

Aircraft Flight Log for the University of Washington, Cloud and Aerosol Research Group

Date 11-21-00	Flight Number 18421	Experimental Observations FIRST IMPROVE TEST FLIGHT. GOALS: CHECK METEOR. INST. SYSTEM FOUND PATCHY, THIN STRATUS FRACTUS CLOUDS IN THE STRAIT OF SAN JUAN DE FUCA N. OF PORT ANGELES. SAMPLED THESE CLOUDS AT BEGINNING & END OF FLIGHT IN STRAIT REGION. LWC PROBES PER PERFORMANCE UNCERTAIN SINCE MAX LWC LESS THAN 0.1 g m^{-3} . FSSP-100 APPEARED TO WORK WELL, HOWEVER, SHOWING DROPLET CONCENTRATIONS OF $100-300 \text{ cm}^{-3}$. NO OBVIOUS PROBLEMS IN STATE PARAMS & CONDUCTED ^{MANEUVERS FOR} CHECK OF GROUND SPEED CALCULATIONS BY FLYING BETWEEN TWO POINTS THAT ARE A KNOWN DISTANCE APART (20 MILES IN THIS CASE).
Project name IMPROVE Test		
Duration 1:43		
Engines on time 1734 Z 0934 LST	Engines off time 1917 Z 1117 LST	
Departure airport PAE	Arrival airport PAE	
Flight Scientist signature <i>C. Rango</i>		
Pilot signature L. SUTHERLAND		
Surface met. & visual obs. at takeoff THIN SCTD CI. AC DIST SE CALM WIND		Ac As Cb Cu Ns Sc (SI)
Research crew WILSON SPURGEON GARVERT RANGNO	Equipment failure UNABLE TO GET 2D-P PROBE TO INTERFACE W/ AIRCRAFT DATA SYSTEM NOISE SPIKES IN J-W OUTPUT	

Flight 1841
November 21, 2000
Voice Transcriptions*
IMPROVE (Flight testing)

9:46 AM

DS: Testing, testing, 1, 2, 3.

9:47 AM

DS: Testing, testing.

9:48 AM

DS: Testing, testing.

AR: Don just got the headset working, so I think I can record now. We have some scruffs of low stratus over Puget Sound. Not really enough room here to sample and not enough of it really, so we're proceeding out to the Puget Sound area where we can see some clouds out there and we'll have a little more room to maneuver. On board in case my piece of paper doesn't get back to Debbie is Don Spurgeon, Tom Wilson, Matt Garvert and myself, Art. No wind in Puget Sound today. I'm looking off at Port Townsend paper mill or something like that and the plumes are going straight up. We have thin scattered cirrus and a couple of altocumulus clouds way in the back of us there 50 or more miles and areas of fog and stratus in some of the valley's and as I was mentioning a little over the Sound less than 10% coverage.

D?: Art, are you there?

9:50 AM

D?: How do you read the cockpit, Art?

AR: Looking at the plume over Port Townsend now as it goes by off the left wing about a mile out. It rises straight up and then drifts toward the west in agreement with the offshore flow we have today. We have stratified haze conditions as well. A goodly amount of haze here in the Port Townsend area due to local burning.

9:52 AM

* AR = Art Rangno, Dan ? = D?, DS = Don Spurgeon, MG = Matt Garvert, TW = Tom Wilson

AR: Roger. I did notice a number of aircraft flying, so that would be great. You just pick a spot you're comfortable with. There's no real science goal today.

D?: Just let me know what you want. We'll just kind of try to hit as many of these clouds as we can and is there any airspeed you want to set up for?

AR: We want to be at science airspeed as much as possible and that would be fine. Just stay in these clouds as much as you can is exactly what the doctor ordered.

9:59 AM

AR: Actually I did see something that might give us a data point come to think of it noticing the plume off the left wing. Do you suppose after hitting a couple of these guys we could take a veer, 90° left, and hit that cloud forming in the plume of that Port Angeles pulp mill over there?

LS: Art, we're probably not going to be able to because there's an airport right beside it there.

AR: Okay. Just a passing thought.

10:00 AM

AR: A little short on headsets and computers today, so I'm going to have to step away here and look at our data and so I won't be on the headset for a minute.

LS: Art, how about a ship's plume? How would that be?

10:01 AM

AR: I have my headset back on. Any clouds up ahead?

LS: I don't see any right now, but we don't have FAA approval here Art. I think we ought to just work our way out there and see what we've got.

AR: I'll roger that.

LS: There's some stuff coming up over to the left, but it's over land and I'd rather not go over it.

AR: Right. Absolutely.

10:02 AM

AR: It's looking a little grim out there right now. You know we have that offshore flow. Maybe it's pushed those clouds further than we can get to. What do you think, Larry?

LS: I really think we probably ought to go back, Art, and I was going to set up two points to get your ground speed checked first.

AR: Roger. Let's go ahead and do that then and then we'll head back to that little patch of clouds.

LS: Okay.

10:06 AM

LS: Art, we can get a ship's plume if we want to do that.

AR: No. Thanks anyway Larry. Say what class was that aircraft carrier that went by?

LS: Probably Nimitz class.

AR: We are heading out to Neah Bay area. Larry's feeling like it might be a little better area to fly because of the heavy air traffic around Port Townsend and the east end of the Strait of Juan de Fuca, but with the offshore flow we ran out of clouds. In fact, you wouldn't have thought there would have been any in the middle of Puget Sound, but nevertheless there they were and they seem to be the only clouds we can fly in at least within a visual radius that seems to be the case. We'll continue with a few thin cirrus clouds and actually a nicely developed castellanus cirrus off the left wing and a considerable amount of haze. Estimated visibility less than 20 miles in horizontal and probably less than 10 miles off the right wing in the forward-scattering direction.

LS: So Art, do you want to hit the clouds first or do you want to get your ground speed checked?

AR: Let's go ahead and do the ground speed in the clouds or is that asking too much?

LS: No, I don't think we're going to be able to do that.

AR: Let's do the ground speed first and give us a couple of tracks and then we'll go to the clouds. Thanks.

LS: Okay.

10:09 AM

AR: A rippled sea down at the surface. Very, very isolated white cap from time to time suggesting 5 to 10 knot winds from the east here in Puget Sound over our locale where we are doing the ground speed check.

10:10 AM

AR: Larry, the ducting back here by the bubble is almost too hot to touch. I don't know if it's supposed to be that way or not, but that's what we've got.

LS: Okay. I'm pulling it down.

10:11 AM

LS: Art, it should be starting to cool momentarily.

AR: Thanks Larry.

LS: Art, did you want to be pressurized or unpressurized now?

AR: We can be unpressurized.

LS: Okay.

10:12 AM

LS: Art?

AR: Go ahead Larry.

LS: We're running this track now. It's a 20 mile track and I'm going to get you a time on it and then go back over it the other way and you want to compare our indicated to the ground.

AR: Roger. After that we want to go back to that cloud area and pound those clouds maybe 10 to 15 min or so and then we'll go back to Paine Field.

LS: Okay.

10:21 AM

AR: Larry, do you have the winds today? I realize they're pretty light. I don't know if you came up with anything, but that might be helpful in this too.

LS: We'll get you a wind after we run this second track, Art. We'll just do a 360 and get it for you.

AR: Roger. Thank you Larry.

10:24 AM

AR: We just completed mile runs to check ground speed. It's indicated airspeed and true airspeed and right now we're getting some winds at flight level and then we'll be hitting some clouds for a few minutes, maybe 10 to 15 min actually, and then we'll be heading back to Paine Field.

10:26 AM

AR: In this area we're at cloud base of some scruffy transparent stratus, broken coverage in the immediate area.

10:30 AM

LS: Art, you might get some of these clouds here while we're in them.

AR: Roger.

10:31 AM

LS: Art, we're going to go ahead and get your clouds now the ones over there at 9 o'clock.

AR: That would be fine. Whatever we can get. Just pound those for a few minutes actually probably not even more than 10 min would be fine.

LS: We're kind of constricted in here. We're working between that Canadian boundary and there's an airport to the south and the mountains, so we'll get what we can for you.

AR: Roger. Thanks Larry.

10:32 AM

AR: Larry, do you recall if this is the same area of the clouds that we sampled before?

LS: That's real close, Art.

10:33 AM

AR: I'm going to leave our only headset for a couple of minutes and look at our only computer that's working, so I'll be back to you in a minute.

10:35 AM

AR: I'm back at the headset. Larry, could we go up about 50 ft or so just to get a little closer to these tops? Thank you.

10:40 AM

LS: Art, how are we doing back there for you?

AR: It's good. If we could get back through that track again at this level that would be great and then we could wind it up.

LS: Okay.

AR: Some visibility reduction along the wing suggesting a little bit higher than true maritime droplet concentrations, although I have to say I already know that.

10:44 AM

LS: Art that's the end of it. How about returning to Paine Field?

AR: That's affirmative Larry. Nice job back there. I think those were our best clouds that we just went through these last few minutes.

LS: Okay.

10:45 AM

Summary for Flight 1841

AR: For the flight summary I guess I'll do it, one headset. Just talked to Don and Tom. Tom indicated that the TANSvector wasn't able to pick up the satellite, so we may not have solid GPS, any GPS, which I just found out. Don said there's still some hardware problems with connecting the 2-D cards to the aircraft data system, so that will have to be worked on some more. Other than that the FSSP looked like it worked very well in the cloud penetrations. I didn't see any other noticeable problems, but I have to point out that there was only one computer and that was the one located in front of Tom Wilson. So I'm running the flight from the bubble back here where I can see what was going on and then running up there. I very easily could have missed some problem. So the main squawk sheet and the list of problems will have to come after the flight rather than right now. But anyway in an interview Tom and Don said those were the only problems that they noticed that stuck out. So that's it. We flew in these clouds just north of Port Angeles. There was a very nice plume coming from the Port Angeles paper mill. A nice little small cumulus cloud on it. It would have had more water than anything we sampled out over the water. Those clouds over the water being a bit scruffy and

ill developed you might say, but nevertheless we got some pretty good penetrations on what was there. Those were about the only clouds we could fly in and not many at that. So in a sense we were kind of lucky to even get those with the offshore flow that we had developing. That's the end of the summary for flight 1841, 21 November 2000.

10:50 AM

LS: Art, that wind out here was 180 magnetic at 12 knots.

10:55 AM

LS: Art, are you up?

10:56 AM

DS: Larry, are you there?

LS: Affirmative.

DS: On this "touch and go," what would you like us to do with the power?

LS: We're going to pull your circuit breaker there. Well it doesn't matter. Leave it on Don.

DS: So could we leave power on until the first "touch and go" and then we'll shut stuff down? It will allow us to get a sounding and to get our final calibration for some stuff.

LS: It doesn't matter. We'll leave it on right until the second one if you want.

DS: Okay. Right after the first one then we'll shut our stuff down and then we'll be ready to go.

LS: Okay.

DS: Thank you.

10:58 AM END OF TAPE