

APOGEE

PEAK OF FLIGHT

NEWSLETTER

The History of Body Tubes

By Tim Van Milligan

I was talking to a good friend recently (who used to work at Estes during the glory years), and he got to talking about the history of some of the "BT" series body tubes for model rockets. I thought the story was kinda interesting, so I pumped and prodded him for more information so that I could share it with the readers of this newsletter.

Before the Estes tubes were named "BT" they were just simply designated with the letter "T." The first one was the size of today's BT-20. It got its start from Orville Charlise when he invented the first rocket motor. Charlise was a fireworks manufacturer, and the one size tube he had to make rocket motors was was one that was pretty close to 3/4 inches in diameter. This motor became the standard size, and is now know as the 18mm diameter size. The tube that fit over the motor became the first rocket tube manufactured.

I was told that the first tubes were not spiral wound, but were parallel wound. This limited them on length, and the quality wasn't the greatest. Eventually, the tubes were made spiral wound. The same company that made them for Estes in the 1960's is still making them today.

The "BT" designation was developed by a rocket designer named Bill Simon. According to legend, he didn't have any set plan when he started naming tubes. He jumped around a bit, leaving gaps in the numbering system to give room for future tubes.

The BT-30, which isn't used at all anymore, was the size of the tube that was used for several of the original Estes kits. It was used in the Scout, Mark, and Space Plane.

The BT-40 was never used by Estes, but was the name given to a couple of tubes in some of the free plans that were given away to modelers. A Harry Stine plan called the "Dirty Bird" was one of the kits that needed an odd size tube, so it was given the designation BT-40.

There is a common perception that the BT-60 came from

a paper towel tube. But actually, the Ranger kit gave us the birth of the BT-60. It was sized so that a cluster of three BT-20 tubes would fit inside.

Before the 24mm D motor was invented, the BT-50 came from the 1/70th scale Saturn 1B (actually, it is 1/72nd scale). The BT-50 was the size of the tube of the 8 tubes on base of the vehicle.

The BT-70 also came from the 1/70th scale Saturn 1B. It was the size of the tube of the service module.

The 1/100th scale Saturn V kit gave us a couple of tubes. The BT-101 was the size of the big tube on the lower part of the model. The BT-80 was the size of the tube that was used on the third stage of the model.

It was the Arcas scale kit that first used the BT-55 tube. The BT-5 was created as the motor tube for the 13mm motor.

When the Centuri company was merged into Estes, the company eventually dropped most of the tubes. The one exception was the BT-56, which was bigger than the BT-55, but less than the BT-60. The reason it stuck was because Centuri had an egglofting kit that used the tube. Estes wasn't about to re-tool the nose cone to fit the BT-55 tube, so they kept it around. There was also another nose cone that fit this size tube too. It was eventually used on the Maniac kit.

The next line of standardized tubes to come out of Estes were the HBT series; which were a creation of Mike Dorffler, and stood for "Heavy" Body Tubes. In this series, the tube size was named for the physical size of the tube. The first of this new series was HBT-1090, which had a outer diameter of 1.090 inches. The HBT-3000, which was 3.000 inches in diameter, was first used in the Pro Series kit: Patriot.

At Apogee Components, our line of standard tubes are based on the Estes tubes. But we choose an easier naming system to remember for customers. It is based on the motor size (measured in millimeters) that will fit snugly into the tubes. For example: BT-5 becomes the Airframe Tube-13mm (because a 13mm diameter motor fits into it). The BT-20 becomes



1130 Elkton Drive, Suite A
Colorado Springs, CO 80907 USA
www.ApogeeRockets.com
orders@ApogeeRockets.com
phone 719-535-9335 fax 719-534-9050

the AT-18mm, and the BT-50 becomes the AT-24mm. Apogee wasn't the first rocket company to choose this naming system. It is commonly used in high power rocketry; for example, a 29mm motor will fit into a tube designated as 29mm. The same goes for 38mm, 54mm, 75mm, and 98mm tubes.

The 10.5mm tube was supposed to be 10mm, but there was a problem with the 10mm motors, so they eventually became 10.5mm in diameter. However, that is a story for another issue of this newsletter. We will continue to name future tubes equal to the outside diameter as measured in mm. For example, the core tube used on the Delta III scale kit is called the AT-22.5, because it is 22.5 mm in diameter.

Update: Changes since this article was first written

First off, I mis-spelled "Carlisle." I'm sorry for this.

Second, I got a lot of emails about the BT-50 tube. They went something like this: "But Tim, but Tim... I looked in all my old catalogs, and the BT-50 was used in other models before the Saturn 1B was produced. The Alpha for example..."

My sources on this article were Bill Simon (who started working at Estes in 1962), and Mike Dorffler, who started in 1969. Again, the BT-50 was created for the Saturn 1B tank

tubes. It was one of those kits that was created several years before it was ever produced as a kit. Another example of this is the Mercury Atlas. It was sitting in the R&D offices for about 5 years before it actually became a kit.

I'm sorry if there are people that don't believe this. But this comes from the source that actually worked on the model. I think this goes to show that my theory on Estes Industries was correct; the "glory days" of Estes invokes a lot of strong feelings which makes it hard for any new rocketry company to break into the market ([see E-zine issue #2](#)).

About the Author:

Tim Van Milligan is the owner of Apogee Components (<http://www.apogeerockets.com>) and the curator of the rocketry education web site: <http://www.apogeerockets.com/education>. He is also the author of the books: "*Model Rocket Design and Construction*," "*69 Simple Science Fair Projects with Model Rockets: Aeronautics*" and publisher of the FREE e-zine newsletter about model rockets. You can subscribe to the e-zine at the Apogee Components web site, or sending an email to: ezine@apogeerockets.com with "SUBSCRIBE" as the subject line of the message.

About this Newsletter

You can subscribe "FREE" to receive this e-zine at the Apogee Components web site (www.ApogeeRockets.com), or sending an email to: ezine@apogeerockets.com with "SUBSCRIBE" as the subject line of the message.

