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THE M.C.GILL DOORWAY

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CNC Detailing of
MD-80 and MD-90
Floor Panels





The big moment—signing the contract. Seated from left, M.C. Gill and Craig Stay, Senior Buyer, Douglas. Standing from left, Bill Gardner, Technical Sales, M.C. Gill Corp.; Al Egbert, General Manager, Douglas; George Boze, Project Manager, M.C. Gill Corp.; Brad Parks, Procurement Group Leader, Douglas; and, Ken Belyea, Contracts Administrator, Douglas.

We Said Yes, Yes, when asked if we could supply fully detailed floor panels for the MD-80 and MD-90.

It used to be that airframe manufacturers bought flat stock panels from a supplier, sent them to their in-house sub-assembly shops and, a few days later, received cut-to-fit panels ready for the production line. Often, additional fabrication had to be performed such as routing, edge fill, drilling, inserts, to name a few, before the panel was finally installed.

Or, someone—either a supplier or the OEM (Original Equipment Manufacturer) itself—used tooling to lay up the panel by hand, pressed it, and autoclaved or vacuum bagged it, applied the finishing touches and pronounced it ready for final installation.

As often as not, all of this work was done by hand. Not only was it time consuming, it was relatively common for final adjustments to be made at the point of installation.

What used to be, used to work. Not anymore.

In the customer driven, cost competitive, quick turnaround economy of the '90's, an airframe manufacturer must be responsive to its customers' needs; and the OEMs' suppliers must do likewise. If they don't, their successors will.

Thus, when McDonnell Douglas/Salt Lake City approached the M.C. Gill

Yes, we manufactured the raw stock panels and, more important, they qualified to DAC's drawings BZZ 7002 (Gillfab 4017-passenger compartment); 7954400 (Gillfab 4109-passenger compartment); and, S00096 (Gillfab 5242-cargo compartment).

Yes, we had the capability and experience to profile the panels to conform to Douglas' drawings on our 5-axis CNC (Computer Numerically Controlled) machine.

Yes, we could meet Douglas' production schedule, demanding though it was. We pointed to our on-time record at Douglas/Long Beach. Meeting deadlines is an M.C. Gill strong suit and our on-time deliveries normally average in the mid to high 90 percent range.

Yes, we had the capacity and experience to meet Douglas' requirements for quantity and quality. Almost 49 years in the business went a long way in satisfying this one.

Corporation about providing fabricated flooring panels for their part of the MD-80 (and, later, the MD-90), we were quick to respond.

The reason for Salt Lake City's request was that, as a weight reduction measure, Douglas decided to substitute some of the passenger compartment flooring of unidirectional fiberglass facing/Nomex honeycomb core construction (Gillfab 4017) with that

of carbon facing/Nomex honeycomb (Gillfab 4109).

The decision to go with Gill for all fabricated flooring requirements was not automatic by a long shot. Before deciding, Salt Lake City posed some very difficult questions and there was only one acceptable answer to each of them, as noted to the left.

In fact, we'd been supplying Douglas/Long Beach with fabricated panels for their portion of the MD-80/90 production for the best part of a year prior to Salt Lake City's inquiry. In addition to the work being done for McDonnell Douglas, M.C. Gill has also profiled:

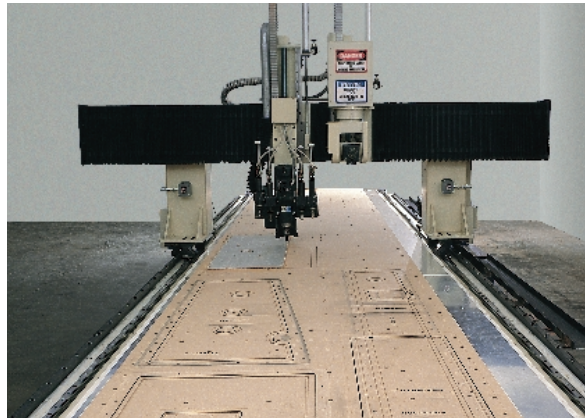
- Heated sliding cockpit window frames for Boeing aircraft;
- Cooler system parts, tooling and air filtration mounting flange tooling for the MD-900 Explorer helicopter;
- Special antennae reels for the Apache helicopter and,
- Radar transparent laminates for customer-manufactured radomes. The parts measured 18"x285" and required 400-500 holes drilled in each part.

Douglas/Salt Lake City officials must have been convinced we could do the job because on August 27, 1993, they awarded a long term contract to M.C. Gill for all MD-80/90 fabricated flooring panels.

The photos on this page should give our readers a better understanding of what is involved in producing a finished profiled floor panel; and a basis for making a more informed buying decision. If a purchaser does not fully understand what goes into a product, the buying decision will be made on what is understood — usually price. But first cost alone is generally a poor rationale for selecting one product over another. The more complete the information, the wiser the decision.



Design engineer utilizes the CAD/CAM system to create CNC programs.



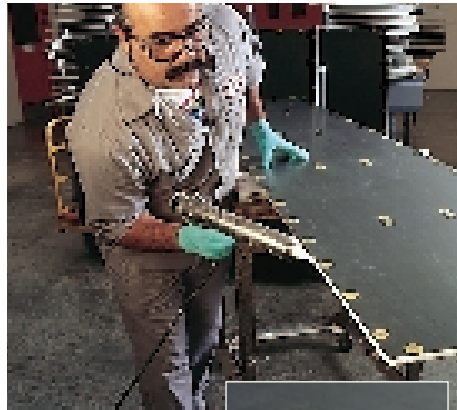
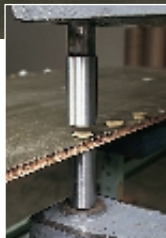
CNC bed with gantry. The machined-in tool paths in the foreground serve as a vacuum chuck to hold raw stock panels in place for detailing.



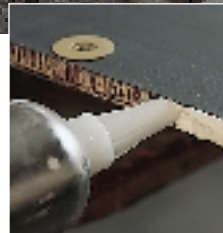
CNC head, drilling and countersinking insert holes.



Technician adjusts panel on the roller table to ensure proper alignment of inserts. Then inserts are firmly set into the panel.



After a two-part potting compound is measured and mixed it is applied with pneumatic gun as edge fill.



Technician smoothens the edge fill compound and ensures there are no air bubbles along the panel's edges.



Quality Assurance technicians examine insert placement on the finished panel prior to Douglas source inspection.



A reference number is stamped on the panel to facilitate traceability, if required.



QA technician verifies the final paperwork necessary for Douglas inspector's visit.



Gillfab 4109 panels installed in the flooring assembly at Douglas' Salt Lake City plant.

The Bottom Line is that You Know Your Total Cost Up Front

A promise is a promise

Next came what some would call the hard part—living up to the promises we made. Convincing a customer that the job can be done and done well is often the biggest hurdle to overcome. The M.C. Gill Corporation has a long history of overcoming hurdles when the customer provides the opportunity.

Once the contract was approved, M.C. Gill established a 14-member “team” whose responsibility would be to cover every facet of the project from the manufacture of the raw stock panels to shipping completed fabricated parts.

Salt Lake City provided us the drawings for each panel in a ship set, and we digitized them for programming the CNC. Based on a shipping schedule for the duration of the contract, work orders were issued for raw stock panels which were cut into “blanks” of a more workable size, profiled, sent to the potting room for edge fill, insert installation, priming to prevent corrosion, finishing, and marking.

Attention to detail pays off

Each step of the manufacturing process is inspected individually by

our Quality Assurance department and once the finished panels are ready to ship, they first must be approved by a Douglas source inspector. Once the panels are received in Salt Lake City, they are subjected to a final inspection before being sent to the production floor.

The attention to detail does not differ substantially from the process we employ for all customer orders, but quantities are larger and adherence to schedules is less flexible. Douglas is concerned with Just-In-Time (JIT) delivery, which means that M.C. Gill has a very small window for delivery of a ship set because shipments are predicated on Douglas production schedules. In short, if we fall behind, the Douglas production line screeches to a halt—and neither party wants that to happen. It's expensive and Douglas can't make good on their delivery schedules.

As of this writing, in the five months ending May 31, we had made thirty shipments of eleven complete ship sets consisting of approximately 325 pieces. Of that, only one panel has been rejected—an acceptance rate of more than 99.7 percent!

Although we are pleased, with this record we expect to do this well—not just with Douglas, but

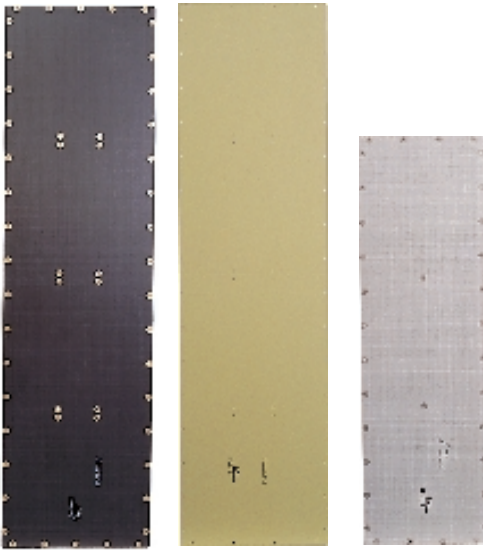
with all our customers. It's one of the reasons we're considered the leader in our industry—we make a promise, we keep it, we're dependable. It's that simple.

How it came to pass

The M.C. Gill Corporation has long realized that to maintain its leadership position, it had to manufacture products that offered more value added for its existing and potential customer base. This dovetailed with the Company's endeavor to pursue vertical integration. It enables us to provide the OEM and replacement markets with additional services and allows us to more closely control the quality of the finished product.

The decision was made to continue to provide the highest quality raw stock sandwich panels and flat laminates, and to offer our customers the option of ordering those products detailed to their requirements. That included cutting to shape, edge routing and filling, drilling, countersinking and installing inserts—finished products that were essentially drop-in-ready.

This commitment was not taken lightly. It meant a major capital expenditure for a three-and five-axis CNC profiler and a CAD (Computer Aided Design) system; for buying



Three different types of finished panels have been cut to size, routed, drilled, inserts installed, edge filled, cleaned, stamped and inspected... ready to ship.

From left to right, Gillfab 4109 (Nomex core/carbon facings) used for passenger and crew compartment flooring; Gillfab 5242 (end grain balsa wood core/aluminum facings) used for cargo compartment flooring; and Gillfab 4017 (Nomex honeycomb core/epoxy facings) also for passenger and crew compartment flooring.

It used to be that airframe manufacturers bought flat stock panels from a supplier, sent them to their in-house sub-assembly shops and, a few days later, received cut-to-fit panels ready for the production line. Often, additional fabrication had to be performed such as routing, edge fill, drilling, inserts, to name a few, before the panel was finally installed.

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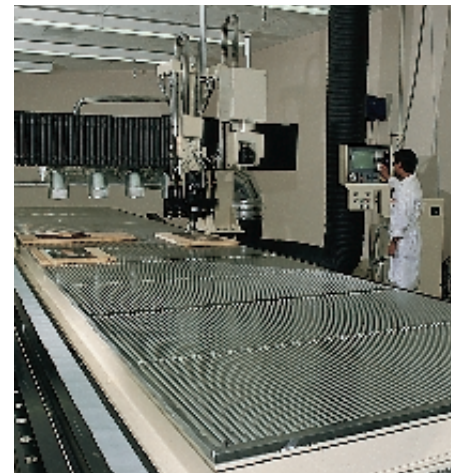
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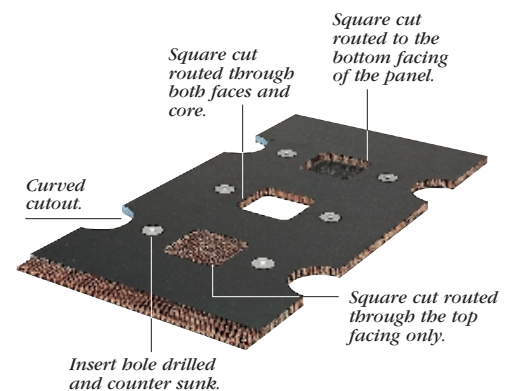
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- Heated sliding cockpit window frames for Boeing aircraft;



The CNC machine is extremely versatile.

As shown in the sample part below, it can be programmed to rout the upper facing of a sandwich panel only—in this case, .010"; rout all the way through the panel (.400"), or through the panel to the surface of the bottom facing (.390"); drill and countersink holes; rout edges; and detail cut-outs.



Putting the finishing touches on a pattern for making molds for a contoured part.

THERE IS NO SUBSTITUTE FOR EXPERIENCE . . . AND HERE'S 949 YEARS OF IT.

What It Means For Our Customers

In recent issues we've talked about M.C. Gill's 49 years in business—stability that means financial solvency, OEM qualified parts and product quality. As a customer, what those 49 years probably mean most, however, is the experience our employees bring to the production floor in the performance of their jobs.

The ability to qualify to an OEM spec means little if the product a particular customer orders is sub par...because the people on the lines have not developed the degree of craftsmanship respective to each operation. We firmly believe that craftsmanship comes only in time, after supervised on-the-job experience. That's why M.C. Gill rewards employees who stick with



Dan Guerrero, Human Resources Director, makes the introductions.



Pete Ortega, General Supervisor, receives his 40 year award from Stephen Gill.



20 through 24 years of service.



15 through 19 years of service.



10 through 14 years of service.

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experience. That's why M.C. Gill rewards employees who stick with the job—**on the Gill job and nowhere else.** Experience in this industry can be obtained elsewhere but it may not be apropos to the way



The Award pin pictured here has three rubies which designate 15 through 19 years of service.

we, the industry leader, do things. On June 15, 1994, we hosted a luncheon for our employees to reward the loyalty evidenced by



Tony Ramos, Receiving Foreman and our oldest "temporary" employee, receives his 30 year award from M.C. Gill.



Ralph Navarro, Production Supervisor, and his brother, Juan, Lead Man I... 28 and 26 years of service respectively.



M.C. and Stephen Gill receiving their 48 and 37 year awards respectively.



5 through 9 years of service.



5 through 9 years of service.



5 through 9 years of service.



5 through 9 years of service.

NO ONE'S PERFECT

Once in a while, we're asked about apparent discrepancies in the data we publish on our products as well as other information appearing in the Doorway and other M.C. Gill literature. Sometimes, we just goofed. Most of the time, though, what may appear to be an error really isn't.

An example of what looks like an error but is not is our Product Data Sheet for Gillfab 4017. The Data Sheet calls out .040" thick facings for 4017 Type 3. But, in a recent Doorway we stated 4017 Type 3 had .022 thick facings.

In fact, both are correct—the products are identical except for the facing thickness. The 4017 with facings that are .040" thick qualify to Lockheed's specification LAC-C-28-1386. The 4017 with .022" facings relates to Boeing's BMS 4-17 specification. Although Gillfab 4017 is not qualified to the Boeing specification, the physical and mechanical properties do meet that spec's requirements, and one of the requirements is that the facings be .022" thick.

An example of an error that really is an error was the fax number that appeared in the last Doorway for Zurbruggen Aerospace Products, our sales agency for Austria, Belgium, Germany, Holland, Luxembourg and Switzerland. It should be 49 5253-988181.

We apologize for any inconvenience either of the above may have caused. And in the future we encourage you to point out to us what appears to be an inconsistency. As always, we want to clear up misunderstandings.

NEWS FLASH

Gillpatch II has been approved by McDonnell Douglas for use on all Douglas commercial jet transport aircraft as announced in an All Operator Letter dated July 12, 1994.

Gillpatch II meets all FAA requirements for cargo liner patch repairs, has a peel-and-stick backing and can be installed in seconds. For additional information please contact our Marketing Services Department at (818) 443-4022 or fax us at (818) 350-5880.

Trivia

A basketball is only about half the diameter of the basket.

★★★★★

The average woman's waistline begins getting smaller at age 52.

★★★★★

Americans spend \$15.4 million a week at car washes.

★★★★★

President Woodrow Wilson, who had an earned doctorate, couldn't read until he was 11.

★★★★★

For the majority, blood pressure is usually higher in the right arm than the left.

★★★★★

The biggest polluter of Lake Ontario is Lake Erie.

★★★★★

Among Prince Charles' distant ancestors are Genghis Khan and Vlad Tepes, the original Count Dracula.

★★★★★

The largest roof in the world is the tent over the Haj airport terminal in Jidda, Saudi Arabia. It covers 105 acres and can shelter as many as 100,000 persons.

★★★★★

Except for flowers, picture painters paint cats more than anything else.

★★★★★

The Sun emits 4 million tons of energy every second. The earth catches about 4 pounds of that in the same amount of time.

THE FUNNY SIDE

A bachelor with money to burn is likely to meet his match.

★★★★★

Life is so uncertain—eat dessert first.

★★★★★

Where there's a will, there's a lawsuit.

★★★★★

The problem with easy payments is that you have to make them with hard cash.

★★★★★

The rooster crows but the hen delivers.

★★★★★

Since he got married, he eats at least one of the three basic food groups every day—canned, frozen, or take-out

★★★★★

"Either pay your rent or move out!" said the landlord to the starving artist. "But just think," replied the artist, "someday, people will walk by and talk about the famous painter that used to live here." "If you don't pay the rent," replied the landlord, "they'll be saying it tonight."

★★★★★

The best thing that can be said for some modern art is that hanging is too good for it.

★★★★★

Teenagers don't realize that someday they'll know as little as their parents — maybe less.

★★★★★

To make a long story short, there's nothing like having the boss walk in on the middle of it.

★★★★★

The only thing worse than learning from experience is not learning from experience.

★★★★★

As the caterer finished totaling the bills, she asked the father of the bride, "Charge?" "No," he replied, "I think I'll just surrender."



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