

More on the story of AVRO Canada's Flying Saucer Program. A taped interview by Les Wilkinson with Mr. John Conway at his residence in Milton, Ontario - talking about the program but in particular talking about working system 606A and John's involvement and memories of same.

Friday, May 4, 1984

I don't want to fill it in with a lot of garbage. I was born in 1926 in London, England. When I was 16 yrs. old I left school and went out to DeHavilland Aircraft in England in Stag Lane and got a job as an apprentice, engine fitter apprentice, and spent some time at Stag Lane and then I transferred from the engine side to the aircraft side in 1943 to Salsbury Hall. From Salsbury Hall I finished my apprenticeship with DeHatfield and at DeHatfield I worked on, the mosquitos, I guess, first of all, as an apprentice. I went through the shops. I was promoted to Engineer Apprentice \_\_\_\_\_ through the drawing office. When I finished my apprenticeship I went in the Engineering side and the drawing office and worked on the development of the Mosquito \_\_\_\_\_, the Hornet on to the Comet until 1951. In 51 I left and went to Hunting Percival \_\_\_\_\_ and worked on \_\_\_\_\_ and helicopters as a propulsion there. In 1955 I immigrated from England to Canada to AV RO. \_\_\_\_\_ At AV RO I was engaged as a designer and they put me into the special projects group where they were working on vertical takeoff aircraft, of which I knew nothing at all at the time. This turned out to be the Flying Saucer project. I started off in design and then because they had a need, I

guess, a shortage of aerodynamicists I went and worked on the aerodynamic side in the test area doing aerodynamic test, more nozzle testing, really of various saucer shape configurations. We were doing mostly looking at the effect of ground \_\_\_\_\_ and nozzle strength, etc. All the various parameters of tipped nozzle/<sup>that</sup> John Frost had been working on prior to.

A1. (Do you remember which project John was involved in when you started?)

John-When I got there he had just started the 6 Viper test rig. That was of which they were/<sup>going to run</sup> just to the back of the Schaeffer building which was where we were, opposite the main AVRO plant. I never really got too involved in the 6 Viper rig. We were sort of looking a little bit further/<sup>ahead</sup> than that. Study, aerodynamic study, propulsion studies were really fairly generalized at that time. But we were looking at the sharp edged saucer, if you like, which is the way I remember it. We started with sharp edged saucers. In other words, the tendency for high speed development. I suppose it must have been about a year we were working on that. Various configurations....we looked at, oh, various intake developments, various nozzle arrangements, various \_\_\_\_\_ deflecting the thrust aft the transition, and sometime during that period, and it seems to me it must have been about a year, we got into the AVRO car. That had started to come up now. I was back on the drawing board doing the very first AVRO car layout. And that was a round edge \_\_\_\_\_ round edge leading edge configuration low speed configuration, in other words. I didn't spend much time with it. I got back on the high speed stuff again. In the design

working directly for John Frost. Now that was really...

Al. (That one John, was the PV704, that \_\_\_\_\_ that might give you a bit of a memory. At this point I was showing John some sketches out of the brochure fold-out related to the PV704. And John was remarking on the knife-edge, sharp-edge, as he called it, there and some of the nozzles and stuff and then went on to explain a little about that.

John - \_\_\_\_\_ was involved in some it. O.K. That was the upper and lower intake.

Al That's the PV704 you're looking at. Now whether you got involved in that...

John -Yep, yep, this was one of the things I did get involved in very considerably. Yeah, was the afterburner.

Al I see.

John -And that was tied in with some stuff which I'd been doing previously in England in very/<sup>same</sup> materials. We were trying to get the weight down, of course, and so we worked with Joseph Lucas in England on these flame holders for afterburning. Joseph Lucas actually did some work and did some tests. They made some up and tested them for us. The thing about that is they were very thin. Gee, I forget, somewhere \_\_\_\_\_ stainless steel, which was a lot thinnner than people had been using prior to. So, that was done by Lucas \_\_\_\_\_. We went on with this sort of configuration and I can't remember /when it became the 704 to 1794 to 60 or 610, near the end if I remember rightly. It was one of the last ones.

Al From what I understand, what I've been able to gather that the 1794



- Al was the American involvement and the company were also running parallel with about the PV private venture 704. They were doing some funding.. cross funding in conjunction with the Americans and the one you're looking at there which is referred to as the company project PV704 was very similar to the 1794 which was operated by 6 Viper Armstrong Siddely engines.
- John That's right, well, o.k. So, they were into it when I got there. Because the 6 viper rig was well on its way when I got there. That was being done independently. So I was working mostly on the nozzle work. All the various configurations, nozzles, thruster\_\_\_\_\_ and, I think I've still got some of those reports at work, actually. But from there, the way I got back on the design work later on working with John, we went into this sort of thing but we did a great number of different sorts of layouts of the high speed airplane, the model 3 airplane, which is where I was mostly involved. And I think when we folded about 1963, no, no, no, long before that, when John/<sup>went</sup> when we ended up.... o.k. that's one of mine, that's right yeah. Now that's the sort of thing we were getting into.
- Al That's the weapon system 606, this is the circular plan form with...
- John With the \_\_\_\_\_
- Al I think it was referred to one time as like an AVRO car but the super-sonic side of it....
- John Well, o.k. yeah, that's right. The same sort of mission, if you like. Vertical take-off, but then high-speed. And this was supposed to be

John a Mach 3 airplane.

Al I've now shown John, and we were looking at 2 photocopies of the drawings and like the 3 view the general \_\_\_\_\_ drawing you sent out that the reference to the fighter bomber, supersonic fighter bomber where is like the AVRO fuselage is grafted on to a circular plan form. We are looking at that and John was discussing that.

John That's why we were developing the afterburner, of course was to get the speed. But we did, I personally must have drawn about 80 different versions of that. I actually have a roll of drawings in \_\_\_\_\_. Cause John would say, you know, I've told you before, that's perfect \_\_\_\_\_ and then we'd change it again. We ended up with some monstrous looking things. That's the same thing, of course, those were artists impressions which were done by, Gaston \_\_\_\_\_, I guess, who is now dead.

Al But then, was this the first circular plan form? Was this the first one of the 606 because I've seen some that look more or less like the PSI2 and they looked almost like the Arrow with the....

John Now, they all came afterward. When the crash came, when AVRO, the Arrow was stopped we, the augmenter wing, not augmenter wing, the involved projects group took on a number of the Arrow people, the Arrow design people, particularly Tom Higgins and Tom Higgins sort of took over the high speed side and left John Frost with the low speed - with the AVRO car. It sort of split down there. And I worked for Tom Higgins at that time. Now, mainly what happened, we were talking to the USAF at that time and I had the job of doing

the ducting, the ducting into that thing and it looked like a can of worms at the time and Tom Higgins said well, what you've got would be easy to do in a delta wing or of the Arrow type wing. It turned out that it wasn't that much easier. The ducting became even more complicated because you had all the crossovers, six or whatever engines we had. I forgot what engines we used. Maybe we had two engines in that one. Two, it shows them at all.

Al I thought you had four in that one.

John O.K. Well, this was a version, but we had a number of different versions here where the engines are all buried in one, down inside, whether two engines, whatever was going...as I say, 80 different versions.

Al These are all paper airplanes?

John All paper airplanes. That's right. The only thing that was \_\_\_\_\_ was the circular plan form at that time. Intakes, oh, we saw intakes which were great big semi-circles on top. You can imagine, knowing what we do now what the drag would have been for a thing like that. But, these were the sort of things we went into. All sorts of intakes, this type intake, the ferry type, the reverse type of intake, intake from top, intake from the bottom. There were a tremendous number of variance in them. All heading for the same thing, as I say. Whether that was 606 or 1794 I never really knew. All I knew I was drawing airplanes for John Frost and whatever he felt was needed we did it. The thing that I was spending more time on really was the integration



of the fuselage into a circular plan form and the propulsion system. So that went on, as I say, until Tom Higgins thought the Delta plan form was more suitable and so when John Frost left our side of the project \_\_\_\_\_ we went into the Delta. And that would have been in ~~1959~~<sup>late</sup> I guess, after the Arrow ceased to exist and so we carried on still working on the Delta shape and then \_\_\_\_\_ there was a large model made and it must have been 6Sx, that would be about 4 feet span and we were just about ready to test that when just about that year, that would still be '59, I guess. I guess we never did test that. \_\_\_\_\_

But, we just threw them into that model \_\_\_\_\_ I'm not sure if we got quite finished. That looked like an Arrow in many ways.

Al With slots in the wings, with augmented or thrust ejector or whatever...

John Yeah, no, now I'm trying to think whether the slots... No, I think it still was a trailing edge slot, there was slots around the edge of the wing.

Al What we should do is stop. We stopped the reel to reel tape and then we had a session of looking through the multiple brochures that I had acquired on the 606 weapon system 606A. Of course, the ones I've got are on the way down to you, George, are of the later 606 and it looks very much like an AVRO Arrow with the swept-back wings, single tail fin and then the slots and stuff down through the wings. There are some configurations with T tail which is different from the Arrow and something along the lines of a TSR2. We looked through a whole raft of these and then we continued and John made

Al some remarks and you'll see a little later that we stopped again and that John went out of the room and came back with 2 small models oh, round about 6 inch, 7 inch wing span, roughly the 172nd type thing and he told me that he had made those up or had them made up at the time. And they are the progression downstream from the WS606. I may cut in and tell you more about that later on when we come to it.

John If I remember rightly we spent an awful lot of time on the circular plan form and with the slot round the periphery, the circle with the fighter type fuselage, various engines, and various intakes, etc. Now, when, after the Arrow cancellation we amalgamated with many of the designers from the Arrow. In other words we got a lot more staff. And the two programs, the low speed program and the high speed program were split and John Frost took over the low speed program completely and Tom Higgins became responsible for high speed program. We followed through, briefed the USAF on where we'd got to on this odd circular airplane and it became rapidly obvious that we were creating a monster, really. The more we tried to explain to other people, the more we realized what a tangle of worms we'd got, trying to get all this ducting to the ducts at the peripheral thing. And Tom Higgins suggested that we could do better by going to a more conventional style of plan form which was more of a Delta. It was a double Delta \_\_\_\_\_ which is what I think you see in the booklet, and put the slots around the, still around the edge of the wing. Then we started to get straight slots which made the control systems a lot simpler. And we got into what looked much



more like \_\_\_\_\_ more conventional airplane, anyway. \_\_\_\_\_

\_\_\_\_\_ From that point we developed into step by step coming down to what was more and more conventional. At some point we dropped off the slots on the medias and started to put the ducting toward the \_\_\_\_\_ engine and/<sup>at</sup> some point in there we considered doing a flying program by taking a caribou and putting the 85's under the wing, keeping the caribou engines but using the 85's to blow the training engines away. We went and talked to DeHavilland at that time about it. That was one thing we got involved in. We got involved in the \_\_\_\_\_ swept airplane with the slots in the center of the wing which was AVRO P52, they call it, P47, I'm wrong. That was P47, that one there which (that's \_\_\_\_\_) and then the props were in the center of the wing between the spars, if you like. (Canard, canard,) That's right. (No, this is with the twin fins on the back.) That's right, yep. (That was an AVRO airplane?) That was an AVRO airplane. AVRO P47. (P?) AVRO P47. (I've never heard of it.) And we did studies on that. We did a half plane model which we tested in the \_\_\_\_\_ wind tunnel \_\_\_\_\_. And we did quite a lot of work on that. We did large \_\_\_\_\_ well, what is called scale but anyway, large scale tests of the intake, the slot and again did that in the wind tunnel at \_\_\_\_\_. And sometime in there which must have been around about 1961 and I think I can probably get that for you came this competition for the naked stripe fighter.

Al

I think here I should explain a little. The two models that John brought in are small models. The one was a painted little grey job

A1

with twin tail fins and John referred to it as the AVRO P47. I've looked up my records since getting back home and I find it's the P470 and that was, if you took the nose off that circle plan form very much like the Arrow, it was very much like that except that the Arrow had sort of ducts that were circular at the top. This one had very square box ducts on it and it had a Canard wing just ahead of the ducts but just behind the pilot, or just roughly behind the pilot. It had this little Canard bit sticking out. It had a sweep on it something like the Arrow, perhaps more so, it seemed as if the wings were back further. The fuselage seemed to stick out more in front of the wing. And it \_\_\_\_\_ had twin tail fins and it was a beautiful little model and had these lines and stuff on top of the wings which John explained. And then he had this other, the little job that was a single engine. The ducts on either side of the fuselage. I noticed the wings on the Canard job, the P470, referred to as P47 by John; the wings were very thin like the Arrow and high speed, supersonic stuff. And the other one, the wings were considerably thicker and the ducts were in like the leading edge of the wing at the wing roots at the fuselage and it had a very highly swept forward section of the wing just like the wings almost tucked in and swept right back like the 101, in the back position and then at 2/3 back the wings were more or less at a 45°, but there was a much thicker wing, single tail fin and stuff, painted up green with Canadian markings on and that was the MVR 4 that John will be explaining to you.

- John Basic, MB, anyway MBMR4 I think it was. So, we entered that competition with this one.
- Al That's the green job with the...
- John Green job with the single engine, again with the slots through the wing, the double delta, the \_\_\_\_\_ type plan form. And, gee, the engine. I think we were looking at a General Electric was it G97? Same engine as the \_\_\_\_\_ had in at that time. Stopped in there and we did that proposal and submitted it and, as it happened, nobody won it because nobody wanted to accept somebody else's, no NATO country wanted to accept some other country's airplane. They all felt they had the same one. We were in competition with things like the VJ101 in Germany and the, what was the French thing with the engine's vertical, the \_\_\_\_\_ and so, it never came to anything. But we did do a lot of work again with those two. The P47 and then the NVR4 is a similar sort of ejector type system.
- Al Are these little models made by yourself?
- John Yes.
- Al So, that's the sort of, one of the few things that were material....
- John Yes...
- Al To see. The other \_\_\_\_\_ were all on paper?
- John Well, this one is, the P47, we made fair size models for the wind tunnel.
- Al I see.
- John There were photographs of that around somewhere.
- Al But I've never been looking for those. I didn't know these existed until tonight. This is downstream again isn't it, from the AVRO car.



John Yes. They've come a long way from the circular plane ...course comes from the same sort of program.

Al Are these \_\_\_\_\_ from the actual \_\_\_\_\_ the wings both of these...

John Down.

Al \_\_\_\_\_ down.

John That's right. There were doors open at the top and down the bottom.

Al \_\_\_\_\_

John Yes.

Al \_\_\_\_\_

John Oh yes. Both of them, markings on one of them. \_\_\_\_\_ slots and these were doors that opened up all the way on both sides and so you had diverters in there, diverter valves which moved over and in forward flight blew out the back.

Al I see

John Take off you blew down here.

Al And these were \_\_\_\_\_ aircraft, were they?

John Umm.

Al Or maybe not quite as high as that.

John I can't remember now what P47 was supposed to do. I don't think it was Mach 3. It was something like 2.3, if I remember. Although those intakes are... No, it probably wasn't a Mach 3 airplane. Now this one, the NBN for Nato strike fighter was just, it was Mach 1.2. At sea level.

Al That reminds me remarkably of a naval aircraft for some reason.

John It's very similar to the \_\_\_\_\_ of course.

Al Until you look at it in plan form, yes.

John The \_\_\_\_\_ the reason for the plan form was just to get the center of pressure and the center of thrust fairly coincident. So, you got the fair size wing area back here, but these were all doors, now the difference between that one the doors open this way on this one. Actually, they were kinked and they did this. That one the outside one did this and formed an intake.

Al This is just for takeoff?

John Just for takeoff, right, and landing. And then doors underneath sort of came down and by moving those doors you could deflect the thrust either straight down or backwards.

Al Is it something along the similar to the Harrier? No, the .....

John That's right the Harrier is a single jet, the whole idea of the I guess, by this time we, we've never looked, when we did the circular airplane there was no, well, there was augmentation, augmentation by the engine itself because driving a fan you are taking a small engine and driving a big fan and so you traded off thrust for \_\_\_\_\_ which is what a helicopter does, really. So, you've got more lift out of this small engines but the actual aerodynamics of the thing didn't gain anything in the circular airplane. On these, we found that by entraining air off the top, <sup>we were</sup> actually augmenting the engine's thrust. And that, of course, is where we are today. We've come, twenty years later, we augment, and got augmentations of 1.7 \_\_\_\_\_ 1.7 times the engines thrust. So, that was, we were getting into

John this augments lift-up which we have developed to this time. But that was the very first, it was the transition between the circular airplane where you had the big fan and this one where you've got your augmentation by the fan, if you like, and here where you've just got the engine for forward thrust. And the augmentation was aerodynamic. And this was all happening just about the time that, well before, DeHavilland took over. But it was about '61, I guess. Because for a short time I went over and took over the Bobcat \_\_\_\_\_ Worked on \_\_\_\_\_ personnel carrier. One each \_\_\_\_\_ so it's quite a stop.

Al Yes.

John And then we went back and did another project, which was, executive jet for a while. And in the meantime all this was going on. \_\_\_\_\_ And for all this time, right up until DeHavilland took over we were still working on this ejector stuff type thing which had come right from, you know, it was just a continuation of the 606, PV74, it's the same group of people working and.... but it got directed from the circular plan form into the Delta and into this sort of thing by Tom Higgins.

Al What do you think about it all, John, looking back? Do you think it was screwball or was it a learning process?

John It was a great deal of fun. I think it was a learning process and we learned about ground cushions, we were the first, really, to develop a ground cushion machine, ground effect machine. And, you know, it could have come to something. I think anything like that given enough money and enough time you could develop something.



John Who's to say the circular airplane wouldn't be? The whole idea was that \_\_\_\_\_ the circular airplane became quite effective. I think that's true to this day. But, people keep on saying they see flying saucers and they are flying more than at Mach 3. But, certainly I think that, the time of, I guess just about the Arrow time, the Arrow \_\_\_\_\_ when we were talking to USAF about the circular airplane with this ducting we started to get awfully tangly. I felt that we were tending to go the wrong way and I think we were right in going to the Delta form because, \_\_\_\_\_ the fact that we've actually come to use the system albeit very different from the way it was indicates that there was something there.

Al You know, if you only learn the way not to go, \_\_\_\_\_

John So, I guess you could say that our experience said circular plan form was not the way to go but given more money or more development or whatever it took... You see we, for instance, the AVRO car, one of the big problems of the AVRO car was the amount of thrust. Wasn't adequate thrust from the three engines we had in there but we were getting what, 3,000 lbs. thrust. We weren't getting much more than the engines themselves deliver, you know, 900 pounds but, General Electric, at that time, had a fan of their own which was producing 5,000 lbs. which is almost exactly the same size, which they had in the \_\_\_\_\_ with fans in the wings, fanning the airplane. Now, that fan may have just made all the difference to the AVRO car. It was about, what, 40% more thrust. So, I don't

John know. Somewhere along the road you've got to say you go this way or you go that way, you know, and you may go the wrong way.

Al Yeah.

John But, I don't know if we were right or wrong.

Al Have you ever been aware of any of the other companies having some of these similar type programs?

John Circular plan form?

Al Yes.

John No, I don't know of anybody else. That's not to say there hasn't been but I've not been aware of anybody going into the circular plan form.

Al This was a very brave venture for little Canada.

John Oh, it was, I think. I think it was a great vision by John Frost.

Al Yes.

John The very fact that he managed to sell it says a great deal for the man. He was quite a visionary, as I say, when he was at Hatfield he was working on this single rotor helicopter, all by himself.

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and Don Whitley, who was involved in this thing in the special projects of flying saucer. He's gone on and look what he's achieved.

Les I'm to have a session with Don later on. I was trying to get as much background so I don't look too completely stupid when I talk to Don..

John Don, I forgot when Don came on.

Les But, he was with John before yourself?

- John No, no, Des Earl was. Des Earl was always with John Frost but Don was working on the Arrow. <sup>Flight test</sup> And I can't think when he came cause I wasn't involved in aerodynamics at that time. It seems to me it must have been maybe around about the Arrow time that Don came, could have been before but I don't remember him, 'cause he was quite involved in the Arrow. So, he became available, of course.
- Les Oh, I see.
- John But he's done a tremendous amount of work, The whole thing would have died several time if it hadn't been for Don Whitley. He's a tremendous engineer. He's a tremendous politician, he's a diplomat knows the right people to get the right answers and knows how to put the question together.
- Les Is there any body you suggest that I perhaps should talk to about any of these projects, that might be helpful. It's always a gamble whether they would remember.
- John Those two, I might be able to get you more information on.
- Les All right.
- John If I can, in fact, the proposal was in my filing cabinet which Al Wheelband took over and when Al left Peter Martin took over. So, Peter Martin should still have it unless he's thrown it out. So, it's a book about yea thick. And in the back of it is about the \_\_\_\_\_ strike fighter. On the back of it was an appendix which had some words on the P47 with, I think, some pictures, photographs of the thing in the tunnel. And some of the slot models that we made which were large scale, so there could be some information there.



Les That would be interesting

John As far as the saucer is concerned there really, you know, to me it's a great confusion of drawing a model circular airplane. It's basically the same fan but the biggest variation was number of engines and way of getting air to the engines, the intakes, where the pilot sat, etc. etc. So my memories are much more post Tom Higgins era, when we got out of the circle and                      you could summarize that my involvement was testing the whole area, whole range of various types of nozzles and then from there going into and doing some very early work on the AVRO car, the high speed AVRO car.

Les That's the one I would refer to think in terms of high speed would be the 606.

John It was subsonic still.

Les It was still subsonic? It was high speed?

John It was high speed.

Les I wasn't aware that there was...

John Yes, because the AVRO car was only Mach .3. It's quite a low speed really, sort of comparable with a helicopter really. But, there was the AVRO car. Now from there we probably went to the 606 or the high speed version which grew from the AVRO car size to a bigger airplane. The Mach 3. And so I drew was layouts, mile after mile of them up until the time of Tom Higgins, the AVRO cancellation.

Les That's the bit I haven't got, isn't it.

John Um hum.

Les I haven't got that                      other than two....

John That's right. And they were all more or less on that style except

John that some were just so grotesque. You know, you work at something and you lose sight of what you are drawing and suddenly you sit back and say, good lord, that looks like the amphitheater at Los Angeles it doesn't look like an airplane at all. Great \_\_\_\_\_

Les What size were these things?

John They were bigger than 18 feet obviously. I can't remember at all. You could get a rough idea \_\_\_\_\_ say the fuselage is about 3 ft. wide and so you're talking 30 maybe 35 ft.

Les 35 was about the size referred to as the 1794.

John So it will be on that order. But you know, so that's the only one you've got, but really, you wouldn't find very much difference if you saw all of them. Because the difference is essentially in the look of the intake. Some went right round the fuselage and became you know like an \_\_\_\_\_ or half an \_\_\_\_\_. We got out of the, seems to me we dropped the lower intake fairly early on because, you know, reingestion, was quite a problem. Although, you know, \_\_\_\_\_ we did a lot of testing too of lower intakes. And recirculation circuits. \_\_\_\_\_

Les We cut off the reel-to-reel tape at this point as we seemed to have covered most of the territory that we had hoped for on this first initial visit. I've had several conversations with John on the phone, just short ones and we discussed just what we might chew over. I left with John the copies that you sent me, George, on the correspondence like the records that the United States, the Air Force made, of the meetings and, just like the minutes of the meetings at AVRO

Les and all that stuff, and other groups had in relation to 606. John seemed quite interested in that as he said, he mentioned early in there that he was in aerodynamic part of the thing and then the engineering that he wasn't familiar with the organization or any of that sort of stuff and it was, some of it, predated himself, it was going on while he was working there but he wasn't aware of it. He seemed quite interested and he suggested he love to read it and it might stir his memory and he'd make a few notes. Then, I hadn't realized up to this point as I mentioned there that his remarks on those other two aircraft, the little models which he showed me, were downstream. They were, actually they were right up to the termination of AV RO Canada as such, they were, I suppose in the true sense the final story of the saucer program although its very hard to put your finger on where it does end. You could say the termination of the AVRO car was the flying saucer part of it because then they were in to the thrust ejector, augments wing and they've of course, gone on and are still with that with DeHavilland, so... it's a very fuzzy type of thing where you come to the end of it. Certainly it didn't all go down the drain as you see and as John had remarked to me off the cuff, that it was a real can of worms and he was asked to explain things that he couldn't really understand himself, but that was all part of the intrigue, I suppose, of working with John Frost, the vision real, as you see. John Conway had a great respect for John's ingenuity and outward thinking. John did say, and we talked about it and it was very very interesting,



Les unfortunately I didn't tape then. I hope to get this later on for a later project perhaps. But John talked of his involvement and how it continued on with the augmentor wing, the jet propelled buffalo aircraft, DeHavilland buffalo that they've taken and got moving and he was talking about flying the buffalo at 42 miles an hour and the perfect control and, of course, he referred to it as having a buffalo with stalled take-off and landing that can fly under perfect control at 42 miles an hour and yet is approaching Mach 1 up in the speed of the 747, which is quite a thing, as he said, they've just done this as a design in research and development aircraft, the buffalo, some support from the United States, encouragement from overseas and the hopes that perhaps, well, of course, the way things are financially it would take possibly Britain, Canada and the United States to combine and get onto a project like this where they could take some larger, considerably larger aircraft and develop it. One interesting factor of it was, talking to me and explaining very briefly, a lot of it right over my head, that when the AVRO company folded lot of the bits and pieces were <sup>transferred</sup> ~~over~~ to DeHavilland and one of them was the 6 viper test rig and with it the 6 viper engine. And he said that when they were going to get involved in some of the preliminary tests they wanted to do for the augmentor buffalo that they wanted to do some experiments and prove some of their facts and they thought, well, if John thought himself, John Conway, they've got these 6 vipers, they took a couple of the viper engines and they actually modified them. They'd gotten some prices from Rolls Royce and some other engineering companys and \_\_\_\_\_

Les

\_\_\_\_\_ and I believe Pratt and Whitney and they were pretty phenomenal prices and there was no guarantee that any of the stuff would work so seemingly John, very modest man and I think very talented man and certainly very cordial, he was the leading light that decided they'd have a go at this modifying the company's viper engines, changing them around to conduct the tests and apparently it worked out very, very well indeed. They did a number of tests down at Ames and so much so down in the states these tests, I believe was handled, I can't be sure, but it was down in the states they did the tests, so much so that the authorities down there said, Boy, we'd like something like that. That's rather startling and we think we'd like a little more powerful. So they took another viper and they did some mods and they talked to Bristol in England, this is DeHavilland, and John came out with some ideas on modifications and they used part of the Olympus engine that is used on Concord, driven somehow by one of these viper engines that were originally off the six viper test rig, and they wound up something to your friends the United States and they were very happy about it and so was DeHavilland cause they made quite a bit of money \_\_\_\_\_ Little spin-off and I don't have the details complete but it was all very interesting stuff. It was a most enjoyable evening with John and myself out there and John's wife Sheila and, the ladies went into the other room and had a very pleasant evening together and it was a very cordial and very pleasant evening and having left the documentation of the correspondence type thing and the records of 606 and John's going to see what he can find around the office of some of these later couple of

Les projects, the P47, 470 and the MVR 4, the Nato strike fighter, he has some stuff of that, so he said if he could run across that it's still around, he'll bring it back and I can peruse through there and copy anything I wish. So, anyway George, there is a little more to our story. I think possibly I'll chase, if I can, Tom Higgins, although John did say he's a rather difficult man to talk to, but I might take a chance anyway to see if I can come up with something else or even confirm what we've got. So, I'll cut this one off for now and get it on its way to you.