

Ten Muzzlers for Two-Stroke Barkers

THE SILENCER PAPERS

Trapp Std. & Comp.
Fun 'N Fast
Bassani
J&R



Skyway 74 & ALD
Xdusor II & S
Std. Honda
Murphy

By Jess Thomas

www.legends-yamaha-enduro.com

PHOTOGRAPHY: DALE BOLLER, BILL DELANEY

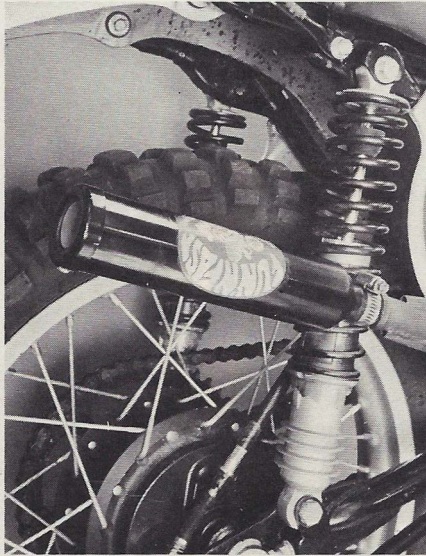
● For all the models and wide price range of the bolt-on silencers and silencer/spark arresters available, there is precious little offered in the way of specific information to go along with the gadgets. A local dirt squirter, either conscience-stricken or hassled by his neighbors or the cops, must go to the dealer, pay his money, and take his chances. For him the outcome is straightforward: either the bike is quiet enough to appease the complainers or it isn't. But for the competition rider things are more complex. A racer must know how the device will affect the power curve of his engine.

To give the reader some idea of how the various bolt-ons affect the performance of a bike fitted with an otherwise open racing expansion chamber, *Cycle* engaged in a lengthy series of comparative tests. The participants were contacted and asked to submit the same bolt-on silencers they offer through retail dealers. To guard against any bet-hedging, the submitted units were checked against ones on the shelves of local dealers. For a machine to test the units on, we chose the most popular 250cc motocrosser in the country: the Honda CR250 Elsinore. American Honda loaned us one of their completely stock magazine test machines. A mixture of Union 76 Premium gasoline and Klotz Special Formula Synthetic lubricant in a 20:1 ratio was used for all the tests. Twenty-seven runs were made on Webco's Schenck Eddy Current Dynamometer. Control runs were made with Honda's silencer, with no silencer, and with Honda's silencer in conjunction with the tailpipe stinger shortened 4.5-inches. All the other models and variations were tested with both standard and shortened stinger. With Honda's standard arrangement, the stinger protrudes about halfway through the silencer and we wanted to determine just how much tuning difference the resulting masking made. The Union 76 fuel cured what was initially a sour-running engine.

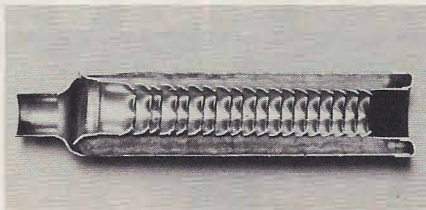
Many dynamometer tests are made with the throttle open at all rpm settings. For our runs the throttle was varied to produce maximum power at all rpm settings in the same way that a rider would while on a race course.

FUN 'N FAST. Like all the straight-through-type silencers, the Fun 'N Fast is a variation of the original expansion chamber quieter, the V-W muffler tip. A one-piece steel tube is used for the body of the silencer and one end of the tube is swaged down to form the clamping neck for the expansion chamber. The other end is left open to accept the core and fiber glass packing. A formed cap holds the core in place and is secured by a single sheet metal screw. All of two minutes is required to replace the packing after removing the screw and pulling off the cap. Sound waves bounce along six rows of raised-edge cuts in the core tube. A smoothly

flared inlet end on the core tube permits an easy transition of gas flow from the clamping neck. A single stainless steel hose clamp is supplied with the silencer to secure it to the expansion chamber stinger. An additional mounting clamp (which fits around the silencer body) is available, but not supplied. During the dyno and field test runs the Fun 'N Fast silencer was held only by the single hose clamp, and it never fell off.



Fun 'N Fast

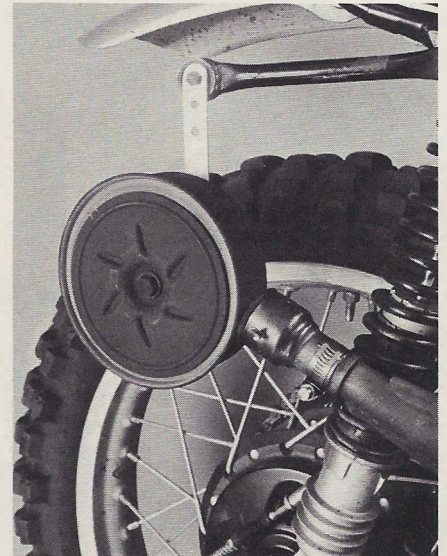


As may be seen on the dyno charts, the Fun 'N Fast preferred to be clamped to the end of the full-length standard Honda stinger, where it produced very slightly less power up to 7500 rpm and very slightly more in the last usable thousand revs when compared to the standard Honda fitting. (It is extremely interesting to note that the standard Honda muffler performed better than the bare Honda expansion chamber.)

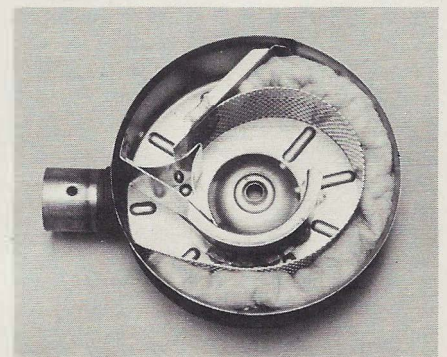
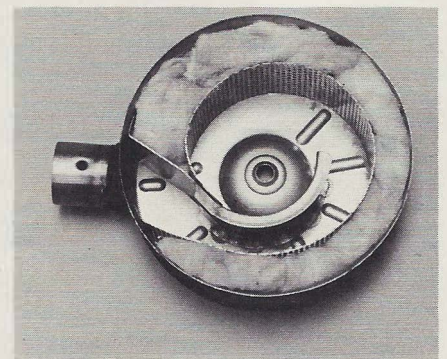
The gloss black paint on the Fun 'N Fast is very durable and does not rub off when hot. List price is \$10.75 from Fun 'N Fast, 18143 Napa St., Northridge, Ca. 91324.

DISCOJET CORPORATION. This aerodynamic R&D company markets both Xdusor and Trapp brands. Xdusor is a flat-sided, pan-shaped device and is available with an integral spark arrester in the Xdusor II model and as a silencer only when called the Xdusor S. Inside the Xdusors is a swirling, snail-shaped expansion chamber which is lined with perforated steel sheet. The volume between

the perforated membrane and the curved wall of the pan is filled with fiber glass which has been treated with a special high-temperature binding agent to prevent the fiber glass from blowing out. As the gases expand at the center of the pan and lose enough speed to make a turn, a series of radial vanes in the removable side cover guides them out to atmosphere around the whole circumference. In the Xdusor II, an additional chamber at the end of the expansion membrane catches the heavier glowing carbon particles when they are centrifuged to the outside and before they slow enough to exit with the gases. Both Xdusor models may be fitted with one of four available different-thickness "tuning reeds" which meter the flow of gases through the cover plate passages.



Xdusor II & S



Both model Xdusors are made with a single standard-size inlet tube (1.175-inch I.D.), and separate adapter couplings must be bought to fit individual exhaust system ends ranging from 3/4-inch to 2-inch O.D. Another option, a center mounting support kit, provides much more secure mounting and extends the guarantee to six months. Both the adapter and the center mount are insulated with high-temperature and vibration-resistant silicon rubber bushes. A hose clamp fastens the adapter to the bike's tailpipe and a big cotter pin through the center of the tubes connects the adapter and silencer in a sort of pivoting live mount that stays gas-tight. Xdusor mounting is sound, if visually peculiar, when both adapter and center mount are used.

Maintenance kits for the Xdusors include fiber glass packing, an 8 mil reed, a new cotter pin, snap plugs, a carbon scraper, and a molded silicon rubber bush for the adapter. Retail price of the kit is \$1.75. Strength problems dictate that the fiber glass repacking hole be limited to 7/8-inch diameter. That means the old glass must be dug out with a length of stiff wire and the new glass stuffed in bit-by-bit. The whole act can be completed in a half-hour or so, but the replacement glass cannot be treated with the original high-temp binder and will blow out sooner. Oil saturation is about co-evil with temperature and vibration as far as packing life is concerned. If an excess of dirty-burning oil is used in a bike, the packing will have to be replaced fairly frequently in order to maintain muffling and/or spark arresting. The outer lid of the Xdusor is crimped to the body much like a food tin can. Along with the test units, Discojet furnished us with some uncrimped ones for photography. The uncrimped ones could be repacked quickly and thoroughly, but a Discojet representative said that the uncrimped assembly was not rigid enough to survive hard usage.

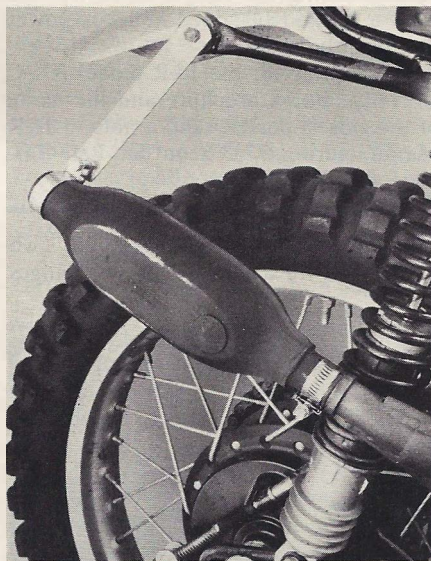
Xdusors do strange things to the power curves of high-speed motocross engines. Of all the combinations of Xdusors and pipe lengths, with and without reeds, the Xdusor II (spark arrestor model) (without reed and mounted on the end of the full stinger) produced the most potent power curve; it was significantly better than any of the stock Honda combinations. Installing the reed is supposed to be a compromise in terms of power so that a quieter exhaust may be obtained. The noise aspect will be discussed later, but the reed so smooths out and extends the power range that it could produce better lap times on slick tracks, either muddy or hard, where the tire cannot get maximum traction. Both models worked best with the full stinger; the S produced a slightly better curve.

Discojet also produces the Trapp silencers, both in Competition and Standard models. Trapps are similar in design to the other brands of perforated-tube-sur-

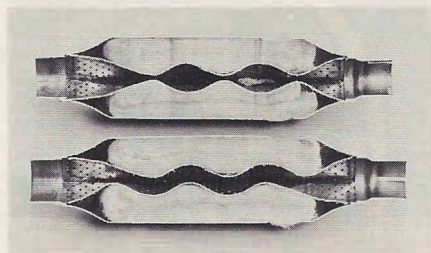
rounded-by-fiber glass silencers, and their resulting orthodox appearance is probably the main reason they were developed. The Trapps require the same probe-and-tuck methods for placing the fiber glass as the Xdusors. The rebuild kit has new plugs as well as glass, and sells for \$1.25. Gloves should be worn anytime spun fiber glass is handled, for the tiny particles tend to embed in the skin and cause a lot of scratching and swearing.

Trapps come in exact sizes to fit individual stinger diameters and are attached to the pipe with hose clamps. Auxiliary rear mounting kits are available for \$1.50 and are strongly recommended. The flat-black paint on both Trapps and Xdusors rubs off easily when they are hot.

Instead of being a straight shot through the center, the Trapps have undulating tubes. The only difference between the two models is that the undulations coincide in the Standard and are staggered in the Competition: a construction which gives the Standard a couple of mini-expansion chambers and the Competition a constant-area section.



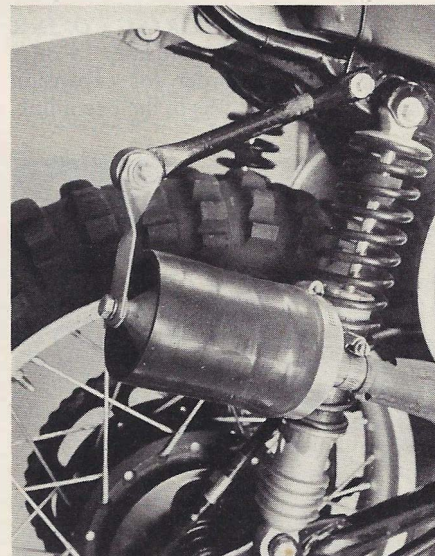
Trapp Std. & Comp.



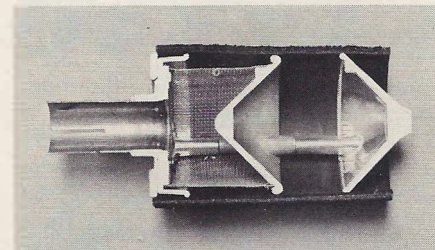
Surprisingly, the dyno showed that the Standard fitted to the full stinger produced the best max-power curve, while the Competition on the shortened stinger gave a more flexible spread. Even more intriguing was the inability of either to come near matching the Xdusor II. List prices for the Discojet models are: \$14.95 for the Xdusor S, \$16.95 for the Xdusor II,

and \$13.95 for either Trapp. Discojet offers a ten-day money-back dissatisfaction refund if the model in question was designed for your intended use. The replace-or-repair guarantee is good for 60 days, provided the Xdusors are mounted with the optional adapter, and all units are extended to 6 months when the optional secondary mounts are used. For brochures listing dyno and sound tests on other machines and the address of your nearest dealer, write Discojet Corp., 920 3rd St., Davis, Ca. 95616.

MURPHY MUFFLER. Murphy is the hands-down winner of the most unusual design award. Four separate aluminum castings, surrounded by a length of silicon rubber hose, are fastened together with three long screws. Exhaust enters through a steel tube cast into the aluminum body and goes into a primary expansion chamber. This chamber is surrounded by a stainless steel screen cylinder which is fine enough to break up and filter any glowing carbon sparks. A cone in the back of the chamber directs the gases outward through the screen to force the hose to expand and let them pass. A secondary resonance chamber allows some additional noise dissipation before the gases again bulge the hose away from the body to escape.



Murphy



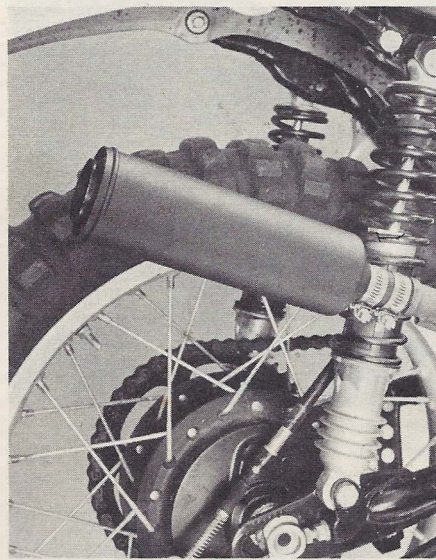
Included with the Murphy Muffler is a roll of pink silicon tape. After the stinger is washed and dried, the tape is wrapped

around the tube until the muffler tube will barely slip on. A hose clamp around the muffler tube fastens the Murphy in place. A heavy boss is provided in the end cone of the muffler for the installation of a secondary mount. We drilled and tapped this boss to accept an M8 x 1.25 bolt (5/16-inch x 18 alternate), and used one of Discojet's kit straps for the mount. No problems were experienced with the mounting, although the silicon tape tended to wad a bit before the burr was carefully removed from the end of the mount tube with a piece of emery cloth.

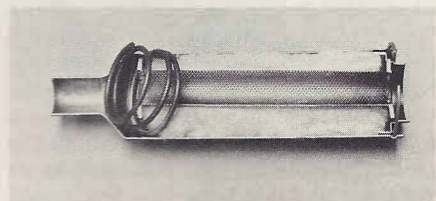
Because of its modular construction, the Murphy is obviously easy to take apart for cleaning. A replacement length of hose is \$7.45, the silicon tape goes for \$1.50 and a new spark arrester screen costs \$3.75.

The dyno charts show that the Murphy is average in developing a good usable range of power, with the tendency to be a little low at low revs and to hold out well at its peak in a gradual drop. The long stinger gave a more gradual climb in power and reached a slightly higher peak, while the shorter stinger produced an opposite trend. With a retail price of \$32.95, the Murphy, with USDA approved spark arrester, may be ordered directly from Murphy Muffler, 5312 East Beverly Blvd., Los Angeles, Ca. 90022.

J & R MANUFACTURING CO. J&R was one of the first companies to offer silencers made to order for expansion chamber ends. As it was in the beginning,



J&R



it remains today: an effective and simple device. A steel cyclinder 2.5-inches in diameter is swaged down to fit over the stinger on one end and left open to receive the core and packing on the other. The core is a perforated steel tube with a locating spring on the closed end and a centering disc on the exhaust end. Fiber glass packing is stuffed between the outside of the core tube and the wall of the container. A big snap-ring holds the assembly together and makes it quickly and simply serviced.

Rebuild kits include fiber glass, a new core, and a new coil spring. For tuning purposes, the cores are available in ID sizes of 15/16, 1, 1-1/8, 1-1/4, 1-3/8, and 1-3/4 inches. The cores each come with a complete rebuild kit and list for \$2.00.

The J&R is mounted on the bike's stinger with a hose clamp. For a secondary mount, we recommend that a large cable clamp and strap be attached to the muffler and frame.

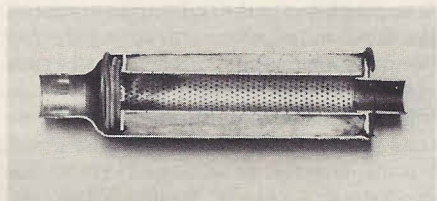
When mounted on the end of the full stinger, the J&R gave dyno readings very close to those of the standard Honda outfit. Shortening the stinger eased out the peak a bit and sustained high rev power significantly better.

Retail price for the J&R model XX-C is \$11.95. For a brochure and the name of the closest dealer, send a note to J&R Manufacturing, 7738 Scout St., Bell Gardens, Ca. 90201.

BASSANI MANUFACTURING. Two body sizes are available for two ranges



Bassani



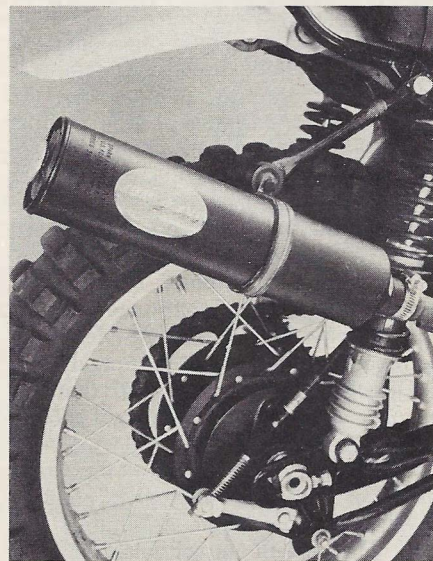
of stinger diameters. The 2-inch OD body is available with neck sizes from 3/4-inch to 1 1/8 ID and a 2 1/4 inch diameter body covers the stingers from 1 1/2 to 1 3/4 inch. Each body comes sized for the stinger diameter of a particular bike.

Design and construction methods are practically identical to those of J&R, with the spring, core, and packing being held in place with a quickly removable snapping. The body is fastened to the stinger with a hose clamp, and is light enough so that the clamp is all that is likely to need. A bag of repacking fiber glass costs only \$.50.

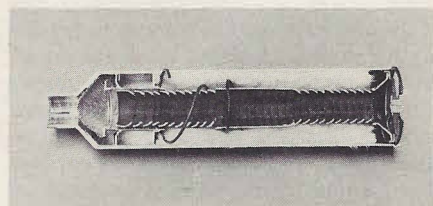
Power-wise, the little Bassani performs brilliantly. Mounted on the end of the stock stinger, it coaxes the engine to pull right along with the standard unit up 7500 rpm, then keeps it from falling off so abruptly during the last 1500 rpm.

The model Q01000 silencer retails for \$12.00 and can be ordered from Bassani Manufacturing, 3726 E. Miraloma, Anaheim, Ca. 92806.

SKYWAY MACHINE, INC. Two distinct models are offered by this established firm: the first is the straight-through competition type and the other is a bigger,



Skyway 74

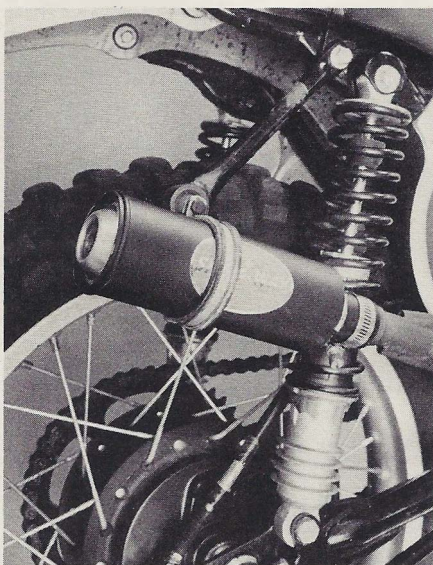


quieter model with a spark arrester and a silicon rubber diaphragm in its end plate. For the 1-inch Honda stinger diameter, they are known as the Model 74 Silencer and Model 74ALD Super Silencer/Spark Arrester respectively. Both models are made with extruded aluminum housings. The straight-through model has

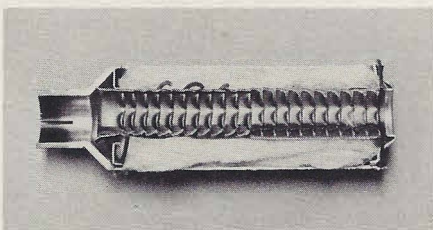
CYCLE

its louvered core tube surrounded by fiber glass, is supported by a load spring on the stinger end, and is secured by a snapping on the exhaust end. The core and fiber glass come out of the 2.5-inch diameter housing quickly and easily for rebuilding in a matter of minutes. Enough fiber glass for three repacks costs \$1.95.

The mounting necks are slotted for their hose clamps and steel reducing sleeves adapt their 1.125-inch bores to the stinger diameter. The extrusion forming process allows the shell thickness to be increased in the mounting neck and diffusion core sections for extra strength in these high-heat and vibration-sensitive areas, while the insulated shell can be left relatively thin to reduce weight.



Skyway 74 ALD



The Super Silencer has the designation 74 ALD: A for aluminum, L for long body (13.75-inch overall), and D for diaphragm. Exhaust gases encounter the spark arrestor module immediately upon entering the Super Silencer. The module is composed of six steel pieces furnace-brazed together. Foremost in the gas/module encounter is a cone-shaped screen which deflects a certain portion of the gas, and all of the glowing carbon particles, out through a swirl-disc and into an expansion chamber. In the center of this chamber is a screen tube which lets the carbon-accompanying gas rejoin that which went straight through the cone. The module's outer wall fits snugly against the inside of the aluminum shell. Removing the arrestor module reveals three .75-inch holes in its wall for

washing and removing accumulated carbon. A spring welded to the core tube compresses against the module to keep it firmly in place. The core tube has three sections of louvered baffle, the center section being off-set from the end ones to promote turbulence so that the sound waves have maximum exposure to the fiber glass packing. A unique end plate in the Super Silencer forces the gases to open a perforated diaphragm in order to escape. Skyway submits that the diaphragm ensures that sound waves of differing frequency do not resonate, and indeed that it causes some waves to collide and cancel each other's energy! The end plate pushes the assembly against the load spring far enough for the retaining snapping to be placed in its groove. As with the simpler Model 74, the Super Silencer can be disassembled, cleaned, and put back together in a matter of minutes.

The diaphragm in the original end plate overheated and permanently deformed during dyno testing. A modified plate/diaphragm assembly has been developed by Skyway and will soon be introduced to their Super Silencer production line. We tested the new plate and it did not deform during severe use.

For riders who have previously bought Model 74s for their bikes and later discovered that they need a spark arrestor, Skyway offers a conversion kit. The kit contains a smaller arrestor module, a core and spring assembly, and a length of fiber glass packing. This kit costs \$16.95.

A complete rear mounting clamp kit is furnished with the Model 74 ALD and is available for \$3.95 for the Model 74. The complete 74 ALD is \$32.95 and the Model 74 costs \$14.95.

Both Skyway models produced excellent power curves. They did so clearly preferring the shortened stingers; the only units in this test to do so. The short, straight-through racing silencer (Model 74) was the only one to allow the Elsinore engine to top 28 bhp. As with all the racing silencers, this one gave a huge burst of power from 5000 to 6500 rpm. Extraordinarily, the Super Silencer allowed the same sort of burst with only slightly diminished numbers and, as we shall see later, with incredibly less noise. The shortened stinger did spread the power out over a wider rpm range, a setting which would give better control on very slick ground.

SOUND LEVEL TESTING: This is the biggest can of worms in all of motorcycling. Nearly everyone wants all machines, not just motorcycles, to operate less obtrusively. Because of several peculiarities in human nature, the control of mechanical noise in our lives involves us with the political vagaries of the legislative, judicial, and law enforcement agencies of local, state, and national government. The deluge of double-talk and techno-jargon used to describe the effects and control

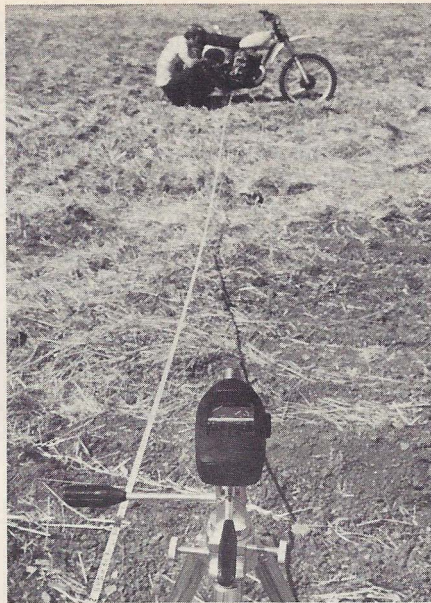
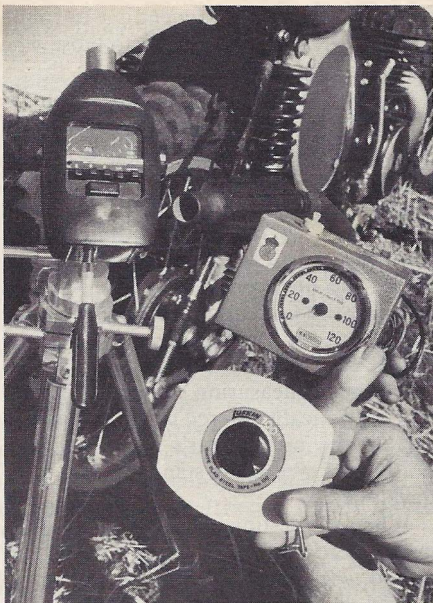
of sound (or noise, depending on one's point of view) is maddening to those who aren't interested in such abstracts.

Initial laws governing noise control were simple and aimed exclusively at loud cars and bikes. If a cop was hiding behind the signboard when you gassed it up with a loud pipe, you got busted. Then the concept of environment became public and acquired a Federal protection agency. When the financial heavies like truckers and construction equipment people came under fire for making their share of the racket, the fuzz had to be technically specific. Sound measuring equipment had to be electronically filtered so that it approximated the human ear's sensitivity, and noise level measuring standards had to be developed.

When the testing standards for motorcycles were established, they were all designed to govern normal street usage. No provision was made to test dirt bikes in their natural environment. The only time competition machines were under official noise scrutiny was when they were used on public streets and highways. The biggest reason for the lack of an on-dirt standard was the technical impossibility of getting similar tractive conditions from place to place. Even the proposed new test standard for bikes used in National Forests specifies tests made on pavement when at all possible.

For the purposes of this test, the results of three different standards will be shown but only one set will count toward our rating. The first test is that used by the American Motorcycle Association (AMA) to govern the noise level of racing machines at motocross events. With this method the sound level meter is placed 50 feet directly behind the bike and the engine is held at a constant rpm, which varies according to engine size. For our 250cc Honda test bike, the specified rpm is 5000, plus or minus 200. A VDO electric tachometer was used to keep the Honda as close to a constant 5000 rpm as possible. As you can see from the results, this test gives no correlation with maximum noise and it is published only to illustrate the differences in standards. It is interesting to note that the open, completely unmuffled expansion chamber passed the AMA's 92 dB(A) maximum.

The second illustrative test is one proposed by the California Highway Patrol to be used in policing their Exhaust System Manufacturer's Certification Program. This program would put the responsibility of performance for a certified system completely on the manufacturer. Teams of CHP technicians now set up road blocks at random locations and execute safety equipment and exhaust emission checks. If the proposed standard passes the state legislature, the muffler systems for newer cars would be checked to make sure they had a certification stamp on them, and older vehicles would be checked for actual noise level. The



Sound level meter, tape measure, and electric tachometer were equipment used to turn sound into numbers for all tests. The AMA racing method and the California Highway Patrol proposed certification method gave results too variable to use. So CYCLE's own dirt-racer-maximum-noise standard was the one which counted for the ratings shown in the results.

testing standard calls for the noise level meter to be held one foot away from the end of the pipe at ninety degrees, plus or minus forty-five degrees, to the direction of exhaust flow. For motorcycles, the reading is taken while "the throttle is rapidly opened to its fullest extent and then immediately closed." It is difficult to figure what the CHP really means by this, for some bikes will cough and die if their throttle is opened as quickly as some people can open it. The CHP test results show the minimums we were able to get by snapping the throttle open and closed as fast as possible and the maximum attainable readings obtained by letting the revs reach maximum before closing the throttle. Besides being susceptible to the effects of differences in operator experience in throttle control, the test is vastly biased against quick-responding multi-cylinder bikes. As with the AMA test we were able to get the completely unsilenced expansion chamber to pass the CHP test at 112 dB(A).

Our comparative test utilizes a slight variation of the proposed National Forest

test. The sound level meter is placed 50 feet from, and perpendicular to, the Honda's path of travel. Then the bike is ridden along the path at a constant 4000 rpm in second gear until its front wheel reaches a point 25 feet from the meter line. The throttle is then opened and the sound reading is taken until the bike is 25 feet past the meter line. The surface is a freshly plowed field which is level and unobstructed for several hundred yards around the test area. There was quite a bit of wheelspin but enough traction was afforded to keep the front wheel slightly elevated for most of the acceleration run. While it is not a test that could be duplicated in many different locations, the results were as repeatable for our purposes as those we run on pavement. And, by doing it in the dirt, we got readings much more near those which could be expected at any motocross or enduro event. The readings expressed are the averages of three runs in each direction.

Our equipment is a 1565-B General Radio Sound Level Meter (fitted with their 1560/9521 urethane foam wind-screen) and a 1562-B Sound Level Calibrator made by the same company. The meter was calibrated before and after each series of readings was taken.

One of the more disturbing regulations in the noise measurement standards for both the Society of Automotive Engineers and the CHP is their allowance of up to 12 mph wind gusts during testing. The SAE suggests that 3 dB(A) allowances be made for temperature, humidity, and wind; the CHP standards do not mention atmospheric condition allowances, except that no readings varying than 2dB(A) may be part of the reported average. We observed variations over 5 dB(A) with the wind gusting under 12 mph. During our

Brand	NOISE LEVEL IN dB(A)		
	AMA Std.	Proposed CHP Cert. Std. Min/Max	CYCLE Dirt Std.
Fun N' Fast	76-79	104/123	90.3
Xdusor II	73-76	102/119.5	87.4
with reed	73-75	99/117	85
Xdusor S	74-76	101/117	85.5
with reed	73-75	101/117	82.75
Trapp Comp.	76-78	101/119.5	86.9
Trapp Std.	74-76	102/118.5	85.4
Murphy	80-83	104/119	88.75
J&R	75-77	108/125	92
Bassani	77-79	112/117	92
Skyway Mod. 74	78-82	113/125.5	89.9
Mod. 74 ALD	72-74	98/117	76.3
Honda Std.	76-79	102/121	88.5
Honda open	88-92	112/131	101.5

Silencer Dyno Charts:

A careful study of these real figures compared to your race track diagrams and the sound figures will decide which system is best for your bike.

1 Std. Silencer

RPM	HP	Torque
3500	6.88	10.32
4000	8.27	10.86
4500	9.89	11.54
5000	14.07	14.78
5500	19.73	18.84
6000	24.24	21.21
6500	27.69	22.37
7000	26.63	19.98
7500	26.17	18.32
8000	25.83	16.95
8500	17.07	10.55

2 No Silencer

RPM	HP	Torque
3500	6.95	10.43
4000	8.27	10.86
4500	9.85	11.50
5000	14.03	14.74
5500	19.62	18.74
6000	24.14	21.13
6500	27.37	22.12
7000	26.40	19.81
7500	26.41	18.49
8000	25.70	16.87
8500	17.59	10.87

3 Std. Silencer

4 1/2" Stinger Removed

RPM	HP	Torque
3500	6.70	10.05
4000	8.15	10.70
4500	9.86	11.51
5000	13.24	13.91
5500	19.71	18.83
6000	23.84	20.87
6500	27.03	21.84
7000	24.82	18.62
7500	25.74	18.03
8000	24.45	16.05
8500	16.49	10.19

4 Fun 'N Fast 1" Silencer Full Stinger RPM HP Torque 3500 6.90 10.35 4000 8.46 11.11 4500 9.88 11.53 5000 13.30 13.97 5500 19.45 18.58 6000 24.06 21.06 6500 27.37 22.12 7000 26.19 19.65 7500 26.24 18.38 8000 26.03 17.09 8500 19.54 12.07	9 Xdusor II With Reed 4½" Stinger Removed RPM HP Torque 3500 6.11 9.16 4000 7.54 9.90 4500 9.14 10.67 5000 11.07 11.62 5500 17.17 16.39 6000 21.15 18.51 6500 25.32 20.46 7000 22.66 17.00 7500 22.20 15.55 8000 24.26 15.93 8500 25.72 15.89 9000 11.80 6.89	14 Trapp Comp. TC-1000 Full Stinger RPM HP Torque 3500 6.93 10.41 4000 8.43 11.06 4500 10.03 11.71 5000 14.32 15.04 5500 20.15 19.24 6000 24.74 21.66 6500 27.66 22.35 7000 26.11 19.59 7500 25.53 17.88 8000 23.63 15.51 8500 17.04 10.53	19 Murphy 4½" Stinger Removed RPM HP Torque 3500 5.87 8.80 4000 7.53 9.88 4500 9.38 10.95 5000 12.07 12.68 5500 18.66 17.82 6000 22.77 19.94 6500 26.86 21.71 7000 25.20 18.90 7500 25.04 17.54 8000 26.18 17.19 8500 21.22 13.11	24 Skyway 74 Full Stinger RPM HP Torque 3500 6.61 9.92 4000 8.27 10.86 4500 10.03 11.71 5000 12.89 14.61 5500 19.66 18.78 6000 24.09 21.09 6500 27.53 22.25 7000 26.46 19.85 7500 26.32 19.85 8000 25.96 17.04 8500 17.03 10.52
5 Fun 'N Fast 1" Silencer 4½" Stinger Removed RPM HP Torque 3500 6.42 9.63 4000 8.42 11.05 4500 9.87 11.52 5000 13.05 13.71 5500 19.69 18.80 6000 23.98 20.99 6500 27.37 22.12 7000 25.18 18.89 7500 25.77 18.04 8000 26.11 17.14 8500 20.98 12.96	10 Xdusor-S With Reed Full Stinger RPM HP Torque 3500 6.30 9.45 4000 7.49 9.84 4500 8.65 10.10 5000 11.61 12.20 5500 17.47 16.69 6000 22.05 19.30 6500 24.91 20.13 7000 24.47 18.36 7500 23.24 16.27 8000 25.10 16.48 8500 25.47 15.73 9000 14.67 8.56	15 Trapp Comp. TC-100 4½" Stinger Removed RPM HP Torque 3500 6.15 9.23 4000 7.94 10.42 4500 9.75 11.38 5000 13.09 13.75 5500 19.79 18.90 6000 23.17 20.28 6500 27.13 21.92 7000 24.40 18.31 7500 25.17 17.62 8000 24.87 16.33 8500 21.22 13.11	20 J & R Full Stinger RPM HP Torque 3500 6.80 10.21 4000 8.01 10.52 4500 9.83 11.48 5000 13.89 14.60 5500 19.82 18.92 6000 24.37 21.33 6500 27.64 22.33 7000 26.46 19.85 7500 26.23 18.46 8000 26.16 17.17 8500 17.03 10.52	25 Skyway 74 4½" Stinger Removed RPM HP Torque 3500 6.71 10.08 4000 7.97 10.47 4500 9.99 11.66 5000 13.63 14.31 5500 20.35 19.43 6000 24.89 21.79 6500 28.17 22.76 7000 25.62 19.22 7500 25.88 18.12 8000 26.03 17.89 8500 21.44 13.25
6 Xdusor II Std. Without Reed Full Stinger RPM HP Torque 3500 6.71 10.06 4000 8.16 10.71 4500 9.72 11.35 5000 13.46 14.14 5500 19.87 18.97 6000 24.77 21.68 6500 27.53 22.24 7000 26.70 20.03 7500 26.01 18.22 8000 27.08 17.78 8500 19.07 11.78	11 Xdusor-S With Reed 4½" Stinger Removed RPM HP Torque 3500 6.04 9.06 4000 7.36 9.66 4500 9.01 10.52 5000 11.09 11.64 5500 17.32 16.54 6000 21.11 18.47 6500 25.27 20.42 7000 22.62 16.97 7500 21.48 15.04 8000 24.38 16.01 8500 25.46 15.73 9000 14.54 8.49	16 Trapp Std. Full Stinger RPM HP Torque 3500 6.56 9.88 4000 7.99 10.49 4500 9.53 11.12 5000 12.88 13.53 5500 18.82 17.97 6000 23.42 20.50 6500 26.63 21.52 7000 25.95 19.48 7500 25.93 18.15 8000 27.71 18.19 8500 14.90 9.20	21 J & R 4½" Stinger Removed RPM HP Torque 3500 6.78 10.17 4000 8.16 10.71 4500 10.31 12.03 5000 13.05 13.71 5500 19.78 18.89 6000 24.13 21.12 6500 27.42 22.16 7000 25.35 19.02 7500 26.01 18.22 8000 26.11 17.14 8500 20.46 12.64	26 Skyway 74ALD (300 Series) Full Stinger RPM HP Torque 3500 6.61 9.93 4000 7.48 9.82 4500 9.55 11.14 5000 13.12 13.78 5500 18.25 17.42 6000 21.96 19.22 6500 25.39 20.51 7000 26.08 19.57 7500 24.26 16.99 8000 26.19 17.20 8500 23.17 14.32 9000 13.54 7.90
7 Xdusor II Without Reed 4½" Stinger Removed RPM HP Torque 3500 6.45 9.68 4000 7.79 10.22 4500 9.77 11.40 5000 12.71 13.35 5500 18.93 18.07 6000 23.31 20.41 6500 26.65 21.53 7000 24.39 18.30 7500 25.21 17.66 8000 26.10 17.13 8500 19.86 12.27	12 Xdusor-S Without Reed Full Stinger RPM HP Torque 3500 6.84 10.27 4000 8.15 10.70 4500 9.71 11.34 5000 13.24 13.91 5500 19.04 18.18 6000 23.86 20.89 6500 26.82 21.67 7000 26.30 19.73 7500 25.68 17.98 8000 25.95 17.04 8500 15.59 9.63	17 Trapp Std. 4½" Stinger Removed RPM HP Torque 3500 6.16 9.24 4000 7.91 10.39 4500 9.76 11.39 5000 12.59 13.22 5500 19.13 18.27 6000 23.14 20.26 6500 26.89 21.73 7000 25.22 18.92 7500 25.07 17.55 8000 26.53 17.42 8500 21.24 13.12	22 Bassani Full Stinger RPM HP Torque 3500 6.82 10.24 4000 8.39 11.01 4500 9.80 11.43 5000 13.04 13.70 5500 21.35 18.13 6000 23.89 20.91 6500 27.80 22.46 7000 26.57 19.93 7500 26.16 18.32 8000 27.31 17.93 8500 20.04 12.38	27 Skyway 74 ALD (300 Series) 4½" Stinger Removed RPM HP Torque 3500 6.55 9.83 4000 7.82 10.26 4500 9.74 11.37 5000 13.54 14.22 5500 20.03 19.13 6000 24.38 21.34 6500 27.53 22.25 7000 25.02 18.77 7500 25.60 17.92 8000 24.75 16.25 8500 19.38 11.98
8 Xdusor II With Reed Full Stinger RPM HP Torque 3500 6.30 9.45 4000 7.50 9.84 4500 9.16 10.70 5000 11.17 11.73 5500 16.58 15.83 6000 20.93 18.32 6500 24.38 19.70 7000 23.90 17.93 7500 22.93 16.06 8000 24.45 16.05 8500 25.29 15.63	13 Xdusor S Without Reed 4½" Stinger Removed RPM HP Torque 3500 6.67 10.00 4000 8.23 10.81 4500 9.81 11.45 5000 13.01 13.67 5500 19.60 18.72 6000 23.61 20.66 6500 27.18 21.96 7000 24.53 18.40 7500 25.21 17.66 8000 25.57 16.79 8500 20.56 12.70	18 Murphy Full Stinger RPM HP Torque 3500 6.12 9.18 4000 7.40 9.72 4500 8.96 10.46 5000 12.24 12.85 5500 18.33 17.51 6000 22.84 20.00 6500 26.18 21.15 7000 25.62 19.22 7500 25.26 17.69 8000 26.42 17.34 8500 19.54 12.07	23 Bassani 4½" Stinger Removed RPM HP Torque 3500 6.45 9.68 4000 7.83 10.28 4500 9.76 11.39 5000 12.69 13.32 5500 19.40 18.52 6000 23.69 20.74 6500 27.42 22.16 7000 25.41 19.07 7500 25.64 17.96 8000 27.08 17.78 8500 20.81 12.86	

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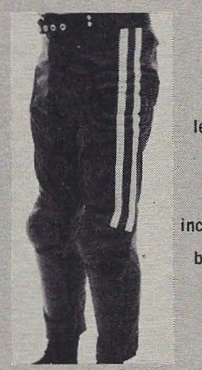
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normal monthly sound level testing, we can wait for any occasional gusts to die before taking any readings, but it was impossible to take all the readings for this test in absolute calm. Some of the numbers on the comparison chart may be biased as much as 2 dB(A).

USING THE RESULTS: It is obvious that none of the silencer tips can be all things to all riders. If a machine is to be silenced as much as possible while still retaining really good performance and the bike is going to be ridden where regulation and/or conscience require a spark arrestor, then the Skyway ALD is the best choice if cost and vulnerability are not prime considerations. The other spark arrestor models, the Murphy and the flat-sided Xdusors, are less likely to get wiped out in the inevitable spills, but they allow more noise—and the Xdusor is difficult to repack properly. And the Murphy is made of cast aluminum pieces which can break apart instead of bending when the silencer is caught between a rock and a hard place.

If real out-and-out racing is your only concern, then any of the silencers is legal according to present regulations. The question in racing should be answered by the model which allows you to have the best compromise in terms of lap times and tactical advantage. When rider abilities are roughly equal, the guy who is sharpest at setting his gear ratio and power curve to suit the course will have the advantage. The real pros will draw a pencil sketch of how the course looks at speed. Then, in practice sessions, they will concentrate on one or two corners at a time until the whole map is covered with notes like: "engine lugging," "too rough for proper throttle control," "excessive wheelspin," and "needs to pull ten feet farther without running out of power, but corner too close to shift." If, for example, the big burst of power as produced by the Skyway 74 did nothing on a particular course except cause wheelspin and handling difficulty, then the Xdusor with a reed installed might give better times or allow a rider to get to a tight section first. By careful cross-referencing of stop watch times and course anatomy, you will gain the ability to quickly make accurate judgements with a minimum of self deception.

Please remember that the power curves in this article are only valid for a standard Honda 250 Elsinore. You may reasonably expect that the silencers will have similar effects on other 250cc motocrossers whose engines are tuned to deliver similar power curves. The differences will be less on smaller motocrossers and greater on larger ones. We don't know yet what the effects will be on mildly tuned enduro and trail bikes, but they usually have fairly effective silencers to begin with. It is our hope that the data in this article will help you to decide which silencer will best suit your needs in modifying the exhaust system of a motocross-type engine.

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