 3.744</b>	-	-	-	-	<b>BT-100</b>	-
<b>BT-101</b>	<b>3.896 / 3.938</b>	<b>BT-101</b>	-	<b>BT-101E</b>	-	<b>BT-101</b>	<b>T-101</b>

\* Approximate Substitution

Shaded rows are for body tubes that have no exact replacements commercially available today.

# It's Important to Know Your Parts - Centuri

- **Centuri Body Tube Part Numbers and Sizes**

- *Centuri body tube number is much more straightforward than Estes number. The first digit or two indicates the tube inside diameter. The last digit(s) indicate the length of the tube.*

**Examples: ST-1610      ST-1318      ST-2018**

**ST-1610 is a 1.60" I.D. diameter body tube (ST-16) that is 10 inches long**

**ST-1318 is a 1.30" I.D. diameter body tube (ST-13) that is 18 inches long**

**ST-2018 is a 2.00" I.D. diameter body tube (ST-20) that is 18 inches long**







# It's Important to Know Your Parts - Centuri

Centuri	Body Tube I.D./O.D.	Apogee Components	Estes	Advanced Rocketry Group	Holverson Designs, Inc	Quest	Totally Tubular
ST-5	.515 / .543	10062*	BT-5	BT-5	-	-	T-5
ST-7	.715 / .719	10085*	BT-20*	BT-20*	-	-	T-20*
ST-8	.865 / .908	-	BT-46	-	HDI0024	-	T-.908
ST-9	.950 / .976	10099	BT-50	BT-50	-	BT-25*	T-50
ST-10	1.00/ 1.04	-	BT-51*	-	HDI0026	-	T-1.04
ST-13	1.30 / 1.34	-	BT-56		-	-	T-56
ST-16	1.60 / 1.64	-	BT-60	BT-60	HDI0028	-	T-60
ST-20	2.00 / 2.04	-	BT-67	-	-	-	T-2.04

\*Approximatesubstitution

(AdaptedfromCenturiMemorieswebsiteandupdated;usedwithpermissionoftheauthor)

# It's Important to Know Your Parts - Centuri

<b>Some Centuri Parts Substitutions – Nose Cones</b>	
 PNC54	Estes generic ogive BT-5 plastic nose cone
 PNC76	Estes generic ogive BT-20 plastic nose cone
 Non-catalog nose cone used on Red-Eye, X-24 Bug, strap-on tanks for Orion & Sky-Lab; fits ST-7	Estes Yankee plastic nose cone
 PNC132	Blast From the Past PNC-132 (v) Shortened Quest PNC53*
 PNC13C	Estes Maniac nose cone or AAA PNC-56A both w/o plastic tube coupler
 PNC160	Blast From the Past PNC-160 (v) Estes Big Bertha nose cone*
BNC51 Mach 10 pod cone	Moldin Oldies
BNC54 Taurus pod cone	Moldin Oldies

\*Approximate substitution

(Adapted from Centuri Memories website and updated; used with permission of the author)

## OK, So Where Do You Start?

- **Information is the real key to a successful cloning project.**
- **Decide what you want to build. Start with a simple project. Keep it within your current skill level.**
- **Get COMPLETE plans – including fin templates, parts list, etc.**
- **See what parts are still available from Estes or other sources.**
- **Decide if you are building a true replica or a close facsimile.**
  - *If you want an accurate nose cone you may need to order from BMS or turn your own;*
  - *Substitute a newer plastic nose cone with a similar shape to the original balsa part;*
  - *BT-20 body tube and nose cones are often used instead of BT-30 parts, although BMS offers a couple of replica BNC-30 cones;*
- **Decide which version of an OOP kit you want to reproduce.**
  - *The Citation Bomarc (boost glider) or later version (parachute recovery)?*
  - *The original Cherokee-D with BNC-55AC nose cone and BT-55V, or later version with PNC-55AC and full-length BT-55?*

# Sources for OOP Kit Info, Tips and Plans

- **JimZ Web Site:** [www.dars.org/JimZ/rp00.htm](http://www.dars.org/JimZ/rp00.htm)
  - *Plans, plans and more plans*
  - *Without a doubt the greatest web resource for cloning kits*
- **Ninefinger.org Model Rocketry:** [www.ninfinger.org/~sven/rockets/rockets.html](http://www.ninfinger.org/~sven/rockets/rockets.html)  
*Scanned catalogs and links galore!*
- **A. Shasta's Page:** [www.geocities.com/CapeCanaveral/Lab/4559/indexframe.html](http://www.geocities.com/CapeCanaveral/Lab/4559/indexframe.html)
  - *A number of scanned plans (most also on JimZ site)*
- **Bring Back the Classics:** <http://members.aol.com/centuri97/index.html>
  - *Great page(s) on cloning*
  - *Some good Estes and Centuri nostalgia*
- **Kurt Schachner's Decal Page:** [www.geocities.com/CapeCanaveral/Hangar/9936](http://www.geocities.com/CapeCanaveral/Hangar/9936)
  - *Scalable reproduction decals for many OOP kits*
- **Ryan McDaniell's:** <http://plans.rocketshoppe.com/>
  - *A number of scanned plans that are off the beaten track*



# Manufacturers of 'Cloning' Materials and Parts Sets

## Totally Tubular (BMS)

- *Estes and Centuri body tubes (many sizes), centering rings and couplers*

## ▪ Balsa Machining Services (BMS)

- *Classic Estes and Centuri and semi-custom nose cones*

## ▪ Tango Papa Decals

- *Replica decals for many, many old kits*

## ▪ Blast From the Past Rocketry

- *Replacement nose cones for Centuri PNC132 and PNC160*

## ▪ JimZ Hobbies

- *Resin replica parts for a few OOP Kits and a large number of replica decals*

## ▪ Moldin' Oldies

- *Replica Centuri & Estes plastic parts*

## ▪ Alien Enterprises

- *Cast resin and fiberglass replica parts for BT-101 based Maxi Pershing 1A*

# Manufacturers of Clone Kits or Complete Parts Sets

- **Apogee Components**
  - *It's not really an Estes replica – it's a BETTER 1/70 Saturn 1B*
- **Blast From The Past Rocketry**
  - *Replica Centuri NASA Space Shuttle, M-10, and Omega II kits*
- **Tango Papa Decals**
  - *Replica Estes Mars Lander kits in 1:1 and other sizes*
- **Balsa Machining Service**
  - *Clone kits for Cobra and soon Mars Snooper 2*

Check these out. Sometimes it's cheaper to buy a clone kit than put the parts together yourself!

## Finding Those OOP, Hard To Get Parts

- **Check the current manufacturers' catalogs first. The check OOP catalogs to see what other kits used the same parts:**
  - *Sometimes you can get the part(s) you need as part of a less expensive OOP kit, or even a kit in current production that re-uses an old part*
- **Get Involved with model rocket collectors:**
  - *Check and see who's buying on Ebay and ROL; contact them*
  - *Email the Webmasters of the Estes and Centuri 'nostalgia' web pages*
- **Send mail to the OldRockets discussion group on Yahoo:**
  - *<http://groups.yahoo.com/group/OldRockets>*
- **Post a Rocketry Online classified:**
  - *<http://www.rocketryonline.com>*
- **Post a Usenet message to the rocketry group:**
  - *[Rec.models.rockets \(rmr\)](mailto:Rec.models.rockets)*
- **Be prepared to pay a hefty premium for true OOP parts.**

# If All Else Fails, Make Your Own!

- **Resin Casting**

- *Apogee Components report TP #12: Making Cast Pastes with Silicone Rubber Molds*

- **Turning Nose Cones**

- *Estes Model Rocket News Vol. 7, Number 1, Dec 1967: Turning Your Own Nose Cones*

- **Vacuforming**

- *NARCON 2003 Session: Vacuum Forming Basics*
- *George Gassaway has an excellent web page on vacuforming parts at <http://members.aol.com/GCGassaway/vacuform.htm>*

- **Custom Body Tubes**

- *Apogee Components report TP #13 Making Spiral Wound Paper Tubes*

Also, check out the comprehensive index to *Model Rocketeer, American Spacemodeling and Sport Rocketry*. There are numerous articles on all of the above subjects: <http://www.nar.org/magindex.pdf>.

## If All Else Fails, Make Your Own: Body Wraps



**“My brother found me a corrugated paper product that will work very well for the corrugations on the Saturn 1B. It is just like corrugated cardboard that has only one side on the corrugations - except it has very small corrugations. I am not sure what it is called, but he found it at a rubber stamp shop. I suspect that it might be found at better craft shops (if I find out what it is called I will post it here). These pictures are with the material wrapped around a BT101 tube. It should give you a good example as to the size of the corrugation pattern.” – Damian Kostron**

**Note: Paul Graf (GrafGulch@aol.com) makes a Vacuform set of 1/70 Saturn 1B body wraps that he sells for \$12/set.**

Taken From Kosrox Website – 1/70 Saturn 1B Construction Tips  
Used with permission of the author

# Important Reference Documents for 'Cloners'

- **Estes 1974 Custom Parts Catalog**
  - *Dimensions of body tubes*
  - *Parts numbers for many special plastic parts sets*
  - *Outline pictures of nose cone shapes with part numbers and dimensions*
- **Estes 1971 Catalog**
  - *One of the best Estes catalogs for color pictures of old, 'K Series' kits*
- **Estes 1979 or 1980 Catalog**
  - *For many of the great post-K series designs (Andromeda, Scissors Wing Transport, Maxi Brutes)*
- **Centuri 1968 Catalog**
  - *One of the best Centuri catalogs for pictures of older Centuri kits, including Mini Max*
- **Centuri 1978, 1979 or 1980 Catalog**
  - *Later Centuri kits, Including Super Kits and Fantasy line*

## Downloading and Viewing Plans

- The JimZ website has a combination of TIFF (Tagged Image File Format), JPEG, GIF, PDF (Adobe Acrobat) and PS (Postscript) files.
- Most web browsers (Including Netscape and Internet Explorer) have built-in support for JPEG and GIF.
- You need to download stand-alone graphics viewers or plug-ins for the other formats.
  - *The 20/20 Graphics Viewer, available as shareware, is highly recommended for viewing a wide range of graphics formats. 20/20 is hard to find online, but the JimZ has an ftp set up for it.*
  - *The MicroGrafx suite has another excellent graphics viewer. This is a commercially available product, sold at computer software outlets.*
  - *PDF files are in Adobe Acrobat format. Adobe publishes free PDF readers for MacOS and Windows computers at:*

<http://www.adobe.com/products/acrobat/readstep.html>

# Some Popular, Easy To Clone Classics

**Estes K-10 Astron Cobra**



**Estes K-47 / 1247  
Astron Cherokee-D**



**Estes K-55 / 1255  
Goblin**



**Centuri  
Laser-X**



**Estes K-42 / 1242 Astron Orbital Transport**



**These all use body tubes still available today, either from Estes, Totally Tubular or several other suppliers.**



## Some Popular, Easy To Clone Classics

All of the needed balsa nose cones and transitions are available from BMS.

No special plastic (or die stamped) cardboard parts are required.

Replica decals can be purchased from Tango Papa Decals or JimZ Hobbies; or they can be downloaded from Kurt Schachner's decal page and printed by you.

Nothing more complicated than cutting body paper body tubes and balsa fins is required to build these. However, the Orbital Transport and Laser-X are challenging enough for even experienced modelers to not get too bored with them. BMS & BFTPR have lasercut sets for OT

All can be built for a total cost of less than \$20 each, including nose cones, body tubes, decals, recovery system, motor mounts, etc. OK, the Orbital Transport might cost you \$25...

Estes still makes (at least some of) the recommended motors for these rockets.

# A Little More Complicated Clone: Estes Interceptor



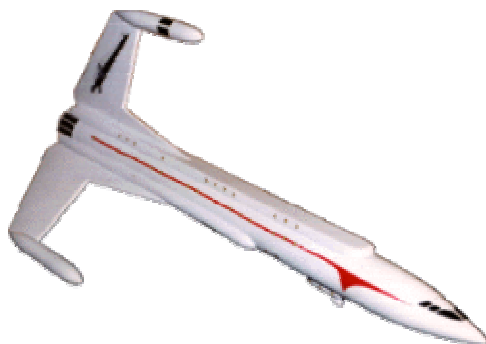
<b>Name</b>	<b>Estes Interceptor</b>
<b>Kit Number</b>	<b>K-54 / 1254</b>
<b>Introduced</b>	<b>1971 (last year offered was 1980)</b>
<b>Length</b>	<b>26.0"</b>
<b>Diameter</b>	<b>1.325"</b>
<b>Recommended Motors</b>	<b>B4-2, B6-4, C6-5</b>
<b>Comments</b>	<b>One of the all-time great Estes kits. Difficulty factor is from need for several custom plastic parts. Lots of fin work.</b>

Type of Part(s)	Description and Source	Approx. Cost
<b>Body Tubes:</b>	<b>Standard Estes BT-55 (18')</b>	<b>2.00</b>
<b>Nose Cone/Wing Pod/ Tail Cone Plastic Parts:</b>	<b>Resin cast replica parts from Moldin Oldies (replicates PRP-50 parts)</b>	<b>30.00</b>
<b>Decals:</b>	<b>Replica decals from Tango Papa Decals or JimZ Hobbies</b>	<b>15.00</b>
<b>Plans and Templates:</b>	<b>Scanned original plans on JimZ web site</b>	<b>Free</b>
<b>Recent Auction Price for Original Kit:</b>		<b>&gt; \$200.00</b>
<b>Total Estimated Replica Cost:</b>		<b>&lt; \$45.00</b>

# A Little More Complicated Clone: Estes Interceptor

- This is actually a very straightforward project. The complexity is just from the skill level of the rocket design, not the difficulty in gathering or preparing parts.
- The cast resin parts set is currently not available from JimZ Hobbies:
  - *Go to Moldin' Oldies for the resin set of nosecone, tailcone, & pods.*
  - *A one-piece version of the Interceptor nose cone is used in the OOP Estes Vindicator (#1367, avail. 1981-1984) kit. It is a direct replacement for the original 3-piece nose cone. One painted, you can't tell the difference. The Vindicator sells at auction for much less than an Interceptor.*
  - *The one-piece version of the cone is also contained in the OOP 'Futuristic Parts Assortment', which also sells for less than an Interceptor. Plus, you get another 4-5 hard to find plastic 'sci-fi' nose cones for other cloning projects (and the same tubes and parts found in any Estes builder's set).*
  - *Given a good traced template of one of the plastic tail pod halves, it becomes obvious that this can be replicated with a balsa nose cone and balsa or basswood vanes.*
  - *A reasonable facsimile of the tail cone can be made from a paper or cardstock transition and balsa strips for the vanes.*

# A Construction Challenge: Estes Starship Excalibur



<b>Name</b>	Estes Starship Excalibur
<b>Kit Number</b>	Estes Industries Rocket Plan #55
<b>Introduced</b>	1968
<b>Length</b>	23.5"
<b>Diameter</b>	1.315" (main body tube)
<b>Recommended Motors</b>	A8-3, B6-4, C6-5
<b>Comments</b>	My personal (Buzz) all time favorite design. The tube and nose cone slicing, plus all the balsa work, make this a challenging project. OK, so this really isn't a clone since it was never a produced kit – it's still a fun, rewarding project!

Type of Part(s)	Description and Source	Approx. Cost
Body Tubes:	All standard Estes tubes. BT-5 (2), BT-55 (1)	5.00
Nose Cones	BNC-55K (1), BNC-5E (5), BNC-5W (3); all available from BMS	15.00
Decals:	None specified in plans	N/A
Plans and Templates:	Scanned original plans on JimZ web site	Free
Recent Auction Price for Original Kit:		N/A
<b>Total Estimated Replica Cost:</b>		<b>&lt; \$30.00</b>

**Note: Cost estimates do not take into shipping or quantity discounts on all those nose cones.**

# A Construction Challenge: Estes Starship Excalibur

- **No special plastic parts are needed for this project.**
- **Expect to spend a LOT of time sanding and sealing.**
- **The need to slice body tubes and nose cones makes this a challenging rocket to build. Many of the techniques used with this design are shared with building scale models.**
- **Custom decals can be drawn and cut from solid color sheets of decal paper.**
- **The needed body tubes are all still available as standard Estes parts, or from any of the other tube sources.**
- **The balsa nose cones are no longer made by Estes but are available from BMS.**
- **Reinforce EVERYTHING, especially the fin/pod joints.**
- **This design flies well if built with a 24mm mount and flown on D12 BP motors.**

# An Ambitious Clone Project: Centuri USS America



<b>Name</b>	Centuri USS America
<b>Kit Number</b>	5310
<b>Year Introduced</b>	1978 (last year offered was 1982)
<b>Length</b>	26.0"
<b>Diameter</b>	1.6" (main body tube)
<b>Recommended Motors</b>	C6-3, C5-3S
<b>Comments</b>	Difficulty of this kit has decreased recently. The Nosecones and ramjet parts are readily available From Moldin' Oldies.

Type of Part(s)	Description and Source	Approx. Cost
Body Tubes:	Centuri ST-10 (2), ST-16 (1) from Totally Tubular	6.00
Nose Cones	Replica set available from Moldin Oldies	20.00
Ramjet Plastic Parts	Included with Nose Cone set from MO	
Decals:	Replica decals from Tango Papa Decals	8.00
Plans and Templates:	Scanned original plans on JimZ web site	Free
Recent Auction Price for Original Sealed Kit:		> \$225.00
Total Estimated Replica Cost:		~ \$40.00

# An Ambitious Clone Project: Centuri USS America

- **Mike Schmidt's Moldin' Oldies makes a kit of nosecone/ramjet hollow resin parts for \$20**
- **Should be built with a 24mm motor mount. The only 18mm motors capable of flying this are composites and a much more expensive than BP motors.**
- **Fin alignment is critical for this rocket. This model reacts badly to misaligned fins.**
- **Replace the fiber ramjet mounts with balsa or basswood – basswood is better.**
- **Reinforce everything. There are lots of parts hanging off of this rocket.**
- **The model needs nose weight if built with a foam nose cone.**
- **Use a single 24" parachute. The original kit used 2 x 18" parachutes.**

# A Less Common Clone: Estes SPEV



<b>Name</b>	<b>Estes SPEV: Spare Parts Elimination Vehicle</b>
<b>Kit Number</b>	<b>K-59</b>
<b>Introduced</b>	<b>1972 (last year offered was 1973)</b>
<b>Length</b>	<b>24.63"</b>
<b>Diameter</b>	<b>2.217"</b>
<b>Recommended Motors</b>	<b>B6-4, C6-5</b>
<b>Comments</b>	<b>Only offered as a special closeout one summer in the summer of '72. Used left over parts from 1/70 Little Joe II and Thor Agena kits.</b>

Not sure about the availability of BT-52 from TT.

Type of Part(s)	Description and Source	Approx. Cost
<b>Body Tubes:</b>	<b>BT-60, BT-70, BT-52; from Totally Tubular</b>	<b>10.50</b>
<b>Nose Cone &amp; Adapters</b>	<b>BNC-52G, TA-5260C, TA-6070; from BMS</b>	<b>13.35</b>
<b>Decals:</b>	<b>JimZ Hobbies replica decal</b>	<b>3.00</b>
<b>Plans and Templates:</b>	<b>Scanned original plans on JimZ web site</b>	<b>Free</b>
<b>Recent Auction Price for Original Kit:</b>		<b>&gt; \$350.00!</b>
<b>Total Estimated Replica Cost:</b>		<b>&lt; \$30.00</b>



## A Less Common Clone: Estes SPEV

- **This is one of the best ‘spare parts’ offerings ever, and you won’t see many of these at the launch site (unless you are flying with NAR President Mark Bundick).**
- **This kit ‘cries’ for a 24mm motor mount. Try BMS for suitable centering rings.**
- **Reinforce the fins if using balsa. Balsa ply, light plywood and basswood are better choices for this rocket.**

# Want To Make A Little Money?

- **There is a definite (small, but growing) market for replica parts to help clone those hard to find old kits. This includes both resin cast and vacuum molded replacement parts.**
- **Some example parts that might be suited to making resin replicas:**
  - *Centuri Quasar nose cone - also used on ESS Raven and USS America super kits*
  - *Centuri Orion and Skylab nose cones*
  - *Estes Saros plastic parts set*
- **Some example parts that might be suited to making vacuformed replicas:**
  - *Centuri Orion body wraps, which came from the Enerjet Athena*
  - *Centuri Skylab vacuformed parts*
  - *Estes Citation Bomarc engine nacelles and body tube raceway*
  - *Estes 1/100 Saturn 1B body wraps*

# Addresses of Mentioned Suppliers

*Apogee Components* (Tim Van Milligan)

1130 Elkton Drive  
Colorado Springs, CO 80907  
Web: <http://www.apgoeerockets.com>  
Email: [tvm@pogeerockets.com](mailto:tvm@pogeerockets.com)  
Phone: 719 535-9335 Fax: 719 534-9050

*Blast From The Past Rocketry* (Mike Jerauld)

2281 Penrose St.  
San Diego, CA 92110  
Web: [www.blastfromthepastrocketry.com](http://www.blastfromthepastrocketry.com)  
Email: [mjerauld@tns.net](mailto:mjerauld@tns.net)  
Phone: 619 276-6238

*Balsa Machining Service*

11995 Hillcrest Dr.  
Lemont, IL 60439  
Web: <http://www.balsamachining.com/>  
Email: [bms@mc.net](mailto:bms@mc.net)  
Phone: 630 257-5420 Fax: 630 257-0341

*Tango Papa Decals* (Tom Prestia)

1901 Mitman Road  
Easton, PA 18040  
Email: [BakerTom@aol.com](mailto:BakerTom@aol.com)  
Web: [www.tangopapadecals.com](http://www.tangopapadecals.com)

*Moldin' Oldies* (Mike Schmidt)

8231 136th Ave. SE  
Newcastle, WA 98059  
Web: <http://moldinoldies.rocketshoppe.com/>  
Phone: 425 255-8364

*JimZ Hobbies* (Jim Zalewski)

Post Office Box #22  
Clawson, Michigan 48017  
Web: <http://www.provide.net/~jimz/jimz.htm>  
Email: [jimz@provide.net](mailto:jimz@provide.net)  
Phone: 248 435-KITS

*Kosrox* (Damian Kostron)

3023 Copper Oaks Alcove  
Woodbury, MN 55125  
Web: [www.tela.com/~dtkostron](http://www.tela.com/~dtkostron)  
Email: [kosrox@eandc.com](mailto:kosrox@eandc.com)  
Phone: 651 714-4512

*Totally Tubular* (Jim Fackert)

10555 McCabe Rd.  
Brighton MI 48116-8526  
Web: [www.buyrockets.com/buyrockets/tt.html](http://www.buyrockets.com/buyrockets/tt.html)  
Email: [jfackert@cac.net](mailto:jfackert@cac.net)  
Phone: 810 231-3471 Fax: 810 231-1631 Eve: 810 231-3471

*Holverson Designs, Inc.* (Doug Holverson)

25075 Co Hwy L20  
Soldier, Iowa 51572  
Web: [pionet.net/~holvrson/index1.html](http://pionet.net/~holvrson/index1.html)  
Email: [holvrson@pionet.net](mailto:holvrson@pionet.net)

*Alien Enterprises*

C/O Edward Miller  
316 E. Queen St.  
Jonestown, PA 17038  
Email: [Thunderhead@ihs2000.com](mailto:Thunderhead@ihs2000.com)

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Sven Knudson  
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Don Lindich  
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Mike Schmidt  
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**The rocket graphics used in this presentation were taken from the JimZ OOP Plans website and used here with permission.**

## A Final Word on Cloning and NARCON 2003

- **“They don’t make ‘em like they used to” is all too true for most current Estes products. Cloning is a way to bring back the challenge to building model rockets.**
- **Today there are more model rocket material sources available to the average builder than at any other time in the history of this hobby. A number of vendors are producing replica parts and kits. It’s not that difficult to reproduce most OOP designs. There are, of course, a few notable exceptions.**
- **A few of the vendors mentioned in this presentation (such as BMS, Apogee Components, and (sort of) Blast from the Past) are at NARCON 2003. TAKE ADVANTAGE OF THIS – BUY WHILE THEY ARE ALL HERE!**