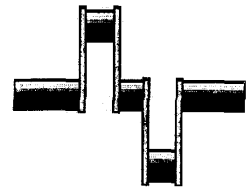


# The Crank Calls

*The Bay Area Engine Modelers Club, Branch 57 of EDGE&TA*

President.....Peter Brooks.....(408) 266-6148...pdbrooks@pacbell.net  
Secretary.....Bob Kradjian.....(650) 343-7585.....bkradjian@aol.com  
Treasurer.....Lewis Throop.....(650) 941-8223.....lthroop@aol.com  
Editor.....Jim Piazza.....(408) 446-4825..jpiazza@ix.netcom.com



September 2001

www.baemclub.com

## NEXT MEETING

15 September, 2001  
AT 10 AM  
AT

Robert Schutz's SHOP  
366 40th St.  
Oakland, CA



## Shows

**PRIME**  
Sept. 21,22 and 23rd.  
Eugene, Or.

### Special Feature

Chris Leggo has provided us  
with a reprint from  
Model Engineer, 1924  
Thank you Chris and  
Model Engineer.

BAEM Meeting Notes  
August 18, 2001

Bob Kradjian, secretary

Thanks to Pat O'Connor for taking notes in my absence. I had to attend a 50<sup>th</sup> wedding anniversary. It seems that I was part of the original wedding party and, no, I wasn't the ring bearer.

New **members** and **visitors** included Tom Armstrong, Kurt Schaefer, and Bob Schenk. Welcome!

President Peter Brooks will be stepping down at the end of the year. We appreciate the good work that Peter has done. Give some thought to a successor for this post.

The treasury is intact with just less than a thousand dollars on hand.

Robert Schutz continues to be our host. We greatly appreciate his generosity and helpful spirit. However, we need help in setting up and taking down chairs and tables. Also, we need to cover the expense of the donuts and coffee. This averages \$40 a meeting, please feed the kitty appropriately.

### First Pops:

Tom Armstrong has finished his "Dinky Deere." This is not a beginner's kit. The casting set is over 800 dollars and the 350 pages of instruction run around 125 dollars. I am told

that the piston rings are made of Teflon

### **Bits and pieces:**

Tom Armstrong also showed a Fairbanks Horizontal. The engine was assembled, then torn down for the paint job. The piston was designed for four rings, but he will use two. He used 4130 for the crankshaft, but could have used hot rolled steel. It may be a runner by the next meeting.

Jim Piazza is working on his four (yes, four) Upshur single cylinder verticals. He is also forging ahead on his pulse jet.

Pat O'Connor's overhead camshaft Wall 4 is looking great. It's truly an eclectic club effort. Valves from Pretel, crank from Bennett, camshaft from Slocum, etc. This engine will be a winner.

### **Engine Shows:**

I have two resounding successes to report. The first was our second appearance at the Blackhawk Automobile Museum. Members Hurst, Gravatt, Myers, and Kradjian showed and ran engines. This is an elegant (and free) venue complete with live music and food. It will also give you a chance to roam through the entire museum. It follows the Pebble Beach Concours on a Monday.

The second show was the GoodGuy's West Coast Nationals. This is the biggest car show in the country with the exception of the Grand Nationals held in the Midwest.

The same group of members listed above participated and were joined by Corl, Pretel, O'Connor, Throop, and Piazza. We had crowds five to ten people deep on Saturday and Sunday. Unless you witness this spectacle you cannot appreciate the incredible interest our engines generate. A common remark is: "This is the best part of the whole show." It was a great time, and I suspect that several of the persons contacted may visit with us in Oakland.

### **Member Profile: Paul Bennett**

(This is a new feature. Let me know if you like it--but be warned--you could be next!)

Our club would not be what it is today without the long and consistent efforts given us by our own Paul Bennett. We enjoyed about 70 meetings in his fine facility prior to his losing a portion of his lease.

Paul is a native San Franciscan who has done just about everything possible that involves speed. He is a life-long sailor on the Bay and was involved for years in class racing. He formerly was an avid snow skier and downhill racer. His motorcycle exploits are legendary. In the mid-60s he was the Open Class champion for the big 650 bikes on a Triumph. He also was an avid "café racer" and I suspect the Marin cops are still looking for him in connection with some notorious dashes to Stinson Beach. Somehow, he managed all this

without a broken bone.

We all know that he is an accomplished fabricator of Cobras. He produced 50 of them before he quit counting.

His interest in automobile racing had him at Bonneville just last month.

Now to small engines---His first efforts were to modify Hornets and McCoys for hydroplane racing. I first met Paul as a member of the Marin RC (airplane) Group, Paul distinguished himself by his well executed and spectacular head-on, mid-air collisions with friend Mario. The group requested that he further perfect this art at another facility.

His first four-cycle engine was an opposed twin original that was published in Model Engineering (British) in the 1960s. He then went on to make an Offenhauser-style four, a Wall four, and then a pair of Wall boat motors (one a left hander, the other a right hander---still in progress).

The project on the back burner is the Bennett Four, a five main bearing original, one inch bore and stroke, with original patterns and castings. I can't wait for this screamer to be completed. Even further back on the rear burners is an aluminum bodied Miller style old time Indy Car in 1/5 scale.

BAEM is fortunate to have this genial, generous, and accomplished man as a charter member.



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## TECH TOPICS

BY  
SCOTT OVERSTREET

Our Tech Topics session last month was top notch and then some – thanks to John Palmer and Dwight Giles. The subject was making piston rings. We learned some history of the evolution of piston rings and that there are now two basic approaches used to make model engine rings. John led off with the “cold iron” approach, as you might guess, and Dwight finished up with a procedure in which heat treating is used. Both John and Dwight suggested making rings from 40,000 psi or better, close grain, grey cast iron, which is available from MSC and other suppliers.

John’s approach is to make a “tube” of ring stock, the outside diameter being the diameter of the desired ring uncompressed plus a little (about 0.010" or so) for final cleanup machining and the inside diameter being the inside diameter of the ring, also uncompressed. Rings are then parted from the tube just a hair wide to allow final cleanup to size. John then makes a flanged clamping mandrel the same diameter as the inside diameter of the ring when compressed. Next, John gaps the rings just enough that they bottom on the mandrel when compressed with a hose clamp, i.e., the gap remains just open. Each ring is then compressed onto the mandrel with the hose clamp, clamped and then,

with the hose clamp removed, machined to the final outside diameter, i.e. engine cylinder diameter. John's final steps are to open each ring gap and clean up the ring sides by flat lapping – both as required. Check with John for more details.

Note: John, in his presentation, suggested making the initial ring stock about 1/8" over the compressed ring outer diameter with section height of about 1/8" and the removal of about 3/32" "gap" material prior to mounting the ring onto the mandrel for rings in the range of 3" to 5" outside diameter. John has approved the above described generalization of his approach to make rings of any size and section.

Dwight's approach is to make a "tube" of ring stock having an outside diameter of the nominal engine bore size plus 0.001". Rings are next parted from the tube as close to final desired width as possible. Each ring is then gaped using a 0.006" slitting saw. At this point you might say "0.006" gap – that's too wide." Well, because of the excess "circumferential" metal made available when the 0.001" oversize ring is eventually compressed to size in the engine bore, the gap will close to less than 0.003" leaving enough material that the gap can be adjusted to 0.003" after heat treating. This is the gap that Dwight likes for engines with bores around 1" or so. Neat trick huh! Dwight next heat treats, or maybe "normalizes" is a better term, the ring to oversize for compressed expansion springiness using a mandrel and heat treat process presented in SIC magazine back in February and March, 1989. Very briefly, the mandrel is designed to hold the ring flat while expanding the ring to the desired normalized size via only a gap spacer pin. Heat treating at about 1450° F for about an hour was recommended. Dwight uses a small ceramic kiln. After heat treat, Dwight flat laps the ring sides for clean up using #600 paper and oil and then perfects the gap with a neat little rotary gap lapper that he built. Check with Dwight for more details.

Our September Tech Topic subject will be "Powder Painting." Ken Hurst has one of the Eastwood powder paint systems which he will show us. This is a hobbyist unit that really works well, so well that many professionals use it too. With it and a kitchen oven (not the oven in the kitchen), and a little practice, any of an almost endless assortment of very tough, high quality finishes can be put on any metallic surface. Ken will describe the process, demonstrate the application of the powder and show samples of the end result.

Scott

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Note for the ED.

There are some pictures on the photo page showing the progress that I am making on the pulsejet. The first is the cutting of the fins. The next is how I solved the problem of cutting the radius of the venturi. I cut a disk with the same radius as required on the nose of the venturi. I used a magnetic holder with an adapter to hold a carbide insert of the same type in the boring bar. I used a DRO and to find where the radius had to start in the throat. I then adjusted the disk on the compound where I had scribed an angle corresponding to the radius. I ran the tool out and did the same with other end of the radius. A little finessing and it was set. Then I started to make incremental cuts and when the tip of the insert came close to the edge of the disk I stopped. Then it was a matter of finishing with a file.



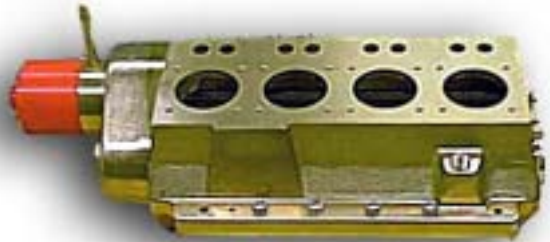
Tom Armstrong's Fairbanks Horizontal and Dinky Deere.



Tom Armstrong's Dinky Deere.



Pretel's Challenger V-8.



Pretel's Panther Pup block.



Cutting fins .



Combustion chamber and Venturi of the Pulso 1

August Photos by Ken Hurst and Mike Rehmus.  
Sept Photos by Lew Throop, Mike Rehmus and Jim Piazza.

Turning radius on the venturi.

