

Disrupt Yourself Podcast

EPISODE 105: PAUL HILL

Welcome to The Disrupt Yourself Podcast. I'm Whitney Johnson, I think, write, speak and live all things disruption. Our guest is Paul Hill, founder of Atlas Executive Consulting and former director of mission operations at NASA.

WHITNEY Welcome Paul.

PAUL Thank you Whitney and thanks for having me.

WHITNEY First question for you today is where did you grow up and what did you think you wanted to be when you grow up?

PAUL I was born in Orlando when my father was a NASA engineer at Kennedy Space Center. Uh, and so my brother and I both wanted to grow up to be astronauts or, or to work in the mission control because we thought everybody's dad worked for NASA. Um, so I always gravitated towards flying, gravitated towards wanting to, to go in space and just never lost the bug.

WHITNEY It sounds like you can't remember a time that you weren't interested in going into space.

PAUL I tell people the story and I think most people think it's apocryphal. Um, my older brother and I learned to count down from 10 to zero before we learned to count up and we would count down to everything. You know, our parents would tell us to go to bed or tell us we had to go outside and do something and we would count down to lift off before we would go do it. So it definitely was, was in the blood, so to speak. And I remember even some of my earliest memories were sitting in lawn chairs on my grandparents' roof in Titusville right, right across the Indian River from the Cape and watching Gemini Titans and Saturn Fives during the holidays blast off out of the Cape. And, you know, I thought everybody grew up watching rockets launch.

WHITNEY When did you realize that everybody didn't grow up watching rockets launch?

PAUL My folks were divorced when I was about five and my mom and my brother and I moved back to Texas where she finished going to school. And so no longer was I surrounded by this small community of NASA people in Titusville, Florida. I'm surrounded by people that they may have seen something on TV about space, but otherwise didn't really talk much about it. Um, and so that's when I realized, okay, so not everybody does this for a living. That's interesting. I wonder why not. (laughing)

WHITNEY So as a young boy, you wanted to be an astronaut. When you went to college, was that your plan? What, what were you planning to do once you went to college?

PAUL Oh I was, I had an Air Force scholarship. Uh, I went to Texas A&M, was in the corps, uh, majored in aerospace engineering from the get go and the plan was to get out of school go to pilot training, become an Air Force test pilot, my master's degree and become an astronaut, which is one of the, the more common ways of getting there. Um, and I almost went down that path and I definitely went in the, uh, get the Air Force scholarship and went into the Air Force.

But before I graduated and went off to pilot training, I had a professor walk into a senior seminar. He drew a graph on the chalkboard. This is back in the day when we still really had chalkboards and he says, he drew one curve and he drew another curve that was steeper and went much higher. And he wrote on one bachelor's degree and the higher one he wrote master's degree and put down a, a stack of papers, he says these are applications for Grad school. Are there any questions?

The biggest thing at the risk of making this sound like it's only about money was he showed this huge disparity in long-term salary, not just how much you were making, but long term ability to, to create more uh, more wealth for retirement essentially. And then we talked some about how long do I want to fly? Do I want to fly jets for a living? You know, what are the odds I could, I would get selected to be an astronaut. And the, the real epiphany for me was I didn't give up on wanting to do any of those things, but I didn't want to bet everything I was doing on getting struck by lightning.

I thought, huh I better stick around and not go to pilot training just yet and get that master's degree as insurance in my pocket in case some of those things don't ever come to pass. It never changed what I wanted to do at all.

In the end, after I got into the Air Force for a variety of reasons that all had to do with the way Air Force makes assignments it was going to become much more difficult for me to get an opportunity again to go to pilot training since I had given one up to stay and get my master's degree. And when I realized that I decided, well, if I'm not going to get that pilot training, uh, even though I had this master's degree, then that's not going to help me become an astronaut, and they're not letting me do the type of work I want to do. So I'll leave, leave the Air Force and go work for NASA because that's the type of work I want to do, whether I ever become an astronaut or not.

WHITNEY Interesting.

PAUL Then I showed up in Houston working in the Mission Control world, developing the first plans for building the Space Station.

WHITNEY You basically did an, a risk analysis and you said this makes more sense.

PAUL That's right, and the thing was, it wasn't, it wasn't um, even, even that choice wasn't risk-free and it wasn't at no cost.

WHITNEY Right.

PAUL I had, had a pilot slot already, which was a guarantee when I graduated I was going to pilot training for the Air Force. I had to give that up in order to stay in Grad, in Grad school. The Air Force allowed me to stay, but I had to, to tell them somebody else can take my seat in

pilot training. I'm willing to give it up. And then if I got my master's degree it was a chance I wouldn't get another one, which in fact is what happened.

WHITNEY Hmm.

PAUL What I didn't really foresee at that time was a few years down the road with the Air Force experience I had and that degree I was going to have opportunities in the Mission Control organization when I got to NASA, that would not have come to me without the degree, without the Air Force experience. And I didn't see either one of those coming. Uh, and, and then when the opportunity presented itself, I found myself looking back thinking, oh my God, good thing I did that.

WHITNEY Right. How long were you in the Air Force?

PAUL I was active duty four years.

WHITNEY Four years. Okay. All right. So you get that master's degree, you go work at NASA. It's so interesting to me how you had these experiences. You make this choice, but it's these two experiences combined that allowed you to do what you did at NASA. So tell us what you did at NASA.

PAUL When I first arrived, I joined a brand new group whose job was to plan the missions for building the Space Stations. So you know, the Space Station ended up being about a million pounds worth of equipment in space, which we took up a chunk at a time. It'd be kind of like filling up a U-Haul trailer and, and building a house a little bit at a time to, to build the house on the highway while you're going down the road. And so we had a, a lot of engineers in our organization who are very experienced in flying shuttles, deploying satellites and things like that. It took a, it took a few of those folks and then a handful of new people like me to now – “you guys, take the brains of these guys with the experience and then start doing the engineering to layout, how do we get the little piece parts out of the shuttle? How do we get them attached to each other and how do you get them each activated?”

In fact, you know, most of my personal effort was how do we get some of these new things turned on? Like how do we first turn on the very first computers? How do you deploy solar rays? How do you turn on the electrical system in space that you just put together? And then after spending oh, six years doing that kind of work and in leading teams of other engineers doing progressively more complex, complex analysis, more complex planning, uh, I became a flight director. So the, the white vest guy in the, the Apollo 13 movie, you know that fellow Ed Harris plays, um, that's actually a flight director named Gene Kranz, real famous flight director from Apollo. And I became one of those. In fact, I was the 40th flight director ever. My job when they selected me was to be one of the first Space Station flight directors. Uh, and then I, I was both a Space Station and Space Shuttle flight director where-

WHITNEY What does a flight director do, Paul?

PAUL They lead the team. So you know, the people that sit in mission control, they have to have a boss. There's one person that's in charge of the operation and that's the flight director. But before you ever get there, they lead that same team of people and a lot of others and putting the mission together. Uh, so you know, we're told, here's what we're going to fly, we're going to build, we're going to add this piece of the Space Station, and we're going to deploy the satellite or whatever it is, then we pull the experts together in a team and say, now how do we do that? Let's start putting that plan together. Let's make sure we have

enough oxygen and rocket propellant and everything that we need on the Space Shuttle. And let's make sure we understand how it's all going to, to occur in space with the astronauts. And then let's put a training plan together. Let's let the astronauts train. Let's train us as a team and be ready to fly, including if we have emergencies while we're flying. And then our job is to go on console and fly it.

The thing that flight directors like to tell people is the flight rule number one, which is a, um flight directors have the authority to take any action necessary, uh, for the safety of the astronauts and the spacecraft, I mean flight directors like to interpret that as we're God, and we're allowed to do anything that we want, which is not an actually the intent of the rule, but it's not far off from the power that you have in real time because there's a flight rule number two. And that is, but you better never, ever make a mistake.

WHITNEY That's interesting. So, um, this idea of mistakes, I, I wanted to ask you about this because, um, obviously the stakes are very, very high. Um, if you do make a mistake, people die and really expensive equipment, uh, goes down the drain. So what is the culture around failure in NASA and what can more traditional businesses or the private sector learn from that?

PAUL I would say that the most helpful culture we have around the subject of failure starts before you get to catastrophic failure and significant tragic events like Apollo 1 or Challenger, or Columbia where we lost astronauts because we, we failed in the, in, in the ultimate ways. We consider everything that we do an opportunity for us to dissect and learn from and become better. We never have a training run that at the end we don't go back and assess how we did, including if it was very successful, and we'll come back to, yeah, you know, I know this worked, but this call that I made here was terrible. Here's what I meant. Here's how it came across. I chose my words badly. In fact, the team started going off down a bad path because I, I made, I made a call that they all listened to. I, I kind of put a red herring out in front of them. That's on me. Here's how it happened. Here's what I was thinking about, and we do it. That kind of debriefing we do as a team.

Because it's necessary for, you know, even if I'm the boss, it's necessary for the people on the team to hear me thinking out loud and say, here's how I screwed that up. Here's what I was thinking because one, they learn the lesson, okay, don't make that mistake for, for themselves, but they also learn, here's what I could've done to help you. I, there's this other piece of information that you clearly either didn't know or didn't understand and that's in my area of expertise and I, I could have told you and I should have seen that you didn't understand it.

WHITNEY So every single time you debrief, you do a postmortem every time and you dissect it and ask what you can learn?

PAUL Every time. And that's in training. That's actual flight operations, and that's if it's successful or if we stumbled and things didn't really go well. And I don't mean just failures, but you know the, this flight went long. We had to add two days on, and we weren't going to get it all finished, or we had trouble with equipment, and we actually caused some particular piece of equipment to fail. But we still pulled off the mission. We'll debrief each one of those. But even if it's, it's a huge success and there's ticker tape parades afterwards, we gather the team together and then we talk about, okay, what did we learn? What could we have done better?

We learned decades ago how to do this in a way where it's not accusatory. It's not going after somebody to find out, okay, who was the dumb guy on the team? Because almost without exception, I mean more than nine times out of 10 the, the person who, who maybe made a mistake, or made a bad call, or was late in making a good call whatever that was

almost always that person says, “okay, this is on me. I screwed this up.” And, and sometimes during the debrief you'll have say somebody on the team saying that's at the flight director with the flight director. Then say, wait, wait, wait. This is all on us. I suffer from the same, same mistake that you had. It's not just you. Here's how we now are going to be better. And sometimes we'd come out of those debriefs with observations that are significant enough that we go back to the entire ops community and say, hey look, we just learned something that a way we have been looking at some particular problem for the last five years, last 10 years is wrong. Here's what we should be doing instead. Here's how we've learned it.

And it's still not, not unusual to have a separate meeting where we'll pull in more people from the ops community to debate about that. Is that really the right learning? Let's talk about that. And then we'll start training everybody differently.

So by the time you have a real failure where you really break parts of the spacecraft, you injure somebody or God forbid we lose another astronaut, then as terrible as experience still is, you're still flexing kind of, uh, intellectual muscle memory because you still bring the team back together, the team knows we now are going to come back together and look at what was our contribution to this? Where could we have seen this coming and made a different call? Where could we, where should we have stopped it? If we had it to do over again, what would we do differently?

I mean, in fact, I have very personal experience with that after the Columbia accident cause I had a very, very, uh, involved leadership role in the Columbia accident investigation. And the return to flight afterwards. So I can tell you, having, having been there that, that community comes together, and it keeps doing the same things even in tragedy, which helps us tremendously, uh, even a-

WHITNEY What was the mistake? What happened? What'd you do?

PAUL For Columbia?

WHITNEY Mm-hmm.

PAUL Columbia was one of those mistakes that had been building in the community for years. And part of it is the same as a similar cultural erosion that happened before Apollo 1 and Challenger. Um, and that is we started making more and more decisions with less and less technical rat, rationale because we started gaining confidence. When I say we, I mean as a community, right?

It wasn't like these three leaders over here, or these engineers. It was a community evolution. Um, and we started, we started buying into the fact that, you know, we're pretty good at this. You know, we, we've been flying shuttles for 10 years, 20 years. We've, we manage higher energies than most people can even wrap their minds around. And we do it mission after mission, like falling off a log. We're good. Everybody knows we're good. And so, you know, sometimes when we see problems we can decide whether or not it's a big issue without really having to put a lot of work into it because we're good. I mentioned that already, right? So we started making more and more technical decisions like that, and we would use words like, uh, our engineering judgment, our engineering in, in experience-base tells us. Uh, and what we really meant was intuition or guessing, and we gave ourselves credit for it because we were in this very difficult profession, had been very successful at it for a long time.

And in most other people were, were in awe of our ability to do it. Not that we have the only jobs that people feel that way about, you know, the first time I even heard this described in more philosophical terms was from Marshall Goldsmith in his book *What Got You Here Won't Get You There*. But I, I also, as you know, I've had the privilege of hearing him describe it person. And that's the, the paradox of success. And, and NASA's experienced in manned space flight is a, is a perfect example of that at work. In fact the, the, the real paradox is even after we learned it, we had to unlearn it twice again and make a very similar failure. In Columbia's case, it was that foam coming off of the tank wasn't capable of doing damage that, even if it hits something it couldn't cause any kind of critical damage, but it also wasn't capable of hitting anything, and we had no data to back that up at all.

Hadn't done any analysis, no tests, no anything. Intuitively it makes sense because it's just this foam that was about the size and density of a loaf of bread. How could that possibly knock the most critical or most complex machine that we've ever built out of the sky, off course on the other hand in, junior high you could probably do the arithmetic that would say, you know, if I hit you in the chest with a loaf of bread at 700 miles an hour, it would probably do dramatic damage, we like, we would have thought of it that way? Somebody posed that question for the shuttle except for the fact that we had also, we also had concluded it's not capable of hitting shuttle, which as, as you know, is not true because it did happen. And the real irony is foam had been hitting the shuttle for decades.

That's how we had chipped the tiles on the bottom of the shuttle. And we knew it. And yet somehow in our brains, the entire community failed to make that right connection. And we did it for all wrong reasons, largely because we were buying into our own success, and we stopped, we stopped doing the same things in every decision that had made us successful all along, which was being very methodical and making sure we can answer "why" on every one of our conclusions, not just well, because we're good. Because, because you're good is never the right answer.

WHITNEY What did you do differently after this happened?

PAUL Um, we, we went back to just as we did after Challenger, um, we went back to absolutely demanding a more rigorous answers to the question, why on many things. So why do we think this is safe? Why is it okay for us to go, why do we think this, this way we've always done this - do we, do we remember why that's the way we do it? Because the fact that we've always done it this way doesn't mean it's right.

It could just mean like in Columbia's case, we've been dodging bullets all along and didn't know. So do we understand what's the actual rationale besides "this is what we've always done" or "we're just good so this is what we want to do." Uh, and we became much better at doing that again as again as a community. Cause you know, the, for me as a leader the real troubling thing about this is that I was cast in the most, the most senior leadership levels, which, which I don't say to mean that the most senior executives look down, look down the line and told people, "Shut up. We're going to tell you this is okay, so we're going to keep doing this."

It wasn't like that. But you know, power goes with the position. Plus most of the people that get promoted to those senior positions are pretty darn good. And in, in and certainly in our case in each of those three eras where we had uh, fatal accidents, the people sitting at the head of the table were heroes of the business that we all recognize. Boy, if you want somebody sitting at the head of the table making the decision, it's that guy. His judgment or her judgment is more equal than everybody's else. Well, as they start realizing how smart they are also, plus they've got lots of things going on. They start making decisions

and not worrying about some problems and as they do that, the community accepts that and the community stops worrying about them. By the time we flew Columbia in Columbia's last flight, I distinctly remember in the last year or two before that having technical issues come up at a lower level that the discussions you would have without any managers in the room would, would end with, well, we don't have the budget to do the test. We don't have the budget to do the analysis. This isn't on the top 10 of the program. They're probably not going to give us any budget because they've got other alligators nipping at their butts, so we're not even going to take this work forward. And that's the scary thing because as a senior manager, the, the organization is now trying to help you do what you want to do and is intentionally not passing things up that some of them think, hey, this is terrible. We ought to not do this. And that absolutely was the case of Columbia and We, we learned that lesson and made organizational changes to sort of stamp that out. The trick will be hanging onto it.

WHITNEY Right. Right. It's the, like you said, it's the paradox of success or the Hubris that comes when you've gotten really good at something, you stop paying attention.

PAUL Right. And your challenge as a leader is you have to, you have to remain aware of that and stay paranoid that you were slipping and that you are taking the rest of the organization with you.

WHITNEY What was your most exciting moment in working for NASA or, or your most fulfilling moment where you just said, yes, this, this is why I did this for my career or at least the first part of my career.

PAUL I guess there would be two. Um, and one of them would be as a technical leader, which in fact I thought was going to be the entirety of my career. And when I say a technical leader, I mean flight director where I was a senior person at my space center, but my job was running the flight control team, planning missions and flying missions, and I thought I'm going to die doing this. And I didn't mean that negatively. I'm going to do this forever. And most flight directors when they leave, being a flight director will tell you, I'd never should have stopped doing that job, this was the best job I ever had. And you can count me in that group, in that group. But I also thought, I'm so good at this. I, I'm just going to keep on doing this. I know I have a knack for doing this and certainly the roles that I played in the Columbia accident investigation and in our return to flight after that, cause I was the lead shuttle flight director for the first flight after that. Essentially demonstrating and testing many of the things that, that I led the development of after the Columbia accident. Things like how you would detect damage if we damage another shuttle and then how you would send astronauts outside of repair parts of the shuttle that were never intended to be repaired in space or on the ground. I led teams to developed all of those things and then on the very next flight it was our job to test those things, to demonstrate that they would all work. Um, and when that flight was over, I really did think this is it. I, I, I, I can't imagine, uh, contributing more as a technical leader than this. Plus it did, it about killed me anyway.

It was the hardest two and a half years of my life. After that, I moved into the senior management, and it was after that, that I became the director of mission operations. So essentially my, uh, my boss's boss from when I was a flight director, and um in that role, when I went into it, I remember thinking, how, how can I be as effective as an executive as I am as a technical leader because it has nothing to do with how smart a rocket man I am. And that's always been one of my great strengths is I'm good at the technical stuff while the clock is ticking. Now I'm sitting in the conference room sipping coffee with a bunch of other managers. How am I going to be as effective doing this?

Um, and I was one of a couple of leaders that led the entire organization through a leadership culture change at, from the top down. And, and some of it was our, our own internal paradox of success. So it not, not talking about all of NASA now, but just the mission control organization and the signs that my predecessor and I saw that our, our leadership environment and, and that organization had started for the first time in our history going down that same path, and we now were making bad decisions and not just bad decisions, it was, it'd become, um, it had become the culture in the management ranks to not talk about any of the significant issues because talking about them made them real and plus it'll leak out that we've got this issue that we're worrying about and are our stakeholders will lose trust in us. I as a manager, my job might be at stake because people will think we're not taking care of business.

And the managers all learned to filter everything out for different reasons than we had stopped talking about technical issues that led up to our accidents, but it had the same effect. We weren't talking about the things that we needed to be talking about. And over about a two, between a two and three year period. I, I led the entire evolution on us coming to grips with that and being able to be critical of our own leadership style. And I say our, I mean both individually and of the organization, but you know, you start criticizing an organization, especially an established powerful organization like say mission control, and it feels like you're being disloyal. You're disloyal to the people here. You're disloyal to, to the guys that we learned the job from. How dare you, the Apollo generation, you know, if you say we're not doing it right, you're saying they didn't do it right. And how dare you say that?

And much of the discussion that, that, that my predecessor started when that I then led, was how we came to grips with that and finally learned that, that we have to, again, we have to be able to ask why we can't just keep doing these things because this is the way we did them before. We might keep doing them still, but we have to be able to say why, and we have to talk about those things that we are most concerned about. In fact, the, the way we said it in the management ranks before we made those changes, don't put any ripples in the pond or no ripples in the pond. And one of the things I am, I will always be most proud of isn't the technical work I did even after the Columbia accident. It was as an executive leading a team where two levels of management below me absolutely learned that lesson and learned that our top value is putting the ripples in the pond. Or-

WHITNEY So that's the most exciting thing that you, you did?

PAUL Oh, absolutely. It changed everything for us as a management team.

WHITNEY Fascinating.

PAUL And not only, not only when I say it changed everything. I mean, you know, it was not long after we made that evolution that, that NASA for a variety of reasons, canceled the Moon and Mars program and essentially it was going to, uh, put half of our people out, out of work and they did, as a matter of fact. So we stopped flying shuttle, not going to have a Moon and Mars program. All we're going to do is fly space station. We might fly astronauts in space again. But you know, if we do that, we're going to hire somebody to do it commercially. We probably don't need to do it anymore because NASA just makes everything too expensive. So we're just going to pay somebody else to do it. And within a year, I had been given permission from my organization to actually go out and, um, essentially bid for work from these commercial enterprises like Space X, like Boeing, uh, like Sierra Nevada. Uh, so these were people that were potential offers, people that we're going to talk about building rockets and space ships to fly astronauts to space. And while officially NASA management told all of us, you're not allowed to go get their work because

we want to put all of your guys out of business cause you're too darn expensive, based on some things that we had achieved and significant cost reductions and we had made and how we did business before the Moon and Mars program was canceled, which we never would've been able to do had we not changed our leadership style.

Because until we did that everybody was circling the wagons to trying to keep everything they had. I mean they were absolutely doing the things that the senior NASA management was accusing all of NASA of doing. We're staying expensive, we're staying big because that's what we're supposed to do. And we learned that, and we had, we cut our operating expenses by, they don't know which ones you look at between 20 and 50% and we didn't do it because we were being made to do it. I went back to my customers and said, here's a 20%, then here's a 50% rebate for all years, and we can still keep doing the same level of work for you at, at a fraction of the cost. And because of that, NASA management said, okay, if you can convince any of these companies to hire you we'll allow you to do it. Keep it quiet though, because we don't want everybody else to find out we're letting you do something...

WHITNEY Interesting. So-

PAUL ...we aren't letting anybody else do, and we won, we won both Sierra Nevada and Boeing's, uh, work. So, uh, Sierra Nevada ended up not getting the contract Boeing did. And so when Boeing starts flying astronauts on their commercial spacecraft in this next year or so, mission control for them, is none other than NASA Mission Control in Houston? So one of the reasons why I say it's my, I'm most proud of it is it was only possible because we spotted our own cultural problems and fixed them and fixed them in time to demonstrate it to our stakeholders that they can trust us. And then we in fact use what we had learned. And convinced Boeing, holy cow, we need these guys on our team. And the Boeing executives would tell you that today, at least they would tell me privately, they may not publicize this, that they only were able to, to make a winning bid because they had us on their team.

WHITNEY So NASA was getting disrupted. You and your team figure out how to disrupt yourselves and change and as a consequence you put yourselves back in the game. So-

PAUL Oh yeah.

WHITNEY By becoming a subject of disruption, you were able to become an agent of disruption and now you do these really interesting things.

PAUL Right, and kind of like my experience leaving the Air Force. When we did it, we didn't do it for seeing this coming. We did it because - this is the right thing for us to do. We can be better than this. We're supposed to be better than this. That's what our, our, our, our training and real time operations postmortems or debriefs were all about, helping to continually get better. We had forgotten it and we relearned it as managers and then we were confronted with this crisis and then if we didn't step up and do the right thing. And now what's interesting is the first discussion I had with my senior management team after it was announced that we were canceling the Moon and Mars Program, of course you know, we're all sitting in this room and shell shock, thinking, Oh my God, man. I mean, for one thing, half of our workforce is now going to get laid off. That feels terrible. Secondly, we're going to start launching and launching people into space and one of the, the top critical risk that we listed was if we go five or six years, five to 10 years, not doing that, we're going to start having critical corporate memory loss and we are the keepers of this kind of experience for the nation. Now our top priority is we have to find work that looks like that and we have to keep those skills alive because one of these days the nation's

going to change its mind and they're going to say, NASA, we want you to go do this next scary thing and we aren't going to have people that remember how to do those types of scary things and we're going to have to relearn them with all the wrong lessons learned again.

And so capturing this commercial work was the top strategic concern that we had. And I never had any significant hope that, that we would be able to do it because NASA had already told me I wasn't allowed to go after it. And what do you know?

WHITNEY Here you are. That's all right.

For our listeners, just very briefly, how are you translating all this really good, meaningful work into the private sector?

PAUL I was, I was fortunate that while I was still at NASA, while I was still the Director of Mission Operations, um, when these things started happening and I realized looking back, we were only successful because we had the foresight to start, to start seeing how badly we were leading to do something about it. Um, that shook me up. Um, in, in that, in a variety of discussions I had, we had in management retreats with our next level of managers down. I still saw too many people that didn't understand, here's what really matters. Here's why we continue to be good. It's not just because we inherited this organization from the heroes of Apollo. It's how we continue to do the job well.

That bothered me so much. I started having regular conversations and I mean every other week group discussions with all of my direct reports, all these senior leaders from the organization and me and we took turns going around the room saying, here's my version of what's right about our culture what's wrong about our culture, what do we, what is it we do deliberately, which things we aren't doing deliberately that we're just getting organically, which isn't good enough. We have to be able to do it deliberately.

And as we did that, it, it became a very common theme. It wasn't all of us learning each other's script and it wasn't me dictating to them. It was us as a group kind of feeling this out, trying to talk about the touchy feely stuff that we weren't really raised to talk to, talk about in the first place. And that, as I did that, this the book that I ended up publishing after I, after I retired from NASA, all started materializing in my head. Here's how we tell that story. And as I started jotting down notes on it and thinking about it, I realized this isn't unique to us. In fact, the things that we discovered, that the struggles we had to go through to spot our own leadership failings and to do something about it, are the same things every manager goes through and what we did to get over it, we can show other management teams how to do so.

When I retired from NASA, it was all about - write that down, uh, in a way that isn't just usable for say I get back to my mission control friends at NASA so that they don't forget, here's the struggle we went through and here's how we caught ourselves and fixed it and here's why it matters. Which was my original motivation to write a book was to hand it back so that these things that we'd never said out loud before, we can now say, okay, here it is. Here's the first iteration of articulating it. Now you guys, you guys can mark it up and make it right the second revision. But then as I was writing it, I realized I can write this in a way that any executive, any manager can pick up and read and see - I recognize my own challenges. I recognize my organization's challenges here. And, and I recognize that these things that these mission control people did to improve, we can do those too. Holy Cow.

You know, because I tell audience after audience when I'm speaking - this ain't rocket science. It just turns out it's harder than rocket science. because, rocket science, follows all

kinds of rules and this is people's stuff. And it doesn't necessarily follow rules unless you're willing to say, this is what really matters to me. And we can talk about these things. We can in fact be as deliberate about these things as we are in the rocket science.

WHITNEY So for our listeners, what's the name of the book? And, and if people wanted to engage with you, what would that look like?

PAUL The book is *Leadership From the Mission Control Room to the Board Room*. And I guess like everything else, it's on Amazon, (chuckles) in fact just recently came out, uh, in, uh, in audible form, uh, in a, on a different title though. The title is *Mission Control Management* in the Audible form.

WHITNEY I like that title revision.

I'm really interested in the interplay between the astronauts and mission control. Can you just talk about that relationship between two parties.

PAUL It's interesting you go through kind of an evolution in, in what that's all about when you become a flight director. Because in general, you know, the mission control team has significantly more data than the astronauts because they ask, first, you know, there's only, depending on the mission, three to seven, maybe sometimes 10 people on board the spacecraft with much less powerful computers. Right? But you download, I mean you, you send down all of that data from the spaceship down to the ground and I have a room full of engineers sitting in front of me with more powerful computers and if we need them, we have, we can bring in a building full of engineers with significantly more powerful computers. So in general, you have a lot more brains and a lot more computers on the ground. So it's much easier to process a lot of data, have lots of engineering discussion.

The thing that keeps us honest and always has - strong personality's not withstanding is what matters most is - protecting the astronauts. Otherwise my Bill, my friend Bill Reed would say that, that, that soft pink body inside that space suit inside that space craft, no matter what else happens, no matter how important I now believe I am - my first job, protect the astronauts, not protecting my job or my sense of power. Anything else, protect that astronaut. It matters more than anything else. And then secondly, don't damage the spacecraft because it costs billions and in fact, every one of our missions we just assume we lose a spacecraft. It's irreplaceable. We're done. So treat it as such. And then the last one is, and then accomplish the mission. Everything else, everything else is small potatoes. Those three things drive everything we do.

How do we discuss things in the control room? Why is it okay for us to talk so directly at people outside of the team think, wow, those guys are so direct, they're blunt. They aren't, they aren't conscious enough of each other's feelings. No, it isn't about that at all. We're very clear, very mission oriented because protecting astronauts, protecting the space craft and accomplishing the mission are complete value set while you're flying the spacecraft. The astronauts know it, they and they know mission control knows it. So it works really well. And we sometimes butt heads over things we do. It is always over the small things. It's always over things that in the end are not big deals. When you start talking about big deals, how do we make this rendezvous work? Is this engine good enough or is it kind of blow up until we get to orbit? Is it safe to go out on this space walk? What should we do here in this very scary situation? Never is there a problem? Everybody on board, everybody on the ground knows - here's what matters most. Nothing else matters besides these.

WHITNEY All right. Couple of final questions. Um, from, from thinking about it, your tenure and even going back to your father's tenure, um, what is the most disruptive thing that NASA has done? Is it a moon landing? Is it what the public perceives is the biggest event or is it something else? Is it like the culture change that you talked about earlier, but what, what is the most disruptive thing that NASA has done?

PAUL You know, I would say, I guess if you're just talking public zeitgeist, if you will, it probably still stands out as the moon landing. Only because it's so audacious and it's so difficult for most people, people in the space business to look up there and say, really, wow, how incredible is that, that we, we, humanity did something like that. Um, what's, what's terrible about that as somebody from that business or just as uh, as, uh, not even just an American, but as somebody who is a, a student of things that we as a species accomplish. It's so easy for people to see how difficult that is. What an achievement that is. That 30 years of flying shuttles doing a variety of different things so successfully and making it look as easy as flying an airplane from Houston to New York, that it must have been that easy.

And it's unfortunate that it does a disservice to all of those great people that did that job. And I don't mean just the shuttle, but even today, flying the space station. You don't hear about it because well, it just must've gotten easy. No, they are awfully, awfully good at a very, very difficult job. And so the public has lost interest. It seems boring. But you think about - 30 years of flying shuttles, that's incredible. Or the fact that we've had people living on space station now for 20 years, how many people are even aware of that? That we've had people living in orbit continuously for 20 years, even after the Columbia accident, there were still astronauts living on the space station. Um, that is incredible. So you could look at it like, one of the more disruptive achievements that, that NASA and the certainly the human spaceflight community of NASA has done as is, we have continued to elevate what people take for granted must be easy. Um, which, I guess that's a good thing-

WHITNEY What do you think the future of space exploration is and do you think that, um, that um, astronauts will be replaced by robots? What, what are your thoughts?

PAUL Uh, I think robots are, will continue to be used and I think they should be used as much as possible because they are less expensive and they don't, and it doesn't get people killed.

WHITNEY Right.

PAUL But I also think that the whole point of going out there isn't just to go out and measure the temperature on the surface of Mars or to see what the composition is of the rings and Saturn just for funsies. For me, it's all about pushing out the human presence and not just one person or one crew that go and plant the flag and come home and we're done. But let's push it out for real. You know, let's, let's get people living on the moon. Let's get people living on Mars and not that, that looks like that great place to live. I mean, I think it would be just as fun to live in Antarctica and a lot easier to get home, but until you've done that, you don't get to that next place, you don't get to that next place.

And so I think we absolutely have to keep pushing people out. It's difficult to tell today what's going to happen, not just next, but over the next 10 or 20 years, NASA is still kind of dithering and in my personal opinion is still somewhat has lost its way, not all of which was, was, was, uh, self-inflicted. Um, but we need to get back to a place we, the nation, need to get back to a place and decide do we want to set an objective? Do we want there to be some hill that we want them to take? And what is it, we need to give it to them and let them go take it. Then we need to decide whatever that next one is. Um, and we have struggled to do that as a nation, um, since Apollo unfortunately.

WHITNEY I'm curious, what are you reading right now, or what, what do you like to read? What are some books that have been really meaningful to you?

PAUL You know, I would tell you one, just actually one I'm reading right now is from Carl Sagan, uh, called, uh, *The Demon-Haunted World*. Uh, which is just incredible, uh, especially for critical thinking. When I read before this that, uh, I can't tell you how many times I've been recommending to people is a book called *Factfulness* by a Sweden named Hans Rosling, and it is fascinating. Uh, it, it breaks the heart that, that he died a few years in fact just before the book was published because this is another one of those folks that I, that I thought I would go anywhere in the world just to have a 30 minute conversation with this guy. It is brilliant. It's, it's along the lines of *Freakonomics*. I would say it's a, it's a somewhat more sophisticated and data driven twist on a, the notion of *Freakonomics*.

Um, but it's absolutely powerful and for anybody who has, who has a concern or feels like, um, like, like, like they're becoming depressed or worried about our future because everything in the world has become so much worse. I tell you read his book and Google him, listen, listen to him on YouTube TV. You can, you can listen to the [TED talk](#) from this guy that you'll walk away thinking, what was I worried about as he explains in measure by measure how virtually everything in the world on average for humanity is better today than it has ever been. And all indications are, it's going to keep going that way. And you read this book and you realize this is not just this telling you that given you a warm hug, here's the data, which you know, that speaks volumes to a mission control guy.

WHITNEY Exactly. So who would you, who that is alive, would you go anywhere in the world to go meet?

PAUL Wow. See now I feel bad cause I have a long list of people that I can't go meet, (laughing) is it of one somebody that I could go meet, right?

WHITNEY Pick someone alive, Paul.

PAUL You know, you know, I would say, uh, in all seriousness, I would love, I would love to have a chat with, um, with Warren Buffet, um, and not because he is such a wealthy man. Maybe he'll take a liking to me and, and give me some money or give me an investment advice. I don't want any of that from him. I would love to hear his thoughts about the, the attitudes he had, opinions that he had as he went along that he then found out he was wrong about. And what it took for him to realize it was wrong and what it took for him to change it.

Cause you know, somebody like him has a long list of those types of things. I mean one of the reasons he's so successful is because he's capable of catching those things and saying them and then doing something about them. In fact, this was an interesting conversation I had with one of our HR reps back when I was still at NASA. He says, she bombed. I'm struggling to find a class that was like a good class for you to take. I said, well how about this? I don't want to take a class because by then I had already been through a lot of classes and I was already, already at very high level of executive management said, but what I would love it is get me in a room with Jack Welch or somebody like Warren Buffett or Bill Gates. And I just want to sit in the audience while they have a conversation and I almost don't care what it's about.

Although I would like to feed them the topics of mistakes that I could have and should have seen coming that I wish I could go back and do over again. Here's how I learned it. So do you want to help me learn something? Help me do that. Actually. That's kind of like why I wrote the book the way that I did. Here's how we screwed up and killed three teams of

astronauts that we didn't have to kill. Here's how we could have known that ahead of time. Here's what you can do to not do the same thing.

WHITNEY So Paul I dare-

PAUL Those are the people I want to hear from.

WHITNEY I dare you. Reach out to him. He might be willing to talk to you. I mean you, after all, were a flight director at NASA mission control. Why not try?

PAUL That's true. That's good. I will.

WHITNEY I dare you. I dare you. And here's my last question for you. What hill are you going to take over the next couple of years? Speaking of Paul Hill, what hill are you going to take?

PAUL Well, you know, the first one, the one I'm climbing still, um, is, is um, getting my calendar more full of more audiences, particularly of management teams at individual companies, but even if it's at conferences, uh, I want to, I want to have more opportunities to speak about some of the things that, that you and I are, have just been talking about with more audiences in order to tweak their interest and give them an opportunity to become aware of how, how much they could do to improve their leadership style, improve the leadership culture in your organization, set the team up for success. So that's what I've been busy with since I retired from NASA and I foresee for the next, I don't know how many years continuing to try to reach out to more and more companies and management teams to do that.

Um, I am hopeful that I will become successful enough doing that. Um, that it will then give me a, give me a little bit of a breather that I can write another three to four books that I've been taking notes on for a few years. Um, but they're fiction and I won't, I really won't allow myself the, uh, the indulgence to write them until I've, I've, I've grown the, the, my audience for this leadership message enough than I can afford it, if you know what I mean.

WHITNEY Interesting.

PAUL And, actually these books are, are as compelling, and as fascinating to me as anything I've ever done. So I'm really hopeful that, that I build up enough business that I, that I'll look and I'll say, you know what? I can do this. I could take the time to write these cause if I don't, I'm going to keep sleeping terribly and wake up in the middle of the night thinking about the darn books.

WHITNEY Okay. Coaching moment. I think you need to write them now.

PAUL (Laughing) Yeah, I know.

WHITNEY What are you waiting for? Like seriously, it's not like you don't have time. So those are my two dares to you Paul, is to reach out to Warren Buffett, write him a very compelling note about how, what you've learned from mission control. You'd love to share it with him and you'd love to hear his, his thoughts as well. I think that would be a fantastic conversation. And start writing your fiction. Any final words that you'd like to share as we close?

PAUL The thing that I, I think so many people lose sight of is, you know, what makes the difference between, um, somebody who has the ability, you know, a high potential versus somebody that actually achieves some in, some incredible thing is, is not largely how good

they are. Not largely how smart they are or the way we usually try to be the smartest guy in the room.

It isn't that, it's how do you lead the team? How do you lead the people around you and, and are you trying to spot the things that we aren't doing as well as we could have, including you as the leader. Are you willing to get those out on the table and be better? Are you willing to have somebody on your team be the genius instead of you? Um, and if you can, if you can get there on those, those questions, it's amazing what people can pull off where as a leader you feel like you're running just to keep up with these brilliant people who are taking their direction from you.

WHITNEY Love it. Paul Hill. Thank you very much. It has been an absolute pleasure.

PAUL I look forward to, I mean, I, I've been looking forward to talking with you since we first talked about it, so it was a pleasure for me too.

Battle entitlement. It's an important lever of disruption, but a sneaky one. As our confidence grows, as we get better at what we do - that's when entitlement can sneak in. And when unchecked, can lead to truly tragic outcomes. The kind we see all over the news. Whether a shuttle crash or a leader or company that crashes - it's often due to an unchecked sense of entitlement

So many important lessons around leading teams in this conversation - be willing to always examine why you're doing what you're doing. Hold each other accountable. Have crystal clear, high-stakes goals that everyone understands. Does your team understand the mission? What is your version of - keep the astronauts alive, don't destroy billions of dollars in equipment?

Practical tip:

The best antidote for entitlement is learning. Fascinating that when NASA was in the practice of doing a thorough post-mortem on everything, they were able to continue to succeed. It was when they skipped it or didn't take a deep dive in examining everything that they started to slip. Do you have a process in place for examining your projects? Even if you do it on your own, start taking a look at what you're learning and how you can improve. Remember - even getting 1% better can make a huge difference over time.

If you'd like to learn more about where you are in your disruptive journey, take a moment and visit DisruptionDiagnostic.com and take the Learning Curve locator. You'll find out where you are - the low end of the curve, the sweet spot or the high end of the curve - and what steps you can take next.

Thank you again to Paul Hill for being our guest, thank you to sound engineer Whitney Jobe, manager / editor Macy Robison, content contributors Emilie Davis and Libby Newman, and art director Brandon Jameson.

I'm Whitney Johnson
And this is Disrupt Yourself.