

ROCK BOTTOM WINNER

Formula Tiger Cub as a stepping-stone to stardom, or just plain old-fashioned fun. By Bob Goddard.

The first competitive event for a new racing machine is always an anxious moment — particularly if the bike going out onto the track is the result of months of hard graft in the workshop. The moment of truth arrives as the flag drops, and the patter of racing boots is swallowed up by the roar of eager engines. The pack disappears out of sight around Riches and the row of heads in front of the pits turn to look for the first machine to appear around Coram Curve.

In this race, for Triumph Tiger Cubs and BSA Bantams at the British Formula Racing club's first meeting at Snetterton in 1977, the Bantams get a 10 second start over the Cubs, so the first bike has to be a Bantam. But the bike I'm looking out for is number 34, the Tiger Cub I've been building over the winter, and being ridden by brother-in-law Graham Harker.

A gaggle of Bantams fly past, the high-pitched crackle of their expansion chambers mingling with the bass rumble of the first Cub to power out of Russell's chicane. It is Dave Heddison, followed by Malcolm Palfreyman, and tucked in behind them is the unmistakable fairing of Graham's bike. With a bit extra speed out of the bend, he slips past into second spot as some of the slower Bantams get overtaken along the start-finish straight (the Cubs and Bantams are counted as two separate classes).

Sticking close behind the leading Cub, Graham again finds a little extra speed through Russells to pull out of Heddison's slipstream and

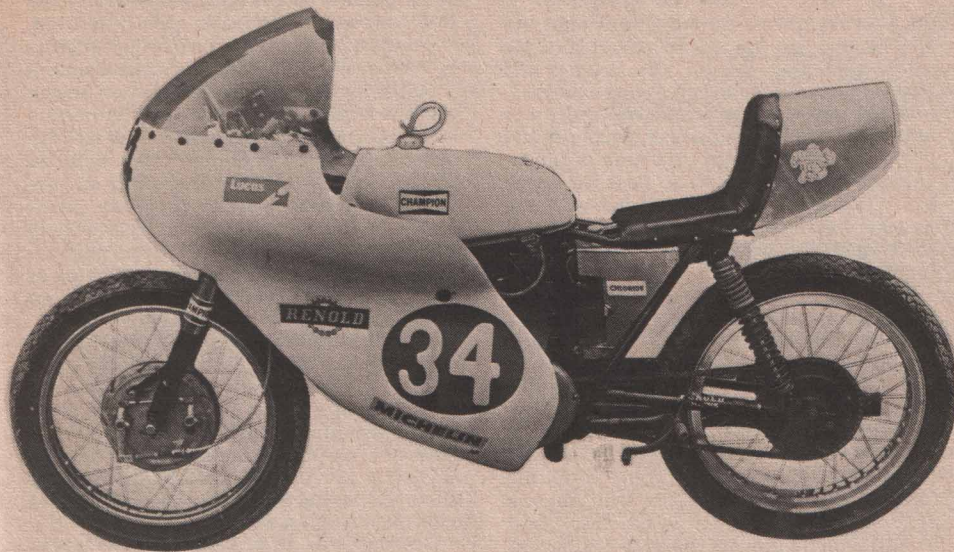


Panic minutes before the first race, as the rear wheel has to be swapped.



The moment of truth. Graham Harker pushes the Cub into its first race.

ROCK BOTTOM WINNER



take the lead on the next lap, and with only three Bantams in front of him he only has to make sure no one overtakes him and he has won the race.

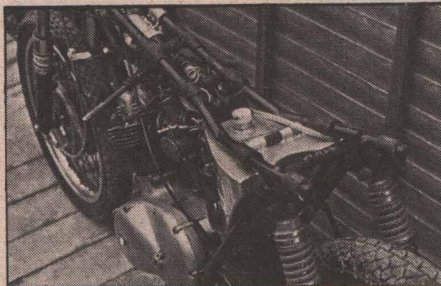
He almost overcooks it at the Esses next lap, and then has to dive between two Bantams to avoid queueing up for a corner on the last lap, but as the leading Bantam wails through Russells to take the chequered flag, Graham appears around Coram with a healthy lead over the rest of the Cub field and takes the flag for his first ever race win. I couldn't have asked for a better debut for the new bike, but in all honesty, it really isn't so difficult to build your own racing bike and go out and win on it. And provided you choose a class that doesn't require exotic Japanese raceware to give you a chance of finishing on the same lap as the leader, you can race competitively without going bankrupt. Bantam and Cub racing is undoubtedly the cheapest way to start, and it is possible to buy a ready to race top class Cub for £100 and a Bantam for £150, and often the previous owner will throw in a pile of spare parts that will keep your racer running for a couple of seasons without major expense.

It will cost you quite a bit more to build one from scratch, but you do get the satisfaction of tailoring your racer to suit you perfectly, and many get as much fun out of building and tuning their Cubs as they do in racing them.

If you are planning to build a racing Cub, the easiest way is to obtain a complete roadster, rather than take the difficult route like I did, of scouring around breakers for bits and pieces. It should be possible to buy a complete non-running Cub (it doesn't matter if the electrics or the big end are knocked out, these will all be replaced anyway) for about £20-£30. Make sure the engine is not one of the really old versions, as this set-up is too weak to withstand the strains of racing, and you must have the motor which has the crankcase split in the middle, and the later shape primary chain-case (not the earlier waisted one). I believe the engines suitable for racing come after engine no. 56360.

Having bought your old banger with

which to set the racing world alight, the next step is to strip it down to its smallest component parts, junking the bits you are not going to need on the racer. All the electrics apart from coil and points can be slung, along with seat, mudguards, chain-guard, silencer, kickstart, handlebars, and—



Frame top-tube bends shown here. Make sure there is chain clearance on left down member. Sponge and rubber pieces protect tank and seat from vibration.

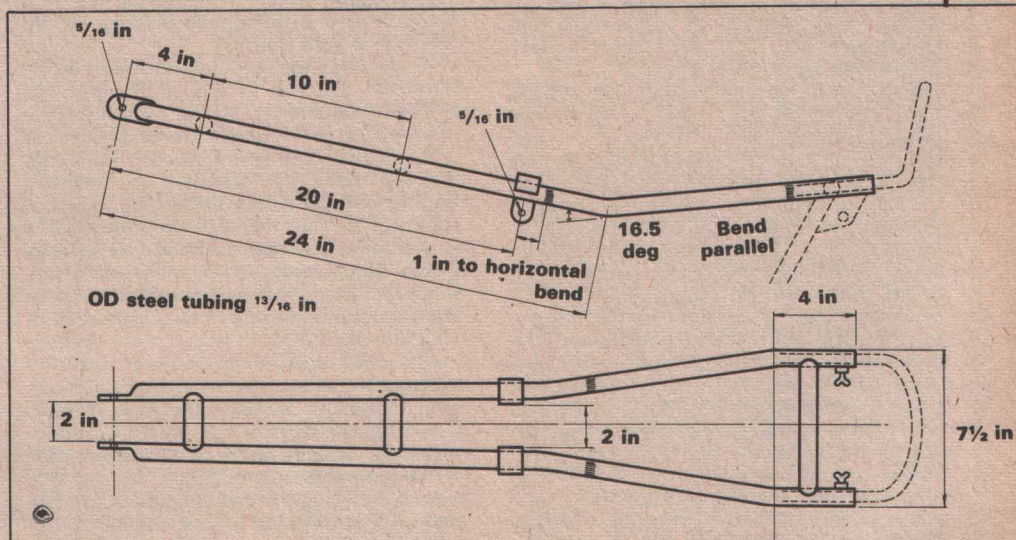
unless you happen to have a genuine Sports Cub (T20SS or T20SH) — the front forks and front wheel can go in the bin too. The only racing club that runs races to specifically cater for Cubs is the British Formula Racing Club, and to compete in these races your bike must conform to a formula which basically says that you must retain the rear hub and brake, main frame loop, and listed Triumph engine parts, apart from piston, big-end and carburettor.

The standard parts that must be retained in your Formula racer can be modified however. Starting with the frame, take off the rear suspension units, rear subframe, and rear footrest brackets, lay the frame on its side supporting the swinging arm pivot casting on a hollow tube, and smash out the swinging arm spindle with a lump hammer and drift. Fit new bushes AND spindle, as new bushes on the old spindle will show play again in no time, and after carefully drifting the new bushes into the swinging arm they will need to be accurately line-reamed to the spindle diameter.

I'd advise you to take the swing-arm and spindle down to a dealer or engineering works to get the job done professionally, as it'll only take a few minutes, only cost a few bob, and save you much aggro. When you rebuild the swinging arm back into the frame, make sure the spacing washer goes on the right hand side, and any end float is taken up with shims. Finally, pump plenty of grease into the spindle.

On my racer I lengthened the swinging arm, and therefore the wheelbase, by two inches, by persuading an engineer pal to mount the swing arm in a jig, saw through it and install specially prepared hollow steel billets in the gaps. This is a pretty tricky operation requiring a very accurate jig, professional turning, and bronze welding (not brazing) to produce a longer swinging arm that is three-dimensionally true, and as strong as it was before. Don't be put off if that operation sounds impossible — I don't know of any other current Cub racer that has been "stretched", and everyone else seems to put up with the Cub's odd handling quirks.

The rear subframe can now be refitted,



Fabricated in $1\frac{3}{16}$ in seamless steel tubing the twin top-tube is bent out at 21 in from headstock bolt, up at 24 in and in again at 32 in. Down tubes to swingarm ends are best joined at rear cross-member.

ROCK BOTTOM WINNER

and you'll find it easier to fit a racing seat later if you saw off the frame section behind the rear suspension top mounts, but get another piece of straight tube welded across between the mounts for rigidity. This bolt-on rear frame section is anything but rigid, and so I again coerced said engineering pal to make me a complete top tube/rear frame unit in one piece to stiffen up the rear and stop the steering head wagging about under heavy braking.

The standard Cub petrol tank has strips of metal right through the middle which act as a top tube, so if you ditch the Cub tank in favour of a classy ally or fibreglass unit, make up a simple bolt-on top tube or not only will the front wheel try to pass underneath the frame when braking, but the classy petrol tank will get ripped apart by its flexing mounting points.

While you're up at the steering head end, give a thought to how you are going to fit a decent set of front forks and wheel into the frame. The standard cup and cone steering

for a racing tyre. Standard Cub wheels are 17 inch, and the rear rim will need replacing with an 18 inch version 'cos Dunlop and Michelin don't do 17 inch racing covers.

While you're in the breaker's yard try to find a BSA Bantam rear wheel, which should be 18 inch. The Bantam rear hub is similar enough to the Cub unit to pass for same, but you'll have to fiddle around with the spindle, bearings, brake plate etc, to get it all to fit in the swinging arm and still turn round.

Before you rush out to buy racing tyres, check how much clearance you will have between the fattest part of the tyre and chain run. My Cub has 3.00 section rear and 2.75 section front Michelin PZ2s, and they give stacks of grip in the wet or dry, and last considerably longer than triangular Dunlops. You can race quite successfully on the standard rims without going to all the expense of fitting alloy ones, but you will need to fit a security bolt to the rear wheel to stop the tyre moving round on the rim, as you unleash all that pent-up power. The alloy rims have corrugations where the tyre bead fits to stop tyre creep. Make absolutely certain that the wheel bearings are good, the rims are true, and tyres fitted so that there is no wobble or shake when you spin the wheel. Irregularities that will not normally show up on a road bike, will lead to wheel pattering and poor roadholding in racing — especially on fast corners.

You can refit the old Cub rear suspension units if you are totally broke, Bantam rear shocks are better if you can find a decent second-hand set at the breakers, or Girling Gas Shocks if your pocket can afford the best in handling. If you write to Girling at Girling Limited, Parts and Service, Birmingham Road, West Bromwich, West Midlands, asking for a list, you can work out the best damper units, spring rates and pre-load settings to suit you and your bike. As a rough guide, if you divide the weight on the rear wheel (plus rider) by the number of inches wheel travel you want, you'll end up with a figure which is the spring rate you want. A medium damper will be sufficient for such a light bike.

If you alter the swinging arm and frame like I did, you can fit a 13.4in damper unit and 60/90 double rate spring with three pre-load spacers giving about four inches of rear wheel travel, and giving superb handling. You can retain the standard oil tank and battery box (ignition will be total loss) but they get in the way of your knees in a tucked-away racing crouch, and look pretty grotty. The central alloy oil tank and battery box fitted to my Cub was a one-off, so if you want one like it you'll have to build it yourself.

Chloride supplied me with a couple of natty little batteries — model number 802, which measure 5x5x2ins and have 7.5 amp hour capacity, which is plenty for a practice and three races in one race day. In between meetings you gently recharge. You can save money by using the old coil and points but so much trouble can be caused by one duff component, that it pays to fit new bits.

The circuitry is simplicity itself: one battery terminal to earth and the other to the coil; other coil terminal to the points

with a capacitor (condenser) in parallel with the points.

If you use Lucas components like I did you'll be able to get advice from their race shop at Joseph Lucas (Sales and Service) Ltd, Birmingham B18 6AU. Protect your electrics by rubber mounting all the components. It is surprising how much vibration a Cub can produce when you're wringing its neck. I made up a battery "envelope" out of high density sponge, mounted the coil on sponge, and hung the condenser on the frame by a rubber strap. A simple on/off switch in the battery-to-coil wire will help prevent you leaving the ignition on inadvertently. I make a point of coiling all my wires like a telephone receiver cable to remove stress and vibration vulnerability.

The standard rear footrest brackets give a mounting position about far enough back for racing, but unless you have lengthened the swinging arm and suspension like I did, footrests mounted here will be too low for sufficient cornering clearance. It will be necessary to cut and re-weld the bracket tubes so that the footrest comes about level with the swinging arm.

The footrests themselves can be made from strong allen-head bolts — preferably high tensile — remember that when you bump start the bike your whole weight will be put on the left footrest while you accelerate away from the start and swing your right leg across the seat. If the footrest bends at this stage the resultant heap of tangled bikes and riders can be humiliating and painful.

You can mount the standard rear brake lever on the footrest itself, shortening the lever and operating rod, and you'll need some kind of backstop — preferably adjustable — to prevent the lever shooting up and hitting you on the shin every time you take your foot off the brake. I used bits of garden hose pipe as footrest and brake rubbers.

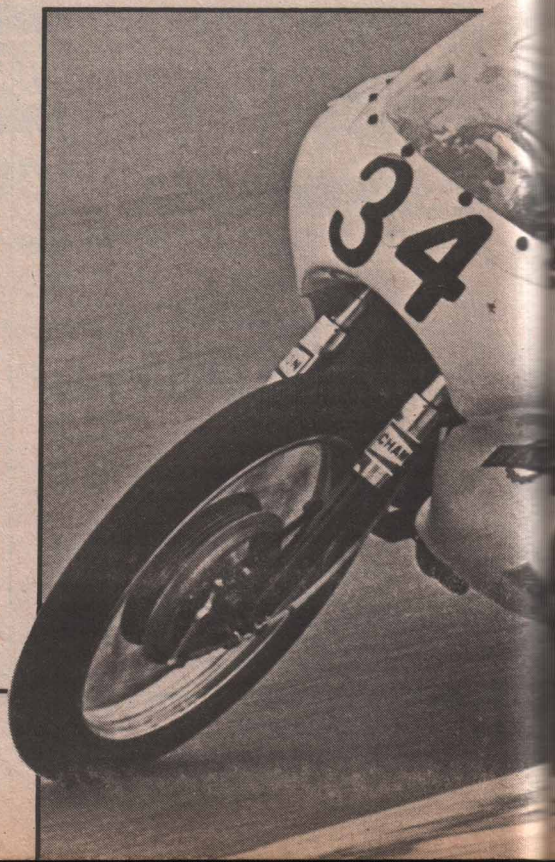
The gear lever is a little more complicated. Saw the toe-peg off the standard lever, and mount it vertically on the gear-change shaft. Make up a gear-lever to fit



Ensure both uprights in gear linkage are vertical, and pivot centres are equi-distant. Threaded tube and fork ends are strongest, and lock-nuts are a must.

ball race could not be adapted to take the yolks of the Honda 250 front forks I fitted, but Tony Foale of frame fame solved my problems by turning up some alloy cups which gave the right dimensions to take proprietary taper roller bearings.

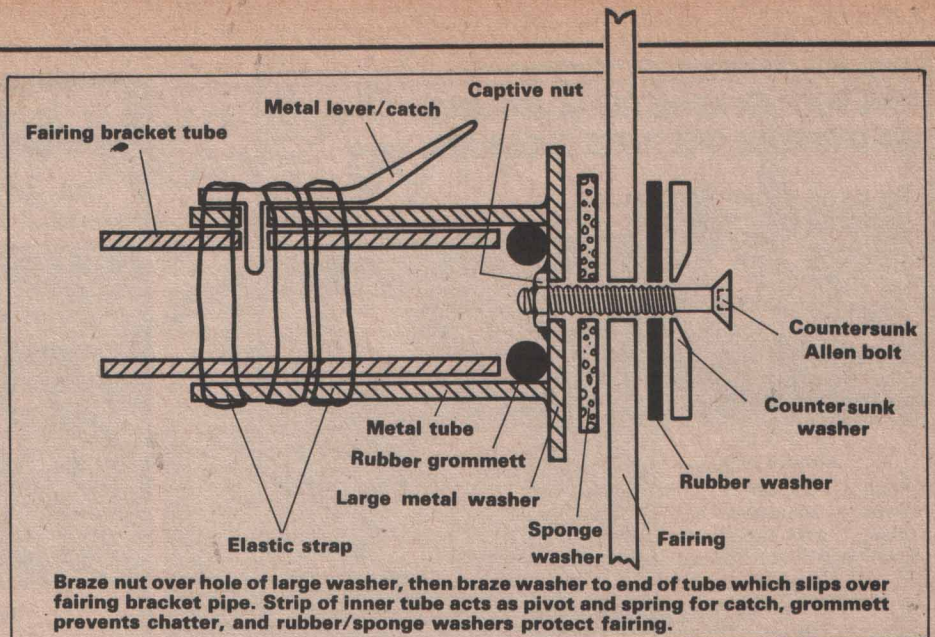
You should be able to find a set of CB72 forks and wheel like I used, or something equally suitable, from a breaker's yard, and the first thing to do then is to take out the front brake plate, and send it complete with the exact measurement of the drum internal diameter, to Ernie Hall, Old Shelve Manor, Lenham, Kent. Tel Pilgrims Way 259. For £9 a wheel, Ernie will fit Ferodo AM4 racing brake linings and turn them down to your drum diameter. It's well worth the money, as you'll find out first time you squeeze the brake lever and the bike stops like it's hit a brick wall. If the bite is too vicious, dress down the leading edges of the linings with a file. As this relining service is a bit pricey, you could leave the standard rear brake linings in and see if you think they need replacing later. Personally, I find that under heavy braking in a race, the rear wheel is almost off the track anyway, so the rear stopper has a limited use. Another advantage of the Honda front wheel is that it is fitted with an 18 inch rim which is suitable



onto the footrest (both will need pieces of tubing on the bolts to stop the levers wandering). Make sure the upright is vertical, with the lever on the footrest in the correct position for comfortable gearchanging, and all you're left to do then is connect your new gearlever with the shaft on the engine. You'll need two threaded fork ends, a piece of small diameter tubing with suitable thread cut internally, locking nuts and clevis pins. You'll probably be able to find most of the bits in a good ironmongers or engineering suppliers, but failing that you can bend a piece of 1/8 inch plate, and mount and weld a bolt through it. Make sure the distance between pivot centres at both ends of the linkage are the same or gearchanging will be difficult. Spare footrest bolts, gearchange and brake levers will save you losing a day's racing if you should slide off in practice.

Spondon Engineering of 23 Moor Street, Spondon, Derby, made the superb full-enclosure fairing fitted to my Cub, and if you want to fit one like it, then you'll need to plan your handlebars and levers to suit. There isn't much room in the handlebar region and I had to get another mate to make up some special clip-on handlebars so that the levers could be mounted inboard of the fork legs, and with sufficiently steep angle to clear the inside of the fairing.

Amal, who supplied me with a 32mm Mark II Concentric carburettor, due to be fitted to the development engine which should be running mid-season, also supplied a super-quick action twistgrip with half-a-drum to give enough travel for the front brake lever. Designed primarily for moto-cross, this twistgrip gives full slide lift on a 30mm carb in one eighth of a turn, so if you've a finely tuned right wrist it could prove ideal. It is quite possible you'll need to get some cables made up specially, and



Venhill Engineering Ltd of 6-8 Lincoln Road, Dorking, Surrey, are best for this. The levers I used are Doherty ones, made in thick and strong alloy with thumb-turn cable adjusters, and they are about the cheapest ball-end levers (compulsory in racing) you will find.

For the front fairing bracket you can simply weld on a piece of tube to the headstock, but as this is likely to be snapped off easily, a bolt-on fixture is better. Another piece of pipe bolted onto the top-tube will provide the best mounting point for the fairing sides, but make sure it is secure or your fairing will flap around and the scrut's may even reject it. I knocked up some ultra-QD fairing connectors which consist of a pipe bolted inside the fairing (see diagram) which slips over the bracket tube, and held in place by thumb clips. These can be easily made out of conduit, with a peg bent down to drop through a hole drilled in both pipes, held in place by a strip of old inner tube, and released by thumb pressure on the upturned blade. A tube bolted inside the nose of the fairing and fitting over the bracket pipe is sufficient provided the rear mounts are firm. A couple of additional clips at the bottom of the fairing may be necessary to make the unit really rigid, but mounting the fairing this way allows it to be removed completely from the bike in about five seconds, which can be the difference between getting onto the grid in time for your race or missing out completely if any engine work is necessary in between races.

Seat and tank are also QD. The tank on my Cub is from a Honda trail bike and has three rubber straps holding it firmly in position where it wedges onto foam and rubber cushions on the frame top-tube. The straps I used are available from Reliant spares stockists as they are originally fitted to Robin tonneau covers.

The seat mounting is an idea cribbed from MV Agusta. A piece of pipe is bent to fit behind the seat hump, and slides into the rear top frame tubes where it is held in place by sharpened wing-head bolts which screw through captive nuts braised to the frame tube. Mounting the seat on this sliding tube allows instant removal, and adjustment to suit the rider.

There is not room in this feature to go into

full detail on all the various engine mods you can make to improve performance and reliability of your Cub motor, but a fuller feature on Cub engine tuning, using a development motor currently being prepared by Lincs Engine Developments and Racing will be published later in the year. In the meantime, you can tune your Cub to be reasonably competitive by bringing it up to Sports Cub spec, fitting a T12 Alpha big end assembly to stop it all flying apart and opening up the inlet tract to take a carb of 26-32 mm.

The engine fitted to my Cub when Graham made his victorious debut on it at the beginning of the season was tuned as follows:

T12 Alpha Bearings big end/con rod assembly (Alpha Bearings, PO Box 13, Dudley, Worcs). Rebores and 9:1 C.R. Triumph piston (CP172 — available from Triumph stockists). Large valve head — (E3963 inlet valve). High Performance valve springs (E3965/6 x 2). Sports Cub (R) camshaft (E3962). 1 1/16 inch Amal Monobloc carburettor and manifold adaptor to suit (Amal Ltd, Holford Road, Witton, Birmingham 6). Phosphor Bronze valve guides (E3208). Close ratio gear box — (Mainshaft assy T1565, layshaft assy T1594). 18/36 single row chain/primary sprockets. (E3581 engine spr., T1341 clutch, D338 1/2 in pitch 48 link chain, and spacer in place of alternator). 17 T gearbox sprocket, 52/54T rear wheel spr.

Use a degree disc to set the ignition timing at 40 degrees BTDC static, with auto-advance mechanism locked. Mainjet 200. Straight-through exhaust with very narrow taper megaphone. Running on Shell 20/50 oil and 5 star petrol.

New Cub spares are still available, but you have to look hard. If you ask each dealer you ring for names of other Cub spares stockists, you can compile a list of useful suppliers. Here's a few major stockists to start with: A. Bennett and Son, 912 Foleshill Road, Coventry. Tel. Cov. 87749; Allan Jeffery M/Cs, 206 Saltaire Road, Shipley, W. Yorks. Tel. Bradford 594916; Harvey-Owen, 181-183 Walworth Road, London SE17 1RR. Tel 01-703 0282; Vale Onslow, 104-116 Stratford Road, Birmingham. Tel Brum 772 2062 or 5837; Pride and Clarke, 158 Stockwell Road, Stockwell, London SW9.