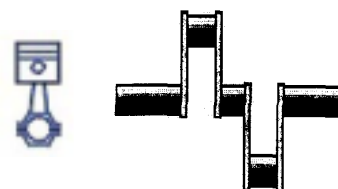


The Crank Calls



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 Secretary.....Bob Kradjian.....(650) 343-7585.....bkradjian@aol.com
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 Tech Topics....Pat O'Connor.....(408) 733-3710.....pat1650@yahoo.com

April 2005

TO JOIN THIS CLUB OR RENEW YOUR MEMBERSHIP

Contact Lewis Throop at
 27272 Byrne Park Ln.
 Los Altos Hills 94022-4324
 Phone 650-941-8223
 Email: lthroop@aol.com
**MAKE YOUR \$25.00 CHECK
 PAYABLE TO LEWIS THROOP**

NEXT MEETING

April 16, 2005 At
 Robert Schutz's Shop,
 366 40th St. Oakland, CA
**Doors open at 9AM
 Meeting Starts at 10 AM**

BAEM Members

If you want a member badge send an email to Mike Rehmus.
 michael.rehmus@byvideo.com

MEETING NOTES

3-19-05

Carl Wilson

Pat O'Connor filled in as President in the absence of Ken Hurst. Ken and George Gravatt were in Southern California showing their engines at Mazda. We had two guests: Bob Sand and Steve Gordon.

We always get nervous when our Treasurer is absent from a meeting on a trip: we tease him about his vacations and our money. Lew Throop showed some photos of his latest venture to Patagonia and the southern coast of Chile. One photo showed the engine room of the ship, so there was some "engine content" on this trip. To allay our nervousness, Lew gave his Treasurer's report: \$892 to EDGTA for dues and insurance.

Lew has received a set of plans for a 10 cylinder, 22 ga. Gatling gun donated to the club by Ray Monaghan. He plans to offer the prints to our members at an auction or raffle, proceeds to go to the club treasury.

Bill Nickels placed a book on machining into the club library, but it appears that no one has taken responsibility for maintaining this. Would someone please volunteer to keep track of our books and videos.

Dick Pretel talked about the first club outing of the year: the Hillsborough Concours. Date is Sunday May 1. Check with Dick if you plan to attend. The second event will be at the Blackhawk Auto Museum in Danville on Monday, Memorial Day, May 30, 10AM - 2PM. We will be joining the Danville Dukes, a hot rod club.

Mike Rehmus reported that his new magazine, Model En-

gine Builder, is at the printer's and will probably be mailed in the first week of April. The centerfold picture is Eugene Corl's 1/3rd scale Chevy small block V-8. Mike also showed some of the drawings for Randall Cox's modular, open crankcase, V-engine that can be built as a 2, 4, 6, 8, or 12-cylinder engine. It is a bar stock engine with a crankshaft built-up from dowel pins and keystick. This will be featured as a build article in the magazine.

John Palmer reported these events:

Hiller Museum, Apr. 23: YAK airplane gathering
 California Antique Farm Equipment Show,
 Tulare, Apr. 15-17
 Dream Machine, Half Moon Bay, Apr. 24

Jim Piazza would like to retire from his position as club Webmaster. If you have some expertise in creating and maintaining web sites, please step up and help us out.

Bits and Pieces

The oldest member of our club is Ed DeGear, 89. He built this 2 cylinder 2 stroke in 1935 for a tethered hydroplane that ran in the high 60's (mph). It is water-cooled, 1 1/4" bore and 1 1/8" stroke, and a displacement of 50cc. Ed did the design, patterns, castings, and machining. He later fitted the engine to a 5' cabin cruiser named Margie that ran above its scale speed. The engine and hull are being restored as a historical project for the San Francisco Model Yacht Club. Dick Pretel is restoring the engine so it can be reinstalled in



Margie. Ed's magneto no longer worked so Dick changed it to battery-coil ignition and made a distributor which incorporates an adjustment for the point dwell. We hope Margie will be up and running by The Old Wooden Boat Show.

Cor Langewis brought another of his many steam engines, this time a 2 cylinder oscillating, reversible, self-starting steam engine. This engine, made from a kit, would be suitable for a large model boat.



Joe Tochtrop introduced his latest kits: 2 sizes of well pump and jack. The smallest would be suitable for a hit-n-miss engine with 3" flywheels and the larger for about 6" flywheels such as his model of the Economy engine. They have a 12:1 reduction gear driving a pump with a 1 7/8" stroke. Joe suggests using baby oil for pumpage. The kits cost about \$75. Joe says that if you have an engine, you need something for it to drive and here it is.

Al Vassallo never ceases to amaze us. Pat O'Connor commented that all the rest of make V-8's or Wall 4's,



but Al goes out and does something completely original. This is his design of a 3-cylinder, 2-stroke, swashplate engine. The upper end is conventional 2-stroke airplane engine with piston ports, and glow plug ignition. It's the lower end that is quite different. The pistons are mounted solidly on piston rods that pass through seals in the cylinder mounting plate and



into the "swashplate case." The piston rod ends in a ball joint socketed into a brass follower on the swashplate. The "swashcase" is oil filled to minimize friction between the follower and the

plate. Fuel and air do not circulate through the swashcase, but down the intake pipe into the cylinder mounting plate. From there the charge passes through a reed valve surrounding the piston rod and into the space in the cylinder under the piston. The descending piston compresses the charge which flows through the transfer port into the cylinder.

Dwight Giles is building a Gray engine for Robert Schutz. He showed the carburetor and igniter from this project. Never thought I would hear of Dwight scrapping a part, but it happened. There are two holes that have to intersect just so inside the body of the carburetor and he had trouble with the original casting. He silver soldered this replacement from brass pieces. Dwight mounted a small laser into a special fixture to aid aligning the part for drilling the holes. He rotated the part until the laser proved the set-up.



Dwight also showed an ad for a small diesel (compression ignition) aero engine that is currently advertised in the Engine Collectors Journal. The kit of castings is \$23.

Pete Solakian sent a photo of the progress on his Challenger V-8. Note the very nice job on the radiator that uses a core from an auto radiator and a muffin cooling fan.

The fan is a standard 12 volt 2.6 x 2.6 pancake type available in any electronic store. The radiator size is 6" x 4" x 1 1/8".

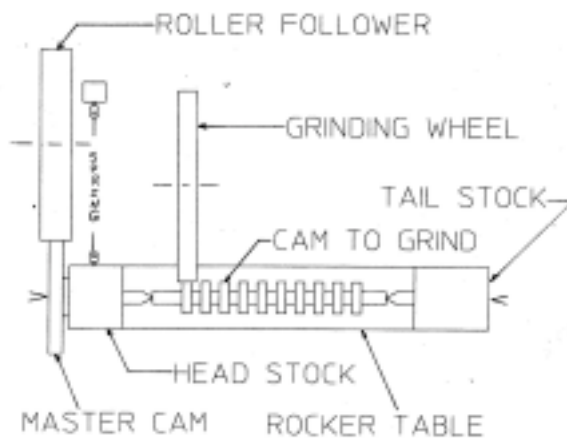


Tech Topics: MAKING CAM GRINDING MASTERS

Carl Wilson

Roger Slocum opened his Tech Topic presentation with a discussion of some of the many factors that must be considered in the design of a cam for an internal combustion engine. They include: Type of follower: flat, mushroom (curved), or roller; Operating through a rocker arm or direct; Rocker arm ratio; Opening and closing times: duration and overlap; Follower lift, velocity, and acceleration; Mass of valve gear: force and vibration – valve spring rate; Compression ratio; Normally aspirated or supercharged; Stroke and connecting rod length: piston speed and valve to piston clearance; Engine operating speed: desired power band and intended usage; Porting and gas flow dynamics. A lot of engineering goes into this component.

The completed design is sent from Engineering to Manufacturing and this is Roger's domain. He is a professional cam grinder for model engines, probably the only one in the world. He built a cam grinding attachment for his K.O. Lee tool and cutter grinder and also makes the master cams that control the finished shape of the lobes.



This is a simplified top view of the attachment. The cam blank is mounted between centers in the headstock and tailstock, which, in turn, are mounted on a rocking table (not shown). The arrowheads at right and left show the rocker axis in this view. An end view would show that they are at the rocking table below the axis of the cam. The master is fastened to the headstock center and rotates with it and the cam blank. The mechanism for driving the cam and for indexing the master to the various lobes is not shown.

This cam grinding attachment is rather different from the one featured in last month's Tech Topics. The masters for Ken's grinder look like oversized cam lobes, and his grinder will reduce them by a factor of about 4. The masters for Roger's attachment look like slightly deformed circles and do not reduce by a geometrical factor.

The rocker table with its headstock and tailstock, the master cam, and cam blank are mounted on a base, which is, in turn, mounted on the table of the tool and cutter grinder. The cam and master are rotated by an electric motor. The master rotates against a fixed roller follower. This combination causes the table to rock or oscillate toward and away from the grinding wheel following the master profile. The cam blank is fed into the grinding wheel with the cross-slide of the grinder until the lobe is finished to size. The table of the grinder is then traversed to the location of the next lobe and the blank is indexed to the proper angular relationship with the master.



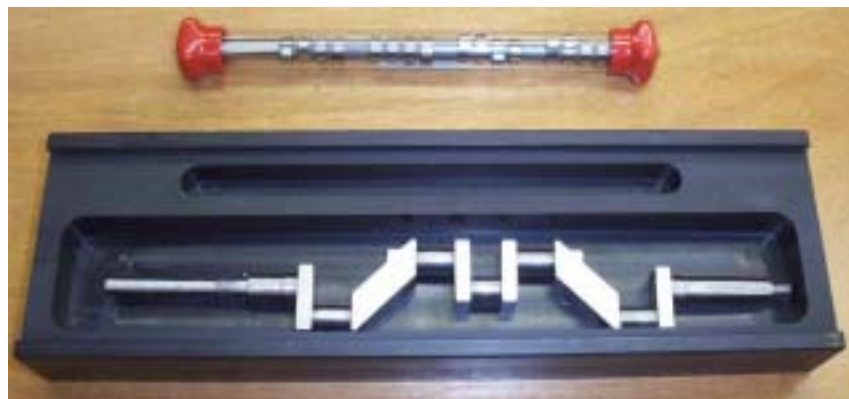
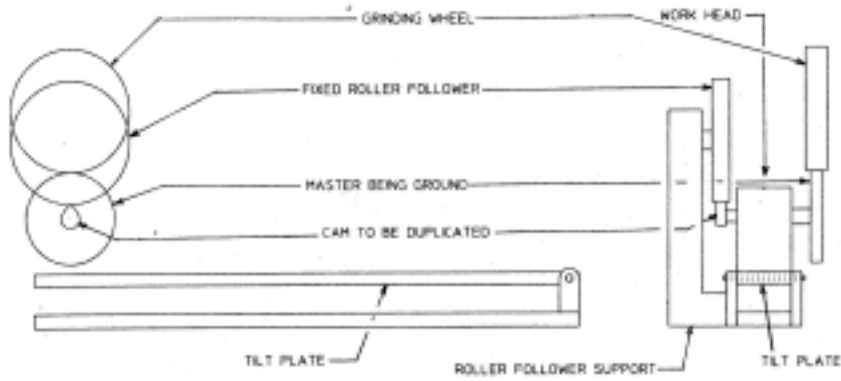
The profile of a cam master can be determined by numerical calculation, but Roger used this "analog computer" for laying out his first masters. The heart of the computer is the cam lobe drawn at 10X full size and mounted on a large degree wheel. The "cam" is rotated 1 degree and the slider with its "follower" is brought up to touch the outline of the cam. The displacement of the slider is read on the dial indicator. Both of these figures are collected into a table of polar co-ordinates that defines the master. This is then machined on a rotary table. Roger soon "automated" this process with a computer program written by a friend that would calculate all the dimensions of the desired master. Jim Piazza took this data and put it into a program usable on a CNC mill.

This is a simplified drawing of the master grinding attachment. It uses the same principle as the cam grinding attachment with its rocking table. If a cam can be

ground from a master, the process can be reversed and a master ground from a cam. Roger machines a full size model cam (that is, the actual size of a lobe on the finished cam) on a CNC mill using MasterCAM (CAM means Computer Aided Manufacturing) and then uses this to grind the larger master. The master, in turn, is placed in the cam grinding fixture to produce the finished hardened and ground cams. Roger emphasized that any errors in the manufacture of the master are reflected at a 1 to 1 ratio from the master to the cam. The model and the master, then, must be made to close tolerances.

The master are reflected at a 1 to 1 ratio from the master to the cam. The model and the master, then, must be made to close tolerances.

Thanks, Roger, for your Tech Topic on this fascinating subject.



TECH TOPIC AT THE APRIL 2005 MEET BY PAT O'CONNOR

For the April Tech Talk we will take a break from internal combustion engine design and fabrication to look at an earlier gas engine. Mr. Cor Langewis will present a talk on his building a model of the first Watt steam engine.

Pat

Check out this web site.
Recommended by Pat O'Connor
Ron's Model Engineering and Model IC Engines Index

<http://archive.dstc.edu.au/BDU/staff/ron/>

Frank Marlow, Metal Arts Press
8461 Valencia Drive
Huntington Beach, CA 92647-6033
714 841 5561 FAX: 714 841 3073

New machine shop practice book out called Machine Shop
Essentials: Q&A

Check Web Site www.metalartspress.com

FOR SALE

Lathe for Sale. Rockford 1930's 14" lathe. 6' between centers. Heavily tooled including 8" 6-jaw chuck, quick-change toolholder, taper attachment, 4-jaw chuck, 3-jaw chuck, and backing plates. It is old and worn but still capable of good work. 2-speed backgear. Overhead motor conversion from flat-belt drive. Overhead motor has 4-speed gearbox and is 220 Volt, single phase. \$1,500 for everything. Can be transported in a sturdy 1/2 ton pickup.

Mike Rehmus

mrehmus@byvideo.com

707-643-1970

FOR SALE

Tree Journeyman 310 - 3 Axis CNC Mill
DynaPath - Delta 10M Control
Table 10" X 44"
Spindle Taper 30NMTB With some tooling & manuals
\$4500.00

David Palmer 707-938-2181

Brian Palmer bdpalmer@sonic.net

FREE

Lewis Throop has decided to recover some room in his garage. If you are interested in experimenting with metal casting Lew has a furnace, oil sand and extra furnace casting compd for a good price--FREE. They can contact Lew at the next meeting, send him an e-mail at lthroop@aol.com. Phone him at (650) 941-8223

Model Crankshafts and Camshafts

By Roger Slocum

Hardened and ground alloy steel crankshafts

Web Site www.cranksandcams.com

Email: roger@cranksandcams.com.

Check out the BAEM Web Site at www.baemclub.com

Send your project photos to the
Web Master Jim Piazza.

Phone: 408-446-4825

Email: jpiazza@ix.netcom.com

FOR SALE

Iron Fever 2004 videos now available

Call 707 643-1970 or email

mrehmus@byvideo.com

if you want a video delivered to the
next meeting. \$20 for DVD or VHS
tape, 94 minutes run-time.

Mike Rehmus

FOR SALE JAPANESE ENGINES

I have been given the responsibility of selling a dozen or so engines belonging to a friend. All engines are new, in the original box, never been opened. They are all Japanese, Saito or OS and range from single cylinder to 9 cylinder radial.

I will bring a few at a time to the club meeting where an offer may be made for the purchase. Sale will be consummated when the owner has approved of the offer.

Chris Leggo.

Upcoming 2005 Events

By Dick Pretel,
Events Coordinator

West Coast Engine Exhibitions For 2005

3rd Annual Men, Metal, & Machines!

Visalia Conventions Center. Visalia, CA
October 22 & 23, 2005. Phone: 1-800-789-5068.
Web Site: www.cabinfeverexpo.com/MMM

East Coast Engine Exhibitions For 2005

NAMES 16th Annual Expo

Date: April 23-24, 2005

- Saturday - 9 a.m.- 6 p.m.
- Sunday - 9 a.m.- 4 p.m.

Location: Southgate Civic Center

- 14700 Reaume Parkway, Southgate, MI

GEARS 2005

September 24-25, 2005
in Portland Oregon

BAEM is invited to the following events

By Dick Pretel, Events Coordinator

Hillsborough Sunday May 1, 2005

E.D.G.E. & T.A. Branch 113 Annual Show May 14, 2005
Held at the AG museum, 4498 E. HWY. 140, Merced, CA 95340
Free museum pass & lunch.

Blackhawk Automotive Museum Danville on Monday, Memorial
Day, May 30, 10AM – 2PM.

Gotelli car show Saturday Sept 27, 2005, 9AM-5PM

Good Guy's West Nationals, Pleasanton August 26-28, 2005

Historic's at Monterey, TBA

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miniature machine shops. See our Centerfold engine stories!

First Issue March 2005

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Best regards,

Mike Rehmus

Editor, Model Engine Builder MagazineTM

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