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Volume 27

Issue 11

November 2000

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**PRESIDENT**

Dave Crego  
(408) 377-9980  
Crego1@apple.com

**VICE PRESIDENT**

Steve Liebenow  
(408) 727-8678  
Steve.Liebenow@divatv.com

**TREASURER**

Anita Kuehne  
(408) 244-7095  
akuehne@kuehneconstruction.com

**CLUB STORE (INTERIM)**

Bill Santos  
(408) 732-6468  
BSantos@Flash.net

**SECRETARY**

Capt Mike Drew  
(707) 452-9284  
MikeLDrew@aol.com

**RAFFLE CHAIRMAN**

Larry Stock  
(650) 964-1531  
SharLar@Sierra.net

**NAME BADGES**

Doris Britschgi  
(408) 866-1677

**LIBRARIAN**

Sharon Renshaw  
(925) 372-7021  
KittyLuvr480@aol.com

**MEMBERSHIP  
COORDINATOR**

Russ Britschgi  
(408) 866-1677

**EVENTS  
COORDINATOR**

Diane Dean  
(408) 683-4861  
DeanD@inreach.com

**MOTORSPORTS  
COORDINATOR**

Chuck Melton  
(408) 739-4174  
Melton01@msn.com

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## Minutes of Meeting 26 October, 2000

The meeting was called to order at 8:05 by Dave Crego. All officers were present except for Mike Drew, Sharon Renshaw and Diane Dean. There were 33 members present, but inclement weather kept all the Panteras safe at home in their garages.

**New Members/Guests:** The club welcomed **Allen Anderson** to his first meeting. Allan met the Gentrys at work and through them, became interested in Panteras. He's a hot-rod enthusiast but is now looking for an L-model Pantera.

POCA president and long-time PCNC member **Dennis Antenucci** was also present, attending his first meeting as a resident of Northern California since 1991.

**Changes To Last Month's Minutes:** The crowd picked on Russ for a change, noting that he'd accidentally typed "this" instead of "his" in his announcement for PCNC board positions for next year.

**Club Library Report:** Howard reported that the contents of the library were in his car, but *not* in the trunk, as he's recently purchased a '69 Chevy El Camino SS.

**Club Treasury Report:** Anita announced that we have issued deposits to both the Las Vegas Speedway, and also to the Los Laureles Lodge (so those nasty Ferrari Club guys won't be able to steal it from us.) Despite this, our treasury remains reasonably healthy.

**Club Store Report:** Bill reported that the 1/18th scale Mattel Pantera models have been going like wildfire, with over 35 sold so far. He will soon be re-ordering them as his initial stockpile is almost gone. He still has three, three-point roll bars for sale for \$500 each.

**Club Membership Report:** Each year, PCNC has awarded Larry and Shari Stock honorary membership in our club, as they are formally affiliated with Reno-Tahoe Panteras. Russ made a motion to continue this for 2001, which was passed.

#### **Past Events:**

**Bad Taste Party:** The party was a rousing success, with some people really getting into the spirit of the thing and dressing in awfully tasteless clothes. As photos were passed around, several people issued reflections which drew lots of laughter. See the article elsewhere in this newsletter.

**Mini-Tech Session:** Martin Mitchell commented briefly on the small tech session held in Marin County. Two Panteras and one Mangusta were present, with the Mangusta getting some minor A/C and window motor work. Quite a bit of time was spent checking out a Porsche 356 replica recently purchased by Walter Villere's girlfriend; a bad tire-rubbing problem was found to be caused by a broken rear suspension, which means there's a bit of work to be done!

#### **Upcoming Events:**

**November PCNC Meeting — 30 November:** Traditionally, the November PCNC meeting is held one week early due to a conflict with Thanksgiving. Since there are five Thursdays in November this year, the meeting will be held at the usual time and place, the last Thursday of the month.

**PCNC Christmas Party — 9 December:** Diane announced that the menu options have been finalized for the Christmas party. The entrees and prices can be found in the flyer elsewhere in this newsletter.

**Super Bowl Party — Super Bowl Sunday:** Brian Bernard will again host the club at his spectacular home in Saratoga for our now-legendary Super Bowl party. Watch for a flyer in an upcoming newsletter.

**PCNC Las Vegas Track Event:** The outlook for the track event has become much brighter. Bill put together a letter to get sponsors to agree to help underwrite the cost of staging the event, and several vendors have stepped forward. As a result, we were able to secure the hoped-for downtown Las Vegas Motor Speedway track (the one outside the confines of the speedway proper.) The fee to run the event will be as low as we can make it, depending on the extent of vendor support. The track is currently in the process of being fully repaved, and improved over the configuration we used back in the early '90's.

John Bentley has joined the track committee to serve as the Public Relations manager. The members of the track committee have been trying to fly to Las Vegas to meet with the management and inspect the track, but full flights have made it impossible so far (*although on the day this is being written, Your Humble Editor flew right over the top of the track and can report with authority that it is still there!*)

**Reno-Tahoe Event:** Larry has been placed in charge of staging the Virginia City Hillclimb, which involves quite a bit of bureaucratic red tape from several departments, as the road passes through two different counties. He may include the Audi club as they have experience staging this event, plus their numbers would be helpful in the \$\$\$ department. The Ferrari club installed a permanent phone line from the top to the bottom of the hill several years ago. The Nevada Department of Transportation will supply the radios, but 12 course workers will be needed to man them, and Larry may have to hire some if there aren't enough volunteers.

The event is coming together, but they had to post a \$10,000 bond with the Nevada DOT to cover possible damage to the road (!) Due to safety and insurance concerns, Larry is contemplating having speed limits as opposed to having the participants charge headlong up the hill. Several people suggested establishing speed brackets, similar to what is done at Silver State. The total enrollment will be limited to 60 cars.

### **Club Business:**

**PCNC Elections:** Russ announced that the nominations for the club officers will be taken and the elections held at the November meeting.

**Charitable Contributions:** Bill mentioned that this is the time each year where PCNC donates a percentage of the proceeds from club store sales to worthy charities. He suggested two, \$300 donations. Russ will put together a nomination package for this newsletter, and a vote will be taken at the next meeting.

### **News, Clues and Rumors:**

**Another Mini-Tech Session?:** Chuck Melton is contemplating having a small party at his house to get a few bodies to help fabricate brake lines for his Pantera.

**Engine Hoist, Anyone?:** John Hansen asked if anybody had an engine hoist he could borrow, which lead to a bunch of razzing about the state of his Pantera. As the teasing subsided, Jim Kuehne offered the use of his hoist.

**Master Cylinder Identification?:** Chuck Melton brought photos of several different Pantera front trunk compartments, and asked the crowd if they could help identify the various brake

master cylinders contained therein. Most everyone was able to agree that the photos did, in fact, show brake master cylinders....

**Atlanta Panteras:** Tony Harvey reported that a recent business trip to Atlanta coincided nicely with a large Italian car show there. PCNC member and Atlanta-area resident Debra

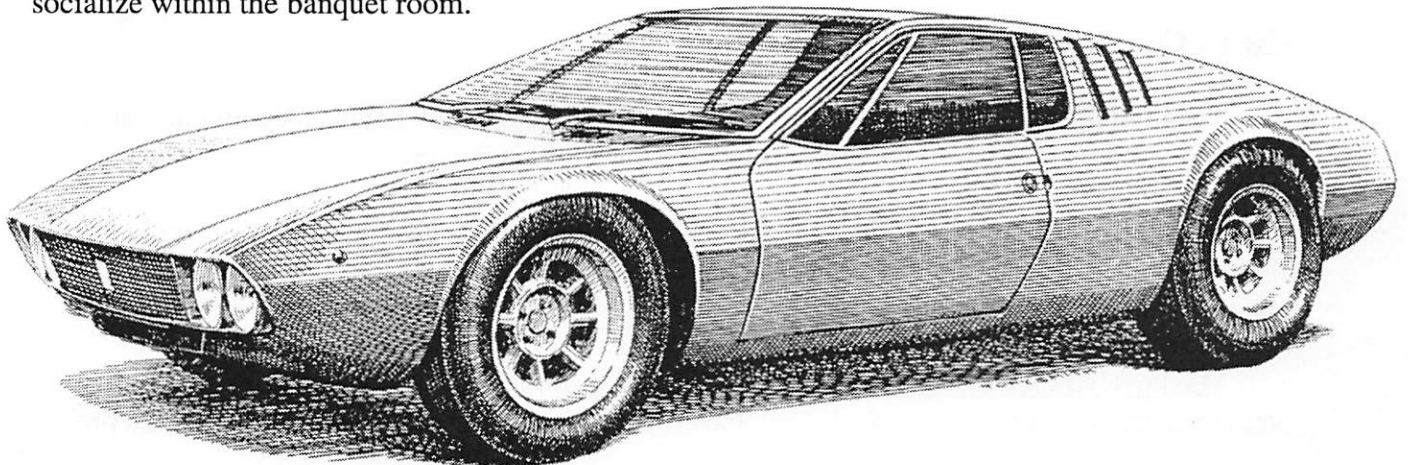


Woummn picked Tony up at the airport in her Pantera and together they went directly to the show. Hers was one of two Panteras there, surrounded by Ferraris, Alfa Romeos and Lancias. Debra's Pantera made quite an entrance, literally stopping the whole show when she pulled in. Tony won a large Ducati emblem that he had to mail back home because it was too big to fit in his bags.

**Raffle Results:** Larry once again did the Rafflemaster thing, with the following results:

- PCNC Tote Bag — John Hansen
- Performance catalogs — Dennis Antenucci
- ZEP Hand Cleaner — Jim Kuehne
- Pantera Parking Only sign (donated by Rod Pack) — Jim Kuehne
- Le Mans Poster — Dennis Antenucci

The meeting adjourned, but as there were no Panteras in the parking lot, the crowd continued to socialize within the banquet room.



De TOMASO MANGUSTA

## Membership News

### November Membership Anniversaries:

We congratulate the following persons for the indicated years of continuous membership in the Pantera Club of Northern California:

**Rod Pack: 19 years**

**Roger & Dianna Hewett: 14 years**

**Chuck & Bev Brown: 13 years**

**Byron & Jean Hight: 12 years**

**Erik Belter: 8 years**

**Roger & Elana Thomas: 7 years**

**Mike & Cheryl Harper: 6 years**

**Ken & Beth Ingels: 4 years**

**Michael & Rochelle Conwell: 3 years**

**Keith & Cindy Gilmore: 3 years**

**Steve & Linda Bogart: 2 years**

**Todd Glycer: 2 years**

**Joe & Sylvie Mendes: 2 years**

**George & Rose Selby-Hele: 2 years**

**Dirk Ault: 1 year**

**Richard Del Curto: 1 year**

**Jason Eaton: 1 year**

**Jasson Teplitsky: 1 year**

### 2000 PCNC Proxy Ballot for the Election of Board Members to serve during calendar year 2001

You may vote either by the use of this Proxy Ballot or in person at the November 30, 2000 membership meeting (see this newsletter for time and exact location of the meeting).

- 1) If you choose to vote by Proxy, you must sign the ballot so a ballot will not be given to you at the meeting.
- 2) If you vote by Proxy and also attend the meeting, you may reclaim your proxy prior to the distribution of regular ballots and thus be allowed to vote then.
- 3) Each Member and each Associate Member is entitled to vote.
- 4) Select one candidate for each office.
- 5) Ballots may be hand delivered to the meeting or mailed to: Judy DeRyke, 808 Duncardine Way, Sunnyvale, CA 94087, in time to be brought to the meeting.

	Memb.	Asoc.		Memb.	Asoc.
<b>President:</b>			<b>Secretary:</b>		
Steve Liebenow	<input type="checkbox"/>	<input type="checkbox"/>	Mike Drew	<input type="checkbox"/>	<input type="checkbox"/>
_____	<input type="checkbox"/>	<input type="checkbox"/>	_____	<input type="checkbox"/>	<input type="checkbox"/>
_____	<input type="checkbox"/>	<input type="checkbox"/>	_____	<input type="checkbox"/>	<input type="checkbox"/>
<b>Treasurer:</b>			<b>Membership Coordinator:</b>		
Anita Kuehne	<input type="checkbox"/>	<input type="checkbox"/>	Russ Britschgi	<input type="checkbox"/>	<input type="checkbox"/>
_____	<input type="checkbox"/>	<input type="checkbox"/>	_____	<input type="checkbox"/>	<input type="checkbox"/>
_____	<input type="checkbox"/>	<input type="checkbox"/>	_____	<input type="checkbox"/>	<input type="checkbox"/>

Signature & date:

PCNC Member: \_\_\_\_\_

Date: \_\_\_\_\_

Associate Member: \_\_\_\_\_

Date: \_\_\_\_\_

# Charities Note

By Russ Britschgi

It is time again for you, the members of PCNC, to decide which charities should be the recipients of the chapter's benevolence funds. The benevolence fund is composed of 10% of the gross revenues received from the club store sales at the Las Vegas Fun Rally. This year the sales were in excess of \$6,000. Thus the amount available for charitable giving this year is about \$600.

## The Selected Charities

At our last regular membership meeting we decided to choose from the same field of six charities as we had last year. These six charities will be placed on a ballot for the November general membership meeting, and as last year you will be asked to select the two you think most worthy. The benevolence funds will be divided equally between the two with the most votes.

The following is a very brief description of those charities to appear on the November ballot.

### Beating the Odds Scholarship Fund: (A new addition to our list last year.)

Beating the Odds is a scholarship fund for high school seniors or college freshmen. All recipients must be either on government assistance or living below the poverty line. They cannot already be receiving a 4-year scholarship. Other guidelines for selection are: character references, lack of family support, a 3.0 or better grade point average, have fallen through the cracks, parents cannot be professional or managers, and parents cannot have attended college. In

general the fund hopes to address the needs of students who have the talents and desire to further their education but do not have the financial backing from their families. It is beating the odds.

### Camp Ronald McDonald for Good Times: (Donations were made in 1991, '93 and '94.)

This Southern California foundation was started to provide a camp experience for children who were victims of cancer. Later it became affiliated with the Ronald McDonald camps for the handicapped. Now year around programs for young cancer victims and their families are supported by contributors that range from international corporations to the members of PCNC.

### Canine Companions: (A donation was made in 1996.)

Based in Marin County, this organization provides dogs trained to assist people with what for most of us is just normal living.

These dogs may be used by paraplegics or quadriplegics for such things as opening doors or for retrieving items which have been dropped. They may serve as the ears for someone who cannot hear such things as doorbells and audible warning devices.

### The American Cancer Society: (Donations were made in 1995, and '97, '98, '99'.)

As a national organization, the Cancer Society has long been at the front in the fight against cancer. It is dedicated to the elimination of cancer through prevention, the saving of lives, and the diminishing of suffering through research, education and service. Cancer can be a slow and insidious disease which puts a great deal of stress on both the victim and

the victim's family and friends. While our small donations may not appear that big when it comes to funding of a research project, it can certainly help to pay for a support group or to supply someone with needed medical equipment. (The 1998 donation was actually made to the cancer research program at Stanford University Medical Center in honor of Ellis Woummn.)

### Guide Dogs for the Blind: (Donations were made in 1990, '91, '93, '94, and '96.)

This San Rafael based charity was incorporated over 55 years ago. It has been breeding, raising and training dogs to serve as the eyes for blind people ever since. Last year, over 1,000 puppies started the process of learning to assist those without sight.

### The Greater Bay Area Make-A-Wish Foundation: (A donation was made in 1998 and '99.)

The Make-A-Wish Foundation was founded as a non-profit organization in 1980 in response to the wish of a terminally-ill boy who wanted to be a policeman. Officers of the Arizona Department of Public Safety granted Chris Greicius his wish with a custom-made uniform, a helmet, a badge, a ticket book and a helicopter ride. This one child's delight in having his wish come true provided that impetus for the creation of a national organization.

Since the Greater Bay Area Chapter was formed in 1984 well over 1,500 wishes have been granted to kids and children not expected to survive to age 18.

### Summary:

Please give these few charities some thought and make your choice wisely. ■

## Officers election November 30 , 2000

Vote at the meeting on the 30th or send in the proxy ballot enclosed in this newsletter. Proxies must be signed to prevent double voting. If you sent in your proxy, but decide to attend the meeting and vote at that time, you may reclaim your proxy prior to the vote at that meeting. Proxies must be received by Judy DeRyke at 808 Duncardine Way, Sunnyvale, CA 94087, in time to be taken to the November 30 meeting. Proxies may also be hand delivered to Judy at the November 30 meeting.

# Building a Backyard Stroker

by Steve Bogart

It all started two years ago when I finally found the "perfect" Pantera. After about six months of searching, I purchased a 1971 pre-L in great original condition from a guy in Southern California. The first few months of getting acquainted with the car went fine, and I enjoyed driving it daily to work in Silicon Valley.

But as the miles went by, I began to notice that the engine didn't have quite as much punch as it seemed it ought to, so I ran a quick compression check to make sure everything was okay. Six cylinders had excellent compression—great. Oh yeah, but this is a V8 isn't it? Well, the other two were barely raising enough squeeze to jet-puff a marshmallow. This was not good news.

Or was it? I had sort of been wanting to build an engine ever since I got the inspiration to buy a Pantera. The only reason I hadn't gotten into it in the first place was that I found a car in such great mechanical condition—or so I thought. Well now I had an excuse to get my hands dirty.

Reasoning that I didn't want to stop driving it (as it was my only car), I decided to build a new engine without using the existing block, and then make the swap when I was done. I figured it would only take a couple of months to build the new motor, and the existing mill could probably hold out that long. A few phone calls later, and a 1971 351C was on its way from a Sacramento salvage yard.

The block arrived looking more or less like a 700 pound knot of wires and grease. Not only had this engine never been rebuilt in 28 years of service under the hood of someone's Cougar, it had never been cleaned or serviced from the look of it. I swept out my little work shop, hoisted the mess up onto an engine stand, and began chipping away the petrified sludge. Within a few days, I had it torn down.

Then came the first delay in what I had expected to be a 10- or 12-week rebuild. TechCraft Machine Shop in Redwood City was my machine shop of choice. Ted Yamashiro is an outstanding machinist with the highest standards. My intention was to build a reliable street motor, and he had all the credential to help me pull this off.

But one of the benefits (?) of his outstanding workmanship is the tremendous demand for his work. The waiting list was about 12 weeks to get on the calendar. That waiting list starts *after* he gets the engine through his hot-tank, and magnafluxes it. I also opted for sonic testing to determine cylinder wall thickness in all cylinders. The block passed with flying colors. One of the heads turned up a crack under magnafluxing and so it was back to the junk yard for a replacement.

After leaving the block and heads with TechCraft I put my 12-week respite to the best use I could. I turned my attention to specifying all the engine components and ordering them. Ted helped with this and we arrived at the following general formula for a high reliability street performer.

In order to get street performance without the unreliability of a radical cam and high rpm, I opted for a stroker. My preference was to build for low-end torque over high-end horsepower. My target was to achieve torque and horsepower numbers somewhere north of 350 in an engine that idles somewhat smoothly and runs reliably.

I chose a Scat crank which pushes the displacement up to 393 cu. in. Since reliability was of key importance, the stroker kit was completed with Wiseco custom forged aluminum pistons with the wrist pin placed high enough to allow for 6.125" Manly forged rods. The longer rod decreases the rod angle against the cylinder wall, a problem with some stroker kits. This is especially critical because of the thin cylinder walls characteristic of the 351C. The Wiseco pistons have a special system which stabilizes the lower oil ring. This is also critical in a piston with the wrist pin placed up in the oil ring land.

After considering 2V heads, and Aussie heads, I finally decided to stay with the early closed-chamber 4V heads that were on the engine. My reasoning was that the low intake velocity problems which the 4V heads are typically accused of, would be offset somewhat by the larger displacement of the stroker. I could retain the bigger valves and put the compression where I wanted it (10:1) by properly specifying the piston. Again, Ted Yamashiro came to the rescue helping me to calculate this.

I continued to round up all the usual suspects to build out a performance street engine. I chose an Edelbrock Performer intake manifold, Holley 750 double pumper carb, Edelbrock water pump, Aviad 10 quart oil pan, high-volume oil pump, BHJ harmonic balancer and Duraspark ignition.

After sending off a ton of money to Summit Racing and a few other vendors for the above wish list of parts, the front porch was soon covered with cardboard boxes of various weight and size. This made it tremendously difficult to keep my wife in the dark about how much money was pouring into this little project.

But soon, most of the parts had arrived and I was still many weeks away from my machine shop date. That's when the idea of porting and indexing the heads came up. I have a compressor and a vague familiarity

with a die grinder, so why not give it a try? I even had that spare cylinder head laying around to practice on.

Back to the mail order catalogues, and I soon had some cutting burrs, and a box full of sanding rolls and tapers. This led to many fun and interesting nights spent grinding and shaping the innards of my intake and exhaust ports.

My 10 year-old son would shine a flashlight back into the ports while I ground and then polished the various inaccessible recesses of the heads. As the black gunk thickened under my fingernails, and the nights wore on, my son lost interest, and I began to lose patience. The next heads I port are going to be on a 4-banger! But eventually they were smooth and clear and I was very happy with the result.

With the porting done, I stopped by a chemistry supply store and picked up a pipette to begin the indexing. For those inexperienced with indexing (as I was) this is a tedious process of laying the heads level on their backs on a workbench and dropping valves and spark plugs in. This allows you to drip oil from the pipette into each combustion chamber to determine its exact volume. You then grind material from the ones that are the smallest, until they all are the same.

By doing this, you equalize the compression on all cylinders. Theoretically they should all be the same in the first place. But this is a Ford we're talking about and the differences in casting are tremendous.

Mine started out with 5% variation from biggest to smallest. It may not sound like much, but this means cylinders with 10:1 compression would be firing in the same engine with cylinders that are 9.5:1. That doesn't make for a smooth running engine no matter how much time and money are spent balancing the weight of the parts. I worked them down to within 1.5% across the set of eight cylinders.

At long last the heads were ready, and by then the machine work was beginning at TechCraft. They began with boring all cylinders .020" oversize. That wasn't enough as some scoring on the walls was pretty deep, so it was necessary to go out to .030" over, and also sleeve one cylinder. The reciprocating assembly was fully balanced, and hardened valve seats were installed along with new valve guides. Threaded rocker studs were put in securing pushrod guide plates, again for durability and reliability.

Soon I had a beautifully prepared block and heads in my workshop ready for the assembly. My first purchase was a notebook where I began to take meticulous notes of every bolt and nut as it went together. More than once I was glad to have done this. During those sudden panic attacks in the night when I woke up wondering whether I had really torqued the cam retainer bolts, or put lockite on the oil pump bolts, there was the notebook to reassure me that I hadn't forgotten to do it, I'd just forgotten I'd done it.

Many weeks later, the engine began to take shape.

What I lacked in speediness, I hoped I'd made up for in thoroughness. The heads finally went on with Comp Cams roller rockers, and I used a custom cam grind which Ted helped specify. It was custom ground at Elgin with 234/240 degrees of duration at .050" and .561/.578" of lift.

I also chose Canton's special pushrods with a narrowed oil hole which limits excessive oil flow to the heads, a common problem with the 351C. The stock valve covers went on, albeit with precious little clearance to the roller rockers. Finally it was ready for a Ford-blue paint job.

Considering that I wanted to leave my original engine unmolested, I decided to trim out the new one with all new stock-style tin parts and emblems. I got a stock air cleaner and DeTomaso valve cover emblems, and put them in place. Now it looked exactly like what was sitting in the engine compartment of my car, but a lot cleaner and newer.

## ***Part Two: The Dyno Session***

One thing remained to be done before I was ready to swap the engine into the car. Having spent more time than I'd like to recall in school studying scientific method, I figured that no job was complete without some good solid testing. The engine would have to go on a dyno before I was ready to install it. Since I'm not an experienced engine builder, I figured this was also my insurance to see if it worked, before going to the trouble of putting it in the car.

But running on the dyno would require some parts that I just didn't have lying around. And again, I didn't want to take the car off the road until the last minute.

So a few quick e-mails to various PCNC members, and I was in business. Jack DeRyke set me up with pulleys for the crank and water pump. Bill Santos had an exhaust system in his garage that he was willing to let me use. And Larry Stock came through with an extra Holley 650 carburetor to try on the dyno in case the 750 DP turned out to be too much. A word to the wise, here. Don't try to dyno an engine unless you are a member of PCNC, it probably just can't be done.

Ted put me in contact with Mike Blackstone, a very experienced racing engine builder in Hayward. Mike has a lifetime of knowledge about engines, and a dynamometer that he's willing to rent when it's not busy torturing one of his monster motors. A good friend of mine for many years, Chris Clark, had recently purchased a Pantera. He volunteered to help me with the wrench duties on dyno day.

I delivered the engine to Mike Blackstone's shop, and his son Tim hoisted it up and bolted it to the dyno. The next day, Chris and I arrived early in the morning to begin getting the engine ready for it's first spark of life. I can't think of any time I've played hookey from work and enjoyed it more. After a couple of hours of



connecting fuel lines, the ignition system, coolant hoses, etc. the moment of sweaty palms for me had at last arrived.

It had been 12 months since that fateful day I had learned I'd need a new engine. Now after many hours of work, and nearly twice as much money as I'd originally intended to spend, it was sitting there on the dyno, ready to hit the switch.

Chris and I gave it a last going-over, and then walked out of the concrete room and behind the bullet-proof glass. Just about this time I started to wonder if that glass wasn't actually designed specifically to protect guys just like me, who have dreams of glory about building a high performance engine. I could admire it there, in the light of the dyno room, behind that fine sheet of glass. And that glass might now save me from ending up with that high performance engine all over the front of my shirt.

Mike Blackstone, without a bit of concern, looked over at me and asked "Ready to go?" Trying to look as confident as possible, I told him to hit the switch. The starter engaged and within a few seconds oil pressure came up on the dyno gauges. So far, so good. Now we switched the fuel line to the open position, and turned the engine over a few more times to prime the carburetor.

That's when the first of the day's surprises hit us. Fuel began squirting out of every corner of the fuel pump. It seems the only part on the entire engine that was not new or fully rebuilt, was just not up to the task. Mike switched everything off and went back to his work while Chris and I ran out and got a new fuel pump and fitted it in place.

About a half hour later, we were behind the glass again, with me not feeling any more relaxed than the first time through this exercise. Again, Mike asked "You ready?", and I gave him a nod. The starter engaged, and within seconds the engine barked to life. Mike shut it down immediately as a matter of course so that all the fuel connections could be double-checked.

At this point I was grinning from ear to ear, just to have gotten this far. Mike, Chris and I looked the engine over carefully and everything was okay, and ready for a complete warm-up to break in the cam. For the next 20 minutes the engine must run at or above 2,000 rpm and can only be shut down if there's a serious problem. Shutting down before the cam is broken in is something you want to avoid at all cost.

Back outside the glass, Mike hit the starter again and the engine lit off immediately with a beautiful roar. He ran it up to 2,000 plus and it seemed to be sitting smooth and steady, firing on all eight. Chris and I smiled and shook hands congratulating each other on the progress thus far.

Talking in a dyno room is not really worth much unless you can read lips. At this point we had the stock headers and exhaust system on the motor, but in a

concrete room 12 x 12 feet with nothing around it, it was still damn good and loud.

Just about then the next little surprise came along. The engine was fuming and smoking as new engines with fresh paint tend to do the first time they're started. But the exhaust system seemed to be getting particularly hot, even for an exhaust system. Mike switched off the lights in the dyno room for a quick check, and I could see the headers glowing like orange light bulbs in the noisy darkness behind the glass.

This is when genuine panic began to grip me as I imagined my new forged pistons melting and being ripped to pieces by the equally expensive rods, which in turn gouge huge holes in the cylinder walls, etc...

Mike, on the other hand, looked pretty calm about the whole thing. He grabbed his pyrometer and a timing light, and headed into the dyno room. The pyrometer confirmed in the light what was already abundantly clear in the dark, this thing was spitting out some *hot* exhaust. According to the little gadget, we were tipping in at between 900 and 1,000 degrees on all cylinders.

Mike clipped the timing light on while he motioned me to loosen the distributor hold-down. Mike spun the distributor a few degrees and within seconds the color of the pipes changed from red to black. The pyrometer confirmed that the exhaust temp was now just above 700 degrees, much more in line with reality.

I tried to catch my breath, as Mike calmly grabbed the throttle and revved the engine a few times to check out the advance curve. Everything seemed to be okay and the engine now had about five minutes on it.

Stepping back to the dyno control panel, the gauges all were reading normal, and we settled down for the rest of the break-in period.

By the end of 20 minutes Chris and I had thoroughly checked over everything on the engine and it seemed to be running fine and not leaking any fluids. We took the chance to organize the tools in the dyno room, and generally get comfortable with what is to be the beginning of several hours of noise and exhaust.

Mike looked at us through the glass and motioned for us to come out behind the glass again. Without a word of warning, he clicked on the computer which records the engine function and outputs, engaged the dyno, and cracked the throttle open for the first dyno pull.

The engine hunkered down under the strain of the pump and Mike let it rev up through 3,000, then 4,000, and 5,000 rpm as the numbers flashed across the screen. At 5,100 rpm he backed off, and then shut the engine down. The engine sat in the dyno room still smoking a little as the paint cured, now 20 minutes old.

A quick analysis of the computer screen showed that the engine was running cool, a little bit lean on the fuel mixture, and had plenty of oil pressure. The torque on the first pull peaked at 4,400 rpm with 331 ft/lbs and

the horsepower had reached 297.8. Not a bad start, but well shy of my 350/350 goal.

After a cool-down period, Chris and I went over everything with a fine-toothed comb, tightening bolts and checking everything. There were no surprises—except that I was surprised everything was holding together so well. There is still something amazing to me about how that bunch of parts and bolts that was recently strewn across my workbench, was now pumping water and oil and air and gas, and actually making horsepower.

We lit then engine up again and this time I just took the warm up time to enjoy the sound and the smell of it. There, bolted up to the dyno, was a mass of iron and aluminum that was once a greasy mess dumped off a truck on my driveway. That took some time to sink in.

But time is money in the dyno room, so we were soon revving the engine up for more pulls as we adjusted the timing and carburetion searching for bigger dyno numbers. With Mike's help at each tuning change, the progress was steady. Finally, with the stock headers and mufflers in place, we managed to squeeze 395 ft/lbs of torque and 366 hp out of it! These were some numbers I could start to really like!

Now it was time for some experimentation. This is where the dyno really shines over seat-of-the-pants testing because you get immediate, accurate feedback. The first change we tested was to replace the stock headers with Hall Big Bore headers. We kept the stock mufflers in place to see the change made only with the headers.

Even with the stock mufflers, this effort put the torque readings broke solidly into the 400+ column across the 3,000—4,300 rpm range. The peak torque had increased by 23 to 418 ft/lbs. The horsepower moved only 3 points to 369. That's hardly enough ponies to run a circus, but the stock mufflers are very restrictive and horsepower peaks at higher rpm where the exhaust system's ability to dispatch the hot fumes is really a factor. So we decided to pop the tailpipes off.

That little modification pushed the 400+ torque band into a much wider range, now 3,000-5,000. It also moved the torque peak up another 18 points to 436. The horsepower responded to the easy-breathing set-up by climbing 33 points (399) and was now

really making me hopeful that I'd see 400 in both the torque and hp columns. That's far beyond the 350 I had expected going in.

Over the course of the next few hours, Chris and I bolted on two different carburetors, and installed exhaust port plates and ran a total of 26 pulls on the dyno. After a while it seemed to be a feverish search to round up those last few horses before pulling the engine off of the machine.

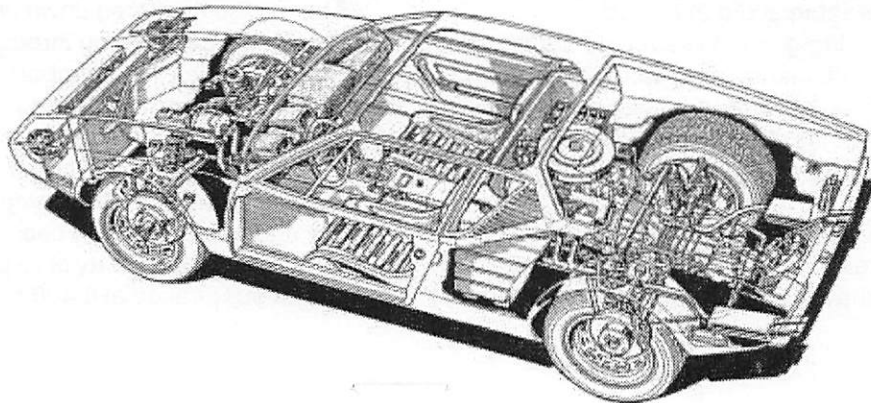
Our efforts were rewarded with a peak torque of 444 at 3,600 rpm and peak horsepower of 433 at 6,000 rpm. The torque band is low and broad showing 400+ from well below 3,000 to 5,300. In other words, we blew through my expectations in a roar of noise and exhaust smoke.

To summarize what worked and what didn't, I'd have to say that the biggest changes came from the headers and the mufflers (or lack thereof). The carburetion didn't seem to make much difference as we moved from a Holley 750 to a 650 and back again. The final increases in horsepower and torque came for re-jetting the Holley 750 to fatten the mixture. The dyno showed the consumption of the engine to be slightly less than 600 cfm at 6,000 rpm, and remember that's 393 cubic inches, not 351. The port plates made almost no difference at all, improving the torque by only 4 points at the peak and reducing it by an equal amount beyond the peak. The peak horsepower went up by only 11 points and there was almost no difference at all below 5,000 rpm.

Mike Blackstone commented that the collector on the Hall big bore exhaust system was particularly small and restrictive, and that significant horsepower gains in the higher rpms could have been achieved by running better headers. But testing that theory will have to wait for a ride on the chassis dyno.

As for the experience of running an engine on the dyno, I got more than my money's worth. The deafening roar of 393 cubic inches screaming into open headers at full throttle, fighting against a machine that is determined and capable of stopping it cold, is a fantastic sound. This is something not to be missed, even if you have to invite yourself along the next time someone you know is headed for a dyno session. It's a hell of a thrill—bring your ear plugs.

Now, to install it in the car and see how it works on the street—stay tuned!



Pantera Club of Northern California

# CHRISTMAS PARTY



and

# Awards Banquet

**Saturday, December 9, 2000**

**Location: Fontana's Italian Restaurant**

(650) 321-0610

1850 El Camino Real

Menlo Park, CA



**Time:** 7:00 pm no host cocktails

8:00 pm dinner

**Dress:** Holiday best

**Cost:** \$36.00 per person,

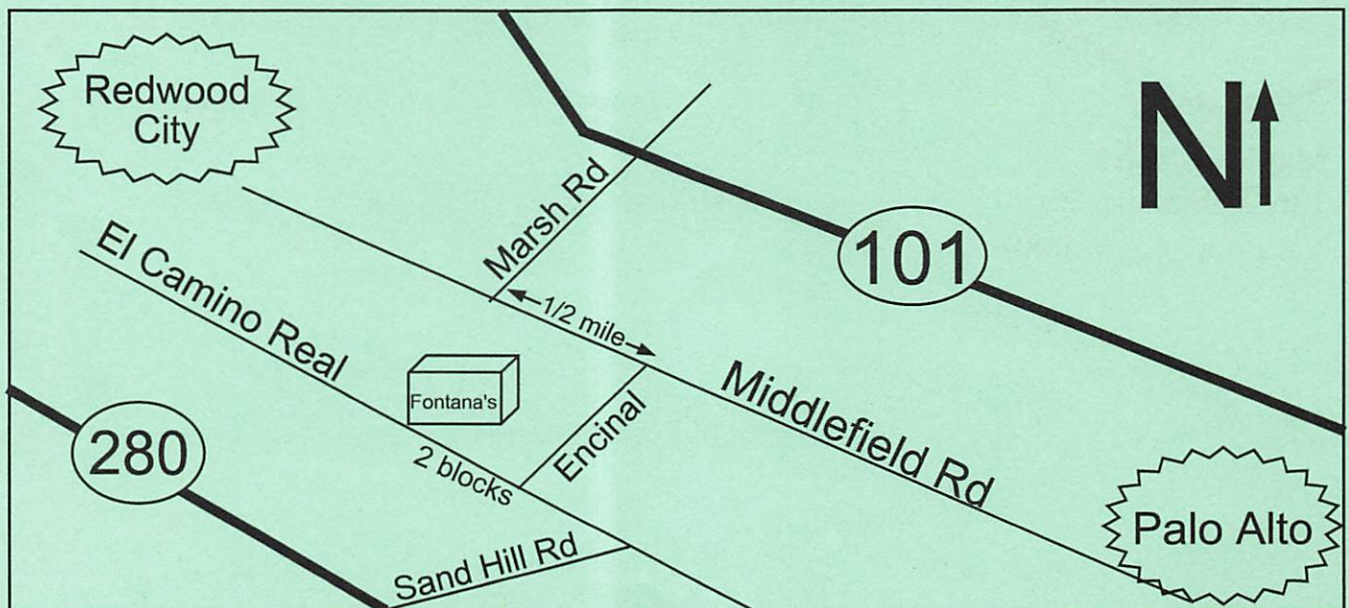
*make checks out to PCNC, include your choice of Dinners and mail to:*

Anita Kuehne, 1072 Hamshire Court

Sunnyvale, CA 94087

Dinner will include salad, and a choice of Filet Mignon, salmon, chicken or pasta (vegetarian).

**Program:** Awards Presentation, announcement of **2001** Officer election results and our famous raffle of Pantera goodies, along with some special fun and entertainment!



# NEXT CLUB MEETING

THURSDAY, November 30, 2000

8:00 P.M.

*(One week AFTER Thanksgiving)*

**COCO'S RESTAURANT  
1209 OAKMEAD PARKWAY  
SUNNYVALE, CA**

**(Take Lawrence Expressway South Exit off Highway 101)**

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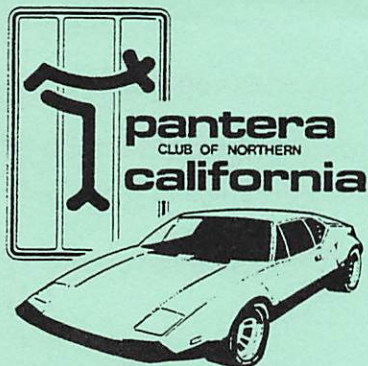
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## UPCOMING CLUB EVENTS

December 9 ————— PCNC Christmas Party (Diane Dean)

January TBA ————— PCNC Superbowl Party (Brian Bernard)

**REMINDER — NEWSLETTER ARTICLES DUE BY 15th OF EACH MONTH**



Maj Mike Drew  
136 Lighthouse Way  
Vacaville, CA 95688



Mr. Ken LEVIN  
8090 Arroyo Drive, #4  
Pleasanton, CA 94588