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Big Gun vs. Bills vs. DG vs. DRD vs. ESR vs. FMF vs. GYTR vs. HMF vs. LRD vs. Pro Circuit vs Two Bros. vs. White Bros.

By the staff of Dirt Wheels

□ The three national organizations that work the hardest to create new ride areas and keep all of our current trails open all agree on one thing—the biggest problem facing our sport today is that of excessive sound. The new generation of high-performance four-stroke ATVs have certainly generated a lot excitement in the OHV world. The trouble is, some of them are just too dang noisy. Especially if they happen to be sporting a loud aftermarket pipe. The sound many of these modified four-stroke quads emit doesn't go over very well with any neighbors or landowners who are within earshot of a ride area, trail, or racetrack.

With the recent advances in exhaust system knowledge and technology, it's easily possible to produce plenty of extra horsepower while keeping the noise factor down.

When the ATVA, the Blue Ribbon Coalition and the National Off-Highway Vehicle Conservation Council (NOHVCC) recently convened

for a "National Sound Summit" with representatives from the OHV industry, the seriousness of the matter was laid out for all to see. Nearly every person and organization in attendance agreed that something needed to be done, and quickly. Basically the only way to quiet our machines down is to convince you the folks who buy aftermarket exhaust systems, that quiet pipes are the only way to go.

Some states, like California, Oregon and Michigan, already have statewide sound limits that are strictly enforced on all public-riding lands; this is something *Dirt Wheels* certainly stands behind. Everyone who has a stake in the future of our sport agrees that we have to solve the sound issue now or face countless new land closures.

LINE 'EM UP

With that said, our pipe shootout this time around will take on a new twist. The machine in question is the very popular Yamaha YFZ450. We have already told you how much it

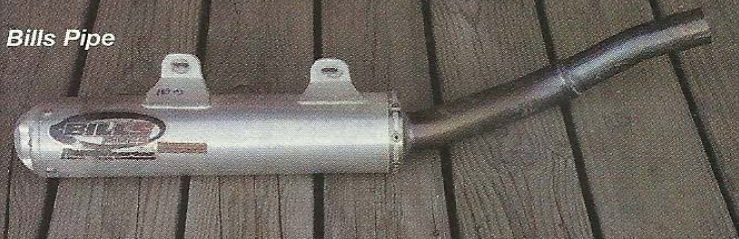
improves with the addition of a freer flowing exhaust. For this test, we wanted to see how much power an exhaust system could produce while still keeping the machine quiet. If we don't start setting limits on the amount of noise modified ATVs make, there is a real possibility that we'll lose our privilege to ride in the places we love.

THE RULES

While we have tested sound levels in past exhaust shootouts, this contest will be strictly limited to those mufflers that are not overly loud. We have asked the manufactures to submit pipes that they believe will pass the 96-decibel limit that California and other states abide by. Also, each manufacture is limited to one model pipe only.

We will be testing slip-on systems that are equipped with a USFS approved spark arrester installed on a new stock Yamaha YFZ450. The only modification allowed is the air-box lid will be removed and the jetting may be changed.

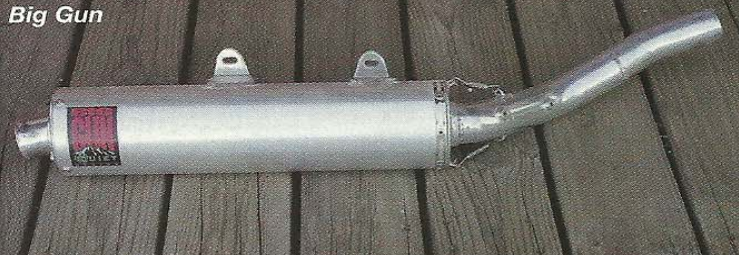
Bills Pipe



GYTR



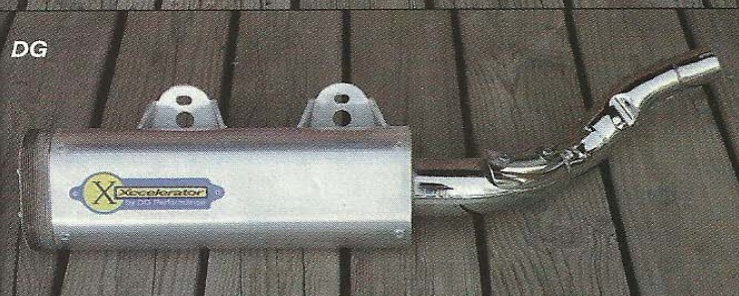
Big Gun



HMF



DG



LRD



Dubach



Pro Circuit



ESR



Two Bros.



FMF



White Bros. E2



CONTESTANTS

You may notice that a few past winners of our shootouts have not entered this year. The main reason they gave us is that they are still working on quiet core products and they weren't ready in time for this shootout. Several of them said they only sell complete systems, and one

even claimed they were, unfortunately, out of stock. If the system you are looking for is not included in this shootout, stay tuned; we will try to test some of the no-shows at a later date.

We did have a wide range of contestants anyway. There are several newcomers such as Dubach Racing Development and Two Brothers

Racing. Both of these companies are dirtbike oriented but have had a hand in developing the engine that is in the YFZ450.

Eddie Sanders Racing and LRD are both long-time ATV tuners but have been mostly vehicle-specific tuners in the past. ESR is a 250R motor expert with many mods for 250R engines for

12 PIPES ON THE DYNO

Brand	hp @5000rpm	Peak hp	dB	Weight	Mainjet	Price	Phone
Stock	23.8	42.4 @8200rpm	87.6	9lb 9oz	165	\$202	Dealer
Big Gun	23.3	46.5 @8750rpm	92.0	6lb 5oz	165	\$370	(909) 948-7029
Bills	24.7	44.3 @9700rpm	96.9	4lb 13oz	165	\$319	(909) 371-1329
DG	25.2	47.0 @9250rpm	98.9	7lb 4oz	165	\$290	(800) 854-9134
Dubach	24.5	47.1 @8300rpm	94.5	5lb 12oz	172	\$310	(909) 808-1114
ESR	25.0	46.7 @8250rpm	96.9	9lb 2oz	175	\$499	(559) 625-3157
FMF	24.8	46.9 @8750rpm	95.1	5lb 2oz	162	\$375	(310) 631-4FMF
GYTR	24.5	46.4 @8250rpm	94.2	6lb 6oz	168	\$360	Dealer
HMF	25.3	46.5 @8250rpm	97.7	6lb 14oz	180	\$284	(216) 631-6980
LRD	24.6	46.1 @8750rpm	95.9	6lb 12oz	165	\$340	(503) 661-6700
Pro Circuit	24.3	46.3 @8500rpm	97.6	5lb 4oz	165	\$400	(909) 738-8050
Two Bros.	24.9	46.3 @8500rpm	91.2	6lb 6oz	172	\$495	(714) 550-6070
White Bros	24.8	47.1 @8400rpm	97.7	5lb 11oz	168	\$399	(714) 692-3404



Eash pipe was track tested along with being run on the dyno.



Chemhelp's Chris Real was in charge of sound testing each of the pipes in our shootout. He took 16 different readings and averaged them out for the overall score. The Two Bros. product was the quietest.

R&D technician Charlie Tissen controlled the dyno for us during our YFZ muffler shootout. He performed three runs with each product. We took the best reading of the three.

both quads and shifter karts. LRD is the 2003 championship-winning motor builder for both Jeremiah Jones and Bill Ballance. Even with their two-stroke backgrounds, both companies are encouraged with the modern day four-stroke engine in the YFZ and claim they can make it fly.

Big Gun, FMF and Pro Circuit have been in the quiet pipe game from the beginning. They have the most development time under their belts and are doing their part by selling more sound-friendly products that perform.



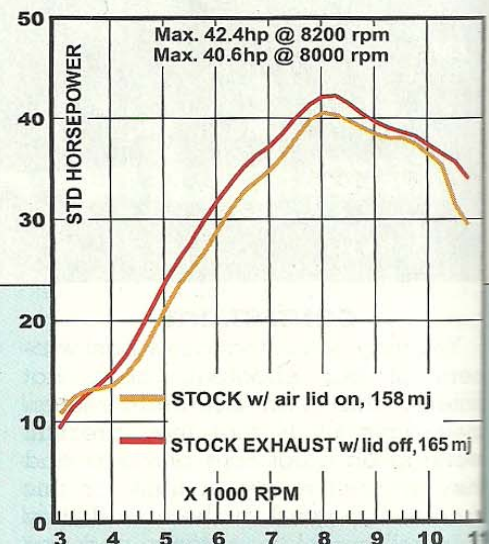
Companies like HMF are working very hard to comply with current sound regulations. Their utility series of exhaust systems are already some of the quietest we've heard.

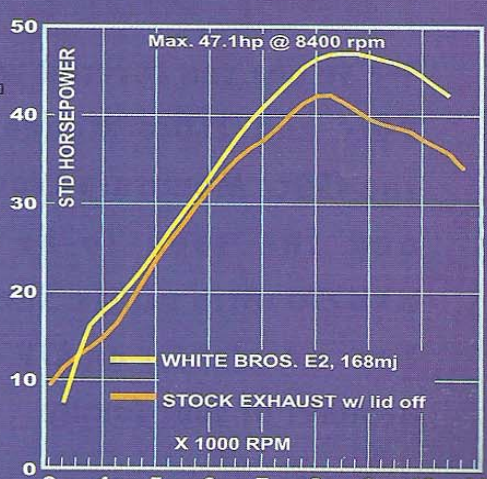
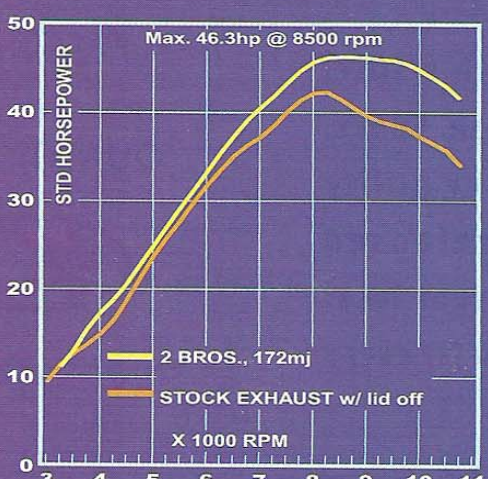
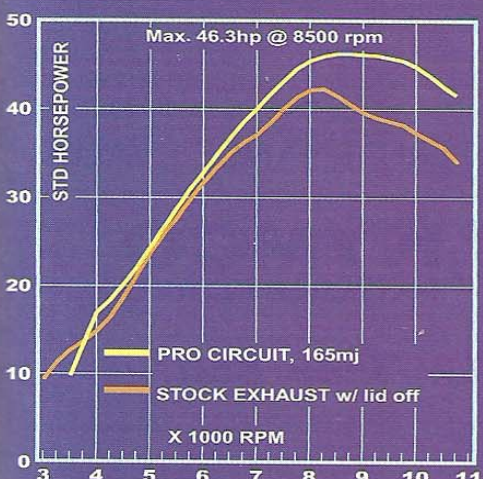
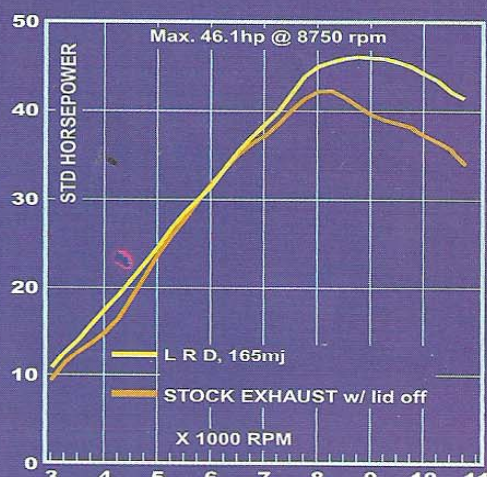
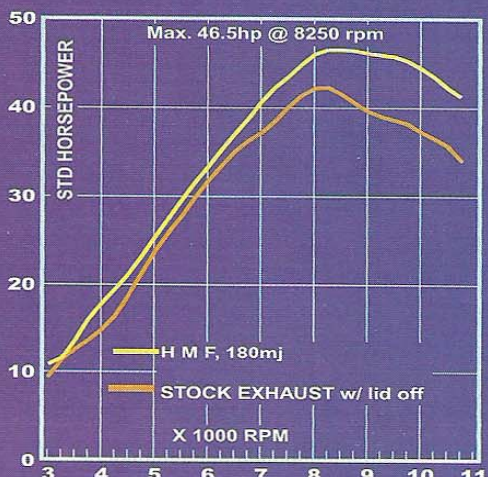
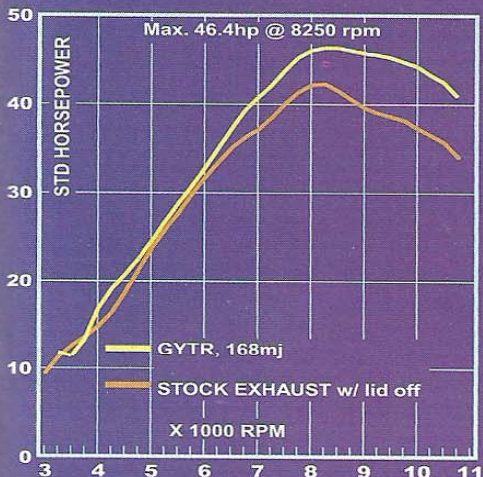
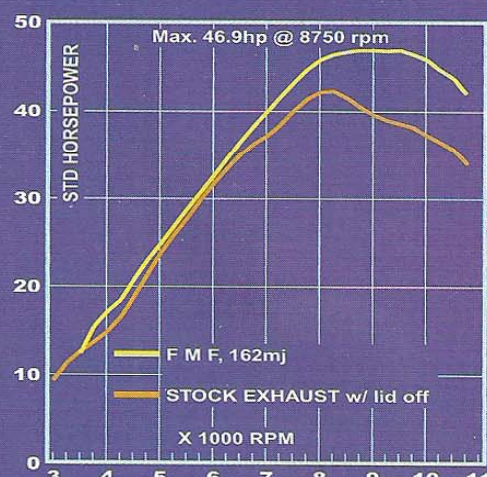
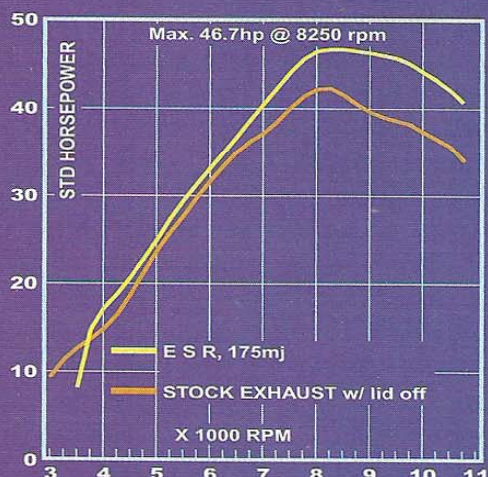
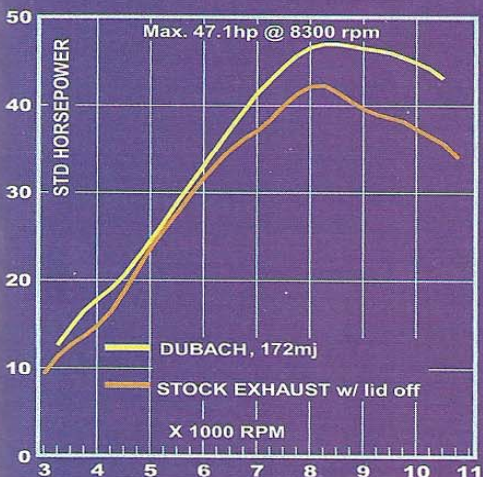
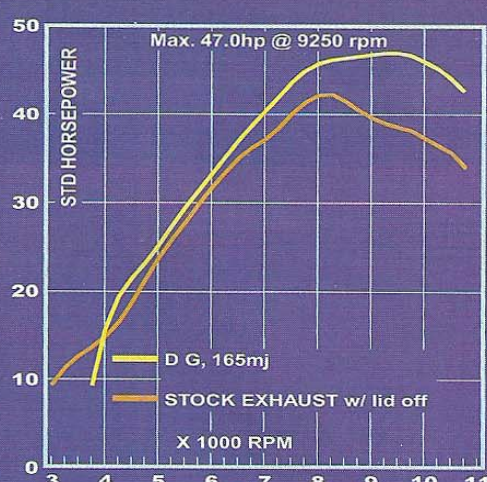
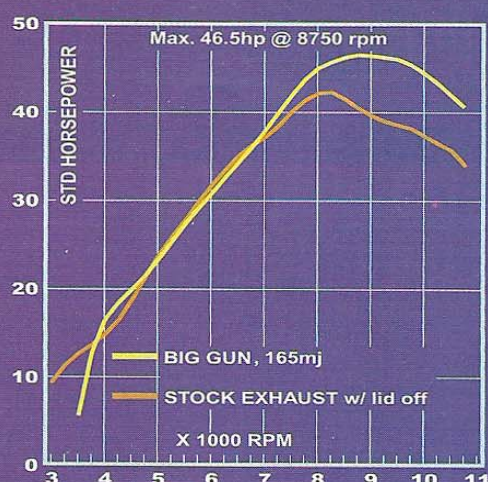
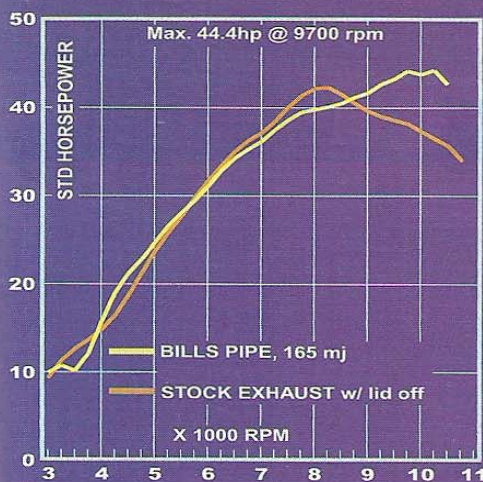
SOMETHING FOR NOTHING

Free horsepower (almost)

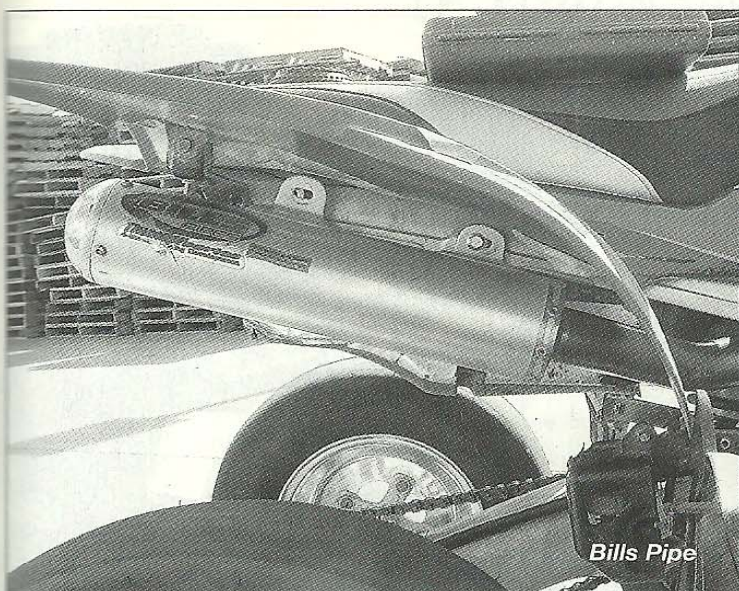
• For comparison sake in this shootout, we are showing the stock graph with the air box removed and jetting increased to a 165 mainjet; stock is 158. With this chart you will see how much

of a gain that is over leaving the air-box lid on and the jetting stock. You will notice that nearly two peak horsepower is gained with this very inexpensive modification. Torque is also improved. At 5000 rpm a two-horsepower increase is also reached. If dollars are tight this can be a quick solution to extra power if needed. •

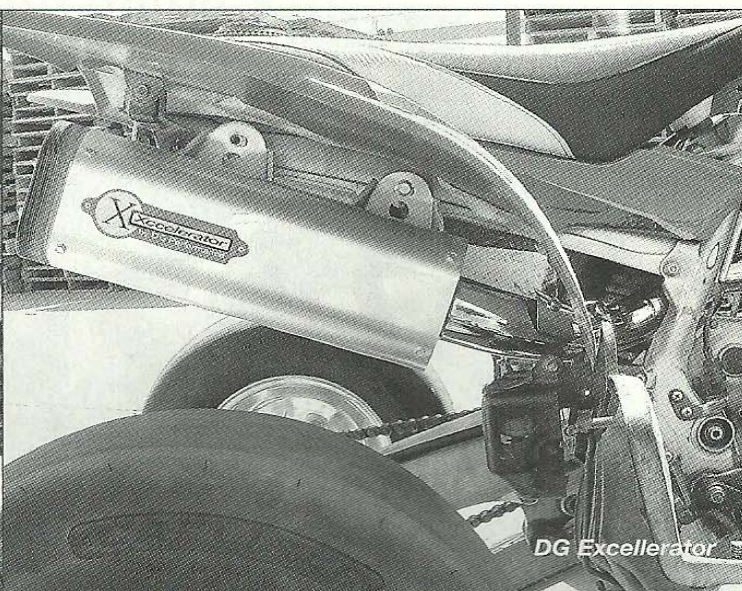




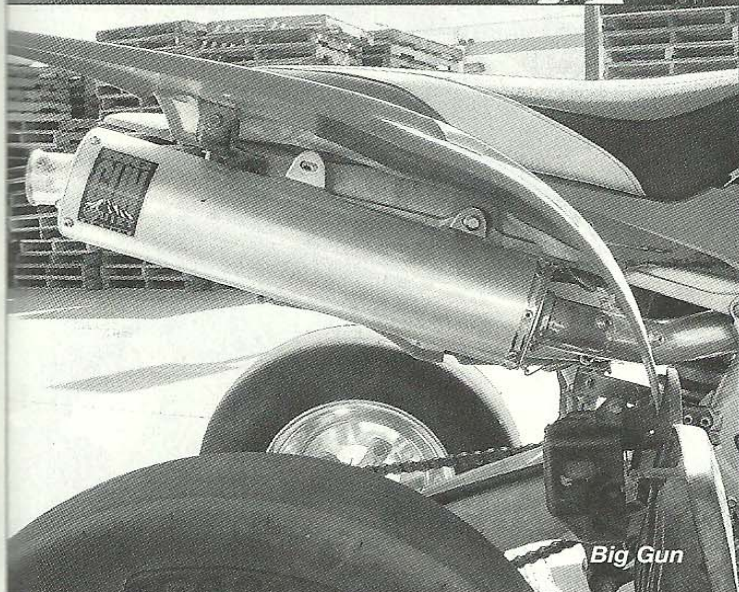
12 PIPES ON THE DYNO



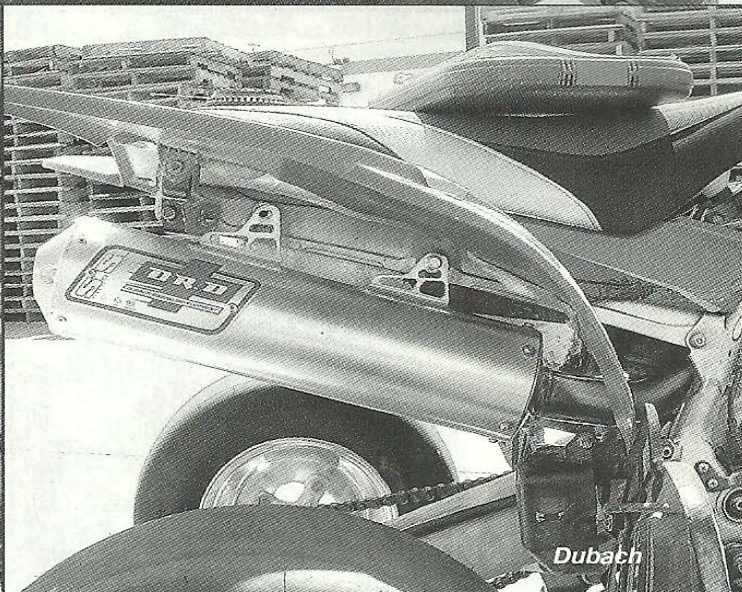
Bills Pipe



DG Excellerator



Big Gun



Dubach

HMF and White Bros both have brand new systems that are said to be both quiet and powerful. The same goes for DG and Bills pipes who also recognize the need to make a more neighbor-friendly product. Our last contestant is Yamaha's own GYTR system. We have used the uncorked version since the YFZ was released and can't wait to see if the quiet product is just as good.

PRICE AND WEIGHT

As we received each muffler from the respective manufactureres, we tossed them on the trusty *Dirt Wheels* scale. We wanted to see just how much weight each muffler saved, verses the nine-pound nine-ounce stocker. By far the lightest participant was the Bills pipe at under five pounds. Next, the FMF and Pro Circuit weighed in the low six-pound range. The heaviest of them all was the portly ESR at over nine pounds.

Of course price is also an issue. You paid \$7000 for your YFZ and you would like to be able to afford to put gas in it. These days, that's harder than ever. Compared to your \$202 stock pipe all of the contestants cost substantially more. DG and HMF are the only units selling for under \$200, with the Dubach and Bills pipe slightly above. The Two Bros. and ESR systems are the high rollers of the bunch at nearly \$500. The rest fall in the \$300-\$400 range. With quality, weight and price taken into consideration, the Dubach system is the clear winner in this area.

QUIET DOWN NOW

Every manufacture has its own unique way of making their systems meet the 96db limit. FMF, Pro Circuit, Big Gun, White Bros, Two Bros, HMF, DRD and LRD all use some sort of insert that installs into the rear section of the muffler. DG, and ESR rely on a

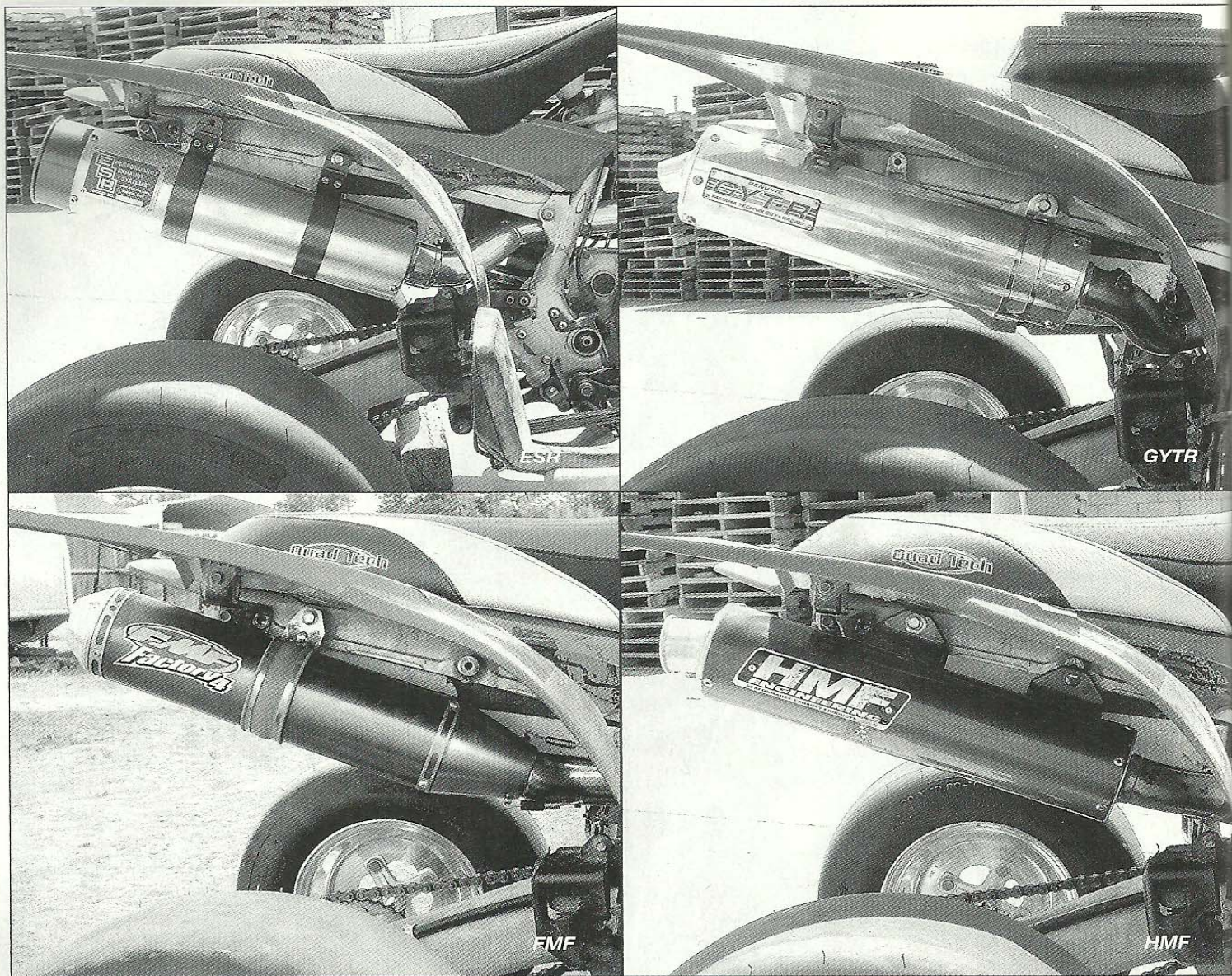
certain number of Supertrapp discs to keep the noise levels down. The GYTR system uses a special end cap and the Bills pipe has a completely redesigned core for their quiet pipe.

All of the pipes we tested, except the Bills pipe, can be easily turned from a quiet model to an uncorked high performance product without too much trouble. The White Bros E2 system is the easiest with their one bolt method. The quiet core insert models can be changed to full race by removing only a few bolts. The Supertrapp equipped systems took a little more effort but could be done without much hassle. With the Bills Pipe, you have to completely remove the center core of it and repack the muffler to make the change.

TESTING

To get a good all around evaluation of each system, we will look at how easy they install, how they performed

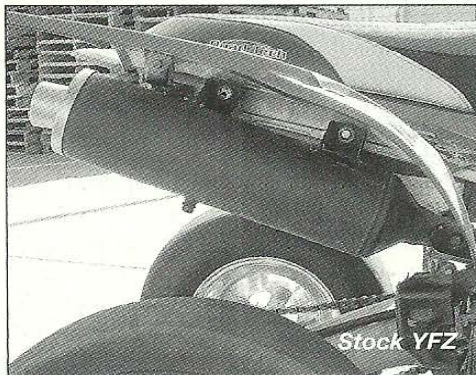
12 PIPES ON THE DYNO



in a "real-world" seat-of-the-pants ride impression and take a sound reading of each unit.

To get the most accurate sound readings possible, we called on Chris Real of the Chemhelp Company. Chris travels the country informing and educating the public about current sound issues. He also works with state and federal employees on proper testing procedures that they use in the field. The sound level we were looking for in this test would be taken at the motorcycle industry council's mandated 3750 rpm.

Chris uses what is known as the SAE J1287 motorcycle sound test method. A reading is taken 20 inches from the exhaust tip at a 45-degree angle, with the meter aimed 90-degrees from that angle. To get the most accurate reading possible, Chris actually takes 16 different readings and works out an average between



the findings. According to Chris, most law enforcement officials will allow 1.5 decibel over the limit. However, to keep from getting tested in the first place, you can maintain your exhaust system by regularly repacking the muffler to keep noise levels at their minimum all the time. Remember, if they can't hear you, they probably will not see you or test you.

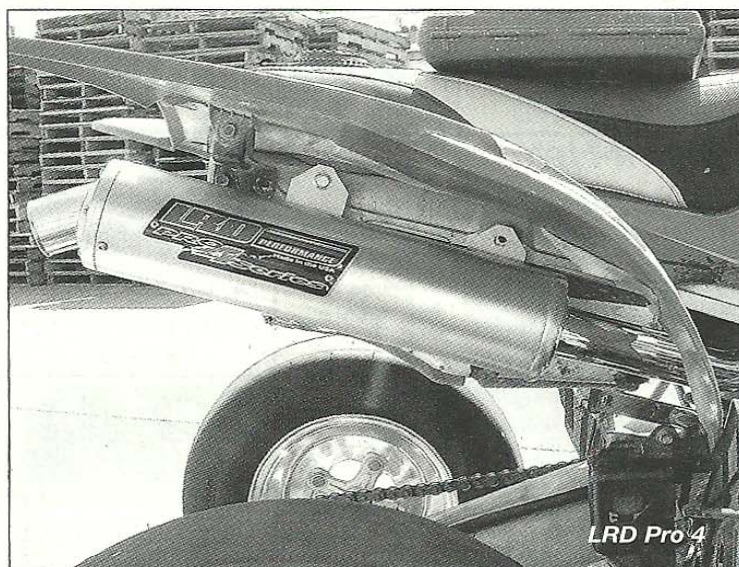
TRAIL TEST

We set up a five-mile test loop and had two skilled riders take turns riding the YFZ with each pipe. The loop had twisty trails, sand washes, hill climbs and a fifth-gear wide open straightaway. This would give us a chance to run through the gears, check low-end torque and top end power. We would also note any problems with installation or other issues.

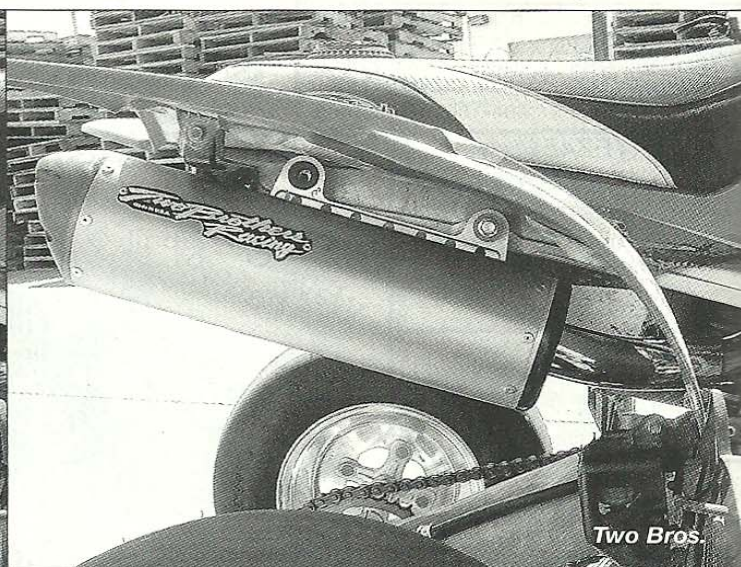
After each run, our riders wrote down comments (good or bad). The following is a brief summary of each pipe on the trail section.

We found that a few mufflers hit the rear brake caliper when the suspension bottomed out. Keep in mind we are using a Elka rear shock with Elka linkage set up for MX racing. By the look of the minor damage caused by the bottoming pipes, they probably would not bottom with the stock

12 PIPES ON THE DYNO



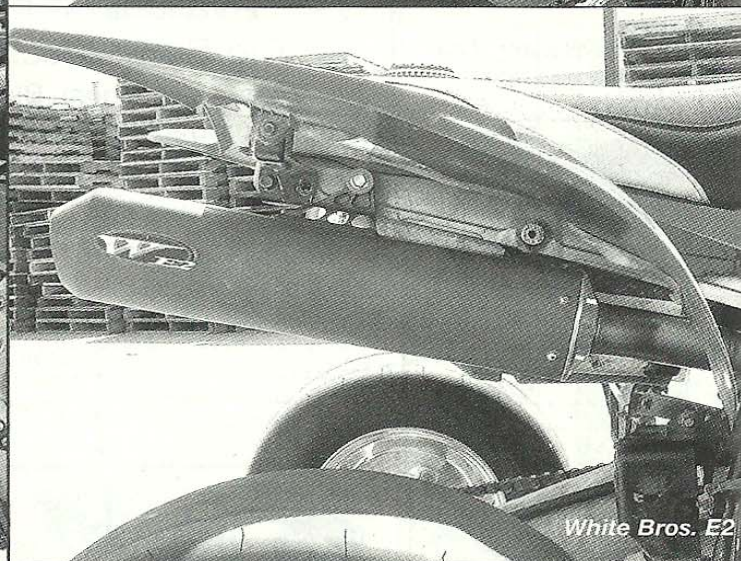
LRD Pro 4



Two Bros



Pro Circuit



White Bros. E2

linkage or with an aftermarket swingarm which lowers the mounting point of the rear brake caliper. None of the mufflers hang lower than the stocker.

BIG GUN

Sound level—92db

The Big Gun was easy to install. Throttle response was excellent. It was not very good down low on the power band. Mid-range felt a bit soft until about three-quarters through the powerband, then it came to life. Construction is decent, but looks a little dated.

DG

Sound level—98.9

Initially it sounded loud. Mounted easy. Bottom end and mid range were way better than stock. The top-end felt good, but felt like it was a bit lean. Could stand to run a little richer. After the test run, we noticed the DG muffler was hitting the rear brake caliper when the YFZ bottomed out.

PRO CIRCUIT

Sound level—97.6

The PC pipe had awesome throttle response and good top-end rev out. Both riders felt a little dip in power on the bottom end. The PC pipe is lightweight and looks very good on the YFZ.

FMF

Sound level—95.1

The FMF system didn't feel choked up like the other quiet systems. It had good bottom to mid-range power and stayed powerful up top. The FMF looks trick and installs in a snap.

BILLS

Sound level—96.9

Bills had the lightest system of the bunch. However, the power was very flat everywhere. It felt slightly better than stock but not exciting anywhere. You can barely hear the Bills pipe while riding. Light on sound, low on power. A disappointment compared to their very good race system.

TWO BROS.

Sound level—91.2

Best looking and quietest of the bunch. This system had the best top-end and was very smooth on the bottom and in the mid-range. The Two Bros was tricky to install and the canister hit the brake caliper slightly. They might be able to trade a few dbs for a couple of horsepower and be on top.

DUBACH

Sound level—94.5

Had a very good feel like a race system. Great bottom and mid-range. Top-end power felt very strong, but fell off quick. Great race pipe if you need it quiet. Installed easy but hit the brake caliper slightly.

WHITE BROS.

Sound level—97.7

Very futuristic looking. The WB system was the easiest to install. Very quiet when riding. Powerband was a little flat on the bottom end but

12 PIPES ON THE DYNO

had a hard mid-range hit and pulled well across the top.

ESR

Sound level—96.9

The ESR pipe was very quick revving. It had the best overall powerband. By far, the best on top end. The ESR installed easy and solid and looks great and unique. We couldn't find anything wrong with this product except weight.

GYTR

Sound level—94.2

Yamaha's own pipe was the hardest to install. The power was flat on the bottom end and didn't pick up in the middle. Better than stock but not by much. From experience, the quiet end cap really handicaps this pipe. Nothing stands out with this pipe in quiet trim.

HMF

Sound level—97.7

Installs easy and has a cool glossy anodized finish, available in red or blue for an extra \$20. It had excellent low and mid-range power. A little too much noise is keeping it from being the best.

LRD

Sound level—95.9

Had some trouble installing. Power was very smooth from bottom on up. Not very exciting, but strong everywhere. Could barely feel it was corked up. Needs a little more power across the board to make it a winner.

BY THE NUMBERS

We also wanted to get some hard numbers from each contestant, so we ran them all on the Dyno at the nearby K&N filter facility. We used a set of Carlisle slick tires mounted on the back of the YFZ to give a true rear wheel horsepower figure.

Former professional racecar mechanic and K&N R&D technician Charlie Tissen operated the dyno. He performed three separate fourth gear runs for each muffler, and gave us the reading for the highest power producing run.

Between each run, we checked the quad's engine and water temperature, and made sure the vehicle was operating at the same temps for each set of runs.

Looking at the dyno graphs, you want to pay attention not only to peak number but the shape of the curve as well. A well-rounded curve will make the quad easier to ride with less shifting requirements. A very sharp graph, that falls off quickly after the peak, is not what

you want to see.

You will see that on the YFZ, it makes its usable horsepower between 4000 and 10,000 rpm. It needs to be revved. For this test, five models looked very strong on the top side of the curve. The White Bros., FMF, DRD, and the Pro Circuit all held over 45 hp for well over 2000 rpms between eight and ten thousand. The Two Bros. wasn't far behind.

For lowend, HMF, LRD, DRD and the White Bros. had the best looking horsepower and torque numbers between four and six thousand.

RESULTS

Since one of the main points of this test was to focus on sound levels, we will start by eliminating the loudest. If a law enforcement officer were to check you while riding any of these pipes, you would likely pass. However, you better cross your fingers if you're using the DG, Pro Circuit, White Bros. or the HMF. Hopefully these companies will go back to the drawing board and try to find a way to eliminate at least one decibel. Although these are great power-producing pipes, they will have to be eliminated from the overall at this time. The Two Bros. and Big Gun will get extra points for being the quietest.

In the power department, the Bills pipe gets the axe for low numbers. Although the LRD has the lowest peak numbers of the rest, it has great low-end numbers but just not enough to stay in the game. Dubach's pipe and the FMF are producing the best numbers at the head of the pack and the ultra quiet Two Bros. pipe has tons of untapped potential. Unfortunately, the Two Bros. pipe is ultra expensive as well and has to be eliminated at this time. The same goes for the ESR product.

Looking at the remaining four contestants; the Big Gun, FMF, GYTR and Dubach pipes, we will eliminate the GYTR for being the low power producer and the most difficult to install. Big Gun was also eliminated for having lower numbers across the board than the other two.

With only two (FMF & Dubach) remaining it's time to pick a winner. With its low \$310 price, easy installation, strong power figures and music to our ears sound numbers, the Dubach Racing quiet exhaust system is the winner of the Yamaha YFZ450 slip-on pipe shootout. Congratulations. □