ooney Aircraft of Kerrville, Tex., is one of the best examples of the value of competition among manufacturers of general aviation aircraft. An underdog for years, Mooney has had to fight hard for every sale, and use every bit of ingenuity at its command to elbow its way into the market dominated by Beech, Cessna and Piper. They've not only done well at it, they delight in needling the Big Three with the claim that Mooney sold more retractable-geared airplanes than any single model of their competitors' retractable-geared aircraft.

[Mooney led this part of the field during June, July, August and September, 1961, but trailed the Piper Comanche 250 on total sales for 1961, based on Aerospace Industries Association's Utility Airplane Council figures for the first 11 months of the year and unofficial tabulations for December: Comanche 250 deliveries, 407; Mooney Mark 20 (21), 286; Beechcraft Bonanza, 282; Comanche 180, 178, and Cessna 210, 171. The Comanche 180 led in October with 33 deliveries, the Bonanza in November with 38, and the Comanche 250 in December with 59.-Ed.]

The problem isn't made any easier by the fact that Mooney has a tough job putting together a dealer organization that's able to compete with the giants. General aviation has grown to a point comparable to that of the automobile industry, in that the industry's leading manufacturers quickly gobble up the biggest, bestestablished, best-financed dealers throughout the country.

Nevertheless, despite these sometimes-overwhelming odds, the Mooney organization has fought its way ahead in the best traditions of the American system of free enterprise and competition. Once in a while this zealous drive shoves them a little off base, as it did recently when a Mooney official contacted a number of its major suppliers around the country and "suggested" they'd better buy a Mooney airplane, or risk losing some sales to other suppliers who did buy a Mooney. Surprisingly, several suppliers knuckled under and bought, but others bluntly refused.

This constant competitive push has another advantage: it keeps Mooney from getting fat and complacent. New ideas and new products get careful attention, because any one of them might contribute toward giving Mooney some slight edge over their competitors. Thus, when an instrument manufacturer (Garwin) came up with a Beech-style six-instrument cluster of high-quality en-

## Mooney '62 Mark 21C WINS SALES

Competing against general aviation's 'big three' is tough, but Texas manufacturer ranks near top in sales of single-engine, retractable-geared planes. Its 1962 Model Mark 21C is flight checked by PILOT editor

by MAX KARANT • AOPA 18



Two all-metal 1962 Mark 21C's in flight. The upper plane provides a good view of the retracted gear and wing shape



Here is a typical Mark 21C panel, except that radio is optional. (N-78915, flown by the author, was similarly equipped.) Critical control knob, discussed in the article, is at the center of the panel, just below the King KX-100 radio. Two larger knobs are throttle (left) and prop control (right). The smaller knob between them, with center push button, is mixture control. Large vertical handle, extending to the floor, is the gear-retracting mechanism. Small handle directly to right of gear handle is hydraulic lever for flaps. New Garwin cluster of instruments is to right of radio.

Mooney Aircraft photos



There's more room in the back seat of the Mark 21C than you would believe. Baggage compartment is directly back of rear seat. Handle for the manually operated retractable gear, which comes from front of cabin to back when retracted, has spring-loaded grip that slips into hole in floor unit

gine instruments, Mooney was the first (and so far, only) manufacturer to grab it, just as they were Garwin's new pictorial gyro horizon.

The 1962 Mark 21 combines these and many other features into a highly-acceptable four-place private airplane, one that should give Piper's two Comanche models (which Mooney regards as their prime competition) further cause for concern. The Mark 21 for 1962 is actually the Mark 21C. but in reality it's the Mark 20C. This confusion is the result of Mooney's efforts to cope with the FAA's type certification system. The original Mark 20, which was largely made of wood, went through the entire FAA certification, a process which costs any manufacturer a fortune. To avoid repeating that expenditure, Mooney got its new all-metal version of the Mark 20 certificated under the original type certificate, which officially and legally made the airplane the Mark 20A, B, and (now) C. But Mooney itself, in an effort to give its sales people a little more to talk about, dubbed what's officially the Mark 20C the Mark 21C, implying that the 21C is an airplane entirely different from the 20C. It isn't; it's one and the same, and is certificated under the FAA's type certificate (2A3) for the original four-place Mooney.

Until I ferried a Mark 21C from

the Mooney factory at Kerrville, Tex. to Henry Weber (AOPA 24889), Mooney distributor in Lancaster, Pa., I had only flown a four-place Mooney a very few minutes in the air, soon after the first one came out. Only other contact with Mooney airplanes I'd ever had was a single-seat *Mite* which I had owned several years ago. This tiny airplane endeared itself to me completely, with some of the finest flight characteristics of any contemporary airplane.

I was attending the Beech distributors' meeting at Wichita in early December when I received a phone call from Mooney, inviting me to ferry one of the 1962 models back to Lancaster. It took the better part of two days to get from Wichita to Kerrville (near San Antonio) on Braniff Airways; had I had the Mark 21C I could have made the same trip in about  $3\frac{1}{2}$  hours. When I finally landed at San Antonio, Bill Mullen (AOPA 169358), Mooney's regional sales manager, was waiting for me with N-78915, the Mark 21C I was to fly to Pennsylvania. It was dark, had started to rain, and Kerrville is some 60 miles back in the hills. Then we discovered we had another hour's wait, because Braniff had put my bags on another plane.

Next morning Bill checked me out in another Mark 21C while they put the finishing touches on my ship. The

weather was IFR but we managed to fly around under the low ceiling, in the rain, keeping the Kerrville airport in sight. It was here that an unusual defect showed up. In starting the four-cylinder Lycoming I used the same technique I've used on virtually all other engines. But it turned out to be wrong, because of something having to do with the Bendix "shower of sparks" ignition system. When I started this engine it suddenly shook violently, shook the instrument panel just as hardand broke something inside the Garwin horizon. Turned out there's a special way to handle the throttle and starter so as to prevent this, and Garwin is supposed to have modified its horizons to withstand such starts.

A number of points quickly became apparent. The manually-retracting landing gear is not nearly as difficult to operate as you might first imagine. It's well balanced, and the only "trick" is to swing all the way through retraction or extension, without hesitating or stopping somewhere in between. The greatest problem along these lines is in the retraction cycle; I had a little trouble a couple of times getting the springloaded lock in the handle in place, because I hesitated during the followthrough. Otherwise the Mooney gear is easy and simple to operate-and is

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## Mooney Mark 21C

## (Continued from page 33)

probably the fastest-operating landing gear in the industry.

One of the most persistent "anti-Mooney" items is the reported lack of room in the cabin. Even I believed that the Mark 21C was not a true fourplace airplane, and that it was just a "roomy two-place" ship. When I mentioned this to Mullen he immediately took me out to a plane, put me in the back seat directly behind him in the pilot's seat, and flew me around the field for a while. I was pleasantly surprised. Both front seats have a lot of fore and aft travel on rails. Once the two people in the front seat are comfortably in place, there's ample leg room in back. But both front seats can be rolled back until they touch the back seat, which may be the source of some of the gossip. Incidentally, I quickly learned that the pilot, especially, must double-check the lock on his sliding seat before takeoff. On one takeoff on the way home I'd apparently only partiallylatched the seat. As the plane accelerated the latch came loose and the seat rolled back so far it took me away from the controls. I grabbed the landing gear lever, locked vertically just under the throttle, and pulled myself forward, carefully locking the seat. But for a few seconds the plane flew itself

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carefully locking the seat. But for a few seconds the plane flew itself. Aileron control is quite stiff. While there is considerable friction in the system itself, this also may be due to the fact that only a comparatively small amount of control movement gives you full aileron travel.

Flight characteristics of the Mark 21C are excellent, in much the same tradition as the single-seat *Mite*. Normal takeoffs are made with about one-third flap, which is operated by a hydraulic pump handle just to the right of the landing gear handle and directly under the propeller control. To lower the flap, you must be sure the hydraulic valve is closed. This is operated by a small knob just below the throttle and mixture controls. With the knob full forward, the valve is closed so that a couple of pumps on the handle will lower the flaps to the desired angle. Both flaps and gear indicators are on the nosewheel housing near the floor, between the two front seats.

In the location of the flap-valve, however, I accidentally found a hazardous situation. Shortly after takeoff, the flap should be retracted. This is done simply by pulling out that small knob, opening the hydraulic valve, permitting the flap to be pushed up into the retracted position by the slipstream. That little knob is almost identical in shape and construction to the knobs that operate the carburetor heat, cowl flap, propeller control and mixture control. Like all these controls, except the throttle, it also has a small locking push-button in the center; to unlock the knob, just push in the center button. Most important of all, however, is the fact that

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the most critical of these knobs all are located together, within an inch or so of each other.

On one takeoff I was quickly going through all the motions that must be performed in any such airplane: gear up, manifold pressure reduced, r.p.m. set for climb—and then, on the Mooney, retract the flap. I performed all these functions quickly—including reaching for what I thought was the flap valve knob. But when I pulled it out the engine quit. I had accidentally pulled out the mixture control, which is right beside it. In a flash I had pushed all the knobs back in; the engine caught again immediately.

Mooney has clustered several such critical knobs together, encouraging such "pilot errors." Clustered within a few square inches are the carburetor heat control, throttle, mixture control, prop control, flap valve and cowl flap. All have essentially the same knob design. The throttle and prop control are larger than the others. One wrong pull in that little area on the panel (as I found out) and anything might happen.

Normal climb is at full throttle, 2,550 r.p.m. and 120 m.p.h. indicated. Maximum rate of climb is at 95 indicated, but it's best to use 120, both for cruising purposes and to keep the engine cool. Once you get to cruising altitude and level off, normal cruising power is 23 inches and 2,300 r.p.m. until you get to 7,000 feet, after which it's 2,300 r.p.m. and full throttle. Fuel consumption at this cruising power ranges from 8.5 g.p.h. at 12,000 feet through 9.8 at 3,000 feet to 10.2 at 7,000 feet.

Incidentally, another peculiarity in the 1962 Mark 21C: the two fuel gauges now read in pounds of 91/98 octane fuel instead of gallons. To figure out his fuel consumption in the term he's always used-gallons per hour-the Mooney pilot now is forced to convert the instrument readings and the performance charts to gallons per hour, by dividing the pounds by 6 (gasoline weighs 6 pounds per gallon). I meant to ask Ralph Harmon (AOPA 22880), Mooney's vice president and chief engineer, why this unusual twist, but was unable to talk with him. The poundsper-hour business is the language of the scientists, but it certainly is not the language of the nonprofessional pilot and the average Mooney owner.

Approaches and landings are simple, straightforward, and should be easy for any pilot. Landing gear speed is 120 m.p.h., flap speed is 100. Base leg is normally flown at 90. Once the flaps are down, trim to 80 m.p.h. (the elevator trim wheel is at the floor, at the pilot's right hand). The Mark 21C stalls at 57 fully loaded, so final can be made at 70. The ship sits quite low to the ground, so my tendency was to land it high. Once trimmed, the ship actually lands itself.

During the flight from the factory to Lancaster I even had the opportunity to fly the Mark 21C on instruments for a considerable period. It's very easy to fly this way, and is quite stable, even in turbulent air. Only thing I didn't like about flying this particular ship IFR was the fact that it had just one radio—a Narco Mark 2A. However, I filed my IFR flight plans accordingly, taking a round-about route to stay out of congested areas, and advising the FAA centers in detail of my radio limitations. As the result, I had no trouble whatever; if anything, the FAA con-

## Mark 21C And Its Competition

Here is comparative data on the Mooney Mark 21C and the two Comanche models which Mooney feels are their major competitors.

	Mooney Mark 21C	180 Comanche	250 Comanche
List price (standard)	\$16,450	\$17,350	\$21,990
Gross weight (lbs.)	2,575	2,550	2,900
Empty weight (lbs.)	1,525	1,510	1,630
Useful load (lbs.)	1,050	1,040	1,270
Top speed, m.p.h. (sea level)	190	167	190
Maximum cruise, m.p.h. (75% power	) 180	160	181
Climb (f.p.m. at sea level)	1,010	910	1,350
Normal range, miles (no reserve)	900	750	740
Service ceiling (ft.)	18,000	18,500	20,000
Stalling speed (m.p.h.)	57	61	61
Fuel capacity (gals.)	48	50	60
Wing loading (lbs./sq. ft.)	15.4	14.3	15.7
Power loading (lbs./h.p.)	14.3	14.2	11.2
Wing span (ft.)	35	36	36
Length	23 ft. 2 in.	24 ft. 9 in.	24 ft. 9 in.
Height	8 ft. 4½ in.	7 ft. 4 in.	7 ft. 4 in.

My total time in N-78915 was 11:02. Total distance was 1,600 miles, which gave me a block-to-block average of 145 m.p.h. for the trip, at normal cruising power. I made several true airspeed computations during the trip, and they averaged from 163 at 3,000 feet through 167 at 5,000 and 174 at 9,500. Fuel consumption averaged just a little higher than it should, undoubtedly because of the difficulty I had in trying to adjust the mixture control accurately. On another leg, my true airspeed was noticeably lower and I couldn't figure out why-until, on approaching for a landing and using my check list, I found that the manually-operated cabin step had been left down. It has to be retracted and extended by the pilot, in much the same manner as the gear and flaps.

The 1962 Mark 21C has a new Hartzell hydraulic constant-speed prop which, except for a fairly frequent tendency to surge about 25 r.p.m. in crusing flight throughout the trip, performed well.

Despite a \$455 price increase for 1962, the Mark 21C is \$900 cheaper than the 180 Comanche, and \$5,540 cheaper than the 250 Comanche. Mooney's increase was 2.8% while Piper's 1962 increase was 5.5% on the 180 Comanche and 7.3% on the 250. These comparisons are for the comparable standard models, without radio. This year Mooney has tackled one of Piper's major selling points: the Autocontrol, which is a single-axis Mitchell autopilot with heading lock. Mooney now is offering a new A.R.C. single-axis autopilot, with heading lock, for \$995 extra; Piper gets \$800 for its Autocontrol.

The new A.R.C. autopilot, incidentally, is based on the same technique used by Alick Clarkson (AOPA 11594) in what now is the Brittain autopilot: a single tilted turn-and-bank gyro that senses both turn and yaw. Tactair also has gone to this type of gyro for a lowcost autopilot; Beech is offering it as optional this year.

All told, then, Mooney has come up with a very salable item in its new Mark 21C. Hal Rachal, Mooney president, estimates they'll sell 500 planes in 1962 for a total of something over \$6,500,000 worth of aircraft. That's an average of about \$13,000 per Mark 21C, which is probably the wholesale price to the distributor. For the owner who wants performance up in the Bonanza-Comanche class, and who is willing to operate gear and flaps manually to get such performance for less than the cost of even a Cessna Skylane, the Mooney certainly warrants the closest examination before buying anything. It's as comfortable and quiet as "the more expensive brands," is now all-metal, and is as easy to fly as a nonprofessional pilot could want. END