

■ MANUFACTURERS ARRIVE at particular engine displacements for their trail bikes for various reasons, not all of them having to do with creating the ideal relationship of power/weight/size.

Domestic and foreign competition categories have much to do with the choice, so it's rather obvious why bikes tend to cluster around 125, 250, 350, 500 and 750cc displacement limits. The 360 is a curious size, and stems from the now-outdated need to have an engine large enough to compete in the 500 motocross class, yet small enough to be technically feasible and conserve some of the nimbleness normally associated with the two-fifties.

Out of this background come the Yamaha RT-2 Enduro and the Bultaco Montadero. They epitomize the differences of the Japanese and Spanish approaches to building dual-purpose machines.

And in any gathering of muddy-booted railbirds, the two bikes are natural objects of comparison. A few years ago, the Bultaco would have been the obvious winner, if the discussion centered around each bike's ability to cope with off-road riding. Now, the story is different. It is difficult, if not absurd, to declare an absolute winner. The Yamaha and Bultaco 360s are close, not only in basic design characteristics, but in performance. But they differ somewhat in intent. This comparison test, actually two concurrent road tests, will hopefully direct the appropriate owner to the "right" machine.

A 360's ADVANTAGES . . . AND

Taken together, the Yam and the Bul show the common attributes of this size of trailbike.

Both are powered by two-stroke, single-cylinder engines. The Yamaha is the more highly refined engine of the two, having five speeds to the Bultaco's four, automatic oil mixing, and the newest Yamaha gimmick, reed valve induction.

Power outputs are similar, but with subtle differences in where the power is available. In both cases, the power (compared to weight) is plentiful—easily on a par with the fabled 500 Single dirt engines of yore. This, of course, is the primary selling point of a 360-cc trailbike. Power, and, hopefully, a torque band that minimizes the need for gearbox rowing.

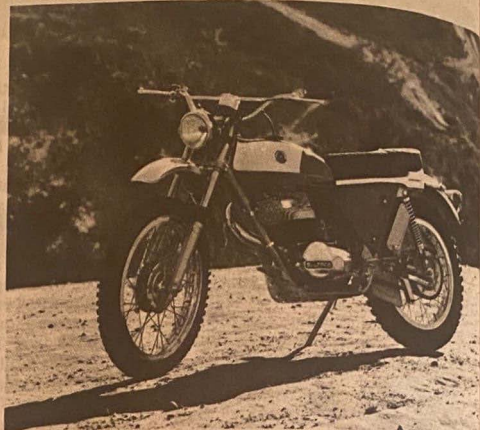
For this extra power, you pay a penalty. Both machines, burdened by lights and other assorted street equipment, are heavy. The Montadero weighs 293 lb. ready to go; the Yamaha RT-2 in like condition weighs 291 lb. This is from 20 to 50 lb. heavier than 250-cc bikes intended for the same use. In practice, the extra weight means you have to throw either bike around just a little bit harder. Stall either bike on a hillclimb and it is just that much harder to push it over the crest, or jockey it around so that you can roll down and try again.

So, you've got your druthers. If you want horsepower and brute torque with lights on, these 360s are the answer, suitable for a heavy rider who can't stand the way his weight bogs down a 250 enduro bike. They are definitely the right answer if your trailriding is social and you anticipate packing double frequently.

BASIC PRESENTATION

The Bultaco Montadero is a pure trail machine in concept, thinly disguised for dual-purpose action. It's a Bandido motocrosser in drag, still sporting its knobby tires and 21-in.

Cycle World Road Test



COMPARISON: YAMAHA 360 ENDURO VS. BULTACO 360 MONTADERO

No, The Bul Is Not A Shoo-In,
Nor Is Either The Perfect
Dual-Purpose Machine.
But We Can Tell You Which
One Is Right For You.

front wheel, but adding a full-length seat, passenger pegs, lights, battery, horn, speedometer, side reflectors, large gas tank and ignition key.

Two factors make the Montadero enduro engine more flexible than that of the Bandido motocrosser: milder porting and the "untuned" silencer. With standard gearing, the Montadero will run 85 mph, but nobody in his right mind would run it up the freeway unless he had to. That street equipment is only there to appease the law when you leave one trail and run up a short stretch of road to catch the connecting trail.

The standard gearing is much too high for anything but fireroading and fast trailing. So the first thing you would do would be to slip on a smaller countershaft sprocket to bring the gearing down. As it is, first gear is about where second would be on a properly fettled trailbike; the ratios are well-spaced for a four-speed machine, but offer no compromise if you want 75-mph top speed and a plonking-speed first gear too.

THE YAMAHA 360

The Yamaha 360 is more truly a dual-purpose machine than is the Bultaco. In spite of that, it looks simpler and more functional than the Montadero, which is a holdover from Bultaco's "gaudy period" of one to three years ago.

Standard Yamaha equipment includes lights, horn, dual seat, turn signals, speedometer, tachometer, battery, neutral and blinker indicator lights, five-speed gearbox, automatic oil mixing, 19-in. front wheel, and Universal pattern tires front and back. The muffler incorporates an approved spark arrester, while the Bul doesn't.

The Universal tires and low mounted front fender make it clear to whom Yamaha wants to sell the machine—the casual dirt rider who will find himself on the highway more than 25 percent of the time. Gearing is high on the Yamaha, too, and it has almost exactly the same top speed as the Bultaco. Even though the Yamaha has five speeds, it still could use a lower overall ratio to make first gear suitable for that tricky slow stuff.

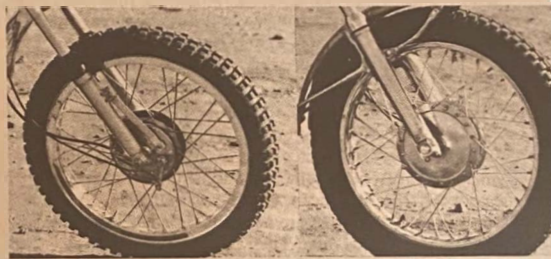
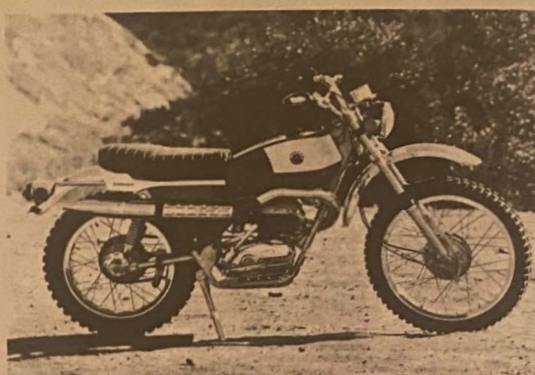
The Yamaha Enduro is similar to its own motocross counterpart, but has some distinct differences having to do with things other than superficial equipment. Where the motocrosser has a lightweight conical hub up front, the enduro machine has the old-style, full-width hub, which provides more stopping power for street use.

GEOMETRY AND SUSPENSION

The Montadero comes from the long wheelbase school of dirt bike design. Its rangy 56-in. wheelbase promises a great deal of stability over rough ground at any speed. The engine and frame cradle are slung low, a desirable attribute. Low center of gravity allows you to turn the machine easier, point it more accurately, and control weight transfer to the rear wheel more easily, without over-aviating the front wheel.

The front forks and rear shock absorber units are of proven quality, a Betor design for Bultaco. Fork travel is impressive, almost 7 in. With its 21-in. front wheel, and moderate trail, you can run the bike around a motocross course flat out, or steer your way up a twisting gully with great precision. The bike is also a stable, slow handler on a fire road (in spite of the 21-in. wheel).

The Yamaha 360 has a slightly shorter wheelbase (54.5 in.) and its engine sits slightly higher in relation to the axle centers. It is therefore a quicker handling bike than the Bul in some respects. But, in an effort to slow its response down, the designers saw fit to include extra trail in the front fork



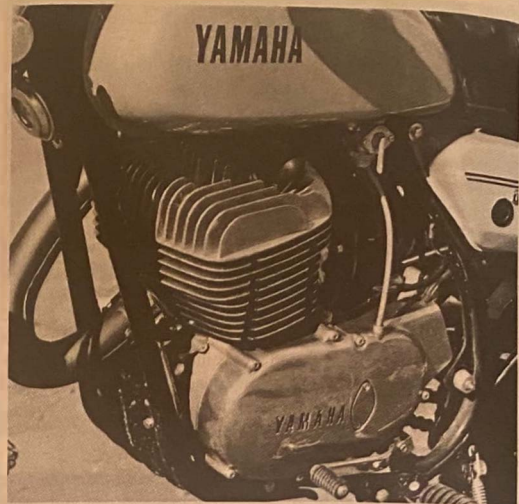
geometry. So, while it is stable enough in the rough, it tends to wobble and resist turning on a fireroad—in spite of the advantage that the 19-in. wheel and fatter front tire should give it in this situation.

A rider sits higher on the Yamaha than he does on the Bultaco, making weight transfer a more sudden proposition. Thus, a Yamaha rider will find himself guarding against involuntary wheelies when accelerating hard in the lower gears, or when climbing very steep hills.

OVERALL HANDLING

The Bultaco is superior to the Yamaha in high-speed, rough-terrain handling, due to the lower c.g., correct steering geometry and long wheelbase. But it takes some hard riding to discern the difference.

The handling picture is further obscured because of the different traction used on each machine. Were you to substitute a 21-in. front wheel and narrow tire for the 19-in.



universal on the Yamaha, you would change the geometry slightly. The steering would become more precise on the trail.

Changing the Yamaha's front wheel, and tire, and relocating or substituting the low-mounted fender for a higher one, and replacing the narrow bars with more appropriate wide bars—all to make the Yamaha appropriate to the type of riding for which the Bultaco is specifically built—would more than cancel the \$105 you would save by buying the Yamaha.

This, of course, favors the Bultaco—at least for serious off-road application. However, this is not the whole story. The Yamaha has enough features to merit any contemplated changeover, if the rider is willing to take the time and trouble.

For example, the Yamaha has a full-floating rear brake, not present on the Bultaco. This feature lessens rear wheel juddering when the back brake is applied, and allows the rider excellent control, particularly on tricky downhill.

Yamaha's forks and rear dampers are improving steadily. While front rebound damping is not as good as the Bultaco's, and the spring rate, or grade of damping oil, allows the Yamaha to bottom in some situations, the forks are up to 90 percent of the situations you'll encounter in cow-trailing. Simply stated, the forks are not of ISDT caliber, but adequate for a Sunday enduro rider. They could use more travel.

The Yamaha rear shock absorber units are much improved, featuring a new type of internal valving that provides better damping control than in the past.

ENGINES COMPARED

Just as Bultaco takes the prize for off-road handling, the Yamaha must win converts for its supple, yet powerful, engine. If you could put the Yamaha engine in the Bultaco frame, you'd have a fabulous enduro machine.

What makes that engine better? A torque band that reaches down to low rpm, minimal vibration and low mechanical noise, and more accurate carburetion at any rpm range. The torque range, which allows you to pull the machine at very low engine speeds, is a result of the reed valve system. When the port timing overlap begins to get sloppy at low rpm, the reed system prevents fuel charge blowback and thus increases low rpm power.

Turn the Yamaha's loud handle on at 1500 rpm and it feels solid. The engine is working, to heave you and the bike up a

rocky hill or out of a bog. Do the same to the conventionally ported Bultaco and it feels flat and wants to die.

Since you have to keep the Bultaco turning somewhat faster to do the same work at slow speeds, you'll need to gear it lower. In enduro riding, you can probably get away with a slightly higher overall gear on the Yamaha than you could on the Bultaco, which, of course, increases your top speed capability.

The convenience of the Yamaha automatic oil mixing system will also be an added inducement for some. We doubt whether it would sway a competition-oriented buyer who is primarily concerned with suspension and handling.

Another plus about the Yamaha is the approved spark arrester incorporated in the muffling system. More and more enduro organizers are requiring a spark arrester, and if they don't get you at the starting line, the Sheriff or the Forestry Service will get you later. The Bultaco doesn't have this feature, and it will prove troublesome to adapt one readily to its exhaust system. A glimmer of light is on the horizon, and Bultaco may offer an arrester in a few months.

SIMPLICITY A VIRTUE

On the other side of the coin, the 360 Bultaco engine is simpler. It doesn't have a reed valve to wear out (and they do) and need regular replacement. Nor does it have an oil metering system to adjust, nor the system's external lines, which get in the way when you need to remove the carburetor.

If you need to replace a clutch cable, it's easy on the Bul. The cable terminates in a universal fitting which pulls on an external lever. To replace it on the Yamaha, you must get into the casing.

Swapping countershaft sprockets is easier on the Bul. And should something jam under the cover plate, there is enough of an open slit to pry the object loose without having to remove the case cover.

Other aspects of the Bultaco make it better for maintenance in the field, examples being the calibrated eccentric rear wheel adjuster, and the wing nut that permits adjustment of the rear brake without a wrench.

TRANSMISSION RATIOS

Yamaha's five-speed transmission is superior to the dated

BULTACO 360 MONTADERO

SPECIFICATIONS

List price	\$1095
Suspension, front	telescopic fork
Suspension, rear	swinging arm
Tire, front	3.00-21
Tire, rear	4.00-18
Brake, front, diameter x width, in.	5.5 x 1.37
Brake, rear, diameter x width, in.	5.5 x 1.57
Total brake swept area, sq. in.	50.75
Brake loading, lb./sq. in.	5.8
Engine, type	two-stroke Single
Bore x stroke, in., mm	3.3 x 2.51, 85 x 64
Piston displacement, cu. in., cc	22.1, 362
Compression ratio	10:1 (uncorrected)
Claimed bhp @ rpm	34.9 CV @ 6200
Claimed torque @ rpm, lb.-ft.	27.9 @ 5700
Carburetion	32-mm Amal concentric
Ignition	electronic, dual spark plugs
Oil system	oil mist
Oil capacity, pt.	oil in fuel
Fuel capacity, U.S. gal.	2.75
Recommended fuel	premium
Starting system	kick, folding crank
Lighting system	6-V alternator & battery
Air filtration	oil-wetted foam
Clutch	multi-disc, wet
Primary drive	helical gear
Final drive	single-row chain
Gear ratios, overall: 1	
4th	6.43
3rd	8.81
2nd	12.62
1st	20.01
Wheelbase, in.	56.1
Seat height, in.	31.0
Seat width, in.	10.0
Handlebar width, in.	34.5
Footpeg height, in.	11.1
Ground clearance, in.	9.2
Curb weight (w/half-tank fuel), lb.	293
Weight bias, front/rear, percent	43/57
Test weight (fuel and rider), lb.	423

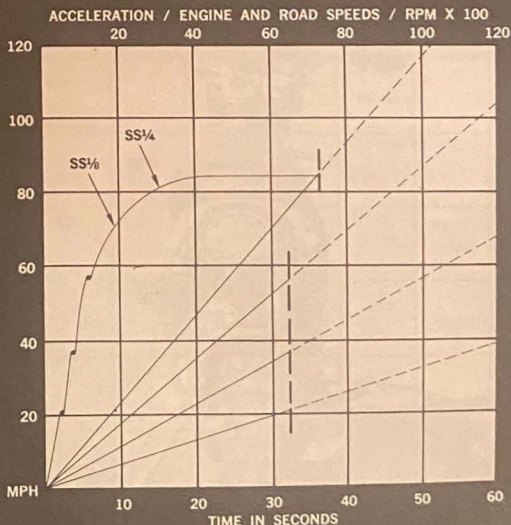
TEST CONDITIONS

Air temperature, degrees F	56
Humidity, percent	55
Barometric pressure, in. hg.	30.14
Altitude above mean sea level, ft.	50
Wind velocity, mph	8-12
Strip alignment, relative wind:	



PERFORMANCE

Top speed (actual @ 7240 rpm), mph	85.06
Computed top speed in gears (@ 6500 rpm), mph:	
4th	76
3rd	57
2nd	37
1st	21
Mph/1000 rpm, top gear	11.75
Engine revolutions/mile, top gear	5095
Piston speed (@ 6200 rpm), ft./min.	2580
Lb./hp (test wt.)	12.1
Speedometer error:	
50 mph indicated, actually	48.6
60 mph indicated, actually	57.8
70 mph indicated, actually	68.2
Braking distance:	
from 30 mph, ft.	49
from 60 mph, ft.	170
Acceleration, zero to:	
30 mph, sec.	2.4
40 mph, sec.	3.8
50 mph, sec.	4.9
60 mph, sec.	6.5
70 mph, sec.	8.1
80 mph, sec.	14.9
Standing one-eighth mile, sec.	9.33
Terminal speed, mph	71.03
Standing one-quarter mile, sec.	15.36
Terminal speed, mph	81.08



four-speed Bultaco gearbox. It's not just a matter of an extra gear.

The Yamaha gearbox is tighter in feel, and engages more positively from gear to gear, a result of the use of guide bars on all shifting forks. Gear lever position also makes shifting the Yamaha gearbox a more efficient proposition than on the Bultaco. On the Montadero, you must consciously move your right foot forward to upshift; and it requires more lever travel to accomplish. With the Yamaha, you don't even think about shifting; the lever is right over the toe and the travel is short.

The advantage of the extra ratio is obvious. The spread between Yamaha's low gear and high gear is slightly wider than that of the Bultaco. Yet the Yamaha ratios are closer together than those of the Bultaco. So, given any equivalent low gear ratio fitted to both bikes, the Yamaha will always have available a few mph more top speed in fifth gear.

Further, the closeness of ratios facilitates shifting and guarantees that the Yamaha will never drop off its power band.

The clutches on both machines are excellent, neither showing adverse reaction to considerable slipping.

ERGONOMICS, ETC.

If we can generalize, we predict that short-legged people will tend to like the Yamaha, which has a compact seating position. Conversely, on the Bultaco the pegs are slightly lower and more rearward in relationship to the seat and therefore will prove more comfortable to the taller rider.

The standard handlebars on the Yamaha are narrow and swept back at an odd angle. They are more appropriate to the street than to rough riding. The Bultaco bars go to the other extreme, being wide, flat and forward; they are particularly suitable for motocross-style riding, standing on the pegs.

While the Yamaha seating position is compact, it ends up being more comfortable than the Bultaco's for two reasons. One, the Yamaha fuel tank is narrower than the Bultaco's, enabling you to get better knee grip and reducing the apparent


bulk of the machine. Two, the Bultaco's kick starter is badly located and digs into the lower foreleg in either a sitting or standing position. Full-length boots are therefore an absolute necessity on the Bul to avoid the jabbing, which not only is painful but interferes with control of the machine.

WHICH FOR WHOM?

By now it should be clear what each bike is intended to do. The Yamaha is a true dual-purpose machine with a formidable power plant, the Bultaco, a competition-oriented trailbike, thinly disguised to just meet the law for street operation. When we say thinly, we mean it. The lighting units on the Bul are the minimum size necessary, and the horn is a feeble device which can barely be heard above the engine. The motocross tires will buzz your teeth out if you spend much time at speed on the street.

But if you really want to "get it on" in the rough stuff, the Bultaco comes off as the superior handler. It's rigged right for the job. Mud won't jam up under the front fender, which is high-mounted. The 21-in. wheel provides precision in the tight stuff. The engine is simple, in the original tradition of the two-stroke, powerful with reasonable flexibility. Field service of the engine and bike parts is straightforward.

But if you are going to spend much time on the street, the Yamaha is the way to go. It has full street lighting, turn signals and an audible horn. The tachometer is a nice, if not absolutely necessary gimmick. Its traction is more suitable to the street or fireroad than is the Bultaco's. The automatic oil mixing makes refueling easy; you don't have to resort to a gas can or carry an oil bottle. The Yamaha's low front fender doesn't make much sense in the mud, but it does make sense on dusty roads or in the rain. And in spite of its dual-purpose nature, it handles quite well off the road.

If you just want to mess around, go for the Yamaha. If you're dead serious, and like woods riding and heavy duty trail riding, go for the Bultaco, unless you're willing to modify the Yamaha to do the Montadero's job. 



YAMAHA 360 ENDURO

SPECIFICATIONS

List price	\$990
Suspension, front	telescopic fork
Suspension, rear	swinging arm
Tire, front	3.25-19
Tire, rear	4.00-18
Brake, front, diameter x width, in.	5.9 x 1.0
Brake, rear, diameter x width, in.	5.9 x 1.0
Total brake swept area, sq. in.	37.2
Brake loading, lb./sq. in.	7.8
Engine, type	two-stroke Single
Bore x stroke, in., mm	3.15 x 2.76, 80 x 70
Piston displacement, cu. in., cc	21.42, 351
Compression ratio	6.3:1 (corrected)
Claimed bhp @ rpm	32 @ 6000
Claimed torque @ rpm, lb.-ft.	27.7 @ 5500
Carburetion	32-mm Mikuni
Ignition	flywheel magneto
Oil system	oil injection
Oil capacity, pt.	3.5
Fuel capacity, U.S. gal.	2.5
Recommended fuel	premium
Starting system	kick, folding crank
Lighting system	AC, 6-V battery
Air filtration	oil-wetted foam
Clutch	multi-disc, wet
Primary drive	helical gear
Final drive	single-row chain
Gear ratios, overall:1	
5th	6.17
4th	8.04
3rd	10.49
2nd	14.40
1st	20.38
Wheelbase, in.	54.5
Seat height, in.	32.2
Seat width, in.	12.0
Handlebar width, in.	31.5
Footpeg height, in.	12.0
Ground clearance, in.	10.5
Curb weight (w/half-tank fuel), lb.	291
Weight bias, front/rear, percent	44.8/55.2
Test weight (fuel and rider), lb.	421

TEST CONDITIONS

Air temperature, degrees F	56
Humidity, percent	55
Barometric pressure, in. hg.	30.14
Altitude above mean sea level, ft.	50
Wind velocity, mph	8-12
Strip alignment, relative wind:	



PERFORMANCE

Top speed (actual @ 7080 rpm), mph	85.14
Computed top speed in gears (@ 6500 rpm), mph:	
5th	79
4th	61
3rd	47
2nd	34
1st	25
Mph/1000 rpm, top gear	12.2
Engine revolutions/mile, top gear	4895
Piston speed (@ 6500 rpm), ft./min.	2980
Lb./hp (test wt.)	13.1
Speedometer error:	
50 mph indicated, actually	46.5
60 mph indicated, actually	54.8
70 mph indicated, actually	64.8
Braking distance:	
from 30 mph, ft.	44
from 60 mph, ft.	162
Acceleration, zero to:	
30 mph, sec.	2.5
40 mph, sec.	4.0
50 mph, sec.	5.1
60 mph, sec.	6.5
70 mph, sec.	8.3
80 mph, sec.	15.7
Standing one-eighth mile, sec.	9.70
Terminal speed, mph	67.66
Standing one-quarter mile, sec.	15.74
Terminal speed, mph	80.00

ACCELERATION / ENGINE AND ROAD SPEEDS / RPM X 100

