Southern pines and tropical palms surround the new sprawling white-metal hangars of the Maule Aircraft factory. The buildings are nestled in a corner of Spence Air Base, in Moultrie, Georgia. A 2,300-foot-long pond has been carved out of the red Georgia dirt to one side of the factory, and the longest runway of the former military airfield is 11,000 feet. Both are excessive, for the aircraft produced there (many of which are sold equipped with floats) do not need such distances.

The Maule M-5 Lunar Rocket is well known for its STOL (short takeoff and landing) capabilities. Now Belford D. Maule, AOPA 173654, has answered operators' requests for "more wing" by certificating the M-6 Super Rocket. With two feet four inches added to the wingspan, the M-6 gives even more impressive performance (stall speed was lowered 10.5 knots, for instance), claims Maule. And the M-6 offers more unusual features in an already unusual design.

Maule does not employ dancing girls or press agents to promote its new products, so it was a while before word filtered north about the M-6, and a while longer before I could go to Georgia. At last, I had a chance to try the new aircraft in Moultrie.

Inside the factory, in the reception room, an aging philodendron drapes around a large model of a red and white Maule. On a large bulletin board are color photographs of Dom deLouise and Burt Reynolds sitting in the cockpit of an M-5, its propeller whirring. The aircraft is dangling in midair, attached to a large crane by a heavy chain wound under the wings. A camera crew, also suspended in the

air, is positioned just in front of the airplane. The filming was for *Cannonball Express*, a movie I did not see. Other photos show the star-laden Maule taking off from a tree-lined street; the aircraft is in its legendary stance, balancing on its tailwheel.

The reception area itself—and the offices beyond—look more like a cluttered family room than a factory. There is even a kitchen where the employees can make their own lunches. The family atmosphere is not remarkable since at least 10 percent of the work force is named Maule, de-

MAULE M-6

A new Rocket for basic bush flying

BY MARY F. SILITCH

PHOTOGRAPHY BY ART DAVIS

continued

M-6

A longer wing gives better short-field performance for bush flying.

pending on who is doing the accounting and whether they are including in-laws. Starting with Belford David Maule, president, and his wife June, vice president, secretary and treasurer, down to granddaughter Shelley, who issues work orders, there are at least eight Maules in the factory's total work force of 75.

The company now produces two basic models, the M-5 Lunar Rocket and the M-6 Super Rocket, derivatives of Maule's earlier M-4s (see box p. 38).

The Maule aircraft are strangely nice looking, neither show-stoppers nor ugly ducklings, though they come closer to the latter. They earn their various Rocket designations from performance, not looks. The nose seems too thin for the boxy rear fuselage and the large tail surface. The gear struts also are wide and utilitarian looking. But it is performance, not looks, that counts in the backwoods.

The 235-hp version is the star performer, and most of the aircraft leave the factory with the large engine, said Dan Spader Sr., aircraft sales manager and chief test pilot. That is the model I flew for this report. Both the M-5 and the M-6 are available with six different engines, ranging from the 180-hp Lycoming O-360 to the Lycoming IO-540 235-hp engine. The M-6 adds the new wing and $3,000 to the basic price of the M-5.

Performance with the same engine is basically the same for both aircraft, with the exception of takeoff and landing distances and stall speeds, Spader said.

With its low power and wing loadings (9.79 lb/hp and 13.2 lb/sq ft) and light weight (1,400 pounds empty; 2,300 maximum takeoff and landing), the aircraft can leap off from incredibly short fields. The claimed length for the M-6, taking off or landing over a 50-foot obstacle, is 500 feet. (The M-5 is listed as 600 feet.) The closest competitor, the discontinued Cessna 180, calls for twice that length. The 180 has a maximum takeoff weight of 2,800 pounds and is powered by a 230-hp engine. The Maule, on the other hand, is as light as a Cessna 172 and has 85 horsepower more than a Skyhawk (though only five more than the 180).

The 180 does win out in useful load and payload. With its long-range fuel capacity of 88 gallons (528 pounds), the 180 can carry 629 pounds, while the M-6, with its 63 gallons of fuel (378 pounds), has only 417 pounds of load-carrying capacity left.

It is easy to load that 417 pounds into the Maule, as two gaping back doors on the right side (in addition to the two front doors on either side) open wide to four feet one inch.

The aircraft is constructed of one-piece welded 4130 steel tubing, covered with Razorback fiberglass coated with butyrate. The wings are all metal with fiberglass tips. Flaps and ailerons are also metal.

The wing on the M-6 has been lengthened from 30 feet 10 inches to 33 feet two inches. Each flap is now 10 feet long, and the ailerons have

continued

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The wing on the M-6 has been lengthened from 30 feet 10 inches to 33 feet two inches. Each flap is now 10 feet long, and the ailerons have

been moved farther outboard. The M-5 has only two down positions for the mechanical flaps—20 and 40 degrees. The M-6 has three positions. The first notch is 20 degrees, the second is 40 degrees. Both are fixed positions. Lug the flap handle back another notch, however, and you have 45 degrees. A bungee system automatically brings the flaps down to 50 degrees as speed slows to 48 knots on approach. If you do not want full flaps, you can leave the handle at 40 degrees. If you need to go around, applying power brings the flaps up to the 45-degree position (you will have to take over with the flap handle to dump the rest).

Spader said that the flaps also could be used as speed brakes for a fast descent. He noted that there are no restrictions against slipping with full flaps either.

The added lift from the longer wing naturally produced a disadvantage—loss of cruise speed. Maule ingeniously solved this problem by adding negative flap. Lower the flap handle beyond the neutral position, and you get seven degrees flaps up. The flaps tilt up at only a slight angle; but when the negative position is cranked in in the air, the airspeed indicator gains a not-so-slight five knots. The increase varies with altitude, Spader said, and M-6 owners have reported five- to seven-knot gains. Emil Conti of Conti Aviation in Blue Bell, Pennsylvania, picked up the airplane used to illustrate this article just after my trip to Moultrie. He said he gained 12 knots cruising back to Philadelphia at 9,500 feet, but Spader thinks this figure is high.

Using negative flap changes the airfoil section, Spader pointed out. The negative flap reduces the drag of the longer wing and gives the increase in speed. Negative flaps have been used before on sailplanes, and Molt Taylor's Mini Imp has been flying with them for several years. But Maule is the first company to use them on a production powered aircraft.

The use of negative flap was so unusual, the Federal Aviation Administration did not know what to make of it; but Maule tested it under many different loads, and the configuration proved structurally sound. "There were no adverse effects," said Spader, "and there are no restrictions on the use of negative flaps. You can even land with negative flaps."

Following up on bush pilots' suggestions for "a little more wing," B.D. Maule worked on a number of configurations for three years before coming up with the version he had certificated last summer. Using full-span flaps and spoilers seemed promising; but there was not enough roll control, so he returned to the use of ailerons. Leading-edge cuffs worked well, but at about 130 knots, the aircraft picked up a buffet. Finally, he settled on the longer wingspan.

The new configuration has been "a shot in the arm" for sales, Spader admitted. In spite of Cessna cutting out the 180 and Piper stopping production of the Super Cub (and the declin-

continued

ing health of the small-aircraft market in general), Maule is thinking of expanding. The company is turning out two aircraft a month—the M-6 outselling the M-5 12 to one—and Spader said Maule wants to up current production to three aircraft a month. "Everything I have here, back to the jigs," he said, indicating the green, bare-frame fuselages in the large hangar, "is sold."

Lack of a huge publicity campaign has not hindered M-6 sales. "People come down to buy an M-5, fly the -6 and change their minds."

It was easy to see why, after flying with Spader. For my introduction to the M-6, we taxied the bright red and white aircraft out of the line of Maules ready for delivery and trundled down the ramp. The bright red interior was neat and well fitted, if spartan. The seats were squared off with white piping, not at all like the working bush Maules one is used to seeing. The black panel looked even blacker for the lack of a great array of avionics. I counted six circuit breakers, lined up neatly under the black throttle and aqua propeller control (both vernier).

A few hundred feet down the ramp, Spader turned the aircraft back toward the rows of aircraft for our runup. He pulled back one notch of flaps and shoved the throttle forward. Before I could yell, "Watch out for your inventory," we were off the ramp. The tailwheel hit the pavement and we bounced into the air, climbing out well above the rows of Maules at 61 knots, best angle of climb.

Spader said the takeoff distance has been measured at 45 feet; landing roll, 100. (Don't count on performance like this, of course, with a pilot of average skills and any sort of load.) With the certification of the M-6, Maule produced a full set of performance charts, something it had never had before (the operating manual is sparser than the panel). Spader sent the figures off to the Civil Aviation Authority for certification in the transport category in the United Kingdom. The British promptly sent the figures back, saying that the numbers could not possibly apply to a fixed-wing aircraft. Spader sent another set of "more conservative" figures, but is planning to publish the more realistic ones once the British approval process is completed.

Onlookers also find the M-6 performance hard to believe. Emil Conti said that a lot of interest in his new M-6 had been shown at Philadelphia's Wings Field. "When you lift off at the first runway light, people come out to look," he said.

When I made my first takeoff—on Spence's Runway 32, not the ramp—the little Maule was off practically before I had shoved the throttle all the way in. My takeoff was not as spectacular as Spader's, but there were more to follow. If you want real short-field performance, hold the brakes as you push the throttle in, with one notch of flaps cranked in already ("so you won't have to reach so far for the second notch," explained Spader), and pull in 40 degrees as you rotate. The M-6 pops right off the runway from practically a dead stop.

Landings were equally impressive. The M-6 floated in so slowly on final (at 44 to 48 knots, the flaps extending the full 50 degrees as we glided down) that I could have counted all the rows of cabbage stretched out in the field below us. It was so slow, I probably could have counted the *heads* of cabbage, had I cared to. "Drives tower operators wild," said Spader, as we hung over the threshold. When one talks of landing on the numbers in a Maule, one talks more in terms of stopping on the numbers. I never realized before how large numbers are on an 11,000-foot runway, and I had

not made such a short landing since I thought I had an in-flight fire in a Cessna Cutlass RG.

Landings were surprisingly easy, despite my being rusty in tailwheel touchdowns. With little wind to bother us, the M-6 tracked straight each time, with the control wheel held back. The M-6's gear is the same as the M-5's, but a new tailwheel will be approved shortly. It will have the same wheel size but will have a bigger yoke and will steer better, Spader said. The beefing-up evidently is overdue, as a number of operators have expressed frustration with the current tailwheel.

The main gear has Maule oleo-pneumatic shock absorbers. Standard main tires are 6:00 × 6, and optional oversize ones are 8:00 or 8:50 × 6. Cleveland hydraulic disk brakes, which did not get much of a workout on the long runway, are standard, and half wheel fairings that fit just behind the tires are optional.

Climbing out to altitude was not as dramatic as the landings and takeoffs, but the M-6 managed to maintain a healthy 1,000-fpm climb through 9,000 feet. We were lightly loaded and the day was not too warm—the outside air temperature was 40°F by the time we reached 11,000 feet. "You can climb out with full power," Spader said.

Factory cruise figures are the same as for the M-5. Leveling off for cruise at 11,000, the aircraft was indicating 117 knots. Sixty-five-percent power gave us 112 knots indicated; and 60-percent power, 104 knots. All slightly lower than book figures. "You can't get the factory cruise speeds," one M-5 owner told me, "unless you want to lose a lot of altitude." Other owners—and even a Maule dealer—expressed similar sentiments. Small tires and speed fairings can add three to five knots to cruise, compared with the performance with large tires, another Maule owner said.

On the opposite end of the scale, airspeed indicators do not have numbers as low as the stall speeds claimed for the M-6. With power off, we stalled well below the 35-knot indication. With power on, there was a definite buffet on the rudder pedals, which Spader said is caused by the slipstream over the elevator, as the aircraft stalls at just less than 45 knots. Control response was good and the stall was gentle.

The stall speed with power off, full flaps, gross weight and forward CG, has been calibrated at 41 mph (36 knots), said Spader.

I had a brief try at the M-5 on the new Edo 2500 amphibious floats (which should be certificated on both the M-5 and M-6 models by the time you receive this issue), and performance was back in the realm of the ordinary. We approached the 2,300-foot pond at 70 knots, not 48, and touchdown was gentle—and short. Applying full throttle for a go-around, we were back in the air before we settled into the water.

The initial takeoff from land had been more dramatic. Spader headed the aircraft for the same spot on the ramp where we had lifted off with the M-6, but turned only half way round for the runup, pointing the aircraft's nose across the ramp. We did not turn toward the Maule inventory for takeoff this time, but went off abruptly in just the width of the ramp.

M-6

Simple and spartan, with a beefier tailwheel on the way, the M-6 is meant for utility.

With the amphibious floats, the M-6 will be certificated with a higher gross weight—2,750 pounds (normal is 2,500). Useful load will be 850 pounds (on wheels, it is 830). The M-5 already is certificated for Aqua 2400s, Edo 2440s, Fiberfloat 2400s and PK 2300s. The M-6 is scheduled for straight-float certification also.

The M-6 I flew had the fuel-injected Lycoming IO-540 engine, with 235-hp. Since the new wing adds $3,000 to the base price of the equivalent M-5 model, the M-6 235C is $44,850. (Top of the line now is the turbocharged model, with the 210-hp Lycoming TO-360, at $45,295.)

Floats, of course, are extra, but most Maules are produced with structural

continued

beefing up and extra corrosion proofing for float installation. Skis are available also, as is an agricultural sprayer rig and a glider tow hitch.

The M-6 had not been certificated with an autopilot when I flew it, but that will be done (the M-5 has Edo-Aire Century IIB).

Maule Aircraft has extended its warranty from the scanty 90-day period to a year. The M-6 has been certificated for almost a full year, and 30 have been sold. When I checked with the FAA about service difficulty reports on the new model, there were none. One airworthiness directive has been issued: During a heavy rainstorm at the factory, the alternate air tube of a fuel-injected model filled with water. Putting a drain in the tube solved the problem, said Spader.

The M-5 has had a few ADs on accessories; one of the most recent ADs called for inspection of the rudder-pedal V-bar tube for cracks. One operator I know found three cracks on his M-5's tube.

The Maule Rocket Association, 6807 South MacDill Avenue, Tampa, Florida 33611, publishes an occasional newsletter. Membership dues are $5 a year. John P. Colman, AOPA 454517, runs the organization.

Maules truly are specialized aircraft, and they obviously appeal to those who have need of a utilitarian airplane. There is nothing similar available new in this price range. The Cessna 185 is a good $33,000 more.

With the M-6, you can take off for the back country and land on a short strip (but don't try a 100-foot one). You can load up through those cavernous doors with bales of hay, a full day's catch or whatever 500-pound load needs hauling out and take off from an appropriately small strip. Or, if you want, you can use it simply to amaze the folks at the airport when you bounce it off the tailwheel before you roll past the first runway light.

If the M-6 is not what you are looking for, or if you think it still needs refinement, just sit back and wait. B.D. Maule is a tinkerer. There is an M-6 on the line with a larger prop undergoing noise tests, and there is a solid-white one with an Experimental sign in the window. Maule, who is rather reticent, did not have much to say about it. And there will not be a lot of fanfare when he does get ready to say something about it. □

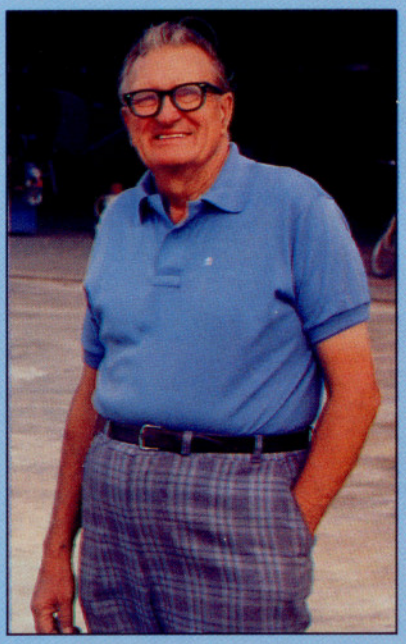
M-6

FROM MICHIGAN TO MOULTRIE

B.D. Maule's invention of a self-starter for aircraft was the impetus for his independent start in the aviation business. He was working for Lycoming at the time and moved to Michigan to manufacture the starter. World War II came along, and he invented a tailwheel, which he put into production and which was used on Piper Cubs. B.D. Maule also lists among his inventions a nondestructive fabric tester.

He also was interested in the total airplane. By 1957, he had completed the Maule M-4, his fourth airplane design. The first was a mid-wing aircraft with a 27-hp Henderson motorcycle engine that he used to teach himself to fly. He later added floats to the 350-pound airplane. His second design was an ornithopter that he flew in 1944, and the third was another ornithopter. The Experimental Aircraft Association convention in 1957 was in Milwaukee, and Maule won the top prize for workmanship and design for the M-4. He decided to produce the aircraft, and by 1962, he had it certificated as the Bee Dee M-4 (he conceded the Bee Dee to Jim Bede, and the rest of the series were just Maules).

He sold the first M-4 in April 1962; it is still being flown in Florida. The M-4 started out with a 145-hp Continental O-300 six-cylinder engine. It was a high-wing monoplane, with an all-metal structure, covered with fabric and butyrate finish. The rudder was linked to the aileron, and the aircraft had a steerable tailwheel. With an 1,100-pound empty weight, it cruised at 130 knots and had a range of 650 miles. It stalled, flaps down, at 39 knots and had a takeoff run of 900 feet.



MARY F. SILITCH

Belford D. Maule

In 1964, Maule started installing the 210-hp Continental IO-360 engine, and that model was known as the M-4 Rocket. The standard M-4 later became the Jetasen. In 1967, Maule obtained approval for the Franklin 220-hp 6A-350C1 engine, and that version was called the Strata Rocket. The M-4 Astro Rocket was a deluxe version of the Jetasen, with a 180-hp Franklin 6A-335B1A six-cylinder engine. The Franklin engines were used until 1975, when Frankin went out of business.

In 1968, Maule escaped the cold Michigan winter, packing up practically the whole family for the trek south to Moultrie, Georgia.

The M-5 Lunar Rocket first flew in Moultrie in 1971; two prototypes were built. One had the 220-hp Franklin and was called the M-5 220C, and the M-5 210C had a 210-hp Continental IO-360-D. Maule installed his first Lycoming engine in the M-5 in 1976—a 235-hp O-540-J1A52 flat six. (Servicios Aereas de America SA of Mexico had been installing 180-hp Lycomings in M-4s.)

The first aircraft to receive a Maule-installed Lycoming is still flying in California, I was told. Maule keeps track of where its aircraft go.

The M-5, in addition to the engine variations, had 30-percent more flap area and larger tail surfaces than the M-4, for better STOL performance. It was about this time that photographs of the little Maule standing on its tailwheel started appearing.

The latest version, the M-6, is very similar to the M-5, except for the wing, and it too performs the same tricks. □

Maule M-6-235C
Super Rocket
Base price $44,850
Price as tested $49,000
AOPA Pilot Operations/Equipment Category*:
Sport/Special-purpose $45,172 to $45,193
Cross-country $55,047 to $55,060

Specifications

Powerplant	Lycoming IO-540-W1A5D 235 hp @ 2,400 rpm Recommended TBO 2,000 hr
Propeller	Hartzell, 2 blade, constant speed, HC-C2YR-1BF/F8468A-6R
Length	23 ft 6 in
Height	6 ft 4 in
Wingspan	33 ft 2 in
Wing area	174 sq ft
Wing loading	13.2 lb/sq ft
Power loading	9.79 lb/hp
Seats	4
Cabin length	6 ft 8 in
Cabin width	3 ft 6.5 in
Empty weight	1,400 lb
Empty weight, as tested	1,505 lb
Gross weight	2,300 lb
Useful load	900 lb
Useful load, as tested	795 lb
Payload w/full fuel (std)	660 lb
Payload w/full fuel, as tested	417 lb
Fuel capacity, std	240 lb usable (40 gal usable)
Fuel capacity, w/opt tanks	378 lb usable (63 gal usable)
Oil capacity	12 qt
Baggage capacity	100 lb
Cargo capacity	700 lb

Performance

Takeoff distance, ground roll (one person, half fuel)	150 ft
Takeoff distance over 50-ft obst	500 ft
Max demonstrated 90-deg crosswind component	12 kt
Rate of climb	1,350 fpm
Max level speed, 8,500 ft	149 kt
Cruise speed (fuel consumption)	
@75% power, best economy	
8,500 ft	143 kt (72 pph/12 gph)
@65% power, best economy	
8,500 ft	139 kt (69 pph/11.5 gph)
@55% power, best economy	
8,500 ft	130 kt (66 pph/11 gph)
Range with max fuel, 30-min rsv	800 miles
Service ceiling	20,000 ft
Landing distance over 50-ft obst	450 ft
Landing distance, ground roll	250 ft

Limiting and Recommended Airspeeds

Vx (Best angle of climb)	65 KIAS
Vy (Best rate of climb)	78 KIAS
Va (Design maneuvering)	109 KIAS
Vc (Design cruise speed)	126 KIAS
Vfe (Max flap extended)	82 KIAS
Vne (Never exceed)	156 KIAS
Vs1 (Stall clean)	57 KIAS
Vso (Stall in landing configuration)	46 KIAS

*All specifications are based on manufacturer's calculations. All performance figures are based on standard day, standard atmosphere, at sea level and gross weight, unless otherwise noted. *Operations/Equipment Categories are defined in June 1982 Pilot, p. 93. Prices reflect the costs for equipment recommended to operate in the listed categories.*