

The NEMES Gazette

Vol 3 No 29
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*The Newsletter of the New England Model Engineering Society,
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Our Next Meeting is at 7:00 PM Sept 3, 1998 at the Museum, 154 Moody Street, Waltham Ma.

Annual dues is \$20.00 - Please make checks payable to "NEMES" and send to the NEMES Treasurer: Kay R. Fisher 80 Fryeville Road Orange, MA 01364

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From the Editor's Desk:

This past month I've actually managed to spend some time down in the cellar making chips, which has been relaxing. I've made a bunch of whistles and my family is getting sick of the noises coming up from the cellar. I've also managed to get several contributions for the Gazette, which is greatly appreciated. If you've contributed something, keep up the good work, if you haven't consider writing one of your projects up to share. With about 100 members in NEMES if we averaged one contribution to the Gazette per member every three years there'd be a backlog of good stuff waiting to get printed. So think about it, and send something in.

I got a call from Richard Sabol asking me to remind everyone that he'll have another load of ledloy offcuts to sell in the parking lot before the September meeting.

See you next Thursday night, scl.

President's Corner by Ron Ginger

Video Tape of NAMES 98

At the NAMES show in April I talked with a fellow that was making a video tape of the show. There have been tapes of other shows, but frankly, they were a bit poor quality. This guy seemed to be doing a better job- camera on a tripod, around later with a tape recorder to get names and information, and even some sound track. I suspect this is a better quality video.

He has offered them to the club at a discount, if we buy them as a group. They are usually \$29.95, we can have them for \$20 if we order 5 or more. If you want one, bring \$20 to the next meeting, we will see if we can get enough to make an order.

He did tell me that my 4 cylinder engine, and all the stuff on the NEMES table made it into the video.

September Meeting

At our last meeting Jeff DelPapa made a comment about a speaker to talk about recumbent bicycles. There were a couple people that asked me to follow up, and Jeff has made an arrangement for Dave Wilson to speak at the September meeting.

Dave is on the faculty at MIT in mechanical engineering. He is editor of Human Power, the technical journal of the International Human-Powered-Vehicle Association. He has been involved in many very interesting projects with human power, and with gas turbines (Im not sure how that combination fits, but Im sure we will learn about it). I understand he will arrive at the meeting on a recumbent bike.

This should be an outstanding program, dont miss it.

Invention and technology Magazine.

At one of our first meetings, Dick Cushing spoke about a free magazine he got from GM. It sounded interesting, but I never followed up on it. Then last year I joined the Charles River Museum, and for the category I joined I received a subscription to this magazine. I have since received a few issues, and have been very interested. It is the first magazine I have ever read every single article in the issue. They are not all mechanical in nature, but have all been fascinating.

The most recent issue has an article on the history of styling in GM cars, and a short biography of Grace Hopper, one of the true giants of the computer industry. If you like technology you should enjoy this magazine. You can subscribe directly by writing to Invention and Technology, PO Box 5337, Harlan, IA 51593-4837. Or you can get it, and a membership to the Charles River Museum of Industry.

Free Lunch

Well, there was a free lunch, but its to late now. At the August meeting Ed Kingsley handed out some flyers from J&L Industrial about their grand Opening of a Woburn store, and a free lunch. I went to the opening and had the free lunch- but to get it you had to listen to a pretty hard sell pitch at several places. But it does look like they are going to have a great store there, they promise to stock lots of items on site- enough to fill something like 94% of orders on the spot.

I talked to a sales manager, and have made some tentative plans to have one of their sales engineers talk to the club about carbide insert tooling. This will likely be at the November or December meeting. Ill keep you posted.

While I was in Woburn, I stopped at the Metal Source (ex-tent sale) of Admiral Metal. They told me they are now starting to handle UPS shipment, so you can phone in and they will pack and ship small quantities of Aluminum, brass or copper. He implied it was at the same low price they charge for pickup.

Could be a good source for you guys that live a bit to far out to drive by. They are also considering opening either Saturday or one evening. In case you havent been there, or heard about them, they are at 280 Mishawum Rd, Woburn, Thats between the Chinese restaurant and the Railroad station along-side Rt 128. Phone is 781/937-7880

Bus trip

Its still a bit early, but Id like to get a feel for interest in bus trips to either Cabin Fever (Jan31) or NAMES (April 24). Id like to see us do both trips if we can get enough interest. Im open to suggestions about the exact schedules and arrangements. If you have any thoughts please let me know. I know I enjoy these trips, and like the chance to get together as a club.

Model Show at the North Shore Old car club Show.

Our member Ed Rogers is also a member of the North Shore Old car club, and has arranged for us to have a model show connected with their annual car show. The show is one day only, Sunday, September 13. Ed has been talking about this at the past few meetings, and this is our last newsletter before the show. It sounds like a good day, Ill be there with my 4 cylinder engine and whatever else I can get cleaned up enough to show. If you have questions, call Ed at 781/233-3847. Our wives and/or girlfriends might enjoy the car show too.

Rollie's Swap Meet

Roland Gaucher is thinking about a swap meet at his shop for sometime in October. Start sorting your treasure now and plan to make this event. Also Rollie is open to suggestion on the day- is Saturday or Sunday best? let him know what you think at the next meeting.

--Ron

Aug-1998 Treasurers Report

Previous balance -----	\$2718.50
Book Shipping Profit -----	19.53
News letter postage -----	-92.47
Interest -----	1.11

Concession Deposit -----	23.96
Dues Deposit -----	160.00
New balance -----	\$2830.63

Please make Dues checks for \$20 made payable to NEMES. You can bring these to the next meeting or mail to my address which is at the front of this and every newsletter.

Respectfully
Kay R. Fisher

Calendar of Events

Thursday September 3, 1998 -- 7 PM, NEMES MEETING at the Charles River Museum of Industry, 154 Moody Street, Waltham, Ma 02154, telephone 617-893-5410

Sunday September 13, 1998 -- NEMES Exhibit at the Northshore Old Car Club Show at Top-sfield Fair Grounds.

Thursday October 1, 1998 -- 7 PM, NEMES MEETING at the Charles River Museum of Industry, 154 Moody Street, Waltham, Ma 02154, telephone 617-893-5410

Thursday November 5, 1998 -- 7 PM, NEMES MEETING at the Charles River Museum of Industry, 154 Moody Street, Waltham, Ma 02154, telephone 617-893-5410

Thursday December 3, 1998 -- 7 PM, NEMES MEETING at the Charles River Museum of Industry, 154 Moody Street, Waltham, Ma 02154, telephone 617-893-5410

If you'd like a list of Engine Shows in the New England Area (and a few as far as Penn.) Send Dave Robie an SASE and he'll send one back to you. He's at PO Box 414, So. Weymouth, Ma 02190

The Meeting, 2 July, 1998

The Meeting, Thursday August 6, 1998

Things got under way about quarter past seven with some announcements by Ron. If you haven't paid your dues yet get them to Kay Fisher. Their was a NEMES email list, but we've lost the use of the server it was running on. If anyone has access to a server that can be used to set up a NEMES mailing list please let people know.

September 26 and 27 Clark's Trading Post up in New Hampshire is having their big Steam Show. This is only an every eight or ten year event. Bring a steam something and get free admission.

Sunday September 13 is the Car Show at the Topsfield Fair Grounds, with a table for NEMES to show model engineering items. Ed Rogers is coordinating this with his Car Club, so be sure to bring

something to help show the folks at the Car Show what model engineering and NEMES are all about.

Don Strang brought up the subject of Drawing Standards. American practice is Third Angle Projection, while British practice is First Angle Projection, so if you're building something out of ME or MEW be careful. He also recently visited the R Murphy Knife Co. in Ayer Mass. At one time they had an extensive line of corkscrews, and when the bottle cap first came out they had a patent on a corkscrew with a built in bottle opener. He has a sloyd knife that he got as an engineering student, and another new one that he recently bought. About the only difference, besides the wear from many years of use, is that the new one has an etched logo on the blade and on the old one the logo is stamped in. Don visited the plant where they make the knives and had a very interesting visit. The company is still using basically early 20th century techniques and equipment to successfully compete with the Japanese in today's marketplace. The blades are stamped from strip.

Brown's Gas can be used to attain much higher flame temperatures than are normally obtainable from burning hydrogen and oxygen. It is the product of the electrolysis of water, monatomic hydrogen and oxygen that have not had time to completely combine into H₂ and O₂ before they are burned together. The result is that the recombination into water results in more net energy being released than in the normal burning of hydrogen in oxygen because the energy that is normally used to break the H₂ and the O₂ apart before they can combine into H₂O is not required and all of the energy from the formation of the water is available as heat.

The main presentation for the night was on aluminum anodizing, presented by Cherie LaPierre and Joel Lipof from Qual-Craft Metal Finishing Co, Inc. of 43 Forest Street in Attleboro Mass. (508-222-4560,) and on aluminum extruding by Roger W. Sitler from Pierce Aluminum Co., Inc. of 136 Will Drive in Canton Mass. (781-828-9005.)

Roger Sitler from Pierce Aluminum started things off with a discussion of aluminum production and extruding. The bauxite is refined and smelted into aluminum ingot, and then the the ingot is alloyed and cast into billet. The billet is then extruded. Pierce is a distributor and fabricator of Aluminum extrusions, sheet, and plate. For extrusions 6000 series alloys are the ones to use.

Almost anything can be designed as an extrusion. In the last 18-20 years the tooling for extrusions has improved greatly, with the advent of the CNC Wire EDM machine being a major factor in the reduced cost of dies. When it's extruded the metal is squeezed like toothpaste coming out of a tube. The shape you get starts with the die, if the die isn't right it really tough to get the extruding to come out the right shape.

Billet is heated to about 380 degrees F (for 6300 series alloy) and put into the extrusion chamber. Then an arm comes in and pushes the metal through the die onto a runout table. The billets are cast in logs, then sheared to the runout size so that the billet is done when the runout table is full. Most new extruders have automatic grabbers that grab onto the extrusion as it comes out and pull it down the runout table. After the extrusion step is completed the extrusion is stretched to match the exact shape required.

18 to 20 years ago rod and bar was machined into product. Today extrusions large and small are being used where once parts would have been machined from the solid. Tooling costs are no longer that high. For a relatively simple shape such as a "U" that is say 3/16" thick and 1" on a side the die might cost somewhere around \$500. Then the minimum practical order from an extruder is going to be in the 500 to 700 pound range. If you don't count the cost of the die (which can be used for many more 500 pound batches) the cost of the extrusions per pound will be about what you would pay if you went down to the local metal dealer and bought aluminum off the shelf.

Aluminum is a commodity, the price goes up and down. Ingots come in from outside the US, and the billets are cast here. One of the things that the former USSR has in abundance is aluminum, and they are now exporting it in tremendous amounts at attractive prices. (If you use something by the hundreds of thousands of pounds a couple cents a pound is a lot of money.) When Roger was working at Eastco they were extruding trailer rails from Russian Billet. There was a piece of iron in the billet that blew out the die, flew across the building and through the wall. Russian Aluminum may be attractively priced, but it has no traceability and should be avoided for critical jobs.

Nineteen years ago when Roger started in the Aluminum business metal prices were about what they are now. In today's market the added value is not in the extrusions, it's in what you do with the extrusion after it's made were the money is.

Tubing and how it is drawn came up. When the tube is extruded directly from the billet it is considered to be welded tubing, even though there is no obvious weld line. The die has two pieces, the inside part is attached to the the outside part upstream from the opening that forms the outside and extending down into the opening so that the metal exits from the die though a hole the shape of the tube being extruded. To get to that hole the metal flows around the section joining the inside and the outside and comes together in the shape of the tube. The heat and pressure generated by the ram pushing the metal through the die fuse the joint together and it comes out looking as if it's seamless. To make a truly drawn tube a tubular billet is extruded with a hole

down the middle and that billet is drawn down further to produce the seamless drawn tube.

Cherie Lapierre, a Customer Service Person by title, gave the talk about Anodizing and Qual-Craft, with occasional help from Joel Lipof the General Manager. Qual-Craft has anodizing tanks 12' by 4' by 3' for clear and black. The other colors they do in 6' long tanks.

Sulphuric Acid anodizing gives a mat or satin finish and is a really good paint base. Chromic Acid anodizing gives more corrosion resistance than Sulphuric Acid.

Plating a metal adds material on the surface of the part. Anodizing creates a controlled oxide surface. The first formed oxide is on the outside surface and is about 50% thicker than the aluminum that is oxidized. A clear anodized coating is about 0.0005 inches thick, and a color anodized coating is about 0.0007 inches thick. Hard anodizing is typically 0.002 inches thick. These coatings are half below the original surface and half above, so the 0.002 thick hard anodized film adds about 0.001 inch to the size of the part.

As the anodizing process takes place oxide is added and oxide is removed, so the result is that the anodized film has a maximum thickness of about 0.0007 inches thick, at which point the oxide is dissolving as fast as it's created. Since the rate of dissolving is dependant on the temperature and higher temperatures cause faster dissolving, hard anodizing which is 0.002 thick needs to be done at cold temperatures, 32-34 degrees F.

The piece being anodized is the anode in the electric circuit, and the cathode is a piece of pure aluminum. The current density (amps per unit of area on the aluminum being anodized) is critical to getting a good result. The anodized surface is full of pores when it comes out of the tank. These pores need to be thoroughly rinsed of acid or the dyes used for coloring will be locally bleached and the color will be spotty. After the dye is applied the surface needs to be sealed. Qual-Craft uses nickel acetate to seal. You can also seal in hot water, but using the acetate saves energy. Sealing keeps the dye in and for salt water it also gives better corrosion resistance. For painted surfaces some people feel that the parts should not be sealed.

The anodized coating is a non-conductive ceramic coating, aluminum oxide. As a result parts can't be anodized in a tumbler the way that parts can be plated to give a continuous coating because the coating is not conductive and as the film builds it's harder and harder to make a new contact. So, you will always have a rack mark on an anodized part.

When you get a part anodized you need to know what alloy it is. For a nice looking coating alloys with a lot of precipitated copper or whatever in them

won't dye a nice even color because copper doesn't anodize and you'll get spots. If you bring a part to Qual-Craft to be anodized they can do a much better job on it if they know what alloy it is. Also, if you are mechanically finishing a part be sure that the tools you use have only been used with aluminum - cross contamination from the finishing tools can leave microscopic pieces of other metals that will ruin what would otherwise be a good finish.

If you plan to have some parts for one of your parts anodized, don't use mystery metal. Check with Qual-Craft on the alloy you plan to use to be sure it'll look good when they finish it and then use that specific alloy.

Prices are always subject to change, but as a quick guide here are some minimum charges as of the meeting. \$85 for anodizing. \$115 for hard coat anodizing. \$140 for hard coat anodizing and Teflon (TM) coating. Teflon (TM) coating alone \$25. Chromate \$50. I'd suggest that if you are planning on any of these coatings for your project that you call Cherie and get the latest on prices and recommended alloys.

TIPS AND TECHNIQUES

by Ed Kingsley

BE A SLACKER

When you've finished for the day:

- 1) Loosen the drive belts on your Lathe, Drill Press and Mill
- 2) Take the drills from your chucks, the end mills from their collets
- 3) Slack the handle on the 4-way or quick-change tool post
- 4) Release the clamp on the tailstock
- 5) Drop the tension on the bandsaw blade
- 6) Back off the grip on your vise(s)
- 7) Center the tables on your mill
- 8) Clear off the Drill Press table or move things to the rear
- 9) "Power Off" the servo's on the CNC (I should be so lucky)

These actions can help minimize the strain on the beds and components of your tools and allow them to get some well deserved rest, until your return.

YADPGS

Unfortunately, aside from observing a colleague, who REALLY should know better, using his Gage Pins to break the tangs off small diameter Heli-coil inserts, I have no new, boring or insightful application for you this month. But, then, it's still August! Give me a couple of weeks.

STEEL CRAZY

... after all these years! Yes, the good folks at New England Brass & Tool, Inc., in addition to Brass and Tools (and Aluminum) are now carrying a nice line of 303 Stainless and 12L14 Leaded Steels, (in direct response to our suggestions), and both are exceptionally delightful materials to work with.

303 is available in rounds from 1/8" to 2" diameter, in 3' long lengths, or by the foot in sizes over 1/2".

12L14..... is available in rounds, from 1/8" to 2" diameter, in 3' long bars or 12" lengths in all sizes.

Give Bob a call at (781) 729-7672, or FAX @ (781) 729-4490, for a list of available sizes and prices.

GO - NO GA

I picked up a small, pencil shaped, pocket sized, deburring tool made by NOGA, and I have become very fond of it. The blades are replaceable, and it is supplied with an "all purpose" blade that has worked well on the several materials and edges I've tried it on, both hard and soft, curved and straight.

I mention this because MSC has it on sale, thru 10/15, (it's not in the regular sales catalogs) for just \$2.99, 39% off list, and \$.41 cheaper than I paid for it last month at J&L. It's item # 05752795, it's called the "Teddy Burr Kit", and it slips into your pocket protector just like one of the guys. I can't leave home without it.

J&L, THE NEW GUYS IN TOWN

J&L has opened a branch in Woburn, MA, one of 31 new stores they've opened, or plan to open, this year. J&L is the Industrial Supply Arm of Kennametal Company, Inc. In case you missed the Grand Opening Extravaganza, August 19th and 20th, here's the story

J&L sees themselves as the "Avis" of Industrial Supply Companies, aligned against the combined might of Travers, Rutland, Penn, KBC, Harbor, et al, but mostly MSC. What J&L believe they're bringing to the table is fast and responsive customer service, plus an ever expanding, "Good, Better & Best" products line.

Their Woburn store has extensive on-the-floor product display, and what they claim will eventually be an in-stock inventory of 90+% of "your" daily needs. I was quite impressed with the displays. One shelf is dedicated to micrometers and another to calipers. Where else can you fondle, the likes of Starrett, Brown & Sharp, Mitutoyo, Fowler and the ubiquitous, albeit mysterious, "Quality Import", one after the other, after the other

I'm OK now, but it WAS empowering. It was satisfying to see that, despite the apparent similarities, you can only guess at in the catalog pictures, there really are significant differences between each of these brands. At my request they promised to con-

sider the possibility of putting batteries in the digital models. "But", they said, "people may forget to turn them off". The knowing touch of Corporate mentality.

SPECIAL NOTE: Items not in-stock at the Woburn store can be ordered and picked up --- without paying a shipping charge! Hartford, CN, is the regional distribution point and I'm told that if you put your order in before 2PM, most items can be picked up the next day. This is a nice feature, especially if you've been putting off buying that 86 pound surface plate or 24" rotary table, just because the shipping would cost as much as the tool.

IF YOU CAN'T BRUSH AFTER EVERY MEAL

... comb! But, seriously, you do have a tooth brush by every one of your machines, don't you? They are the handiest tools for digging the "stuff" out of "things", without causing injury or damage to the "thing". I keep (2), one "wet" and one "dry", by all MY machines. They are particularly good at cleaning "things", like threaded things and slotted things and soft things that scratch easily.

We've all spent years learning how to use this tool, so why use them, just 2 or 3 times a day, in the bathroom? I'm not too crazy about these trendy, contour shaped, multicolored appliances. I prefer the straight ahead, one size fits all variety, but once they're properly broken-in, they're all pretty much the same. Keep one or two by the sink, too. They're great for cleaning cutting boards, and graters, and peelers, and threaded things, and alcohol doesn't bother them, but then, some of us know that already.

--Ed

A Quick Change Toolpost by Steve Earle

Since the little "quick-change" lathe toolpost I built has generated at least a small amount of interest, I was coerced into writing a commentary on the hows and whys of its construction.

I've been involved with lathes and other machinery for about 20 years now, and I've had occasion to try out quite a few assorted lathe tool holders. Some have been quite reasonable to deal with, and others have been "condemned" after short periods of frustration. I'm aware of the availability of some very nice small toolposts, but the layout of funds could be substantial. After all, if we have the equipment, why not make useful stuff for ourselves?

The first toolpost everyone has, and probably hates, is the lighthouse type. I guess I don't want to know who giggled while maliciously inventing those. I will admit that the interaction between tool center height and front rake angle is a fine form of torture, but I don't need any more torture. I just want the tool to go where I choose, and not be compromised by rockers, holders, and different bit lengths.

I have a toolpost made by Rivett which incorporates a square-hole collet in an eccentric bushing, allowing independent setting of center height and side rake/clearance. It's an interesting approach, although not very useful for rapid tool changes. Also since I usually grind rake and clearance into the tool bit, the adjustment available is not of too much utility.

Somewhere in the piles of, well, stuff, I have a couple of old single side-slot toolposts, which serve well but require shimming or rocking (on a small wire or dowel) to get correct center height.

I wanted a toolpost which would allow quick access to a number of tools without fussing and fooling to get them set. Accordingly, some years ago I built a 4-sided indexing type rig which still works quite well. Still there are three drawbacks that I can see. First, the way it functions, I'm limited to 90 degree indexes. I can stop in between, but then the tool position is not positive, whereas at the 90's, there's a positive stop on which to locate. Second problem - I still have to shim the tool to height. Third, as little a problem as it may seem, I can use only four tools without having to rearrange something.

Now is when the audience asks, "How many tools would a person want?" My answer is "MORE!!" Right now I have over a dozen, set up and ready to go. There's straight turning for brass, another for steel/aluminum, facing for brass, for steel, chamfering, small cutoff for brass, for steel, small boring, larger boring... you get the idea. And if I'm actually doing a job of multiple parts, with various forms; radii, angles, etc.; it can get even worse. I don't think 20 or so is too many.

The real beginning of the quick-change toolpost was when I found three of the tool holders at Surplus Tool in Seekonk. When I inquired about the toolposts' whereabouts all I got was a disgusted comment about someone "ripping it off." Well, it seems like a fairly stupid thief who would take the toolpost sans holders, but since they were so cute they came home with me. (Yes, I paid for them!)

Anyone who has worked in a "real" machine shop knows the great utility of the Aloris- type toolposts. That's what I was aiming at when I started figuring out exactly what to create. I couldn't get very worked up about replicating the Aloris internal mechanism in miniature, though. It's not so much a lack of skill, but I wanted to actually finish and use this thing, not make a pristine scale model.

There is a simplified and dimensionally interchangeable version of the Aloris which uses a cam and plunger to clamp the holder. It could be fairly simple to make, but I didn't like the idea of pushing the holder away to lock it. I'd much rather pull it into intimate contact with the toolpost body

The drawings are for the most part self-explanatory. In use, tightening the allen screw in the back of

the plunger pulls the plunger inward, and the angle in the plunger seats the holder into contact on three surfaces of the body. Although the plunger is free to rotate if a holder is not installed, I have yet to experience difficulty dropping the holders into place. There's no need to get very brutal, either; just snug the screw to a strong finger-tight. It can't get away because it can't back-drive a 10-32 screw.

I made all the parts from everyday low-carbon steel (s-t steel we call it at work!). First square up a block for the body, then set it at the 22.5 degree angle and drill clearance for the plunger screw and bore for the plunger. Flip it over, pick up the hole location, and counterbore for the screw head.

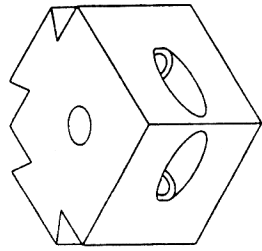
Next make the plungers. They are just 3/8 rod with a 10-32 hole. Now screw them into the body "blank." Here you want them tight - not tight in the bore but tightly screwed in. Now gently machine the dovetails. I used a commercial dovetail cutter, but if you have a shaper that would certainly work too. After the dovetails are cut, remove the plungers and face off about .025 from the hole end. See, now you have a plunger that perfectly matches the dovetail yet will pull in below the surface. You may want to match-mark the parts so you know which one goes in which hole. Deburr the parts so there are no hang-ups.

The tool holders don't need much commentary. Just leave as little metal as possible for the dovetail cutter to remove; i.e., clear out the middle with an end mill first. Also, don't try to make them fit the body too nicely. Clearance of .001 is way too little. Using .005-.010 gives enough room for tolerances, finishes, heat treatment, and ease of use. This goes for the other parts, too. I experienced some slight surface growth when the parts were case-hardened, and it almost caused difficulties.

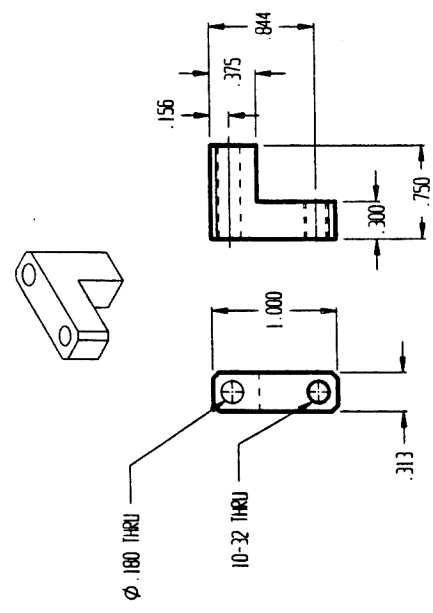
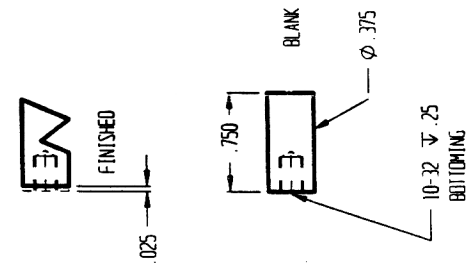
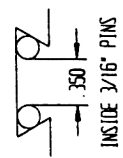
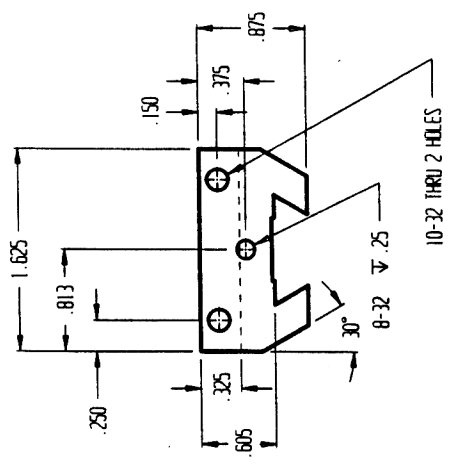
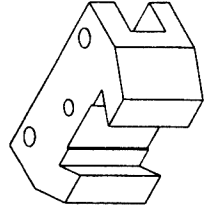
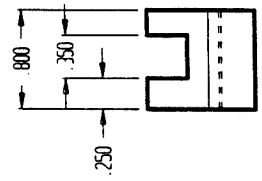
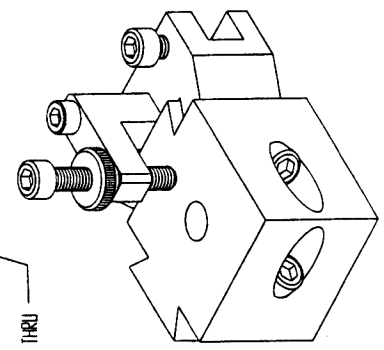
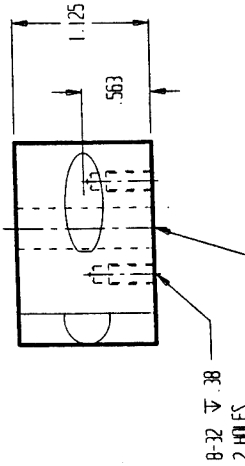
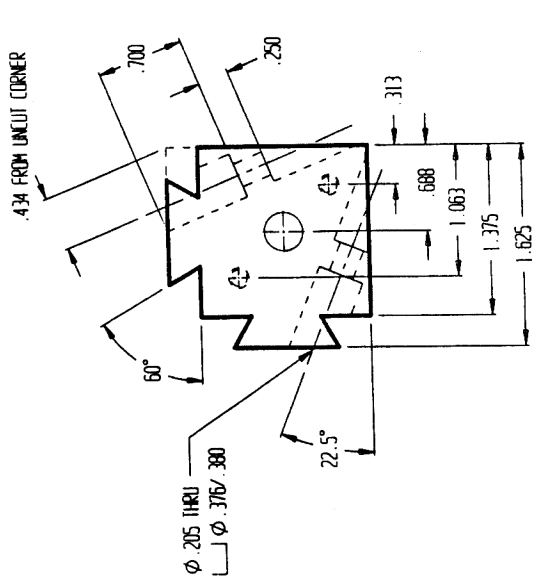
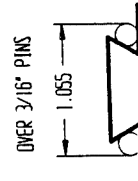
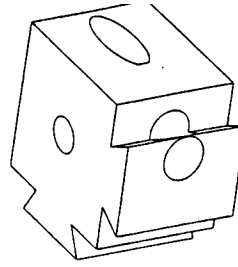
As mentioned, I had mine cased then hot-oxidized so they look nice and function well. They would certainly work if left soft, but you'd have to be more careful in handling. If you want, use tool steel and grind to size and finish after hardening! Whatever gets you excited is OK for me. Couldn't you see it in brass?

No doubt there are other ways to deal with the height stop, but this was easy and functional. It also makes a nice handle to grab when changing tools. I made little knurled locking nuts but ordinary 10-32 hex nuts would be fine. The plunger screws could become little locking levers or knobs. I leave a short allen wrench stuck in the screw because it's easy, except when it vibrates out and bounces to the floor.

A couple other comments - I've done various case-hardening experiments and concluded that for my purposes it's better done by the heat-treating house. Although the lot charge may seem hard to take, it sure saves annoyances, and the price will be long forgotten ten years from now when the parts are still working like new.



ALL DIMENSIONS TYPICAL
IN BOTH DIRECTIONS



The tapped holes in the base of the body are for attaching a suitable spacer to get the average tool height into the useable range. You could just make the body taller, but if you then change lathes you may be in trouble.

I made a fistful of little plastic dovetail "things" which I mounted on the lathe bench. This gives me quick access to a bunch of frequently used tools.

Although this toolpost has existed for less than a year, in that time I have not needed or wanted to use any of the other old relics. I never knew how nice it would be to change tools in literally 3-4 seconds and be certain that they are in the same place every time. So after you build one you too can have a museum of obsolete toolposts.

**Museum Display
by Steven S. Cushman**

At several meetings we have discussed the idea of having a display area at the Museum, used to show projects and other items of member work which demonstrate the types of work we accomplish as Model Engineers.

This sort of display has great potential for interesting Museum visitors and assuring them that the Museum does not just represent "ancient" history.

At the September 1998 meeting, I plan to have a sign up sheet intended to collect information as to who might be willing to share their work in this fashion, how much space might be required and for how long members might be able to loan their work.

I don't think there is any requirement for showing finished work, in many ways "work in progress", photographs and parts which failed may be excellent items for display. This might be very appropriate to members whose completed work is often very large and difficult to transport. Some supportive written material could also be beneficial.

I've been thinking toward a plan where the exhibits change concurrently with our meetings as this would probably be the most convenient situation.

Please give some thought to this subject. Hopefully we will have a good response at the September meeting, and be able to work towards starting our display at either the October or November meeting.