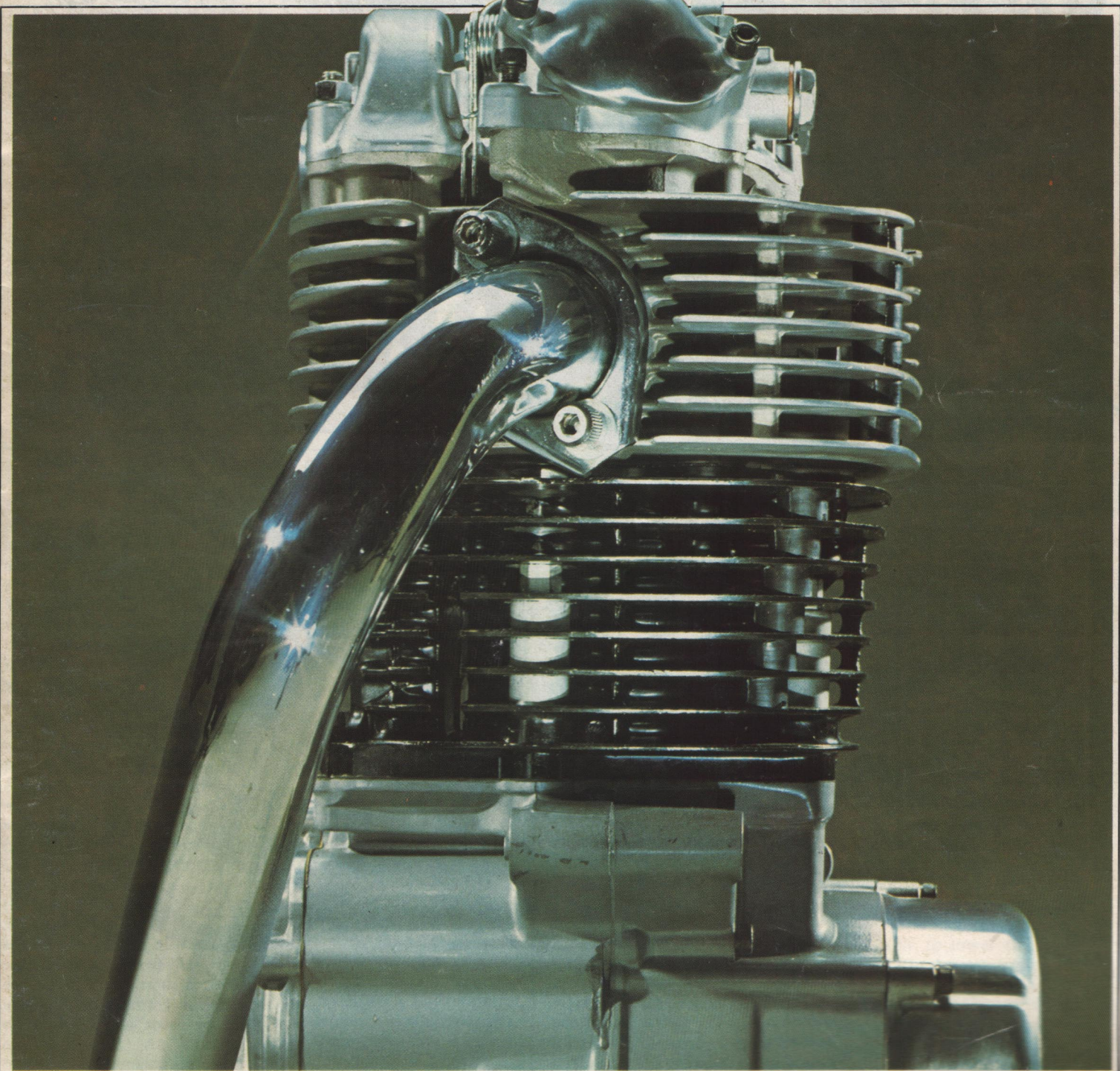


# Limit

**YAMAHA**

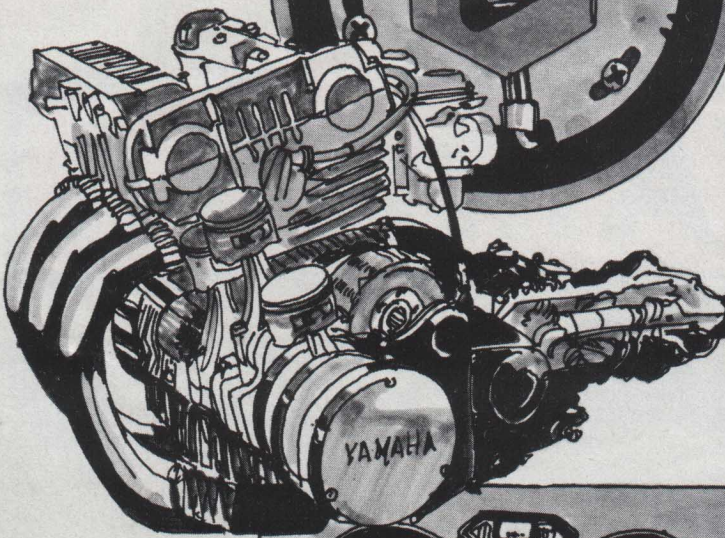
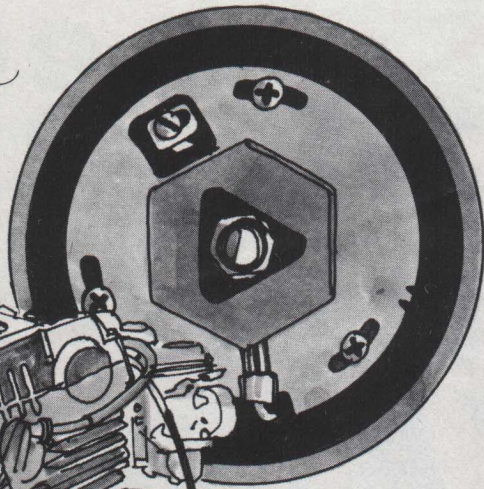


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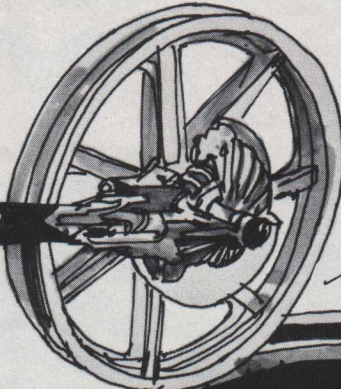




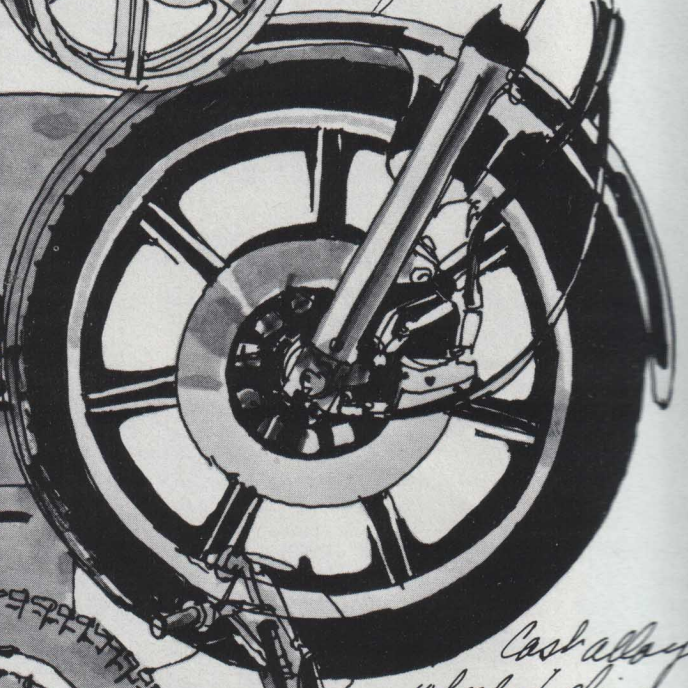
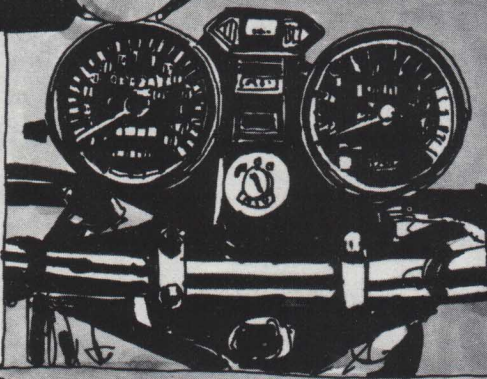
Breakerless  
"T.C.I."  
ignition



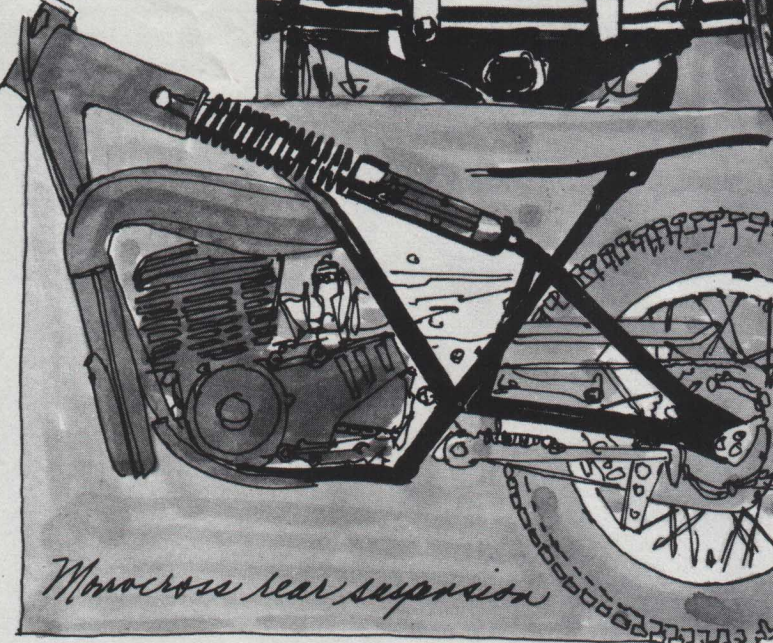
4 stroke, 3 cylinder,  
shaft drive



Self  
cancelling  
turn signals

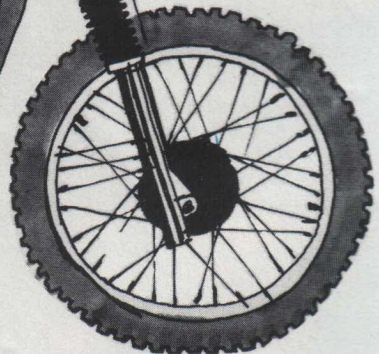


Cast alloy  
wheels / disc  
brakes



Monocoque rear suspension

Air/oil  
leading axle  
forks





## YAMAHA XS1100

It's big, tough and fast. The new top of the line Yamaha that the heavy-metal fans have been itching for....the Yamaha XS1100. Four cylinders, double overhead camshafts, big brutal lines and lots of horsepower. This one is going to rewrite the rules of the game in motorcycling's biggest capacity bracket!

Winding open the throttles on the big 1100cc engine will thrill you down to the soles of your riding boots but you can still relax, secure in the knowledge that Yamaha engineers have designed the XS1100 to be one of the safest, as well as one of the fastest, bikes on these modern roads.

Its got the biggest brakes in the business: two giant 298mm hydraulically-operated discs at the front and a similar, single 298mm unit at the rear. Tires

the XS1100 and the kickstarter pedal is not even fitted to the engine unit. Just in case of emergency, the kickstarter is bolted to the frame in an easily accessible position. In the unlikely event of you suffering a flat battery, it is a simple job to connect the kickstarter and boot the big four into life. The battery itself is a sealed unit, virtually maintenance-free, and with the large capacity necessary to serve an engine as big as the XS1100.

The transmission set-up of the XS1100 is basically the same one which caused such a sensation when introduced on Yamaha's XS750 in 1977. The XS1100 has a beefed-up strengthened version to cope with the added horsepower. Engine power runs through a tough five-speed gearbox and multi-plate clutch to a transfer shaft. A bevel gear and pinion finally put that power through the cast alloy rear wheel and on to the road.

always the focal point of any motorcycle. These lines are aided by the use of a recessed lockable filler cap.

The "Control Panel" of the Yamaha XS1100 gives an immediate clue to the lengths to which Yamaha have gone to make the mechanics of riding so easy that the rider can perform the necessary functions almost automatically.

At the rider's fingertips are the main light switches, the dipswitch, and the controls for Yamaha's unique self-cancelling turn indicators. These are timed to automatically switch themselves off after the rider has completed his turn! Handlebar levers are of the new "bell-crank" type for easy operation via their extra-leverage capabilities.

In the central instrument console are the speedometer and smooth-operating electronic tachometer, plus a fuel gauge, low oil pressure warning light and neutral indicator.

Beneath the instrument console is the large, rectangular halogen headlamp that gives night-time vision unrivalled by any similar machine.

Front forks are big and strong, with 38mm diameter fork legs and the unique Yamaha "teflon" bushes that allow a continuously-smooth fork action. Calipers for the powerful twin 298mm disc brakes are carried in racing-style behind the fork legs.

Finally, to allow for changes in load, or differences in rider weight, the XS1100 has the new Yamaha three-stage front fork pre-load adjustment. This simple manual adjustment combines with a similar five-stage capability on the rear shocks to allow the rider to set suspension spring tensions to suit his own requirements.

Everywhere you look, the XS1100 has small refinements that all add up to superb rider comfort and convenience.

Twin horns add to the safety factor, while inside the halogen headlamp are two plug-in connectors that allow quick and simple fitting of auxiliary spot of foglamps without any complicated re-wiring.

Behind the headlamp, there is a fairing bracket already fixed

in place on the frame to facilitate easy fitting of a touring or sports fairing.

In the right side cover below the seat is an electrical power point to accommodate such things as an electric shaver or any other camping or cold-weather riding aids. Also accessible through this cover is the machine's electrical fuse box.

The seat itself is fixed rigidly in place and does not hinge upwards. Everything is accessible through the side covers. Another point on the seat is that Yamaha's engineers have deliberately constructed both the frame and the seat itself to arrive at a seat height much lower than competing machines of similar bulk to the XS1100. This gives a much more comfortable and secure riding position.

Through the left side cover on the machine, the rider can reach the large capacity, low maintenance sealed battery as well as the toolkit that is capable of handling most roadside repairs on the XS1100. Alongside the battery is a lockable box for documents and valuables.

## YAMAHA XS750

Yamaha's sleek three-cylinder 750cc "superbike", the XS750, is supreme proof that the customer need sacrifice none of the comforts of life simply to get racing-style performance. The XS750 will perform with the best of them while still offering luxuries unsurpassed by any of the competition.

Let's consider the performance aspect first: heart of the XS750 is the three-cylinder, double overhead-camshaft power unit with its triple linked carburetors, two-into-one exhaust system on the right and a single left-hand pipe and muffler. Visually it's one of the most exciting power units around...with more than just a touch of the Grand Prix racer about it.

This year Yamaha engineers have gone all-out for extra performance from the XS750 and have made modifications that have resulted in substantial horsepower and speed gains. Thanks to this horsepower increase they have been able to lower the final drive ratio to get improved acceleration without reducing top-end speed. Quite the opposite! Yamaha engineers have extracted so much extra power from the

# Yamaha 1978

are the strongest available, the "V-rated" series capable of constant 230km/h (140mph) speeds and a powerful halogen headlamp allows you to maintain high cruising speeds at night in perfect safety. Without a doubt, Yamaha's new XS1100 will be setting the standards for others to match.

The XS1100 power unit is a four cylinder four-stroke with double overhead camshaft valve operation. The unit is fed by four linked Mikuni constant velocity carburetors while an inter-connected, vacuum-operated ignition control unit retards the ignition for easy starting and then automatically advances the spark timing as the throttle is opened. As well as making starting easy, this also brings significant gains in fuel economy. Fully-transistorised ignition maintains a healthy, correctly-timed spark at all engine speeds. An electric starter is a standard item on

Continuing the superlative reputation for handling that other bikes in the top end of the Yamaha range have established for themselves, the XS1100 has a solidly-constructed duplex cradle frame, designed with the awesome power of the big four cylinder in mind.

The engine is rubber-mounted to cut down any vibration (though the XS1100 is one of the smoothest power units ever) and the frame also carries an engine oil-cooler.

Strong, cast alloy wheels are fitted as standard: a 3.50 x 19 at the front and a squat, tough 4.50 x 17 inch rear.

Knowing that the XS1100 rider is the kind of guy who will want to cover lots of miles at a single stretch, Yamaha have specified a 24 litre petrol tank. Styling-conscious riders will admire the smooth, clean lines of the tank.....which is







# Yamaha 1978

XS 750 that top speed has increased despite the drop in gearing that achieves better acceleration. The customer now has the best of both worlds!

As well as indulging themselves in the search for outright horsepower, Yamaha have also refined their latest XS750 in several ways. The 1978 version now has full transistor ignition to give spot-on ignition timing and a consistent, healthy spark even at the highest engine revolutions.

The three 34mm Mikuni constant-vacuum carburetors now include a two-stage starter jet for easier starting and a smoother "warm-up" period.

The rest of the XS750 specification more than matches the superb standards already set by the power unit.

Its shaft-drive system with constant velocity joints throughout has been universally hailed by the motorcycle press as the standard by which the efforts of all other manufacturers of similar machines must now be measured.

And the frame and suspension design is such that when the XS750 was initially tested by the world's leading motorcycle journalists last year, they reacted with such comments as "the best-handling of all the super-bikes" and "the best-handling machine ever to come from Japan"!

For this year Yamaha have even gone a stage further to maintain their handling advantage. The XS750 now features front forks that have an easy-to-set, three-position adjustment that can pre-load the fork springs to three different tension settings. Therefore the rider can set the front suspension to his own needs in terms of his weight and riding style. The same is true of the rear, where the hydraulic rear shock absorbers have five different settings.

These front and rear adjustment capabilities have an added boon for the touring rider. He can stiffen up the springs to compensate for the extra weight of touring

equipment, camping gear, baggage and so on.

Also new this year is another aid for the touring or sporting rider. The Yamaha XS750 now features an extra-powerful halogen headlamp for fast night-riding in perfect safety.

For passengers, there's the addition of a grab bar at the rear of the seat, while riders will appreciate the vacuum-operated fuel cocks which avoid carburetor flooding while the bike is standing, and they will particularly enjoy the extra leverage of the new, bell-crank handlebar levers.

All in all, the new version of the Yamaha XS750 is a perfect example of how to make the best bike better yet!

## YAMAHA XS650

The Yamaha XS650 was the company's first venture into the large capacity four-stroke field and now, ten years later, the machine is still a market leader in its particular capacity class.

The Yamaha XS650 specification has all of the points that earlier manufacturers in this class should have had...but didn't! Oiltight single overhead camshaft power unit, electric starter, five speed transmission, constant-velocity carburetion, Yamaha's unique self-cancelling turn indicators, full instrumentation with speedometer, tachometer, neutral, high beam, stoplight and turn signal operation indicator lights plus a warning light against excessive brake lining wear. All these are part of the basic Yamaha XS650 specification along with the added feature that, of all the bikes in its class, the Yamaha is the only one featuring twin hydraulic disc brakes at the front.

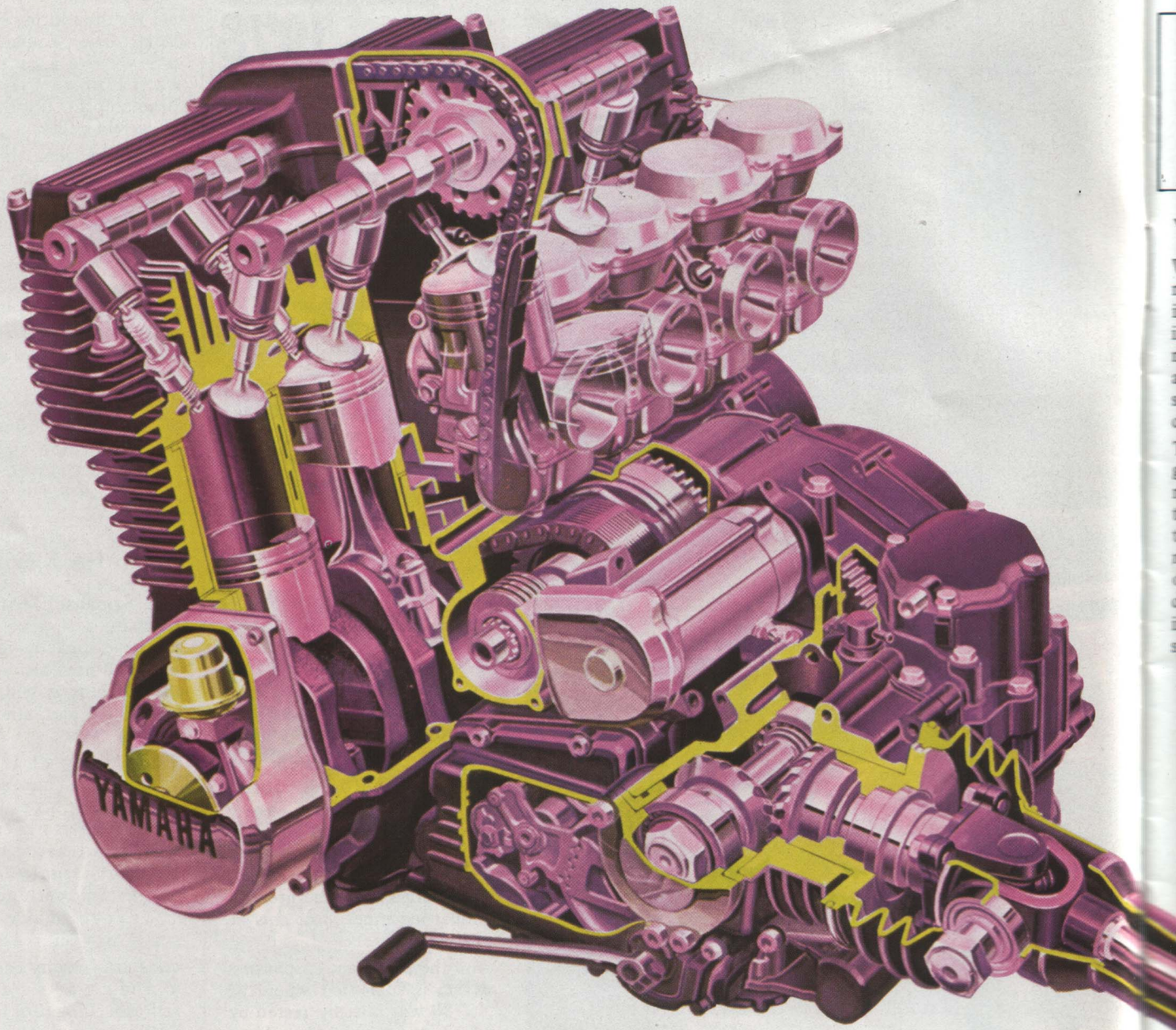
This year the list is expanded even more. The Yamaha XS650 now features front forks that have easily-set three-stage pre-load adjustment to compensate for different loading or usage conditions. Another Yamaha innovation in the class!

The Yamaha XS650 might have been introduced ten years ago but the continuing development ensures that each year's model is right up to date with current trends and customer requirements.



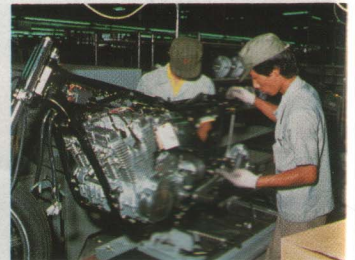
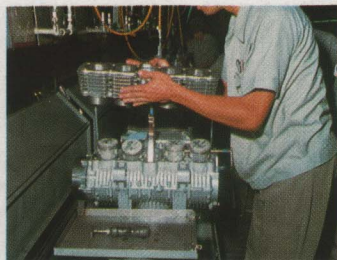
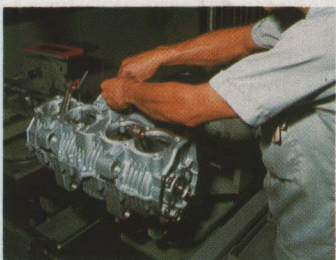
# XS1100





# XS1100

A Yamaha XS1100 on its way through the assembly line and engine testing procedures.





# Yamaha 1978

## YAMAHA XS500

What most road-going motorcyclists are looking for in the perfect touring machine is a bike that can cover the miles at relatively high speeds and, after a long day's riding, still allow the rider to feel comparatively fresh.

The XS500, still one of the great favourites of the Yamaha range, comes close to the ideal touring motorcycle despite the presence on the market of machines up to twice the size of its 500cc. Light and compact enough to be nimble in traffic and to maintain speed on tight, rural roads, the

XS500 can often make better time over a day's riding than more bulky, cumbersome large-capacity machine. Yamaha's approach to motorcycle design has always been to concentrate on efficiency.

The superbly-engineered twin cylinder 500cc power unit has double overhead camshafts and four valves per cylinder.

This year it's more powerful than ever and proof of its efficiency is that fact that, in this age of big-capacity machines, the Yamaha is still a much-desired motorcycle.

Other manufacturer's 500cc machines, often with more cylinders than Yamaha's two, have been either forced off the market or had to be expanded in size to compete in terms of sales. The Yamaha is as popular as ever!

The Yamaha-patented

omniphase balancing smooths out the vibrations that are inherent in vertical twins while the sporting chassis set-up and two disc brakes complete a specification in which total efficiency is the keyword. Yamaha efficiency ...which continues to prove that you don't need a big bike for those big mileages!

## YAMAHA XS400

Already hailed by the world's motorcycle Press as one of the best "middleweight" machines on the market, Yamaha's XS400 goes one better this year by growing from its former 358cc capacity to the more-beefy 400cc range.

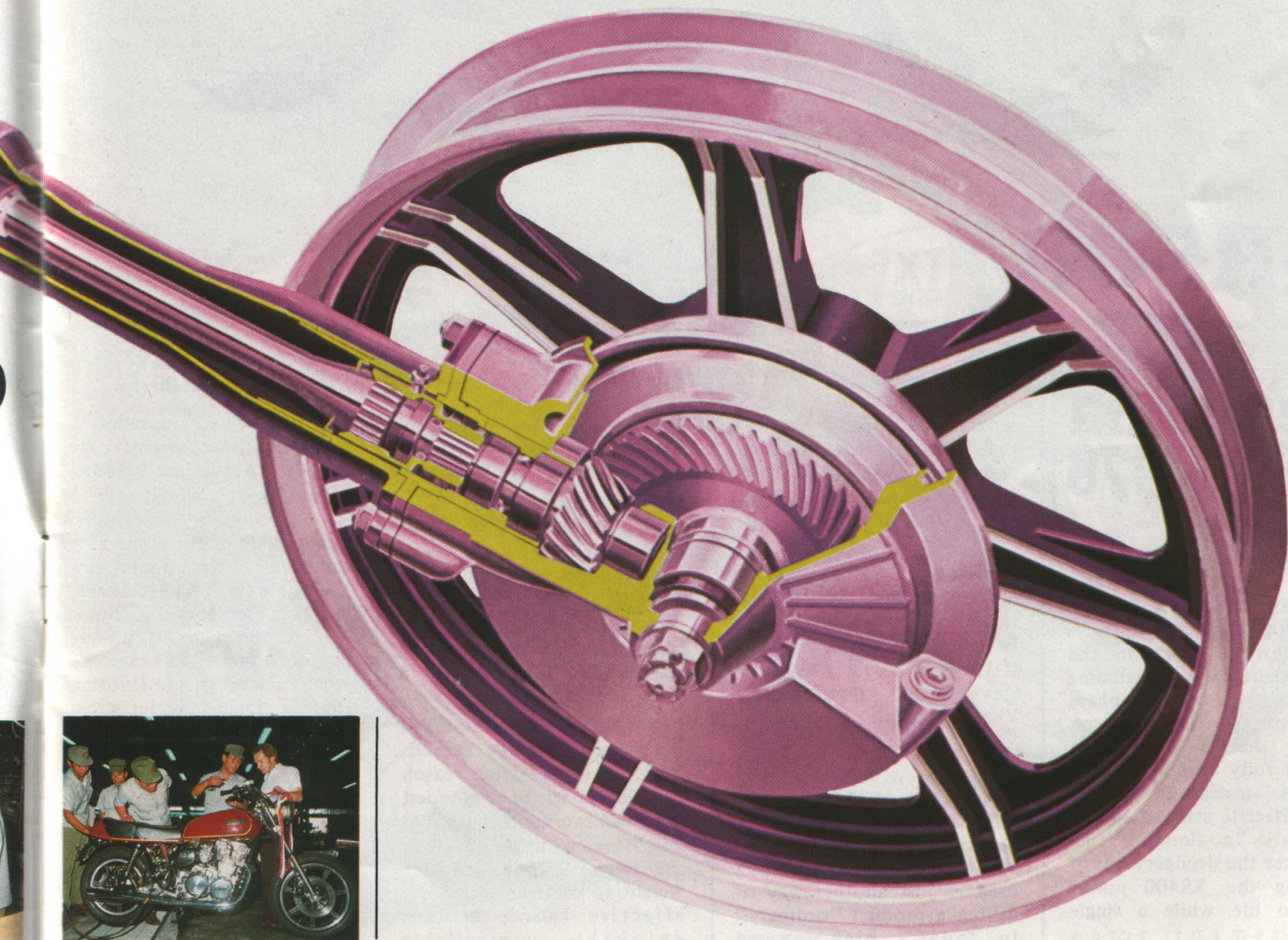
The XS400 packs a heavyweight punch in an eminently-handleable middleweight package. It is one of the very best of what people today have come to call

"commuter bikes". These are machines which will happily serve as a workhorse during the week, taking the rider in perfect safety and comfort to and from the office or factory. Then they are capable of abruptly changing character when the weekend comes around. Of turning into the type of sporting or long-distance touring motorcycle that signifies "real motorcycling" to most enthusiasts.

At one time a sporting motorcycle was a distinctly different animal from the utilitarian "transport-only" two-wheeler and the twain certainly never met.

The XS400 has changed all that and gives its rider virtually two choices of machine in a single package...truly "a bike for all seasons".

For those weekends on the open road, the combination of the XS400's twin cylinder







# SR500

## Yamaha 1978

engine and six speed gearbox will whistle the rider along at over 90mph. And for those trips through town to the office there are such welcome features as a three-phase electromagnetic field coil system that will keep the battery fully charged even in "stop-go" traffic and on short runs. Electric starting and an automatic "no-flooding" fuel tap takes the drudgery out of bringing the XS400 power unit to life while a single adjustment screw synchronises both carburetors.

The buyer of a motorcycle in

today's world doesn't want to waste time on constant service. He wants a machine that he can ride without any maintenance worries.

The XS400 fills that requirement and does so while still being capable of over 90mph on the open road or covering literally thousands of inner-city commuter runs between services.

If there was ever a bike for "everyman", that bike is Yamaha's XS400.

### YAMAHA XS250

Describing something as being "functional" has often been used as just another way of calling a product "ordinary" in today's high-powered marketing world. But Yamaha's 1978 XS250 lightweight street motorcycle

is here to prove that this is not always the case...the XS250 establishes beyond any doubt that a motorcycle can be both functional and fun!

Motorcycle writers have coined the phrase "urbo-bike" to describe such machines as the XS250. It signifies a machine that is as happy and effective in congested urban surroundings as it is on the open road.

It is hard to imagine a machine better filling the "urbo-bike" description than the Yamaha XS250 and the basic reason for this is its twin-cylinder, overhead camshaft engine that combines with six gearbox speeds and a 166kg machine weight to offer an incredibly effective balance between enjoyable, controllable horsepower and that all-important fuel economy factor.

### YAMAHA SR500

In an age where complicated multi-cylinder engines are commonplace it becomes increasingly difficult for a manufacturer to provide the public with that "something different" to fire up some new enthusiasm. At Yamaha, however, we found a simple way to add a totally unique model to our 1978 range. We went back to an old favorite, the big single cylinder street machine, and presented it in a bang up to-the minute guise. The new SR500 has all the thumping power of the big "singles" that ruled the motorcycling roost two decades ago...all the characteristics to delight those who remember "the good old days". On the other hand, its specification is right up-to-date: the SR500 is no old-fashioned has-been with a



fancy paint job. It is modern motorcycle engineering at its best. An all-alloy 500cc engine with overhead camshaft and five-speed gearbox in a light, lean chassis that will put middle-sized motorcycling in a new perspective.

And, of course, modern motorcycle technology has been used to overcome the bugbears of old-time biking...especially the complicated starting procedures that were the biggest drawback of the old big singles.

In the old days you needed a right leg like a football player to kick a thumper into life. On the Yamaha SR500, starting couldn't be simpler. Yamaha have provided an automatic ignition advance/retard unit in conjunction with a piston

position indicator and a compression release. This combination allows you to fire up the SR500 with a single, smooth, swinging kick.

So: for the traditionalists the SR500 can bring back the "good old days" without any of the bad things that time may have glossed over. For the modern motorcyclist who thinks nothing of nostalgia, the SR500 introduces a new style of mid-range motorcycle. Simple in design, lean and lithe, lightweight.

An old favorite presented in modern form. A motorcycle that is unique in today's world...the Yamaha SR500. The concept of the SR500 began to germinate in the minds of Yamaha design and marketing men almost as soon as the XT500 four-stroke dirt

machine had appeared on the market.

That model met with immediate public acceptance with the off-road fraternity and a surprising number of riders who, despite the Enduro aspect of the XT500, never took them off the highway.

It seemed obvious that the XT500 had sparked off a wave of nostalgia for the big single-cylinder four-stroke "thumper" and, in addition, was arousing the curiosity of young motorcyclists who had never even considered this type of machine before.

The SR500 was the natural next step. A complete breakaway from the heavyweight machinery that has come to be associated with sports machines today.

From the outset the SR500 was designed to be a machine utilising its power-to-weight ratio to give a sparkling performance. It's a slim-line sportster that is lighter than any other model in the middle-sized capacity bracket with a narrow, high-riding profile that allows it to be whistled through the bends at an incredible angle of lean.

Once the Yamaha XT500 had hit the market, the advent of the SR500 was merely a matter of time. Now it's here—a completely unique machine on today's market and one that is here by public demand. The Yamaha SR500!

Heart of the SR500 is the single cylinder, four-stroke power unit. It's the biggest single cylinder machine made by any major manufacturer

# XT500





# Yamaha 1978

today and has all the lusty, thumping power that one has come to associate with this type of engine. Single cylinder engines rely more on solid, stomp-pulling torque than buzzy rpm and they produce the type of horsepower that a rider can actually "feel" and relate to.

The SR500 has an "oversquare" bore to stroke ratio of 87 x 84mm. The larger bore means that it can rev higher than most four-stroke singles and still have the relatively slow piston speed that means good torque and rugged reliability. Producing 32bhp, the SR500 is fired by capacitor discharge ignition and breathes through a 32mm Mikuni fitted with an accelerator pump for easier starting plus a hot idle compensator for steady, even low-speed running. Valves are operated via a single overhead camshaft.

## YAMAHA XT500

In past years the large capacity single cylinder four-stroke was the "glamour" bike of the off-road motorcycle market. The "thumper" ruled!

In later years, however, the lighter two-strokes were the kings on the dirt.

Even so, there was still a great amount of feeling for the big single. Such a groundswell of

affection that Yamaha felt that it must surely be something more substantial than simple nostalgia.

Hence the XT500 - the first really "full-sized" 500cc single cylinder machine to be sold in quantity since the nineteen-sixties and an immediate hit with motorcyclists on each side of the generation gap. The thumping, striding horsepower of the 499cc overhead camshaft engine gives the XT500 a character all of its own.....a character appreciated even by riders who were too young ever to have had the chance to ride those singles of almost two decades ago.

The enduro-styled XT500 is a real dual-purpose bike, capable of effortless cruising on the road or of thumping its way across the rough country to great effect.

An idea of its capabilities can be gained from the fact that Sweden's Bengt Abert is using a Yamaha XT500 four-stroke motocrosser to such effect that in 1977 it became the first four-stroke to win a Grand Prix motocross in almost ten years...against the absolute best opposition in the world. And an XT500 in the hands of Frenchman, Gilles Comte, won the gruelling marathon from the Ivory Coast in Western Africa to Nice in France. Conditions ranged from muddy jungle roads to the sands of the Sahara desert...an incredible test which the Yamaha XT500 passed with flying colours.

Now, thanks to Yamaha, those people who would have considered any 500cc

four-stroke single to be merely a collector's item are thinking again.

The "thumper" is back! The XT500 is everything that the old "thumpers" were - and then, some!

## YAMAHA RD400

Yamaha's most powerful street two-stroke, the RD400, is a direct descendant of the machine's that made the company's name synonymous with motorcycle sport - the famous and incredibly successful twin cylinder road racers.

Since Yamaha first appeared with their twin cylinder two-stroke power unit over 15 years ago, it has been continually developed and refined to a pitch where it is perhaps the most efficient and powerful middleweight two-stroke machine in the world today.

Cast alloy wheels, disc brakes, CDI ignition, reed valve Torque Induction and Autolube oiling are all part of the RD400 specification.

The sportiest of Yamaha's middleweights in terms of both power, styling and handling, the RD400 oozes its racebred heritage from every angle. This is confirmed by a ride on the machine, with acceleration, top speed, braking and handling being almost up to racing standards. So close to racing standards, in fact, that the Yamaha RD400 is one of the most popular machines with riders in the production road racing category.

You might not want to take to the racetrack, but if you

want all the thrills and excitement that a racebred machine can offer, then the Yamaha RD400 is for you!

## YAMAHA RD250

One of the very first sports machines ever introduced by Yamaha was a 250cc two-stroke twin and it was acknowledged by all as one of the toughest fastest bikes in its class.

Now, over 15 years later, nothing has changed. Yamaha are still making a superb 250cc two-stroke, twin cylinder sports machine and it's still acknowledged as one of the leaders in its class.

Chosen by sporting riders and production racers as the ultimate 250, Yamaha's RD250 has an engine that still has all the hallmarks of its race breeding. The Yamaha 250cc twin cylinder power unit has taken many riders over the years to World Championships and Grand Prix wins and it is still doing just that! The RD250 engine shares many of the features of the racing power units and these similarities show up in its overall performance.

Torque Induction, Autolube oiling, cast wheels with front and rear disc brakes, a frame based on recent Yamaha racing machines and six speed transmission. All of these things combine to make the RD250 one of the most exciting projectiles in its class. Again!

## YAMAHA RD200

The Yamaha RD200 has established itself in past years

# RD125





at the top of the lightweight street bike field and the 1978 version of the machine continues that tradition in an even more emphatic manner.

Light in weight, easy to handle and economical to run, the RD 200 cannot fail to find favor with lightweight fans...especially those who like their lightweights fast!

The 200cc twin cylinder engine has a direct relationship to Yamaha's Grand Prix winning two-strokes and this shows up in the sparking acceleration and high cruising speed.

Cast wheels and disc brakes emphasise the true sporting nature of the RD200 while rider comforts are not neglected. Comforts like an electric starter and a wide, comfortable seat that would do justice to much bigger machines. Whether you use the lightweight and precision handling to weave through the rush hour traffic to work or if you prefer to play racer on the back roads, the RD200 has to be top of your lightweight list.

## YAMAHA RD125

"Good things come in small packages" says an old maxim...and the Yamaha RD125 is motorcycling proof of that statement!

Howling its way to 10,000rpm, the RD125 has a power unit that is almost identical to machines that, not so many years ago, were winning World Championships for Yamaha. Now those same engines in refined form are providing lightweight enthusiasts with one of the most exciting rides on the road.

The little RD125 is a true sports thoroughbred with its racing heritage moulded into every line. Even the chassis is based on Yamaha racing design and the whole machine handles, brakes and performs in a manner that belies its engine size. It's one of the safest, sportiest machines on the road, regardless of capacity and one of the most comfortable too. A wide, comfortable seat that would not be out of place on a big touring machine combines with full instrumentation and adds luxury to the sporting package.

Whichever way you look at it, there's no way the competition can handle what the RD125 has to offer.

## YAMAHA RD50

The little RD50 is Yamaha's smallest sportster and though it's tiny...it's tough too!

Putting all of Yamaha's racing experience to work in a scaled-down package, the RD50 has all the attributes of the bigger sporting machines.

True motorcycle hydraulic front forks and a big front disc brake, duplex cradle frame with hydraulic rear suspension, Torque Induction and Autolube, a five speed gearbox and sporty slimline styling set off to perfection by Yamaha's famous "speed block" motif.

Economical, easy to handle but still an exciting little performer, the RD50 is an ultra-lightweight that's ALL motorcycle!

## YAMAHA RS125

The Yamaha RS125 might fall into the ultra-lightweight category but don't let this mislead you into thinking that it's one of those dull and dowdy 'economy bikes. Far from it! The RS125 has put the fun right back into small-bore biking thanks to its ideal combination of lightweight, great handling and zippy, high-revving power.

An alloy cylinder engine with 14bhp on tap will push the 96kg lightweight along at over 120 km/h and the braking and handling of the RS125 are well on a par with its performance. Frame is a double cradle unit that obviously reflects Yamaha's racing background while front forks are not the spindly, poorly - damped items that so many other manufacturers choose for their small capacity machines. The RS125 might not be expensive but, even so, Yamaha have spared nothing in terms of basic specification

The front forks are sturdy, hydraulically - damped components similar to those fitted to the bike's bigger brethren in the Yamaha range.

And as far as braking is concerned, a 245mm disc brake at the front eliminates any worries that the rider might have about pinning the RS125 down to a standstill in an emergency.

Ultra-lightweight or not, this machine is built to the same exacting standards as the rest of Yamaha's sporty range. The only thing cheap about

the RS125 is the price you pay for it!

## YAMAHA RS100

For those motorcycle enthusiasts who want the pleasure of two-wheeled transport but who do not want to cope with either the weight, power or expense of a large-capacity machine, Yamaha has a perfect answer....the RS100.

Its single-cylinder, two-stroke engine uses the same type of reed-valve induction that works so successfully on Yamaha's World Championship road race and motocross machines and the little bike's sporting lines are a clue to the Yamaha racing heritage.

The RS100 is a true motorcycle in every sense of the word, despite its small-capacity, economical power unit. It will buzz to 8500rpm and a road speed of over 110 km/h, while the combination of a low centre of gravity and a five speed gearbox make it a delight to ride in heavy traffic.

Even though it only has 100cc at its disposal, the RS100 is all motorcycle!

## YAMAHA FS1 & FS1DX

The smallest of the Yamaha lightweights, the 50cc FS1 and FS1DX combine all the attributes of a big machine in a bright little package that serves as an ideal introduction to motorcycling.

These little sportsters, despite their small size and power output, reflect a lot of the thinking that has taken Yamaha to the top in the racing world.

A rigid pressed steel chassis makes them among the very best-handling machines in the ultra-lightweight class while the 49cc engine zips the bike along at a more than respectable speed.

There is a great accent on safety with the FS1. Waterproof drum brakes on the FS1 and a 203mm hydraulically-operated front disc brake on the FS1DX plus front forks that would do justice to a bike of much larger dimensions. They all combine to make a machine that, despite its size, gives that real motorcycle feeling.

The sporty image is enhanced by such styling extras as the "speed block" paintwork, the rubber boots on the front forks and the chromed external springs with

lively performance and a host of safety features to leave the rider in no doubt that, despite the size, the FS1 still reflects Yamaha's racing background.

## YAMAHA "BOP"

BOP! Even the name is amusing and that's exactly the feeling that Yamaha's bright little bike is meant to instil in its purchasers. Bright colours and zappy jet-age styling make the BOP a bike for the young....or for those who don't feel like growing quite as old as their birth certificate might say they are!

The whole emphasis is on biking for fun, and that means taking out the inconveniences that can sometimes make motorcycling a chore.

For example, vacuum-sensitive fuel taps mean that you don't have to worry about switching the fuel on and off, there's a luggage rack and a helmet lock and simply lifting up the seat reveals the oil tank, battery and toolkit.

The sleek, modern styling is designed to match today's leisure clothing fashions and the combination of Autolube oil injection and reed valve induction means that the power unit stays clean. The engine is an eager little 50cc unit that, mated with a four-speed gearbox and the BOP's wide-tyred, 10 inch wheels, turns the 60km/h top speed into an exciting, enjoyable riding experience. The incredible fuel economy makes the BOP a great choice for short-haul commuting. Only thing is, you'll probably enjoy the experience so much that you'll start looking for errands to run or excuses to nip into the office at the weekends.

No doubt about it....the BOP is the bike that makes every ride a joyride!

## YAMAHA "CHAPPY"

Not every motorcyclist likes the feel of leather against his skin and flies on his teeth! There are literally many thousands of enthusiasts who prefer less esoteric motorcycling pleasures - like simply getting up on two wheels and going!

For those who prefer their motorcycling to be both enjoyable and uncomplicated, Yamaha have the ideal machine...the Chappy.

Simply get on it, kick the engine into life, twist open the throttle and away you go. You



# Yamaha 1978

don't even have to worry about changing gear. Just let the Chappy's automatic gearbox handle that worry for you!

Small wheels, wide tires and a deep seat combine with true 'big -bike' styled suspension to give a super comfortable rider, right up to maximum speed. And the alloy 50cc two-stroke engine is oh-so-economical!

Designed specifically as a machine suitable for all ages and either sex, the Chappy has an open-frame design allowing women riders to ride comfortably in a skirt or dress. On the other hand, its modern styling suits the male rider equally as well and is an ideal compliment to today's casual men's clothing.

Male or female, old or young, you'll find the Chappy the perfect answer if you like your motorcycling to be comfortable, economical and uncomplicated!

## YAMAHA DT400MX

You can't really call the Yamaha DT400 "a wolf in sheep's clothing" for the bike is one of the toughest-looking on/off road machines ever built. Even so, the description almost fits because the sleek, stylish lines of the DT400 give no hint of the power available from the big two-stroke single.

Fully at home on the street, with the five speed transmission and 29bhp motor giving a more than respectable high-speed cruising ability, the DT 400 comes equipped with all the luxuries of life. Turn indicators, powerful headlamp, deep, comfortable dual seat, passenger footrests and speedometer/tachometer panel angled at 25 degrees towards the rider for easy vision.

Despite all of these niceties, a single glance at the DT400 reveals that it was destined to do something more than provide transportation to the office (though it would function quite competently in that role).

The monoshock chassis is a direct development of the unit used by Heikki Mikkola to win the 1977 World Championship and the 400cc motor bears a great deal of similarities to the

Championship-winning machine.

The off-road performance capabilities of the DT400 rank on a par with many pure moto cross racing machines and yet the big Torque Induction two-stroke is flexible enough to ride as a trials-type machine!

The reed valve induction aids in this respect and Yamaha Autolube oiling system plus Capacitor Discharge Ignition also combine to make the DT400 unit the kind of reliable power unit that you need if you are going to embark on the kind of long distance cross-country expedition that the big Yamaha seems to invite.

The Yamaha DT400 is meant for the kind of motorcyclist who enjoys his freedom...the freedom to ride the wide open spaces at speed. But it also gives that motorcyclist a second choice...a powerful bike for road cruising while flexible enough for commuting.

It is the absolute essence of the dual-purpose machine: capable of completing the International Six Days Trial on the one hand while happily dealing with six days commuting on the other!

## YAMAHA DT250MX

It's not uncomplimentary to suggest that Yamaha's DT250 Enduro machine sets a double standard...especially when that double standard is the best possible compromise between the demands of street and off-road riding! In each of these areas the DT250 sets riding standards that other manufacturers can only hope to emulate. The superb Yamaha DT-Series power unit has been the subject of constant improvement and development since it first

appeared a decade ago. Now it represents the ultimate state of the art in the attempt to design a power unit that will perform as well on the open road as it does on the moto-cross track.

Versions of this have powered Yamaha moto-cross machines to World and National Championships and the latest DT250 features another direct development from the racing scene...the monoshock cantilever chassis. Proven both in moto-cross and road racing, the monoshock chassis revolutionised the world of suspension development when Yamaha introduced it five years ago. And Yamaha is still the only major manufacturer to utilise the cantilever frame for a volume production machine.

In every respect, the DT250 represents the pinnacle of "dual-purpose machine" development. It has everything that the serious off-road rider needs, including such refinements as unbreakable plastic front mudguards, re-settable trip meter and speedometer for the enduro enthusiasts, a chain tensioner and rubber boots on the front forks to keep out the water and dust.

On top of all this, the 23bhp, five-speed power unit and lighting equipment that meets all Government regulations (it has turn signals too) mean that the DT250 is more than respectable performer on the street.

## YAMAHA DT125MX

The design of lightweight enduro machines has improved immeasurably over the past few years, with more and more manufacturers realising that not every trail rider wants to manhandle

either the weight or the horsepower of the bigger machines on the tough trails.

Yamaha has always offered a top-quality lightweight in its dual purpose Enduro range but there's no doubt that the new DT125MX is more than a match for any comparative machine. It follows the big bikes in the Yamaha DT range in having the monocross suspension chassis that Yamaha designed for its World Championship - winning moto-cross racers. Now that competition technology has been put to work on an Enduro lightweight with staggering results.

Both in the chassis design and in its basic engine specification, the Yamaha DT125MX bears a close relationship to the Yamaha 125cc motocross racers that took Dutchman, Gerard Rond, to Grand Prix wins this year and which earned American National Championships for Bob Hannah and Broc Glover in the past two successive seasons.

This race-breeding is evident in the performance and the handling of the DT125MX...a machine that is unique in the Enduro field.

It's a tough trail lightweight that still has full street equipment making it capable of true double duty as a ride-to-work bike during the week and a really effective off-road lightweight whenever the getaway urge hits.

The engine of the DT125 MX is based so closely on the engine of the moto cross YZ125 that it even looks the same, with heat dispersant matt black finish, alloy deep-finned head and cylinder barrel. The motor features a racing piston plus competition transfer porting. A high-grade steel crankshaft runs in roller bearings and drives through a multi-plate clutch to the six-speed gearbox.

It is all of this combined with reed valve torque induction that enables the engine of the DT125MX to produce true competition performance with street tractability.

## YAMAHA DT50

Just like the rest of the famous Yamaha DT Enduro range of dual purpose street/trail bikes, the new DT50 is equally at home on city streets or out in the rough country.

Only difference between the DT50 and its bigger

# IMPORTANT

During the year to come Yamaha will produce in the region of two million motorcycles for sale all over the world. Each country has its own regulations relating to turn indicators, mirrors, mudguard lengths and so on as well as certain horsepower ratings for favourable insurance rates. Therefore, we at Yamaha produce machines to enable national importers to take advantage of these things and to enable them to comply with all of their particular governmental regulations.

As a result, the models contained in these pages do not represent the complete Yamaha 1978 range and certain machine specifications may differ from country to country. For example, all of the models featured here are those built to the French market specifications and may differ elsewhere.

You are advised to contact your local dealer for full details of the Yamaha models available in your particular country and for the exact specifications of those models.





**RD400**



**XS250**

# **DT125MX**





# YZ125



## Yamaha 1978

brothers, as far as capabilities go, is its lack of cubic inches...and to those riders whose preference is towards lightweight machines, that won't matter a bit.

The DT50 is a genuine enduro machine on a small scale; a great little street bike that can carry you way across the city to work or out on the country lanes - but still a bike with true off-road capability.

Sharing the same tough little four-speed, Torque Induction engine as the TY50 trials machine, the Enduro-styled DT50 features a large capacity 6 litre tank (plus separate oil tank for the Autolube engine unit), braced handlebars and enduro mudguards.

The high level exhaust pipe with heatshield completes the sporting look of this Yamaha ultra-lightweight especially designed with a dual-purpose role in mind.

### YAMAHA TY250, TY125 & TY50

For 1978, Yamaha have a three-machine trials range headed up by the well-proven TY 250, the machine developed by Mick Andrews, double European Trials Champion, and used by him to win such classics as the Scottish Six Days Trial.

The TY250 lines up alongside another popular Yamaha trialler, the TY125 that combines performance with lightweight for those trials riders who prefer to utilise a favorable power to weight ratio rather than outright horsepower.

Finally, there's the little TY50M...a little jewel of a trials bike in miniature with a 3.2bhp 50cc engine featuring reed valve Torque Induction, Autolube oiling and a four-speed gearbox.

The Yamaha TY50M might be a lightweight in terms of engine size, overall dimensions and horsepower but it's very definitely in the "heavyweight" class when measured in terms of its "go-anywhere" capabilities.

The little TY50M is a genuine trials machine, capable of tackling many of the same sections as its bigger brothers in the Yamaha trials

# YZ250





range. Just like the rest of these machines, the TY50M draws on the experience of double European Trials Champion, Mick Andrews, and this experience is reflected in the machine's styling and specification. It's no "boulevard" bike posing as a trials machine....the TY50M, while quite happy cruising the cafes, is quite capable of dealing with the rough stuff.

For off-road enjoyment, trail riding, novice-class trials or even as a snappy little street bike, the TY50M brings the real excitement of a genuine competition machine to motorcycling's smallest category.

### YAMAHA YZ400

In his first season with the Yamaha Moto Cross team, Finland's Heikki Mikkola took the richest prize in moto-cross racing, the World 500cc Championship. And he did it with his special development version of a bike that you, "Mr. Average Moto Cross Racer" can go out and buy....the Yamaha YZ400, a bike that can take you out of the "average" ranks and up amongst the winners.

The specification of Mikkola's title-winning bike is not so different from the YZ400 on your dealer's showroom floor. Let's take the similarities point by point:

First of all, the YZ400 and the Championship winner share the famous cantilever Monoshock chassis with its rigidly-triangulated rear swinging arm section and single, long travel gas/oil shock. It allows 250mm of rear wheel movement and the exceptionally smooth weight transfer characteristics from the front of the bike to the rear as the power is turned on (and vice versa when the rider shuts off) keep the rear wheel following the ground contours much better than any conventional suspension machine. You won't fly through the air so much on a YZ400....you'll be smoothly riding the bumps, keeping the power flowing through to the ground and making time while others are airborne!

Tuning the suspension to suit your own needs and to match the terrain of each and every course that you race at is simplicity itself. An external adjusting ring at the top end of the De Carbon shock allows you to adjust the damping characteristics of the shock

Continued on Page 31.

# YZ400



# XS500





# Yamaha World Champions

## HEIKKI MIKKOLA

Total domination is the only way to describe Finland's Heikki Mikkola's blitzkrieg on the 1977 World 500cc Moto Cross Championship. He was top points scorer in nine of the twelve Championship rounds and in one of those, the final Swiss event at the end of August he made only a token start as he had broken a bone in his hand during a race crash the previous week. In the other two events where he did not top the points the tough Finn took a fourth and a second place overall.

Twenty four 45-minute motos made up the twelve title rounds and in the 22 of those races that he competed in, Heikki won 12 of them, never finished lower than fifth throughout the Championship season and retired on just one single occasion! Even that was due to a melee caused by another rider that snapped off his front brake lever!

By the time the Grand Prix circus had completed the tenth race in the series, on the tree-dotted "Citadelle" circuit at Namur in Belgium, Mikkola had clinched the Championship beyond any doubt. At the close of the season he had crushed Suzuki's Roger De Coster by 272 points to 219....even without contesting the final Swiss round with its possible 30 available points.

In actual fact, before the season was even half over it was glaringly obvious that Mikkola's drive for the title was all but unstoppable. For after a fourth place in the season opener the hard-charging Finn took an almost-unprecedented string of seven high-point efforts in succession!

The signing of Mikkola to Yamaha last winter was one of the major surprises in moto-cross history. He had ridden for the Swedish Husqvarna factory since the early seventies and had captured two World

Championships for them....the 500cc title in 1974 and the 250cc Championship in 1976.

With a another World Championship gold medal in his trophy cabinet from the season that he had just completed, it seemed totally unlikely that Mikkola would switch from the machines that he had ridden throughout his motorcycling career. As well as two world titles, Husqvarnas had given him the 1973 Inter-AMA Championship in the USA and Finnish National titles in

moto-cross, enduros and ice-racing (he was also a national snowmobile champion!).

So why switch brands while a reigning World Champion? For Heikki the answer was a simple one. He had a chance to try Yamaha's 1977 500cc racer and summed it up in a single phrase..."it's a better machine!"

Heikki's ambition was to once again wrest the 500cc crown from Roger De Coster and, in his opinion, the only machine that could enable him

to do this was the new Yamaha.

His confidence in the bike was totally and obviously justified!

The moto cross season opened in Austria where Mikkola debuted the bike with a satisfactory fourth place overall by taking third place in the opening moto and fifth in the second.

Then, at the Dutch round that was next on the calendar, the Finn literally shattered the moto cross world with two absolutely runaway wins and overall victory. The blitzkrieg had started!

From then on the 1977 season was virtually a Mikkola walkover. In Sweden he followed Brad Lackey to second place in one moto but won the next to take another overall win.

At home in his native Finland it was another (and extra-satisfying) double moto sweep, while in Germany he continued the overall win streak despite losing one moto to Dutchman, Gerrit Wolsink. Heikki had won the first 45-minute battle and this second place assured him of another top score.

In Italy Heikki again topped the points, winning the first race and pressing eventual winner, Roger De Coster, in the next.

It was across the Atlantic for the next two rounds, the American GP at Carlsbad in California and the Canadian event a week later.

Heikki has never been a great fan of the hard-packed, spectacular Carlsbad track but he took a workmanlike fourth place in the opening moto and won the second after a mishap between Brad Lackey and Roger De Coster.

By a quirk of the American regulations Heikki was denied the overall win despite the fact that he was the highest Championship points scorer! He and Gerrit Wolsink had tied on their moto placings with Heikki taking a fourth and a first for a total of five race



Heikki Mikkola



points. Wolsink totalled the same with a third and a second. The American supplementary regulations decreed that any ties would be decided by whoever had completed the two motos in the shortest elapsed time...and by this method Wolsink took the win.

Strangely enough, the World Championship points system bore no relationship to the American Motorcyclist Association race scoring and on a Championship points basis Heikki had taken 23 points to Wolsink's 22. And for Heikki, that was what really counted. Whatever the American regulations said, he had topped the Championship points and extended his lead over De Coster and Wolsink!

In Canada a week later, Mikkola hammered the point home with another overall win by means of victory in the first moto and third behind Wolsink and Lackey in the next.

The British Grand Prix event opened with Heikki's one and only retirement on his way to the title. A slower rider brought off Roger De Coster on the opening lap of the first moto and Mikkola was involved in the melee. The ensuing tangle broke off his front brake lever.

As the race went on, the lack of a front brake caused Heikki to crash on a fast downhill and, though he remounted, he retired shortly afterwards as his goggles were filled with mud and he was already out of the points.

Just to emphasise the fact that he was on top of the world, Mikkola came back to dominate the second moto and tie up a second place overall behind popular American, Brad Lackey.

Then came the tenth race of the Championship year, with Heikki poised on the verge of winning his third World title.

And win it he did! Roger De Coster made a desperation effort to keep the title out of Mikkola's hands by winning the first moto but Heikki was right on his shoulder in second spot.

In the second moto Suzuki's Wolsink took up the challenge and he and Mikkola were locked in a torrid dice for almost the whole of the race until Gerrit crashed the Suzuki at speed.

From that point on it was just a case of cooling the champagne! Heikki Mikkola

and Yamaha were World Champions!

Just to round out the season, Heikki emphasised his superiority with yet another win...this time in Luxembourg. He did it by winning one moto and taking a third place in the other. From every angle the Luxembourg Grand Prix was a great day for Yamaha as, in addition to Heikki's win, Sweden's Bengt Aberg won the first moto on the XT 500-engined four-stroke entered by Swedish Yamaha distributors, Hallman & Eneqvist. It was the first Grand Prix win for a four-stroke in over ten years!

The final Grand Prix of the year came in Switzerland but was anti-climactic from the Yamaha point of view. Mikkola had injured his hand in a race crash the previous week and, although he tried to start the first moto, he was unable to compete. He pulled out of the first race after a few token laps for the benefit of the Swiss crowd and was then a non-starter in the final moto.

The disappointment was lessened, however, by a celebration barbecue after the race organised by Yamaha and Camel Cigarettes, sponsors of the GP series.

Riders, mechanics and friends from all of the rival teams joined with pressmen, trade personnel and fans to toast a winning combination - Heikki Mikkola and Yamaha,

World Champions in their first season together!

## STEVE BAKER

When it was announced at the beginning of the 1977 season that Yamaha had picked young American, Steve Baker, to spearhead their World Formula 750 Road Racing Championship effort, the general reaction was that the combination was assured of success.

That reaction was soon confirmed when Baker won the opening round of the series at Daytona and then, apart from just a few exceptions, simply kept on winning...and winning...and winning!

The 25 year old bespectacled American (he hails from Bellingham in the Pacific Northwest state of Washington) had staked his claim to the Yamaha team with a scintillating 1976 season in which he dominated American road racing (including double 250 and 750cc wins at both Laguna Seca and Loudon National Championship events) as well as winning four of the six races in the John Player Transatlantic Trophy Series, the giant Imola 200 and the British "Race of the Year" at Mallory Park.

Having inked his name to the Yamaha factory contract, Steve began the 1977 season in the same way that he had climaxed the previous one.

At Daytona in March the F750 Championship year began with the classic 200 Mile race. This year, however, the race was marred both by bad weather and raging controversy.

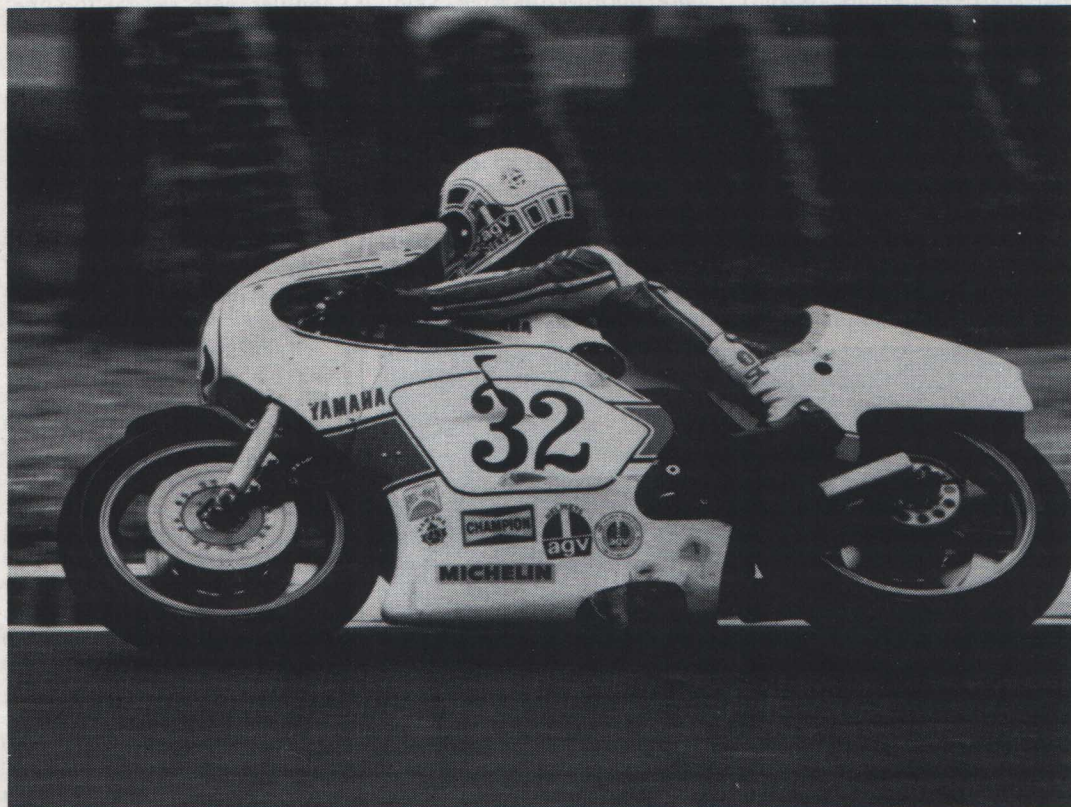
Riders and tyre technicians battled with the race organisers over the length of the race, pointing out that there was no way that today's 130bhp racers could run 200 miles in the kind of heat and speeds that are a feature of the Florida classic without shredding the treads completely off of the sticky "slick" tyres.

Eventually the American Motorcyclist Association decreed that the race should be split into two 100 mile segments and the event got under way.

When the checkered flag dropped to conclude the first race it was Steve Baker ahead of another American Yamaha star, Kenny Roberts with Japan's Takazumi Katayama third.

The teams were all in the pits readying the machines for the second - and decisive - race when the changeable Florida springtime weather took a hand and the speedbowl was drenched by a tropical downpour.

The rain continued on into the afternoon until the AMA had no choice but to cancel the second event and award the race on the basis of the



Steve Baker



# YAMAHA WORLD CHAMPIONS

first segment results. It was a decision that left Steve Baker several thousand dollars richer and in the lead of the F750 World Championship!

After that it was time for Steve to pack his bags and leave his native country for his first complete season in Europe...a season that was to conclude with him becoming America's first-ever World Champion!

Baker began his European odyssey at Imola in Italy, scene of another 200 mile classic.

In this race the rivalry between he and fellow American, Kenny Roberts, continued...with Roberts getting the 15 points for the win and Steve having to settle for the 12 points accorded to the second placeman.

Next the circus moved south to the tight little autodrome at Jarama, just outside Madrid in Spain.

Roberts had gone back to America and there was a generally-poor entry so Steve won the event with ease, never having any real pressure to cope with.

At Dijon in France it was a different story. Spurred on by a wildly-enthusiastic and totally-partisan French crowd, local ace Christian Estrosi of France and Phillipe Coulon (from just across the border in Switzerland) took top honours. Steve had never seen the circuit before and declined to dice with the pair of local track specialists, settling instead for safe third place points.

Even so, he was still firmly ahead in the Championship

and was about to embark on a winning streak that would clinch the title for him.

At Brands Hatch in England, Austria's Salzburgring and Zolder in Belgium, Steve raced to clearcut victories and clinched the title at the Belgian event.

He then completed his European year in the Champion F750 Classic over the sweeping curves of the Assen track in Northern Holland but he had to be satisfied with a second place to Italian charger, Marco Luchinelli.

The wily Italian gambled on being able to complete the second part of the two-segment race without a pit stop for refuelling. Baker stopped for fuel and, despite a heroic all-out effort in the final stages, just failed to catch Luchinelli at the line. Just over half a second was all that separated them when the results were computed!

In fact, the Zolder race in Belgium was the last outright win that Steve was to gain in the F750 Championship series. (Not that it really mattered, as he had already annexed the title in the most decisive manner possible).

Back on home turf in the Champion Spark Plug 200 over California's picturesque Laguna Seca course, Steve again had to settle for a second place overall. He ran third in the first heat behind superfast American youngster Skip Aksland (Yamaha) and Kawasaki's Greg Hansford and then totally dominated the proceedings in the final race. Aksland, however, took second place and so clinched the overall victory.

Deciding to give the final German round a miss so that he could remain on his own side of the Atlantic, Steve finished his season at Mosport

Park in Canada where he ran third to the Kawasakis of Greg Hansford and Yvon Du Hamel. This was the only Formula 750 Championship race of the year that was not won by a Yamaha!

With the Laguna Seca and Canadian rounds out of the way, Steve hung up his leathers for a well-earned winter rest. He had completely dominated the opposition in F750 racing (as well as finishing second in World 500cc points) and at the close of the season had scored more than twice the tally of his nearest competitor, young Frenchman Christian Sarron. The points spread was 131 to 55 in Baker's favour.

Very definitely a satisfactory season for the young American...and even more so when one considers that he had never even seen the majority of the European circuits upon which he had to race for those Championship points!

## TAKAZUMI KATAYAMA

After a season in which he won half of the 350cc Grands Prix in which he competed, hard-riding Takazumi Katayama took the checkered flag at the Finnish Grand Prix to become Japan's first-ever World Champion.

Born in Japan of Korean parents, Takazumi first came to Europe in 1974 and immediately gave notice of his abilities with several top-line performances, including a Grand Prix win. Ever since then he has been one of the major forces on the GP scene, particularly in the 250 and 350cc categories. In addition he had been a leading light in F750 racing, despite the fact that he only contests this class when it does not conflict with his program in the smaller brackets.

Takazumi began the 1977 season as the focus of attention in the 350cc class when he was chosen as the rider who would pilot the new 350cc three-cylinder two-stroke that was developed as an independent project by Yamaha Motor Company NV in Amsterdam.

Harley Davidson had got a grip on the class for the past couple of years and everyone was anxious to see whether the new, and relatively untried, Yamaha could combat the well-proven Italian two-stroke.

They had to wait until the

West German Grand Prix in May before they got the answer as Katayama did not contest the opening round in Venezuela and then the Austrian GP was stopped after a multiple crash.

In West Germany, however, the triple made a dream debut and Takazumi got on to the Championship scoreboard with 15 points for the race win!

He went back to his twin-cylinder machine for two races in Italy and Spain as the power curve and lighter weight of the YZ350 were better suited to the characteristics of these tracks and added to his points tally with a couple of third places.

Then it was back to the triple and back to the winner's laurels with successes in both the French and Yugoslavian Grands Prix.

A retirement in the Dutch TT at Assen temporarily slowed down Takazumi's title bid but a subsequent trip north for the Scandinavian swing in the Championship was to clinch things for the cheerful Oriental.

A typically hard-charging ride at Anderstorp gave Katayama the maximum from the Swedish Grand Prix...which meant that a win in the next race in Finland would clinch the title.

And win it he did. Another win, another 15 points and the World 350cc Championship was Takazumi's beyond any doubt!

Even without contesting the Czechoslovakian or British events Katayama still finished the season well ahead of his nearest competitor, Irishman, Tom Herron. He scored 95 Championship points to the 56 earned by Herron.

What did Katayama think of the new Yamaha triple? Obviously he was well satisfied with its performance during 1977 but he is even more pleased by the fact that the machine still has a terrific amount of development potential.

There is plenty more power to come from the motor, he feels, and it is already faster than the twin cylinder machines or the Italian opposition. In addition, Yamaha Motor Company NV had to concentrate all of their efforts on the engine in order to get it ready for the start of the season. Therefore chassis development was a little neglected.



Takazumi Katayama



With some development work on the chassis, and with some attention paid to weight reduction, the machine is going to be even more effective. In fact, Takazumi rode the thing in a 500cc race at one point this season and almost won the event outright despite a slow start and problems getting the bike to fire cleanly until a couple of laps had gone by. The machine was so impressive that the race organisers gave him a special trophy for his efforts!

On certain tracks, Katayama feels, the triple could be a definite contender in the 500cc class!

As well as his win in the 350cc Championship, Takazumi won a number of Formula 750 events and also ended fourth in 250cc points.

For the popular Japanese (who also has earned a living as a pop singer!) the 1977 season was very definitely one to sing about!

## GEORGE O'DELL

When George O'Dell and Cliff Holland powered their four-cylinder 500cc Yamaha outfit across the line in third place at the soaking wet British Grand Prix meeting they had established two milestones in motorcycle racing history. They had put England back at the top of the World Sidecar Championship for the first time in 25 years and had given Yamaha its first-ever win in this Championship category.

Although O'Dell never actually won a Grand Prix all year, he was a more than worthy Champion. The sidecar class was season-long struggle between four riders, O'Dell, Swiss star Rolf Biland and Germans Werner Schwarzel and Rolf Steinhausen. And although O'Dell never actually wore the victor's laurels, he was always in there swapping places and bumping fairings with the rest of the quartet.

A superbly consistent season in which he only failed to finish once (and he was leading that race at the time of his retirement) saw George never finish lower than third in any Grand Prix.

This impressive record of consistency is made even more worthy when one considers that, for most of the season George was riding an out-dated outfit by the standards of his opposition

and twice had his first-string machine wiped out by crashes!

At the start of the year, with Kenny Arthur in the chair, O'Dell flipped his hub-centre steering Seymaz Yamaha at Cadwell Park. It rolled over six times and was so badly damaged that he had no option but to leave for the first two Grands Prix of the year armed only with his conventional Windle Yamaha.

The difference between the two types of machine is staggering. The Windle is typical of the Championship sidecar outfit of two or three years ago. It utilises front forks and fairly-conventional rear suspension, even though the rider directs the plot from a near-prone "kneeler" position.

Outfits like this became immediately outdated when guys like Biland and Steinhausen produced outfits with hub-centre steering and racing car-style suspension.

Nowadays outfits such as these corner faster than solos in many instances simply because of the suspension and the amount of tire rubber that can be put on the road. They are virtually three-wheeled racing cars.

Realising that, while his Windle was adequate for National events, it was not the best machine for a serious World Championship assault, 31 year O'Dell scraped together all of his resources for a new Seymaz for 1977. The Windle (luckily, as it turned out) was to be kept in reserve.

With the Seymaz out of action after the Cadwell Park crash, George and Kenny Arthur set off for the Austrian and German Grands Prix with the faithful Windle and jubilantly returned with second and third placings to show for it!

In addition, they had been able to fit in a visit to the Seymaz designer's workshop in Switzerland and repair the new outfit in time for the French Grand Prix that was next on the calendar.

France was another solid points score thanks to another second place but the next race on the list, the Dutch TT at Assen was the biggest disappointment of George's Championship year.

By this time O'Dell had split with Kenny Arthur and Cliff Holland was in the chair. They were well in the lead of the Dutch TT when the Seymaz suspension collapsed and they were out on the

sidelines.

From Holland the Championship circus moved on to the ultra-fast Spa-Francorchamps track in Belgium and once again the "old" Windle-framed outfit was wheeled out for the race.

George had practised the Seymaz but it's steering characteristics were just not suited to the 150mph swervery at Spa. The rear wheel was getting light on the fast bends and the whole rig was weaving from side to side!

So out came "old faithful" again and repaid George with another 10 points for third place.

In Czechoslovakia George had the Seymaz really dialled in and felt confident of a good chance at the win. Then, in the final practice session, another rider spun in front of him, hit the Armco barrier and shot back on to the track to smack into George head-on!

They escaped virtually unhurt but the machine was practically a write-off. The British duo were committed to their back-up Windle outfit for the two most crucial races of their season...the last two Grands Prix in Czechoslovakia and England.

In Czechoslovakia they again took a third place and went into the Championship lead ahead of Biland.

It all now depended on who crossed the line ahead at Silverstone. Neither actually had to win the British event...they just needed to beat one another.

Silverstone's raceday dawned with rain in the wind...and down it came for the sidecar race.

Biland had been shatteringly fast in practice but as the race got underway it was obvious that O'Dell and the faithful old Windle outfit were masters of the rainy

conditions. Biland had hampered his chances by choosing the wrong tire for the prevailing weather and suffered the ignominy of being lapped by O'Dell.

And so, before a cheering horde of home fans, George O'Dell and Cliff Holland became the first British World Sidecar Champions since Eric Oliver did it with a single cylinder Manx Norton 25 years previously!

As well as the World title, George was able to look back on another achievement that will set him and Yamaha firmly in the motorcycling history books. He became the first man ever to lap the Isle of Man TT circuit on a sidecar at over 100mph. In winning one of the two Sidecar TT races he eventually set the new lap record for the 38 mile Mountain Circuit at 102.80mph!

Not only that, he did it with that old Windle outfit and is confident that he could get round at over 106mph with the Seymaz Yamaha!

"Me and three or four other riders are capable of doing that with one of the new-style outfits" says George.

"Which makes the 112mph solo lap record look a bit sick considering that they use the same engines as us but on a bike that is half the weight and that only has to drag one person along!"

Proof indeed of the incredible cornering speeds of today's sidecar outfits.

Poor George finished the year in the same way that he began it. He rolled his outfit at Laguna Seca and ended up in hospital with a broken leg.

"A bad start to a season and a bad finish" he said wryly from his hospital bed.

"Thank goodness there was some good stuff in between!"



George O'Dell



The Yamaha Motor Company and its parent corporation, Nippon Gakki Co. (which translates as Japanese Musical Instrument Company) have satisfied literally millions of customers in their 80 years of business life. Customers ranging from musicians to motorcyclists!

Very few of those customers, however, have any idea of the origins of the corporate giant that is now one of the acknowledged leaders in the varying fields of musical instruments, audio equipment, boats, marine engines, motorcycles and sporting equipment such as skis and tennis rackets.

The Yamaha story begins back in 1851 when Torakusu Yamaha was born as the third son of an astronomer in the employ of the powerful Kishu clan in feudal Japan. As he grew up, the young Torakusu trained as an engineer and began his career as a watchmaker and clock repairer in Nagasaki. Soon afterwards he moved to Osaka to specialise in medical equipment engineering and manufacture. It was this switch that led to the eventual formation of Nippon Gakki for one day Yamaha was sent over to Hammamatsu, there to perform some repairs to medical equipment in the local hospital.

Torakusu enjoyed life in Hammamatsu and decided to settle there, working on various mechanical jobs.

Today, the giant Yamaha factories are still located in that city!

The next turning point in Yamaha's career came one day in July 1887 when he was called upon to repair a small organ belonging to the Hammamatsu Elementary School. The organ was an imported model that was a prized school treasure as well as a valuable educational item.

It had ceased to pipe out sounds, and though Torakusu had never before worked on any musical instrument he soon had it operational once again.

Fascinated by the instrument, Yamaha decided to copy it and build one of his own. Two months later the ingenious engineer had completed his own organ. It worked perfectly but Torakusu had no musical training and therefore was unable to judge whether his organ was as good as the original.

There was only one answer as far as a man of Yamaha's

# THE ORIGINS OF YAMAHA



high standards was concerned.

In order to gain an expert opinion he and his craftsman assistant slung their organ from a bamboo pole and carried it on their shoulders to the Tokyo Music Institute (now the Tokyo Academy of Arts)!

The woodcut illustration accompanying this feature shows Torakusu Yamaha and his assistant carrying that first organ to Tokyo.

The journey was over 100km and the verdict that awaited Yamaha was a cruel one. Head of the institute, Shuji Izawa, said that the organ was superbly made but hopelessly out of tune!

He suggested that Torakusu should remain at the school, study the basics of music and then try once again.

After a month's hard study, Torakusu returned to Hammamatsu, constructed his second organ and returned to the Institute in Tokyo with it.

"At least as good as the import" was the verdict this time...and so began the next phase of the Yamaha story.

His confidence aided by the verdict of the experts in Tokyo, Yamaha began production of the organs and, in 1897, constructed a new factory to handle these. The Nippon Gakki Company came

into being, soon expanded its range to include pianos, harmonicas, xylophones and other small instruments and was the foremost Japanese company in the musical instrument field when its founder, Torakusu Yamaha, died in 1916 at the age of 61.

Following Yamaha's death, the presidency of the company was taken over by former police chief, Chiyoamaru Amano. His tenure as president, however, was marred by a series of crises. Two factories were burned down in quick succession and then, before re-construction had finished, the replacement factory was hit by the great Japanese earthquake of 1923.

At the same time, Japan was nosediving into a recession and Nippon Gakki - already struggling from the disasters that had struck it - was not spared from the effects of the bleak economic climate.

As if all of this was not enough, the company also became a target for one of Japan's newly-formed labour unions. In fact, the Nippon Gakki dispute of that era is still considered one of the three worst labour strikes ever experienced in Japan.

The total effect of all this was that the company was on the brink of bankruptcy.

A saviour appeared in the form of Kaichi Kawakami, who gave up a dazzling career as a rising young executive in the Sumitomo Electric Wiring Company to take on the seemingly-hopeless task of rescuing Nippon Gakki.

Miraculously, Kawakami was able to restore the past glories of the company and take its prosperity to new heights. He was also the person who took one of the most significant steps in the corporation's history...the decision to construct the Yamaha motorcycle.

During wartime, Nippon Gakki had been using its extensive engineering facilities to make aircraft propellers. There was no demand for such non-essential items as musical instruments so Nippon Gakki were able to turn their expert knowledge in the field of wood-crafting (an essential in the musical instrument business) to the construction of propellers.

As the war went on, Nippon Gakki's technology kept pace with current developments so that eventually they were able to replace the wooden propellers with sophisticated, variable pitch metal ones.

When peacetime came, the young engineers on this side of the Nippon Gakki business were sitting idle and it was Kawakami's foresight that was able to see the lightweight motorcycle as an integral part of Japan's rebuilt economy.

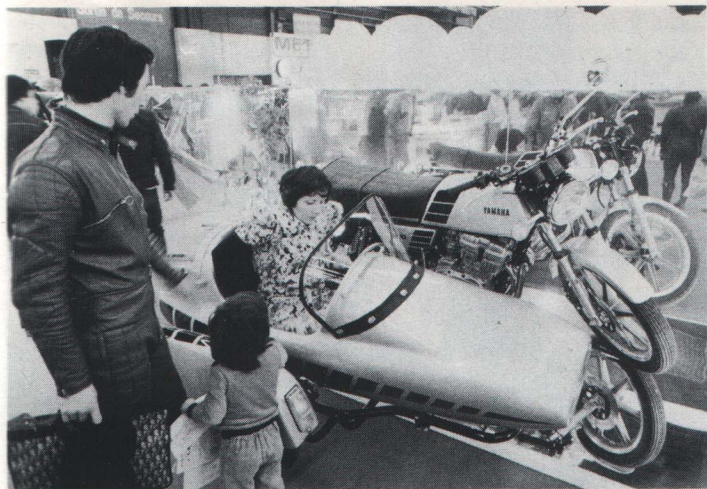
He felt that the motorcycle would supply a cheap and reliable transportation need, Nippon Gakki had the technology available to construct such a machine and so the die was cast. There was to be a Yamaha motorcycle.

Kawakami himself did not see the project through to total completion as he retired in 1950 for health reasons. His son, Genichi, took over the presidency of the company and, five years after his father's retirement, put the first Yamaha motorcycle (the 125cc YA1) into production.

Now, little over 20 years later, the name Yamaha has become synonymous with high-quality motorcycle engineering while Nippon Gakki continues to be one of the world leaders in the musical instrument field.

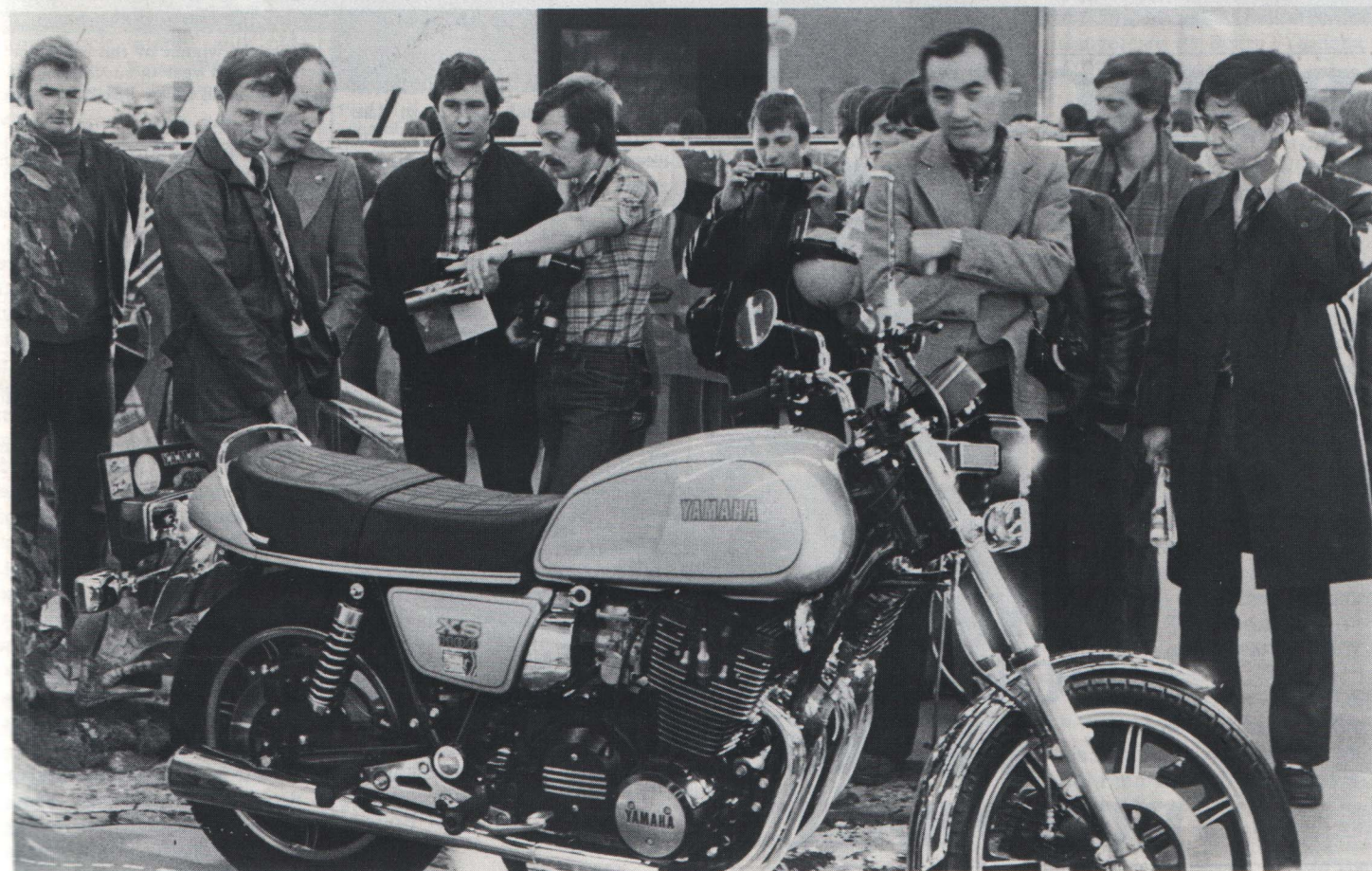
Not even Torakusu Yamaha could have envisaged such a growth for the company that he daydreamed about as he and his companion trudged to Tokyo with that first Yamaha product!



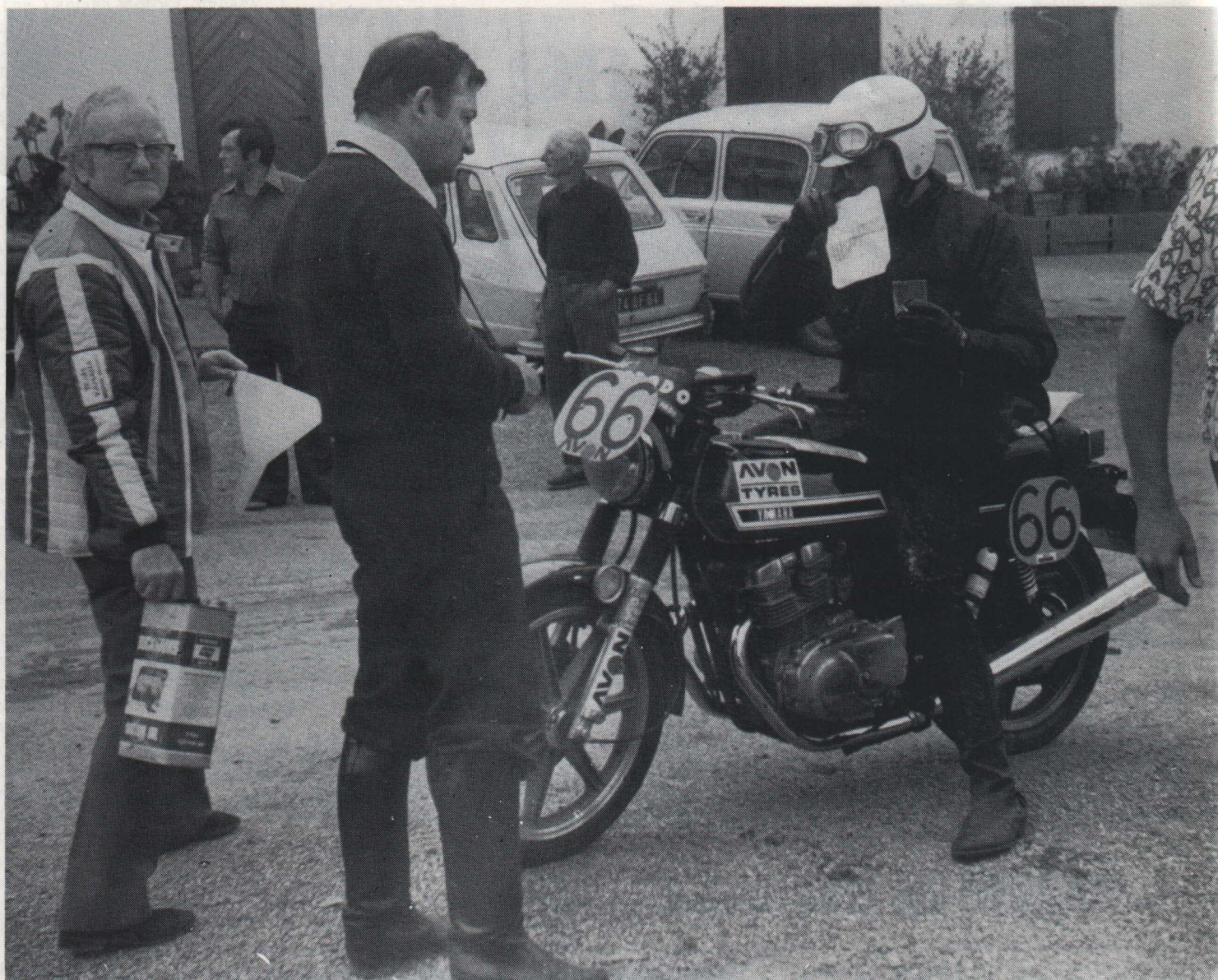


## ..PARIS in the FALL..

A selection of pictures by Derek Berwin from the Paris Show in October. The show was highlighted by the first-ever showing of Yamaha's new "superbike", the shaft-drive XS1100 four.







# POLICEMAN ON THE PYRENEES

## YAMAHA DOMINATE FRENCH ROAD RALLY

There was much jubilation in the British camp in the French city of Pau on the evening of June 26th when it was announced that Bill Emmerson, the British policeman from Newcastle-on-Tyne, had won the Circuit des Pyrenees for the second year in succession, riding again on a Yamaha XS 500. His win last year, on an XS500 twin provided by the British importers Mitsui, was the first ever by a British rider in the 25-year history of this tough rally which takes place amid the mountain roads of the Pyrenees.

With 330 strenuous miles packed into the one day against a very demanding time schedule, the event attracts both civilian, police and military riders with awards for both classes and has always placed the accent on riders from the police services with the main opposition coming from the French Police Nationale and C.R.S. who

Outright winner of the event for the second year in succession - British policeman, Bill Emmerson.

know the area like the back of their hand.

The event is organised by the Union Motocycliste Paloise.

British police riders have been trying to win the event since they first competed in 1968 and until 1975 their highest placing had been achieved by Ron Hawkins of the Metropolitan Police when he finished third in 1971 on a 650 Triumph. Then, in 1975 Mitsui decided to take a hand by loaning the Federation of British Police Motor Clubs three Yamahas for the event. Chris Spence, also of the Metropolitan Police, promptly finished in second place on a DT175. The pundits began to forecast that these Yamaha trail bikes would dominate the event in the future.

But in 1976 Bill Emmerson decided to prove them wrong when he asked to borrow an XS500 for the event. Mitsui



were happy to oblige with the XS500 and in addition two DT175's were also provided for the British policemen. Emmerson took the event by storm, losing no marks on the public road sections and climbing the closed-to-the-public, 5 kilometre Col de Houratate mountain road in the phenomenally good time of 4 minutes 8 second to establish standard time. This was too much for the opposition and he came out on top for the first ever British and Yamaha win. But that wasn't all! The two DT175 models finished first and second in the 175cc military and police class. Mitsui were well pleased!

It wasn't surprising that the British importers again decided to loan the "coppers" three Yamahas for this year's event and it was decided to have three separate capacity sizes in addition to the XS500 to be used by Bill Emmerson (loaned to him this year by Ken's Motorcycles, the Yamaha dealers in Newcastle). He was teamed with Bill Veloz of the Thames Valley Police, again on a DT175. As a result of his second place in the 1976 175cc military class, he opted for the DT175 again as he found this enduro bike very much to his liking.

Dennis Harper of the West Midlands Police was selected to ride the new DT250 monoshock model and old campaigner Brian Phipps, a plain clothes man from the Metropolitan who has been riding in the event since 1970 was selected to handle the RD400. In addition, Chris Spence, formerly of the Metropolitan and now in civil employment entered on a private DT175. It was a pretty good Yamaha entry from the United Kingdom plus a number of French nationals also Yamaha-mounted.

From the moment he arrived, it was evident that Emmerson was out for the "double" for he spent every available minute out on the course - and on the Bois du Bager and Col de Houratate in particular. These are the two special test climbs which are closed by the police on the day of the "race". During the practice days, both climbs are open to public traffic so events can be a bit hairy. On the Thursday of practice week, the French police did close the hill for an hour or two for the competitors to get the hill

taped at "racing" speed. It was evident that the Houratate was in vicious mood this year after the continuous rain and bad weather, for the surface was very loose and broken up in several places. Indeed, Emmerson had several nasty slides when trying hard on the wet Thursday morning session. His time during the event on the Sunday proved this for although he still made fastest time on the XS500, he was 5

seconds down on his 1976 time. And quite a few riders dropped it on the loose hairpin bends.

The British police Yamaha party suffered a severe blow during the week when Brian Phipps overdid things a bit on the fast RD400 and came off, fracturing two vertebrae in his back, which side-lined him for the event.

With the first man away at 5 A.M. on the morning of the



French rider, Jean Castera, waiting to check out of the Lohitzun control point. Riding a DT175 Yamaha, he was placed second in the overall results, was best French rider and also the winner of the 175cc Civilian class (for non-Military or Police riders).



Aime Beche was one of several French riders who chose the Yamaha XT500 single cylinder four-stroke 'thumper' as his mount for the Pyrenees Rally. His is fitted with an extra-large petrol tank.

event, the weather continued dull and disappointing. There was no sign of the blistering heat usually associated with this annual marathon and the climb up the Col d'Aubisque to its summit of nearly 2,000 metres was shrouded in thick mist. This caused a wholesale loss of marks on the ultra tight Ferrieres/Gourette section. Harper was about 4 minutes down on this section and even Chris Spence dropped about 4 minutes here. At Lohitzun, however, where the police refueling party was headed by Norman Vanhouse of Mitsui, all the Yamaha runners were in good heart.

"It's going like a bird and hasn't missed a beat" said Dennis Harper. And the thing which impressed Bill Emmerson most of all was the petrol economy of the XS500. "You needn't fill it right up" said Bill, "its much more economical than last year's model" he added.

And so the day went by with many riders falling by the wayside. Only 75 of the 125 starters finished the course.

The results, announced that night at the reception and prize presentation, gave a great deal of joy for Yamaha people present for it proved to be almost a Yamaha benefit.

Bill Emmerson made best overall performance, with a clear 125 mark margin over the runner-up, Jean Castera of Sauveterre de Bearn (Yamaha DT175 mounted).

Dennis Harper made best performance in the 175cc military and police class on the DT175. Jean Castera who was runner-up to Emmerson, was best performance by a French rider and best in the 175cc civil class. Then first-timer Laurence Noble from Huddersfield, who had had only two days on the course before the event was best 350cc civil class on his RD350. And just to rub it in, Chris Spence (DT175) won the special test award at the finish after a re-run with Bill Veloz (DT175) and Dennis Harper (DT250) who had all tied on their first run when they beat the time of Jean Castera (DT175). That special test in the centre of Pau was certainly a Yamaha benefit!

The Federation of British Police Motor Clubs won the team award represented by Bill Emmerson, Dennis Harper and Peter Graveson.

Norman Vanhouse. Mitsui UK.



The word "Supertracker" might not be part of the motorcycle race fan's vocabulary right now but by the end of the 1978 season it certainly will be.

It's the name that Anglo-American race promoters, Bruce Cox and Gavin Trippe, have coined for the big 750cc multi-cylinder, American-styled dirt-track racers that they are introducing to Europe next season.

The plan is to run these beasts on selected long-tracks all over Europe as an added attraction to the regular European sand-track and grass-track scene and Yamaha are heavily involved with the project.

Already Cox and Trippe have inserted the thin end of the wedge by running their team of Yamahas at selected races in England. This was done mainly to test the reaction of the public and to see how the American-style bikes would work on the very different European track surfaces.

Riders like four-time World

design with which Roberts took the American Championship title in 1974.

The conventionally-framed Yamaha was purchased as a back-up machine that could be used while the monoshockers were still being sorted out.

When the Trippe, Cox Yamahas first appeared in Europe, at the British Long Track Grand Prix at Hereford, they were up against a team of Triumphs from the British factory.

Completion of the monoshock chassis models at Kenny Roberts' factory in California had been slow due to the pressures of Kenny's own racing program and though two of these models were at Hereford, Cox elected not to run them until they were completely proven.

For the two races at Hereford, Cox decided to pin everything on the performance of Barry Briggs and the back-up machine but was more than confident that this combination could easily deal with the half-dozen factory Triumphs. In addition to Briggs, Cox had

who volunteered to ride it!

He would take part in the race, but mainly as a treat for the fans rather than a serious racing effort.

As the starting gate snapped up for the first race, Barry Briggs took the Yamaha twin out in front of the Triumphs while Collins wrestled with the four-cylinder power.

Throughout the four laps, Briggs held a comfortable lead until the very last turn when he went out with a rear tire puncture. European dirt-trackers run lower tire pressures than their American counterparts and this had allowed the tire to rotate on the rim, tearing out the valve stem.

Collins concentrated on demonstrating the shattering horsepower of the TZ750 supertracker on the straights and playing it safe on the turns. Even so, he rocketed by half of the Triumph team on the final lap to take fourth place.

By the time the second of the two races came around a new rear tire and plenty of

Everyone concerned was more than happy with the performance of the Yamaha's with Briggs' best lap of 27 seconds being less than two seconds slower around the 1000 metre track than German long-track ace, Egon Muller's lap record for Hereford.

"And I wasn't riding anywhere near as hard as I could have done" said four-time World Champ, Briggs.

"These seven-fifties are so much quicker than the normal five-hundreds that we see in Europe. Once the chassis work and tire combinations have been found to make them work on European tracks, they'll provide some really spectacular racing."

After the Hereford event, Trippe, Cox "borrowed" Chippy Moore from the Triumph squad to race the Briggs machine in a round of the British Sand Track Championships on the beach at Redcar in Northern England.

In addition, they prepared one of the monoshock racers

# SUPERTRACKERS!

Speedway Champion, Barry Briggs and the 1976 World Champion Peter Collins were astride the Yamahas and at the British Long Track Grand Prix at Hereford the team was one of the centres of attraction.

With riders like Briggs and Collins in the saddle, the American-styled Yamahas were obviously no mere publicity gimmick

The Trippe, Cox Yamahas were of three different kinds. Mainstay of the team is a quartet of 750cc twin-cylinder Yamahas (XS650 models fitted with racekits made by American tuning wizard, Shell Thuett). These are housed in monoshock frames built by double American champion, Kenny Roberts and are similar to the machines with which he contested the American national series this year.

They put out some 65bhp at the rear wheel (over 75bhp at the crankshaft) and on the mile-long ovals in the USA are capable of 130mph!

Also part of the team is a conventional-suspension machine that was totally built by Shell Thuett and is the

another surprise in store for the British fans. He had managed to persuade Yamaha in America to release the four-cylinder TZ750 road-race engined dirt-tracker of Kenny Roberts for use at Hereford.

This fearsome beast, with a 130bhp engine shoehorned into a dirt-track frame little heavier than a moto-crosser, had been created for Roberts to combat the might of the Harley Davidson vee-twins on the American dirt-tracks.

Roberts won with it first time out on the Indianapolis mile but even he admitted to being scared by the awesome power!

The thought of a whole field of machines such as this was too much for the AMA and after one more race (where Roberts retired with the tread shredded from his rear tire) they banned anything other than twin-cylinder machines from dirt-track competition!

Cox rightly figured that the British fans would love a chance to see this beast and World Speedway Champion, Peter Collins, was the hero

security rim bolts had been fitted to Briggs' machine and he went to the line ready to take the win that he felt should have been his in the first event.

This time there was no mistake. He led the whole four laps and was never even pressured by the Triumphs.

And Collins was getting more and more used to the four-cylinder and was staggering everyone with its speed.

"I must have been hitting close to 100mph and never got out of second gear" said Collins!

Not only that, Peter was more than coming to terms with the beast on the turns and was beaten by only one of the half-dozen Triumphs.

Meanwhile, Briggs was steaming away out in front and the flag dropped with Yamaha's first and third and only British grass-track charger, Richard "Chippy" Moore able to keep a Triumph in contention. He placed second with the rest of his team trailing.

for American speedway racer (now riding for Hull Vikings in England) Mike Curoso.

The bikes would clash directly with the regular grass-track style machines favored by the British sand-track racers and everyone was interested in the outcome.

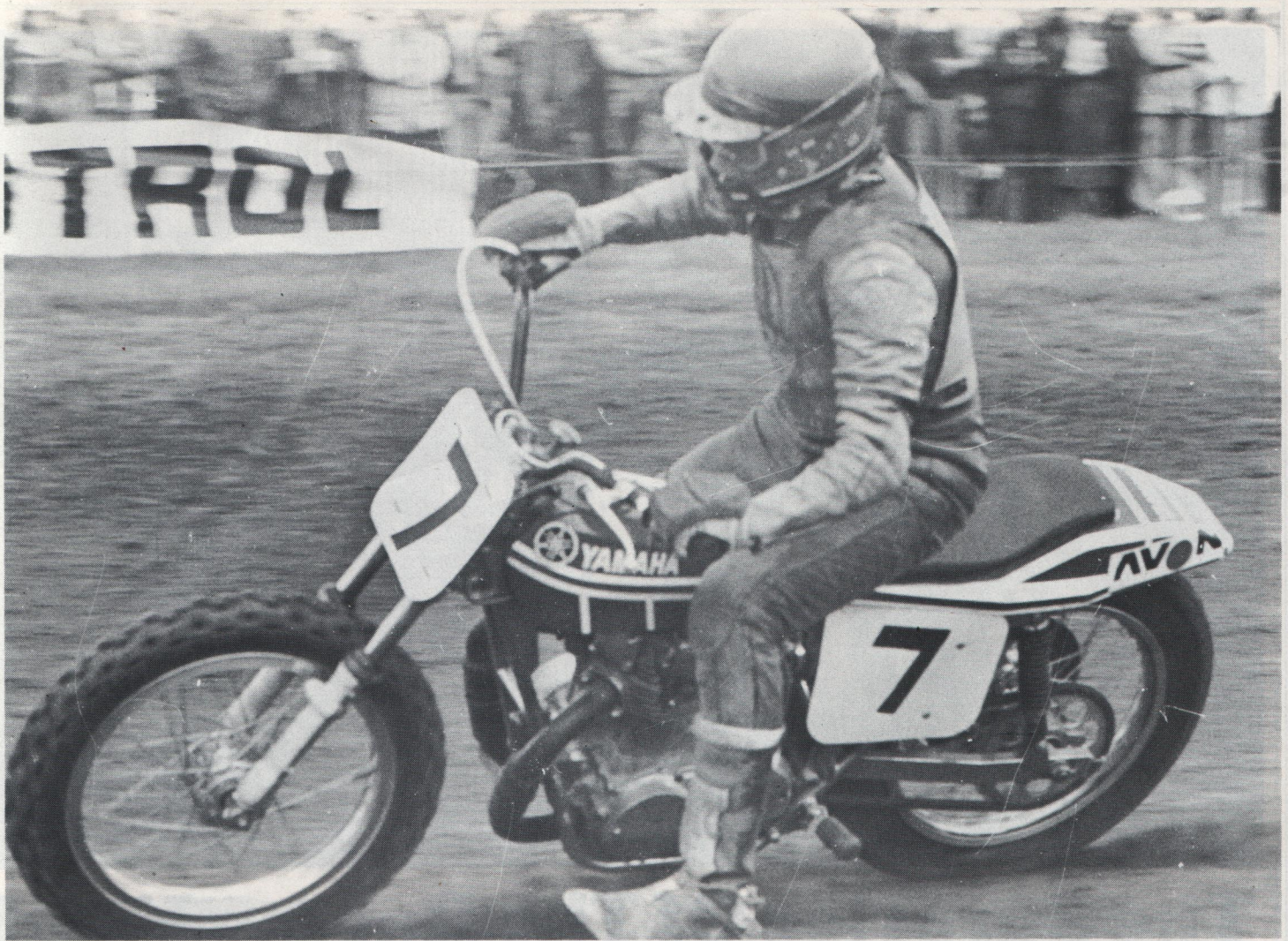
The local crowd felt that the American-styled machines would be just too heavy for the wet sand of the beaches but at the end of the first lap it was Curoso at the head of the field on the monoshock with Moore in third place, just behind sand-track specialist, Keith Stephenson on a 580cc Jawa with four-valve head.

After a couple of laps Moore moved by Stephenson and it was the Yamahas running 1-2!

Then Curoso crashed with a sticking throttle but Moore went on to take a comfortable win.

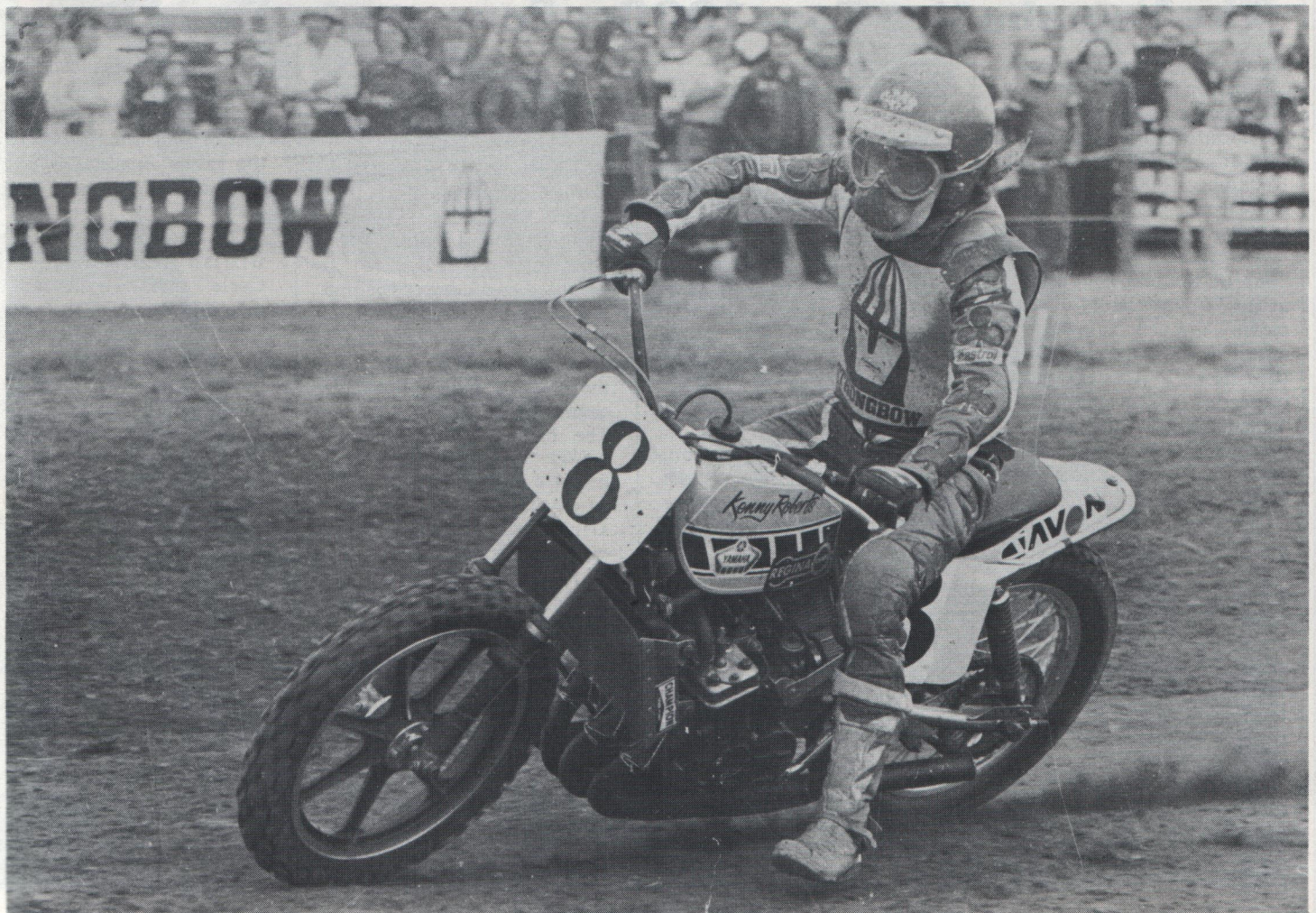
Any questions as to the relative merits of the "supertrackers" as against the conventional machines had been answered...and Moore emphasised this with a second comfortable win. ●



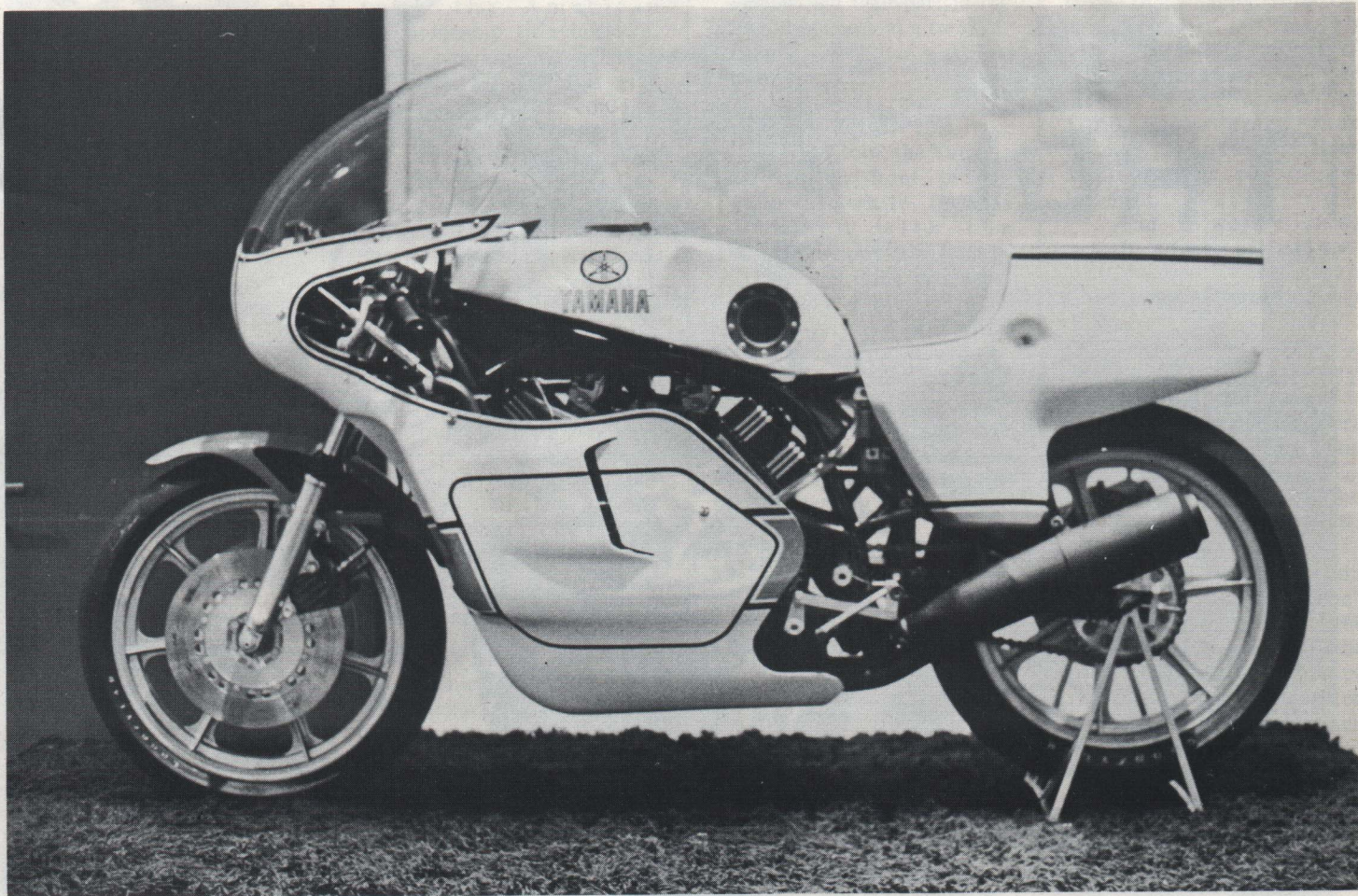


Peter Collins (8)

Barry Briggs (7)







# The Surprise Of The Racing Year!

## The Yamaha Vee-Four 1000cc Four-stroke Road Racer

The recent American dealer convention in New Orleans saw Yamaha spring the surprise of the motorcycling year when they announced an incredible 180mph, 1000cc, vee-four, four-stroke road racer to a totally-unsuspecting public!

Described by the press as "one of the best-kept secrets in the 70 year history of road racing" the new Yamaha was unveiled at New Orleans and then flown to Amsterdam for inspection and evaluation by Yamaha Motor Company NV personnel. Now the monster is back in Japan undergoing further development.

The new four-stroke racer is a completely new machine from stem to stern. The power unit is a water-cooled vee-four with the cylinders mounted at 90 degrees to each other. The engine is mounted with the cylinders "in line" with the frame in similar fashion to the Harley Davidson or Morini vee-twins.

There are four valves per cylinder and the motor will scream to an amazing 14,000rpm....at which it pumps out in excess of

130bhp!

Double overhead camshafts drive the valves with the camshafts driven by chains from the crankshaft. The cam drive is on the right for the front bank of two cylinders and on the left of the rear pair.

The water-cooled alloy cylinders have wet liners while carburetion is handled by fuel injection rather than carburetors. A fuel pump and filters control the petrol supply from the gas tank with its aircraft type filler.

Gears take the drive from the right-hand side of the crankshaft through a dry clutch and a six speed gearbox. Final drive is by chain.

Exhaust pipes siamese into one silencer unit on each side of the machine and the fuel injection system sits in the "vee" between the cylinder blocks.

Twin water radiators are fitted, one in each side of the fairing, while an oil-cooler radiator is mounted in the nose of the streamlining. A wire-mesh grill in the front number plate allows a flow of air to the oil-cooler.

Instrumentation is comprised of a tachometer, water temperature gauge and an oil pressure gauge.

The chassis utilises monoshock suspension but departs from normal Yamaha tradition in that a short shock absorber unit (gas-filled) is mounted at 45 degrees behind the engine. Normal Yamaha monoshock frames have a long shock absorber running from the steering head, above the engine to the rear sub frame. The height of the vee-four power unit precludes this, however, and the re-positioning of the unit allows for a much lower overall machine height.

Front suspension is via normal Yamaha telescopic racing forks while the wheels are tough cast magnesium ones fitted with huge twin disc brakes at the front and an equally-large single disc at the rear.

The chassis has been designed so that the entire engine can be dropped out for repair work in a matter of minutes.

Yamaha's Mr Hata, the man

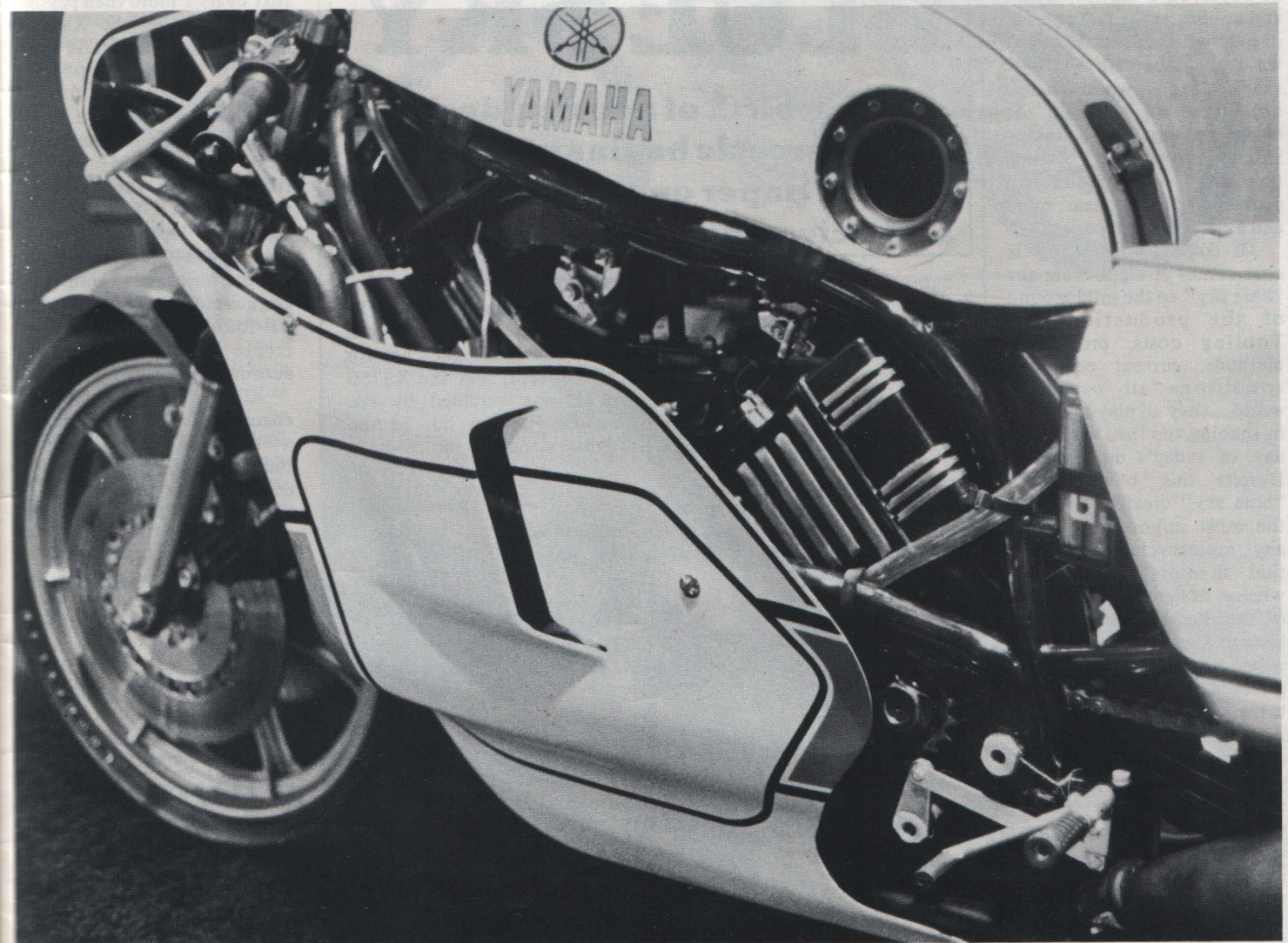
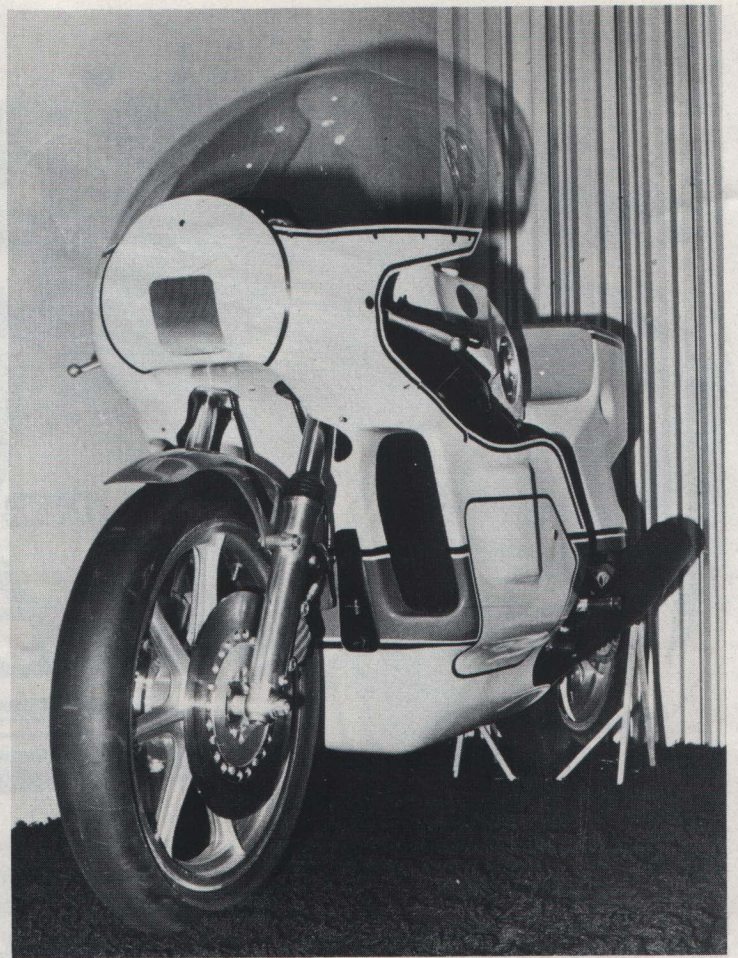
in charge of advanced racing design and technical development, was in New Orleans and told the press that the actual final design of the machine had not been settled on.

He told John Nutting of the British newspaper "Motor Cycle" that "we are not yet committed to the final design. It has only been a very short time in development".

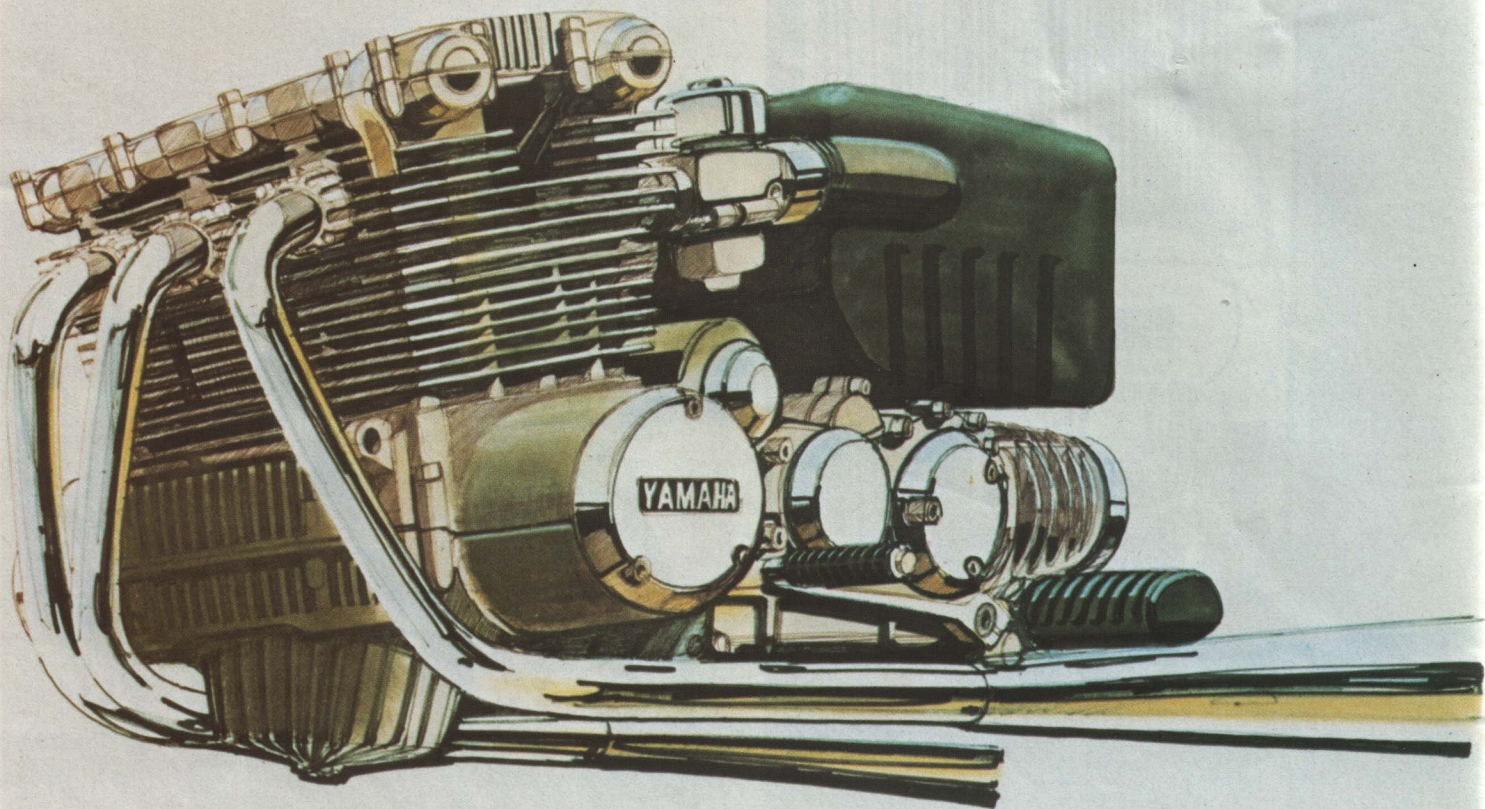
Mr Hata also revealed to Nutting that the French Bol d'Or 24 Hour Race was a prime target for the new machine as well as possibly the new "open" class of the 1978 Ulster Grand Prix. There is also a similar class in the Isle of Man TT races and rumours are currently abounding in America that 1000cc four-stroke racers are to be allowed to run with 750cc two-strokes in an all-new US National Championship class!

Thus the sight of Yamaha four-strokes and two-strokes vying for the Number One position in some of the world's most important road races is a distinct possibility in seasons to come!









A double-overhead camshaft triple engine option for the new Yamaha big bike. Very close indeed to the final XS750 design.

Every brand new motorcycle design begins as a blank sheet of paper on a drawing board and an idea in the fertile mind of a design specialist. It's what we at Yamaha call the "blue sky" stage...when there's nothing at all to cloud the designer's mind. No taking into account of costing, tooling or production problems. Just a clear mind and a clean sheet of paper!

Of course, no motorcycle ever comes straight from the "blue sky" to the solid ground of the production line. Tooling costs, production methods, current economic conditions all over the world....they all play their part in shaping the final version of any of today's motorcycles. Despite this, however, the "blue sky" creative period is the most important stage of any motorcycle design. It's that all-important first step when a designer weighs up all of the market possibilities in his mind and comes up with what he thinks the general public will want to buy in two, three or even four years time. And what he thinks they will continue to buy for some years to come. After all, any motorcycle has to have a reasonably lengthy potential sales life in order to justify the immense tooling costs necessary in today's world.

So, bounded by these basic parameters, the designer sets to work and produces a

# BLUE SKY

.....the birth of any new design of motorcycle begins with a clean sheet of paper on a drawing board and a clear, unclouded mind.....

number of alternatives that the production and costing specialists can then get to work upon to see whether they can become reality.

This article deals with the various options considered by Yamaha when they were

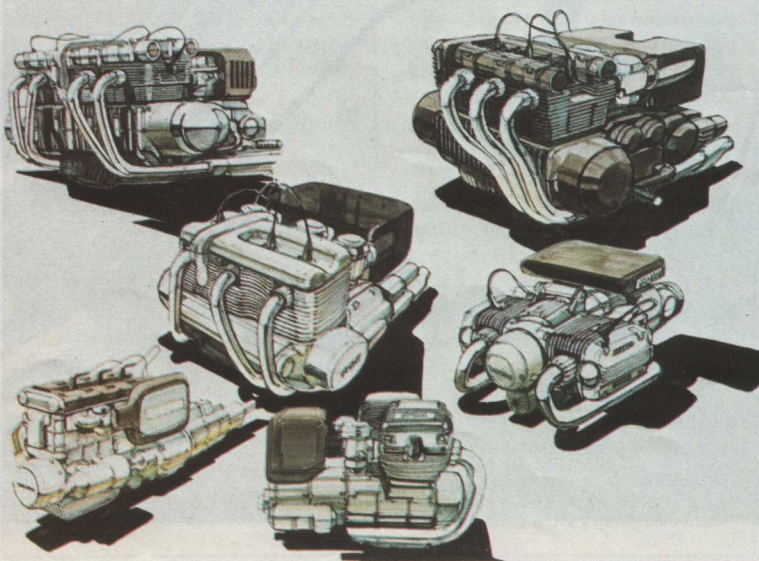
looking for a new sports tourer to head their model range. The eventual choice, and one can see the original sketches for this concept, was the XS750 which was heralded by the world's press as one of the finest machines on today's

market irrespective of size. There's also an engine sketch that bears a more than passing resemblance to the XS1100 that now leads the world as far as the big horsepower, multi-cylinder sports touring machines are concerned.

But, as you can see from the accompanying illustrations, the designers minds strayed far from the accepted "Japanese" concept of across-the-frame four cylinder motors. There were suggestions for vee-twins, flat-fours and even an in-line triple with a distinctive automotive flavour.

All of the machine and engine sketches in this feature were prepared by GK Industrial Design, the Tokyo company that produces all of the "blue sky" ideas for Yamaha.

GK design staff get constant input from Yamaha



Various engine options considered for a new big bike from Yamaha. Clockwise from top left corner, they are: a big double-overhead camshaft four with centrally-located cam drive; an overhead-cam triple with camshaft drive from the right end of the crank; an overhead camshaft flat-twin; a transverse vee-twin; an automobile styled triple with crankshaft in-line with the frame and (centre) a three-cylinder with cam drive between the two right-hand cylinders.



marketing men in Europe, America and all of the other significant world markets. In addition, their own people are frequent travellers to the various Yamaha areas of operation to see and feel for themselves what seems to be the type of motorcycle that turns tomorrow's customers on.

Ideas are constantly being sifted through, explored, expanded, quite often rejected. Yamaha's own staff know the feelings of today's market and have a good idea of the future directions that buying habits are likely to take. GK give it that "designer's touch" that so often shapes those buying habits.

Once an idea has been decided upon as worth pursuing, the development process gets into gear. The original groundwork usually results in Yamaha placing development or experimental contracts in the hands of specialist engineering groups, universities...and even individuals who seem to have hit upon a possible technical breakthrough.

An example of this is the monocross suspension system. It was the brainchild of an independent engineer and Yamaha adopted it, developed it and eventually revolutionised the world of suspension with it.

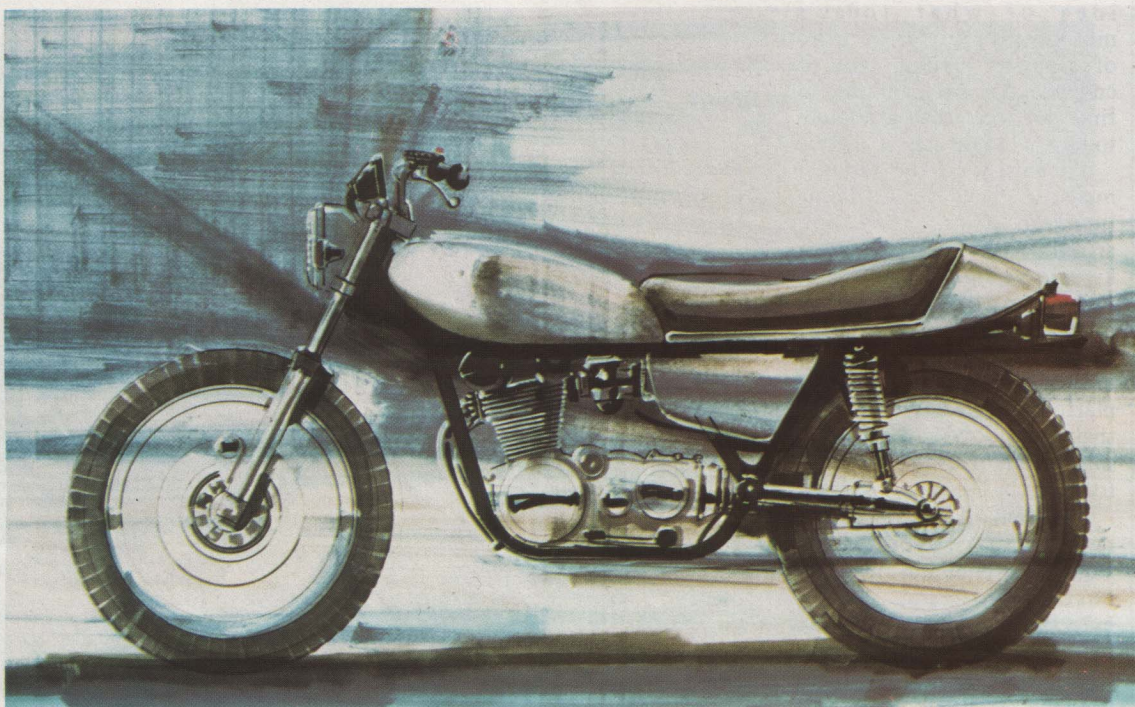
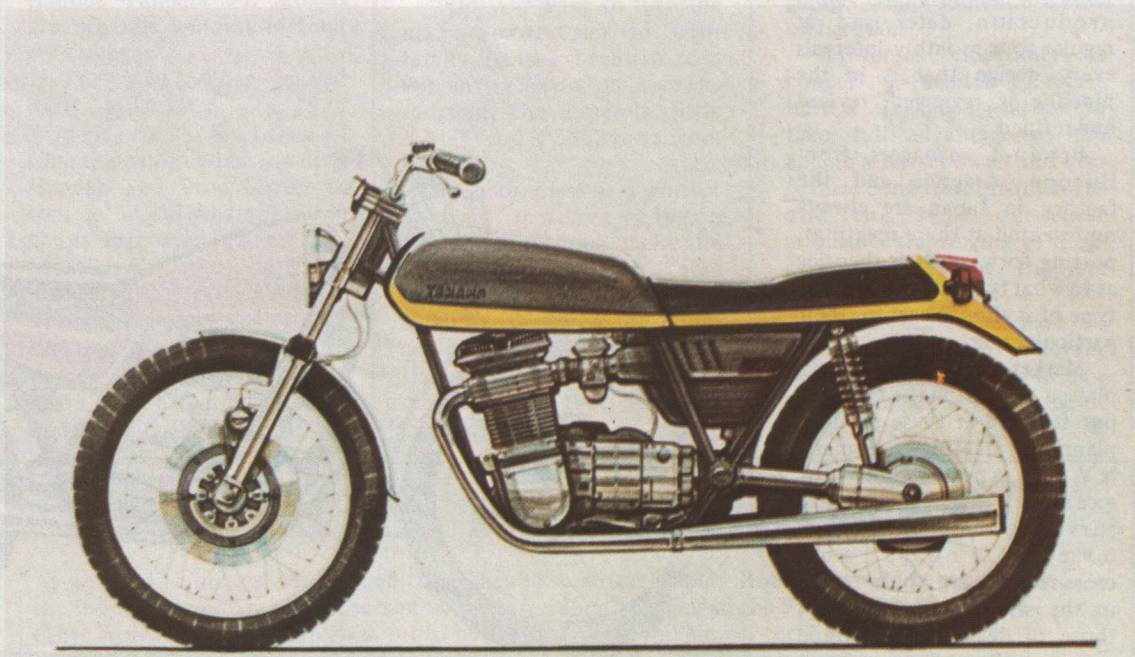
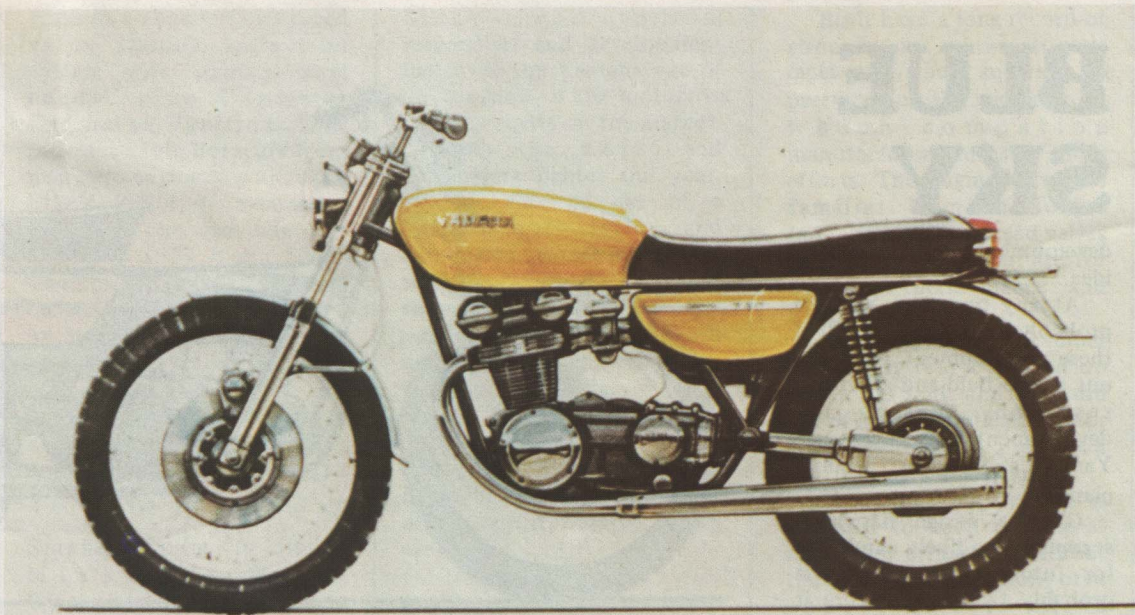
First of all it jarred every other manufacturer in the sphere of moto cross racing into revising their suspension systems by winning Grand Prix races and, in 1973, a World Championship for Sweden's Hakan Andersson.

The success continued into 1977 with Heikki Mikkola winning another world title for Yamaha...this time the all-important 500cc category.

In addition, the monocross (or "monoshock" as it is often known) suspension system has also been used to score World Road Racing Championships for Yamaha, to win International trials events and American National Championship races on both road and dirt tracks.

Finally, the monoshock suspension found its way to the production line for Yamaha's YZ motocross and DT Enduro ranges.

Evidence indeed of the wisdom of backing enterprising individuals in the



Various styling stages of the machine concept that was eventually finalised as Yamaha's XS750 triple.



# BLUE SKY

development of a promising idea.....!

At any one time Yamaha probably has from 10 to 20 of these development contracts out in the field and all of this research, testing and development finds its way into Yamaha's five-year product planning.

Once a design has been accepted as a likely candidate for future production it is probably five years before it hits the dealers showrooms.

Yamaha usually work five years in advance of actual production dates and at regular four-monthly intervals every design that is in the pipeline is reviewed, revised and refined.

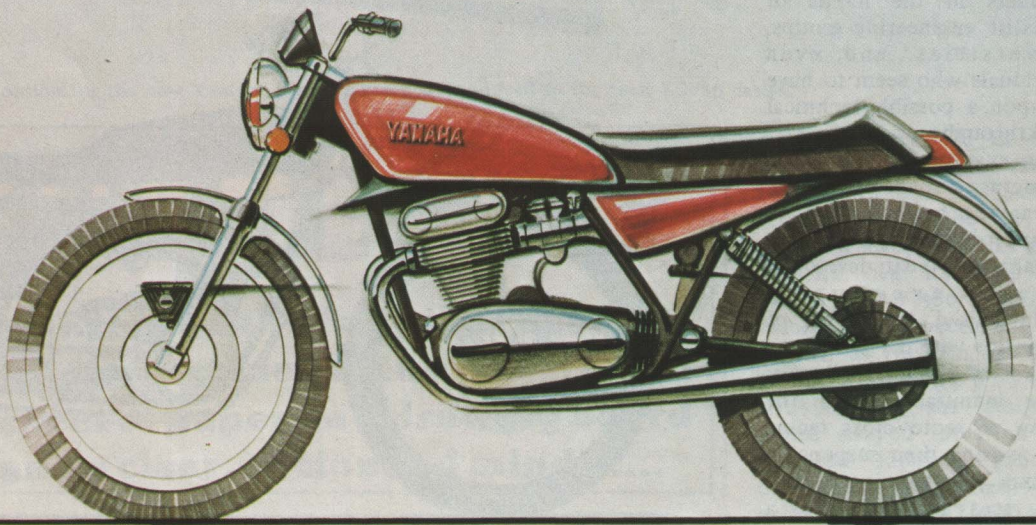
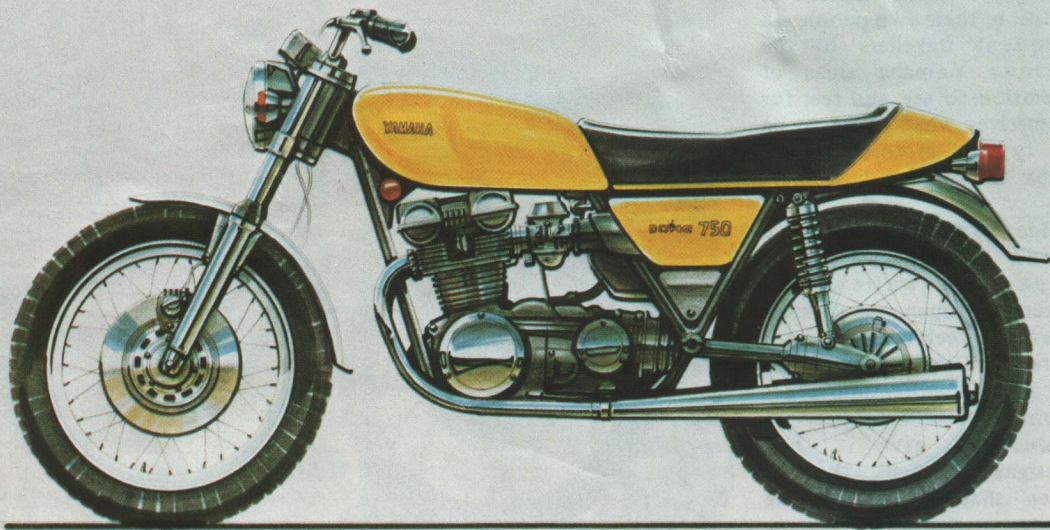
Product managers from Europe, America and the factory in Japan are always represented at these meetings, putting forward their theories as to what type of bike or what type of styling is best for their particular market.

Market research obviously plays a big part in the thinking put forward at these product planning meetings. Yamaha NV in Amsterdam, for example, are constantly surveying motorcyclists all over Europe and cross-referencing these "man in the street" opinions with those of dealers, other trade personnel and respected journalists.

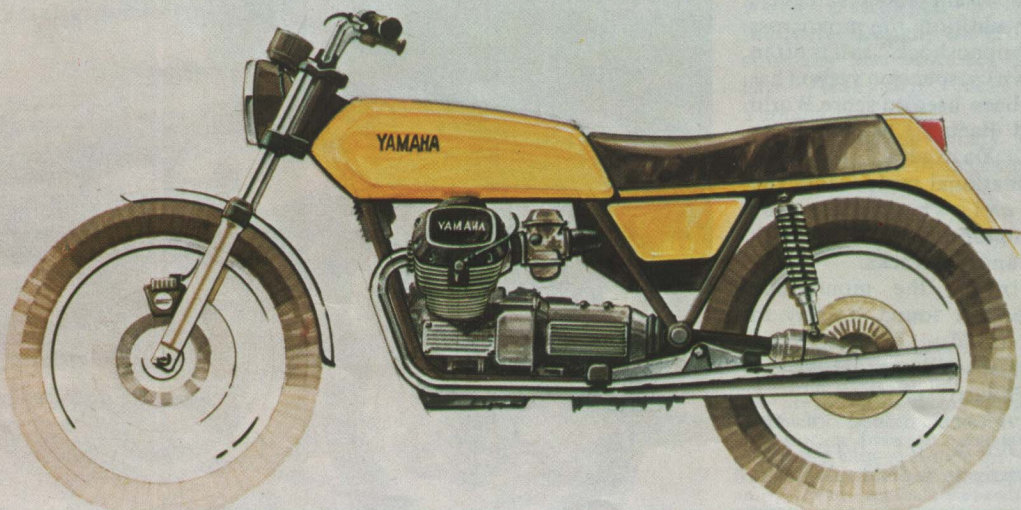
The plan is to formulate an idea of what today's motorcyclists prefer in terms of capacity, styling, type of engine and so on....and also to find out what they are likely to buy in the future.

At this point the product managers have to do some inspired forecasting but, armed with their specialist knowledge and the backing of their market research programs, they have a finger on the pulse of their particular market. It is from this platform that they can put their point of view and help shape tomorrow's Yamahas for you, the customer.

Product managers, market research, development engineers, planning meetings, costing programs, tooling exercises..... It's all a long way from the "blue sky" and a clean sheet of paper on a drawing board!



More variations on the XS750 theme.



Another Yamaha big-bike concept was this shaft-drive vee-twin sportster.



# Yamaha 1978

Continued from Page 15.

while a simple ring nut allows you to preload the spring to the desired tension. Changing shocks or springs is a thing of the past with the YZ400.

The second thing that the YZ400 has in common with Mikkola's machine is the front fork set-up-air-damped forks that can be altered simply by changing air pressures. They also have the conventional steel internal spring and are protected from mud, water and grit by rubber boots. The leading axle design brings two strong points with it: quicker, more precise low-speed steering and the facility to extend the fork legs below the axle point to expand the oil capacity.

Also 'borrowed' from Heikki Mikkola's World Championship-winning machine is the fabricated aluminium rear swinging fork unit. Light in weight but incredibly rigid and touch.

From the chassis to the 41bhp engine...similar in most respects to Yamaha's World Championship winner, this

features a super-efficient reed valve Torque Induction system with stainless steel reeds, plus Capacitor Discharge Ignition that provides a full, hot spark from near-zero engine rpm up to the bike's 8000rpm maximum. Not everyone can ride like Yamaha's 1977 World 500cc Champion, Heikki Mikkola, but with a YZ400 you'll have a lot more in common with him than perhaps you ever thought possible!

## YAMAHA YZ250 AND YAMAHA YZ125

Smaller cousins to Heikki Mikkola's World Championship-winning moto-cross racer, the 125cc and 250cc versions of the famous Yamaha YZ models are big-time winners in their own right.

The YZ125 has proved itself with 1976 and 1977 American National Championship wins for Bob Hannah and Broc Glover as well as World Championship Grand Prix wins in the hands of Holland's Gerard Rond.

The YZ250 is a direct descendant of Yamaha's first-ever World Championship winner, the machine which took Sweden's Hakan Andersson to the title in 1973.

Since then, continual refinement and development has made the Yamaha one of the toughest of the motocross middleweights on the market.

Both the YZ125 and YZ250 are lighter this year, thanks to the use of a chrome-moly frame and aluminium rear swinging arm section. Both have increased rear wheel travel for the monocross chassis and both have more horsepower to put to the ground.

The YZ250, in fact, has a brand new engine, a more compact, six-speeder (one more than last year) to make it more competitive than ever.

## YAMAHA YZ100 & YZ80

Do you want to turn the mini-motocrosser in your family from a beginner to a winner? There's one sure-fire shortcut, the dynamite little YZ100 and YZ80 racers from Yamaha.

Each of these is a perfect racing motorcycle in miniature, so don't make the mistake of calling them "minibikes". Your son would laugh you out of the house and a quick spin on either of these little tigers would soon convince you that, for once maybe, he's right!

Both have a long record of success in mini-motocross races everywhere and they are pretty much the yardstick by which competing manufacturers measure their efforts. The engines have the familiar Yamaha Torque Induction with its reed valves controlling the flow of fuel for optimum performance and tractability.

The expansion chamber exhaust system is routed up under the tank and seat and out of the way while Capacitor Discharge Ignition provides a full, hot spark at all times.

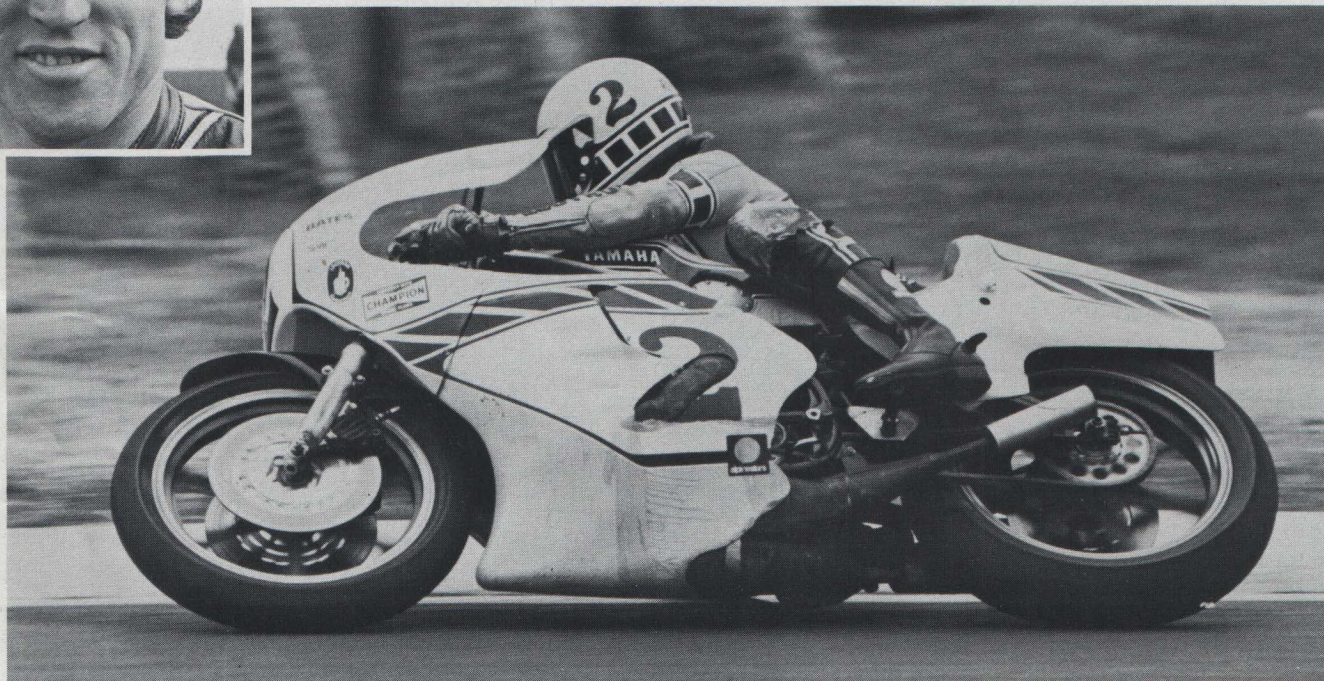
The whole engine unit is designed to keep running at maximum efficiency without the constant attention of a tuner. After all, a mini-motocrosser wants to race, not stand around the garage while someone works on his bike!

As far as "rideability" is concerned, the little YZ racers have a six speed gearbox to take full advantage of the engine's horsepower and also feature long travel front forks and the same cantilever monoshock springing as their counterparts in the big capacity classes.

Which brings us back to where we started...if you want your mini-motocrosser to be a winner, better get him one of these!

## ROBERTS FOR EUROPE!

As we went to press it was learned that Yamaha superstar, Kenny Roberts, would be contesting the full European Grand Prix season next year, riding Yamahas in the 750cc, 250cc and "one other World Championship class yet to be decided" that will almost certainly be the 500cc category. Roberts has already won the Imola 200 and twice been top individual performer in the John Player Transatlantic Trophy Series. Now European fans can watch his dazzling prowess over a full season of racing. Roberts will apparently have the support of a major commercial sponsor.





# Yamaha XS500 Does 500 Non-Stop Hours For New World Record!



Don Mitchell, Owen Fitzgerald, Richard Kennett.

A three-man team of West Australians recently set the all-time long distance motorcycling record by riding an XS500 twin non-stop for 500 hours!

Riders Owen Fitzgerald, Richard Kennett and Don

Mitchell piloted the machine for West Australian dealer, Ken George, who has Yamaha shops near Perth in Victoria Park and Subaico. Previously the record had been held by another group of Australian riders from Queensland, who

rode an RD400 two-stroke non-stop for just over 466 hours in 1976.

The new record attempt was conducted strictly along guidelines laid down by the Guinness Book of Records. Basically these require that the engine does not stop running and the machine does not stop moving for the whole duration of the run. Additionally, no more than three riders may be used.

For 20 days and 20 hours the XS500 ran faultlessly with the only problems being a puncture and a worn out front tire. How were these changed while on the move? The Yamaha was run into a hydraulic hoist that had been fitted with wheels and then the front wheel changed as both the hoist and the motorcycle were pushed gently along with the engine still ticking over!

As for refuelling...this was done with the aid of a sidecar outfit that would cruise up alongside the XS500 and, with the help of a hand-operated pump, transfer fuel from a

tank mounted in the sidecar!

Media coverage of the event was fantastic with newspapers, radio and TV following the event throughout the three weeks. On the Sunday night that the engine of the XS500 was voluntarily switched off at the 500 hour mark the new record was the lead item on all of Perth's three TV stations!

How did the XS500 fare? A stripdown in the workshop revealed that timing was off by only two degrees, valves were OK, cam and balancer chain still properly adjusted and everything else was in superb condition. The engine was running as quietly and as well at the finish as it did at the start!

The Ken George organisation said that they made the attempt with the objective of proving to the public that the Yamaha XS500 is an economical and reliable sports or commuter bike. They could hardly have provided more proof of that fact!

Ken George Pty. Ltd. are Yamaha distributors for West Australia.

