

Founded by Dave and Beth Carr in 1995

**October 2006**

<http://www.portlandmodelengineers.org>

President: Greg Dermer	(503) 281 9238	depcco@easystreet.com
Vice President: Pat Wicker	(503) 612 8499	pwicker@aracnet.com
Treasurer: Bud Statton	(503) 324 9514	budstatton@worldnet.att.net
Membership: Carl Petterson	(503) 245 8335	tomten@easystreet.com
Editor: Jarod Eells	(503) 830 0157	jarod@eells.us
Webmaster: Greg Dermer	(503) 281 9238	depcco@easystreet.com
Member-at-large: Bill Miller	(503) 246 2175	bilau@gte.net

### **For The Beginner #33 by Wes Ramsey**

#### **FITS**

### **September News Summary**

This was a busy month for Portland Model Engineers. The group met early in the month for our annual picnic and returned to Bud Statton's shop for good food, some aluminum and brass casting, and other fine examples of metal work. Thanks for hosting a fun event! A number of members came out to try their hand at making molds for sandcasting. Pictures and details as always in the next few pages.

The second event this month was G.E.A.R.S. 2006. For two days, Kliever Armory was taken over by steam and gas models, reproductions and their owners. Plenty of vendor reps were on hand to answer questions about their products.

Next month we will meet back at Grant Carson's shop. It is scheduled for Saturday, October 14th, 1:00pm at:

A & G Products  
7360 SW Bonita Road, Unit C  
Tigard, OR 97224

Remember, if you have a metal-related project -- complete or not -- we like to see it. Bring it in and share a few words on the subject.

### **Hand Turning on the Lathe Tutorial**

The second session in our tutorial series will be conducted by Tom Hammond. He is presenting on hand metal turning, a technique for rapidly producing bevels, curves and braking corners on the lathe using hand-held tools. It will be start at noon, one hour before the usual meeting time. Bring a sack lunch and join us!

Fit refers to the amount or lack of clearance between two parts. Fits can range from free running or sliding, where a certain amount of clearance exists between mating parts, to press or interference fits where parts are forced together under pressure. Clearance fits can range from a few millionths of an inch, such as would be the case in the component parts of a ball bearing, to a clearance of several thousandths of an inch, for a very low speed drive or control lever application. Many times a machinist is concerned with press or interference fits. In this case two parts are forced together usually by mechanical or hydraulic pressing. The friction forces involved then hold the parts together without any additional hardware such as keys or set screws. Tolerances for press fits can be easily damaged by attempts to press fit them if there is an excessive difference in their mating dimensions. In addition, press fitting physically deforms the parts to some extent. This can result in damage, mechanical binding, or the need for a secondary resizing operation such as hand reaming or honing after the parts are pressed together. A very typical example of press fit is when a ball bearing inner race is pressed onto a shaft or an outer race is pressed into a bore. Thus, the bearing is retained by friction and the free running feature is obtained within the bearing itself. Ball to race clearance is only a few millionths of an inch in precision bearings. If a bearing is pressed into a bore or onto a shaft with excessive force because pressing allowances are incorrect, the bearing may be physically deformed to the extent that mechanical binding is present. This will often cause excess friction and heat while in operation resulting in rapid failure of the part. On the other hand, insufficient friction retention of the part resulting from a press fit that is not sufficient can result in the wrong part turning under load or the mechanism falling apart while operating. If you let the smoke out it won't run.

## A & G PRODUCTS

Saturday, October 14th, 2006

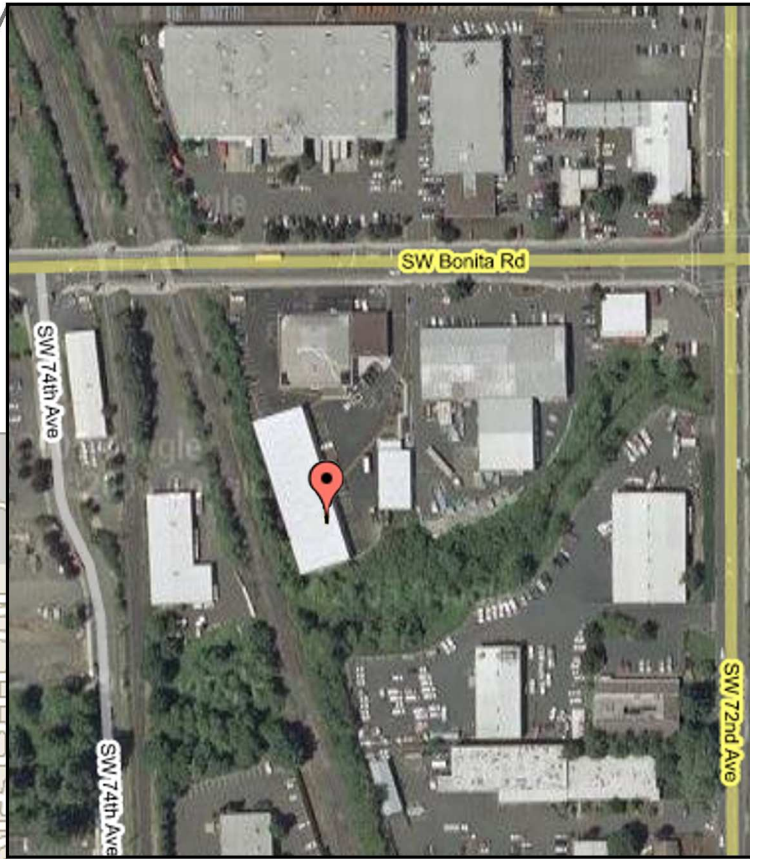
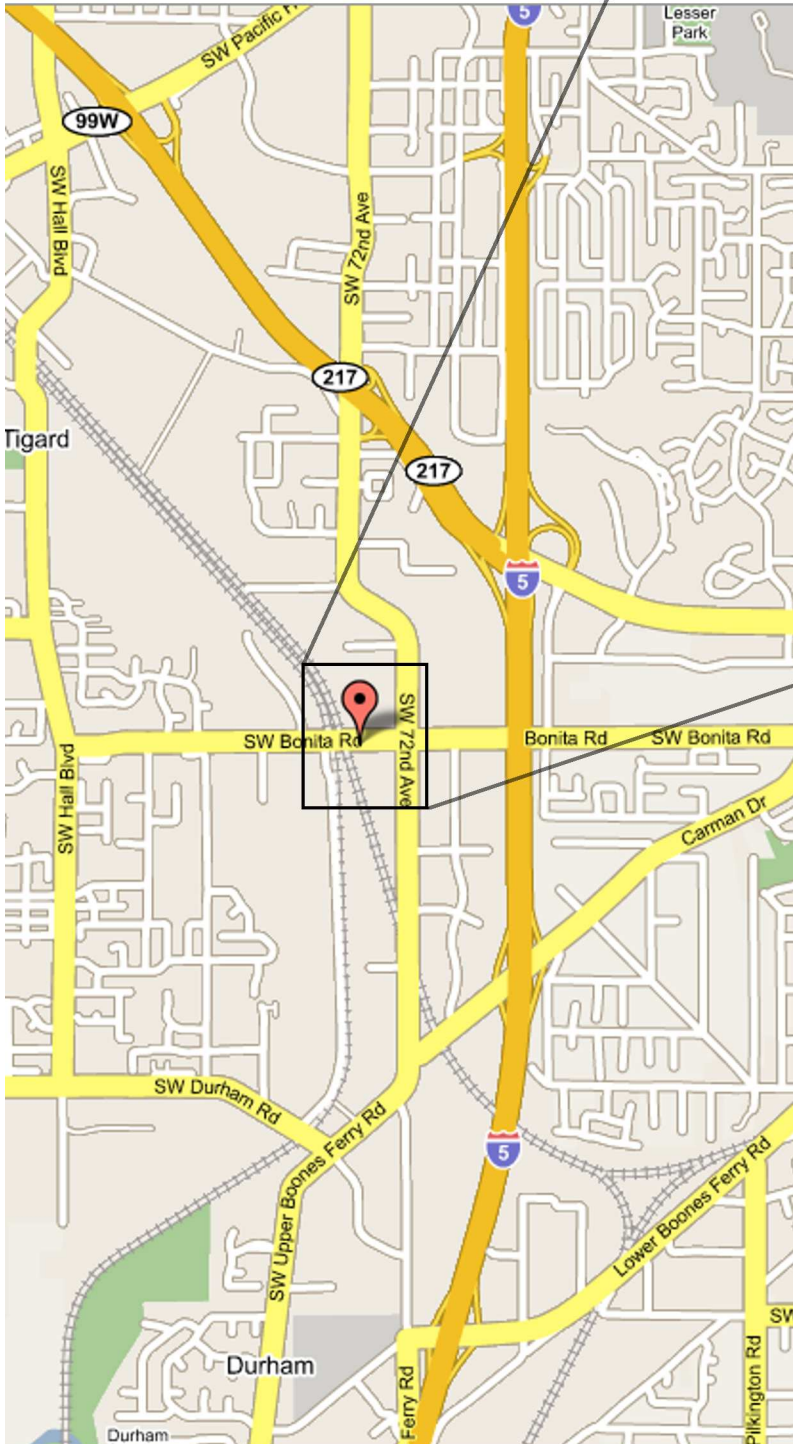
Meeting, 1:00pm

Tutorial, 12:00pm

A & G Products

7360 SW Bonita Road, Unit C

Tigard, OR 97224



### Directions to Grant's

#### From I-5:

Use exit 292 to Hwy 217, go north about 1/4 mile toward Beaverton to SW 72nd exit. Turn left onto SW 72nd Ave, go about 3/4 mile to Bonita Road, turn right. A & G will be on your left.

#### From Hwy 99 (Pacific Ave):

Turn south onto SW 72nd Ave, proceed about 1-1/2 miles to Bonita Road, turn right. A & G will be on your left.





Eric and Matt Driggers trying their hand at ramming sand. Colby McAdams ramming up her first mold.



Jamie McAdams shown with his go-kart wheel pattern. Gary Martin was in charge of the sand pit and did a great job of explaining the finer points of cutting gates and risers to all.

Greg Swenson experimented with casting his part into a mold printed with rapid prototyping. The risers were done with lost foam.

Casting crew: Bud Statton, Kevin Filter, and Jarod Eells



Bud fires up the furnace and ... a short time later... we have hot brass ready to pour!





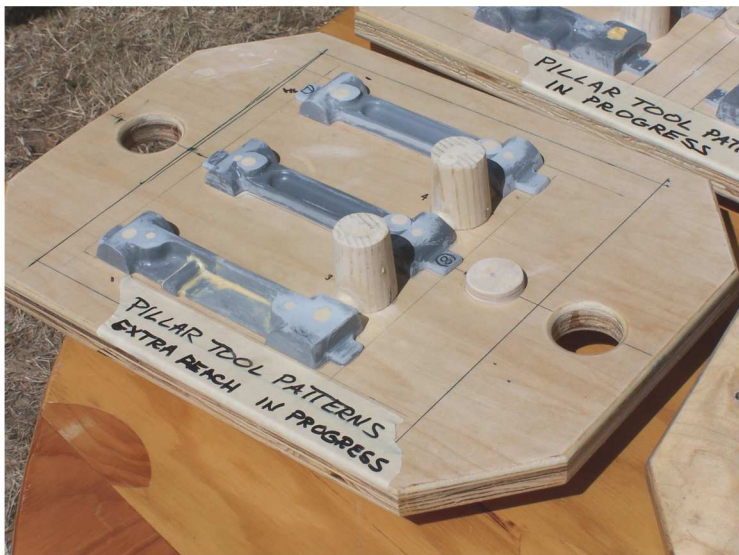
Starting on the previous page: Bud charging the furnace and hot metal ready to pour. On this page: pouring brass for Greg's experimental method and the mold that he printed. The part was drawn in SolidWorks and then inverted.



Bud "slagging the pot" to remove impurities and dross.



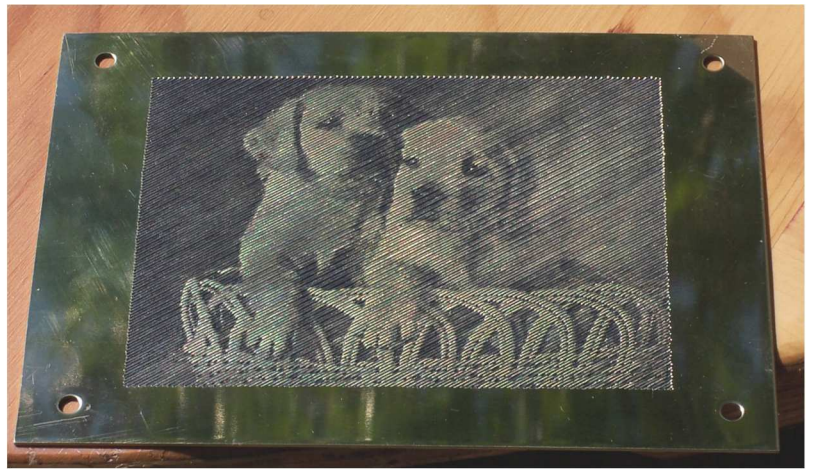
The finished pillar tool that Carl Petterson brought in. Below are two of the pattern boards used for parts. The pillar tool allows very sensitive drilling and tapping.







Roger Linscheid brought in examples of pictures drawn by CNC control. This uses the color of the original image to drive the amount of material removed. (Above)



Larry Derry brought in a model of a 1903 Cavanaugh Red Devil. (Right)



Below two shots from G.E.A.R.S: Randy Rockwell demonstrated a portable furnace constructed from firebrick with no mortar. This furnace was able to melt aluminum in 20 mins from a cold start. He wanted to show that doing foundry work does not necessarily mean expensive complicated setups.

