Ralph Johnston as interviewed by Dan Hall on July 21, 1984, for the Smokejumpers Oral History Project. OH# 133-52.

DH I'd like to start the interview Ralph, by asking you uh... when did you become involved with the smokejumpers?

RJ Well, approximately about 1957, I went to Redding, California, I was working on a uh... helijump suit so I went to Redding, California in '57.

DH What were you doing at the start?

RJ I was a ground fire fighter, started in 1948 and by accident got in the helicopter program by the fact that I was looking for something for speed of attack, so I believe in the air attack concept and uh... so that, I got into that in 1957 and that time we were trying to develop methods to jump out of helicopters, this is hover jump so that's where I got, I went to Redding, not stationed there but uh... talked to some of the smokejumper experts on jump suits.

DH Now how did the idea of using helicopters to fight fires come about?

RJ Well I guess it goes back a long ways, uh... people have uh... for years, back in the '30s looked at methods of trying to use air craft to attack forest fires and so in about 1946 in Canada a Bell helicopter was utilized in a forest fire for the first time. And then it progressed from there over the years to where newer and better helicopters were developed and that's basically the concept of them.

DH When did you start flying helicopters?

RJ I never did fly a helicopter, I was just a... like I say, a ground fire fighter that got in the aerial program and uh... saw its potential and believed in it from the speed of attack concept and so I uh... was a fellow that went around and trained people the efficient use, how to operate it. I didn't, I never flew em.

DH What advantages are there of a helicopter versus a plane?

RJ Well in short zero air speed, you can land many places an aircraft can't so zero air speed I think is probably the easiest answer.

DH Do you feel that it's hindered any by the fact that you can't carry as many guys or as much cargo as a plane can?

RJ Well true but uh... you're mixing apples and oranges. There's places you can land with two fire fighters or two or three hundred pounds of freight that an airplane could never land, so that's basically the difference.
DH Is there a difference in cost between using a plane to fight a fire versus a helicopter?

RJ Yes, definitely. Helicopters are a lot more expensive, but there again you have to look at the trade off in cost because there's things a helicopter can do no other machine can do so the cost factor, they are expensive, yes.

DH And when did they first start training guys to jump out of...?

RJ Nineteen forty-nine.

DH Do you know where that was at?

RJ Yes, Angeles National Forest in uh... Southern California, Region 5.

DH Who is, who were the guys that were involved with the project at that time?

RJ The only one I can remember is a fellow named Don Beedebau and uh... they didn't have any suits or anything like that but his name was Don Beedebau and he was the foreman of this Hot Shot camp where they had the helicopter station.

DH And how did they decide what was the best way for a guy to exit out of a helicopter?

RJ Well it was just a procedure where you swung one, your right leg, you released your seat belt, swung your right leg out, you'd fly with the door off and you'd swing your right leg off, put it on the skid, bring your left leg off, over, and put the left foot there and then you'd turn around and watch the pilot, pilot would signal and you'd jump.

DH Did they do a lot of experimenting with having a helicopter in the air or putting a skid down on the ground?

RJ Uh... not at that time, no, not that I know of, huh uh.

DH How often was this tool used in the beginning?

RJ For helijumping?

DH Mmm mmm.

RJ Oh moderately so uh... anytime that, the reason why that was is because there was places if you couldn't land you'd jump so it was used, I'd say, 10% of the time probably.

DH Did you have a hard time uh... selling this idea to guys?

RJ Excellent question, you bet, uh... like I was saying, '57 was when I got into this and that, you could say, is the model that
started the modern concept of the use of helicopters on forest fires, I mean by that, jumping guys uh... dropping water from the air, hose trays, etc. There was a lot of skeptics, you bet, even close friends didn't believe in it, you know, they thought I was crazy, but uh... yes it was.

DH How did you go around proving to them that they were wrong?

RJ Well, we did a lot of demonstrations and uh... training sessions and this sort of thing but I guess uh... it just was slow, grueling uh... approach to it, but the real world was on fire itself and people could actually see it, do it, the demonstrations, people were still skeptical, but I think actual use on fires eventually sold it.

DH What kind of things would you stress when you were going through a training session?

RJ Well of course safety was the big thing, number one uh... correct weather approach to part the aircraft so that, of course, we want an accident free operation which, in like any endeavor, you don't have at times, but anyway, that and then we wanted to train people what they could and could not do with the aircraft. And then uh... what kind of minimum landing area needs, how to construct a helispot or a landing area for helicopters. And then we got into the tactical use of it, some of the principals of how to use it, and initial attack work on fires and logistical operations of how to transport freight, how to hook up some loads.

DH I guess the next question I want to ask you is what kind of a helicopters were they using in the start of this?

RJ Well they were the Bell, the old Bell uh.. D-model which was a very under-powered machine uh... they were never designed for high altitude work, it was a light Bell helicopter.

DH What kind of uh... birds are they using now?

RJ Oh there's a variety of models out there, but the Bell, the Hiller, the Hughes, the Sakorsky, the French machines, the Allouettes and uh... and occasionally they'd use some of the Boeing Vertals, the tan rotor thing on this, you know, going fires.

DH Is there any that advantage one model has over another?

RJ Mmm mmm, you bet, uh... just about like anything uh... they each have their place. For high altitude work, the French make the best in the world, that's called a Llama. Uh... if you're interested in heavy lift, why Sakorsky has a big flying crane concept. If you want something fast, but not heavy on payloads, then some of the lighter models, light turbines.
DH Is this a tool that's used a lot now?

RJ Oh extensively, you bet. There's probably uh... oh I just, probably a conservative estimate in the United States with all the fire services, I'm talking about the federal agencies, states, counties, cities, etc. why probably over 300 helicopters are used.

DH How did the idea of uh... dropping water out of a helicopter originate?

RJ With probably the Canadians. They had the bucket concept, 55 gallon drum that you'd hook onto the helicopter and they'd hover fill it. And then they didn't pursue that step and then uh... eventually, let's see, an operation fire stop which was 1954 in Southern California, they experimented with many different types of things in air attack and one of them was how to drop water from aircraft whether it be helicopters or air tankers. But anyway, '57 is when it really got operational in uh... as far as my records go for in the United States.

DH What size of water buckets are they using now?

RJ Oh, they've got 2000 gallon capacity. We started with 35 gallons in a bag, we were limited due to the lifting capability of the helicopter. But uh... today, yeah, there's about... they have buckets now with 2000 gallons capacity. Not used very often, but it is available and they have been used and the Russians have a helitanker that I... I think hauls 3000 gallons, it's internal thing inside the aircraft and I guess, what I read, they use that on fires.

DH Are internal holdings like that common or is that pretty rare?

RJ It's rare. Most of them are all external, either in a bucket that's attached underneath the aircraft or a fixed tank mounted underneath the aircraft so internally, there's been a little work in America with that, but as far as I know, the Russians only have a large capacity for that.

DH How do you train a smokejumper to exit from a helicopter? Is it more difficult to get him to jump out of a helicopter than it is a plane?

RJ Good question. In my experience, yes, I never trained any smokejumpers in helijumping, but there seemed to be a certain amount of fear there and I've been both. I've parachuted from airplanes and I've jumped out of helicopters and part of the time I parachuted out of airplanes, I've done a lot of helijumping. It was kind of my feeling, if you were brought up as a smokejumper where you go the door of an aircraft, you know something is on your back, but if you're going off the skid of a helicopter, there's nothing on your back so I think it's maybe more difficult for a smokejumper than somebody who has never
jumped.

DH What about training a pilot in heli-attack procedure?

RJ Yeah, that's uh... takes some work on that too, particularly, well, it's a new, new mission for them, they're just not flying from a to b, so the helijumping thing required a lot of training. There was heavy, close coordination between the jumper and the pilot uh... the use of the bucket or tank demands training of the pilot on air speed, drop heights, and then there was uh... well there still is, the need to train the pilots in fire organization and tactical use of the aircraft.

DH How does a pilot release a bucket full of water?

RJ He's got a uh... little button on his stick that's wired down to that uh... tank and when he gets over the target, why he hits that button which is an electrical cylinoid that's mounted uh... wired through the bucket. When he hits that why the, hits that cylinoid and opens the door.

DH Is that something the pilot has to practice constantly so he can hit the target?

RJ Yeah, uh huh.

DH These guys that are flying the helicopters now, are a good majority of them Vietnam vets?

RJ I don't know anymore, I'm dated, course I've been gone three or four years but uh... I don't know. Some are I'd say, at one time there was a big percentage of them, but right now I'd say maybe 50%.

DH When these guys were returning from Vietnam, did you feel that they were taking more chances, risking more with those birds than anyone else would?

RJ Uh huh, yes, yes. It was inherent, it wasn't I think a... it was just the fact that you're in a combat environment, and it's get the job done at all cost. If you lose it, if you lose somebody, fine. So I think, yeah, there was a, there was an element there, I think the biggest thing I'd see is that uh... they'd come into a landing area to let off fire fighters and some didn't hardly want to touch skids down, start kicking them out just like they were under fire you know, combat, so there was some of that.

DH Do feel that in anyway reflects on the safety record of heli-attack?

RJ I don't know, but, but we had accidents before Vietnam, we had them during Vietnam, we had them after Vietnam. If a guy really wanted to study it, probably there was potential there, yeah.
DH How do you characterize the safety record of the heli-attack?

RJ Oh I would say probably there's no, the accident frequency rate is no worse than airplanes or smokejumping or uh... or general, fire fighting in general really. The, nationally, outside of fire, the frequency rate, the accident frequency rate with helicopters is much higher than airplanes. However, the fatality rate is just the opposite, whereas when an airplane goes in, particularly mountainous terrain where you're going in at forward airspeed, people get killed, hardly anybody you see come out. But the helicopter, if it's a good proficient pilot, you land at zero air speed, even if you have an engine failure, sure you bust the machine up but people walk away.

DH Is that due to the inherent design of the helicopter?

RJ Yes, inherently the helicopter is a safer aircraft than a helicopter uh... than an airplane because it has that ability to land at zero airspeed versus forward speed.

DH Is there any one kind of accident that occurs more than any other?

RJ I'd have to think on that one.

DH How many different bases did you go around to in the states to try and sell your idea to?

RJ Well, it was primary in California to start with, it went to a few bases, but as I say it was pioneered primarily in southern California, we sold it there. From then on it went to everyone. While I was still at the Forest Service, I went to every region in the Forest Service, training people, not necessarily, I guess in a left-handed way we were selling it, but I went to every region in the Forest Service and put on schools. So some places we were training people, but many of those people never used it before so I guess you could call it selling it too.

DH Were any regions that were more agreeable to you immediately than others?

RJ Yeah, some like region-3 of the Forest Service seemed to accept it uh... much easier than other places., but yeah, some were, some were more receptive than others, true.

DH Can you think of any reason why that might be so?

RJ Oh, basically human nature for starters, we're reluctant, reluctance to change. And then some places, too, couldn't utilize all the capabilities like other places, like I mentioned region-3 of the Forest Service accepted it, but the thing was uh... you'd say well let's use this thing to drop water with, well they don't have any water. They don't even have pumpers you know, at that point in time they didn't, to even fill the tanks, it's a very arid area and you mentioned hose, laying hose to the
area, well they didn't uh... didn't even have hose, period so why use it.

DH Where's region-3 at?

RJ That's Arizona/New Mexico.

DH O.K. Are uh... helicopters used rather frequently for rescue flights?

RJ Not frequently but they're used, yeah in the, we talking the fire fighting environment?

DH Mmm mmm.

RJ Yeah that's not a big, big use, but it's there and has the capability to do it if you need it.

DH Is there a certain limitation, say a distance to a fire that limits the helicopter's use?

RJ Well only on it's endurance or I mean by that, how much fuel it can pack with it so, as far as uh... you don't look at it from the same standpoint you would an airplane. You base the helicopter close to the problem area, you don't an airport so uh... but you can, even light machines you could top off the tanks and fly for two hours and 45 minutes to three hours, so not, not per se, no there's no limiting factor.

DH How long would it take for uh... a helicopter to get to a fire, is it instant or does it take some time?

RJ Well it's, there's no answer to that question. It's dependent on where the fire is, the, you know, the helicopter could get the person there in ten minutes or it might take an hour, so it's dependent on where the fire is.

DH What made you decide to try jumping out of a plane?

RJ Pardon me?

DH What made you decide to try jumping out of a plane?

RJ Well I always believed in the concept and I always wanted to be a smokejumper, but it just never seemed to work in, in my, the way I planned my career along and then I got attached to a smokejumper base in Redding, California and then they asked if uh... I'd be interested and I said sure, so that's, I always had the desire, wanted to do it.

DH Why would they approach someone who wasn't a helicopter pilot to work with the heli-attack?

RJ Well they didn't approach me, I just did it. They didn't approach me, I just, like I say, got into the thing by accident
and uh... and stayed with it, so I knew more than the pilots did and we didn't have any Forest Service helicopter pilots at that point in time, most of all our pilots were fixed wing pilots and they didn't uh... our fixed wing pilots didn't identify or seem to care too much about the helicopter.

DH Mmm mmm, uh... does the Forest Service use private contractors just for helicopter flying now?

RJ Yes, uh huh.

DH Do you feel that there's an advantage...

RJ Well, the whole program is contracted uh... some regions maybe all in one helicopter so essentially it's a contracted operation and that's true with the Department of Interior too, same thing.

DH Now how do you convince a private contractor that this is the way that they need to go?

RJ Money, they write contracts, you know, they advertise and they'll say, well, they're in it for business, that's what I'd say.

DH Now you said, the Department of the Interior, what, do they use these for the same thing?

RJ Yes, see I spent 25 years in the Forest Service and then the last six years I was with the Department of the Interior in an organization called the Office of Aircraft Services which was a national office for aviation for the Department of Interior. That included contracting aircraft, training people, etc. So yes, the Department of Interior and fire fighting, the Park Service, the Bureau of Indian Affairs, the Bureau of Land Management utilized the aircraft for fire fighting and then they also utilize now, helicopters with fixed-wing in a variety of other missions uh... U.S. Fish and Wildlife uses helicopters and fixed-wing in uh... coyote hunting, animal damage control. U.S. Geological Survey uses them for offshore work, flying their inspectors out to offshore oil rigs uh... snow surveys. BLM uses them for uh... herding cattle or wild horse I mean. National Park service has helicopters with the National Park Police in Washington, D.C. so there's a variety of missions out there.

DH When you were with the Forest Service then, what were your duties?

RJ Well, after I got in the helicopter program, it was primarily training people the efficient use of helicopters. I did that at a regional level uh... Western regional level and a national level.
DH Who were your supervisors that were, that you had to report to on this?

RJ Well first one was the guy that run the jumpers there at Redding, and then from there on it was just whoever was uh... the boss.

DH How did you feel in the beginning when you'd heard about the use of helicopters?

RJ Oh I just believed in it from the beginning, took this friend of mine that I mentioned, this Beedebau, was a friend of mine I knew and he was messing with it there in 1949 when I was down there and I thought it made sense then. Then another friend of mine got into it in 1954 and they still didn't have all the equipment, but then, I just, in short, believed in the air attack concept.

DH Do you think there's a difference between these pilots that fly the helicopters versus the fixed wing pilots, are they all pretty much the same type of guys?

RJ I don't know, I can't uh... the helicopter pilot versus the fixed wing pilot?

DH Mmm mmm.

RJ Well they're two different breed of cats, but personality wise, yeah, they're pilots, they're all the same in that category. But the helicopter pilot's more of a, you might say intrical to your organization fire fighting wise, I mean he's out there with you. The air tanker pilot you never see, maybe you could be, you could be on fires for years and never ever meet that guy that comes over and drops the, the gook on the fire, where the helicopter pilot, he's out there with you on a one to one basis.

DH Do you ever use helicopters to drop retardants?

RJ Oh yes, yeah, for years. See we started out with water and then we started, well, within two years after we started using the tanks, we started using borate, so yes, so that's been going on for years.

DH Is it more efficient coming out of a helicopter than dropped by a plane?

RJ Yes, mainly we're uh... air speed.

DH And why is that?

RJ Well, because the pilot can adjust his speed whereas a air tanker, he's got one speed, he's got to drop that and he can't get below that or he's going to fall out of the sky. So yes,
with a helitank, could be a lot more accurate and uh... cause you're closer to the ground and you can adjust the air speed.

DH Do you feel that helicopters are being used to the full extent that they should be?

RJ No, huh uh. And that's a long answer for that one, a variety of things go in there, but basing, where you base them, agencies, they don't base em in relation to the problem area. And then there's uh... bigger machines out there available and money and the financial aspect gets into it, but they can use bigger aircraft and haul bigger, more crews and all that if money and values and all that are equal.

DH How do you go about correcting these things then so that the helicopter is used more and more?

RJ Well that's an educational project, uh... process. Then of course money is probably, there's many people out there too that want them, don't have the money, they can't get the funds. So it's a, let's say, there's a lot goes into that, into that question and some of it's education, some of it's selling ideas and so forth.

DH Have you ever flown in a helicopter over to a fire?

RJ Oh yeah, sure, many times, yeah.

DH What's it like? How do you feel when you, hovering over that fire?

RJ I don't know, I just, like I say, the speed of getting there, that was the difference. I got a, get a feeling of accomplishment.

DH How'd you feel that first time you went up in a helicopter?

RJ Well, the first flight it was, boy, this is an easy way out and that was way before I got into the, the program so I was still on the ground, but uh... 1949 I was on this fire with another guy, and we had a crew of men and we built line for miles and we were clear to the top of that mountain and I saw a helicopter land, I kept looking way back down there where I was supposed to hike out to. This guy lands the helicopter and says do you want to fly out of here, and I says sure. So it was a great feeling knowing I didn't have to hike two hours to get back to the truck.

DH How do you go about building a landing zone for a helicopter? What are the kind of things do you have to look for, what do you have to build?

RJ Well you look for a location somewhere, exposed knob or ridge top or something like that and then it's just a matter of clearing the brush or timber within a, you need at least a
minimum of ten, fifteen foot square touch down pad and then you need approach and departure, generally all of 75 foot clearance uh... is adequate.

DH Do you usually, have you had to fall trees in order to make a big enough area?

RJ Oh yeah at times, in heavy timber you would, sure.

DH Do you feel that the helicopter has more trouble flying in rough weather than an airplane does?

RJ I think so, yeah, a little bit more, particularly the lighter machine, more sensitive to strong winds, primarily, turbulence.

DH Does that create problems when you're out on a fire trying to fight it?

RJ Well, to a point, there's times you get conditions so bad you can't fly. The Forest Service manual used to say uh... winds exceeded 30 miles an hour, you grounded them, so there's times you're just deprived of the use of it.

DH Whose decision is it that the helicopters can't fly?

RJ Well, it's a mix between the manager, the air officer or safety officer or whatever it may be and the pilot. It normally it seems like the pilots will keep on flying when they... beyond the point that they should cause they're looking at dollar signs.

DH Mmm mmm.

RJ That decision primarily is made by the air service officer or air service manager.

DH What kind of altitude would that helicopter be at when he's releasing a bucket of water or say retardant?

RJ You mean the height above the ground?

DH Yeah.

RJ Oh 75 to 100 feet.

DH How does that differ from an airplane?

RJ Well, they're higher because they need a little bit more room, you know, they're moving faster so it, they can drop a little lower than the fixed wing.

DH The pilot, if a contractor is under contract with the Forest Service, pilot puts the bird down and wrecks it, how does that reflect on the heli-attack?

RJ Say that again, I'm not...
DH If a pilot that's a, flying for a private contractor wrecks his helicopter, does that in anyway reflect on the heli-attack? Does someone come out and say, well gee, you know, we really shouldn't have been using the helicopters because they're really not that...?

RJ Well, at times, yeah it could. It's a, not necessarily the term heli-attack, it just affects the safety program in general you know and they categorize those by helicopter accidents or fixed wing accidents.

DH Have you run into any problems trying, when you, trying to sell this idea on a national level, that you don't experience when you're working with the regional office or with a private contractor?

RJ No, I can't think of any. I, it's a, no, I can't think of anything.

DH What about the other way around, are there problems you encounter with a private contractor or with the regional office that you don't experience at the national level?

RJ Well, at times contractors can be, you know, difficult to work with or uh... the basic problem it seems that uh... it used to be, you didn't get pilots that were really qualified for the aircraft. Minimum, they put minimum requirements and so that was probably the main problem was a people problem.

DH How did you feel about them using pilots who really weren't qualified for that?

RJ Well, we didn't like it. That's the reason we started a lot of regulations saying that uh... the pilot had to have 500 hours or 1000 hours, etc. But no, I never did like it, it never did make sense to me if uh... any kind of business, here you have a $100,000 piece of equipment or $500,000 and you put somebody in there that's really not qualified to do it, it never made sense to me, not only from a safety standpoint, but just overall efficiency.

DH These rules and regulations you're talking about, were they drawn up as you went along or were they common sense things that you could see something down the road?

RJ Oh it was kind of a combination of both, but things just, you know, we learned the hard way as we went along.

DH Is there any one rule in particular you might say that came about as learning a lesson the hard way, that you can think about?

RJ Well, not at the... any more than what I probably already mentioned. We learned, that say, the hard way about having

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qualified people to fly the aircraft, we learned the hard way that we need qualified people or Forest Service personnel who are trained how to manage them efficiently, we learned things the hard way on a lot of accessories, the buckets and the tanks and the hose trays and this sort of thing, so some of it was just trial and error we learned the hard way.

DH I had heard that uh... in '57 they were experimenting with the helicopter use here at Johnson's Flying Service. Did you, were you involved in any way with that?

RJ No I wasn't, uh... actually I think they were using them here in uh... well I've got pictures shows they were testing up here in 1949 or '50, just out here at the airport. Then uh... in '57 or '58 they ran some kind of project in the Selway, but I... I don't... I wasn't involved in that, I just new of it.

DH Were there other people who were doing the same thing that you were doing?

RJ Initially, not that I know of, I was it. Then as things progressed we got more people involved and uh... as far as a rover type of position like I had, I was, like I say, it for a long time then uh... oh somewhere in the late '60s, the regions then started getting a... a person they called a heli-attack specialist and they would go around and do what I was doing. In fact, some of those guys I trained and got started, but... so, I think every region of the Forest Service, at least in the Western regions, have a helicopter specialist.

DH How did you feel about that when they first started using helicopter specialists?

RJ Well I always believed in them because there was just too big of areas out there so we needed that type and it was a good, good plan.

DH Make your job a lot easier?

RJ Yeah, you bet.

DH Is there anything that you can think of during the growth of the heli-attack that you'd like to change or do over again?

RJ I don't know. I think, the only thing I guess that bothered me is we moved so slow, it could have all happened faster. We were slave to a point on the availability of the aircraft to do the job, but then we got all this internal fighting, infighting and arguing over who, was it, could we do this or couldn't do that so I always felt we could have moved faster than we did. And there's still some places I don't think are any different than they were 30 years ago with their use of the aircraft.

DH Was there a lot of bureaucratic red tape that you had to cut through when you first started doing this?
RJ No, because there was no book on it, there is now, but there wasn't then. That's what probably made it fun, I helped write the book.

DH This book you talk about, is that the rules and regulations?

RJ Yeah which is, you know, the manuals which... helicopter handbooks, there's a manual, material, helicopter guides and this sort of thing.

DH What about the mechanics that work on these helicopters are they highly trained?

RJ I don't know what they are now, but they used to be, no, they were sometimes they weren't even, there wasn't even a mechanic. I was just some kid that was driving fuel truck for the pilot, that pumped fuel, but he wasn't a pilot or mechanic. And then see the Forest Service, for a long time, I don't know what it is today but uh... there was no such thing as a helicopter rated mechanic per se in the F.A.A. jargon. There was mechanics that knew how to work on them, but there was no licensing and now I think it's changed. Now there's licensed A and P, helicopter mechanics; A and P stands for aircraft and power plant. So I think they're is, but for a long time there was nothing. Then sometimes the pilot was also doing that. Fly all day, before regulations you could fly from daylight to dark, then he'd work on the aircraft after that.

DH Do you feel there's an advantage to having these mechanics checked out and certified?

RJ Oh yeah, you bet, it would uh... you know, it's a different, different ball game, much more sophisticated, particularly now that you've got the turbine engine and all that so it's definitely a good, good idea.

DH Do you have to place a lot of trust in a mechanic?

RJ Oh yeah, sure.

DH Have you ever seen a pilot that you thought maybe had flown too much, too exhausted to fly?

RJ Uh huh, lots of them. Like I say, it used to be we didn't have any regulations and they could fly all day from daylight to dark and some of them got run down, run down, sure.

DH What do you do in a situation like that, can you tell them not to fly or...?

RJ Sure, yeah, it's not an easy decision, but you can, you can do that if you're a manager type.

DH What kind of uh... regulations do they have now against that?
RJ Well, now there's flight duty limitations, they can only fly X hours a day, like eight hours the first day and then seven hours a day after that and they have to have a certain amount of rest so you've got some control there now.

DH Mmm mmm. How do you see helicopters being used in the years down the road?

RJ Well, I just think we'll see increased use, particularly the bigger machines and uh... the more they come on line, so I can visualize uh... probably increased use and more utilization of larger aircraft possibly, where you can haul 15, 20 man crews, maybe 500 gallon tanks you can transport and this sort of thing.

DH Do you feel that in the future that the cost of using helicopters is going to become prohibitive?

RJ No, it depends the way you look at it, it's uh... it's the values you've got, if you, you know, you pay for what you get so uh... if the values of the area you're trying to protect is in the millions and millions of dollars, then it's peanuts to say O.K. we're going to be paying $2,000 an hour for this aircraft to protect it so uh... it's all relative.

DH What about using uh... helicopters for cargo runs just to ferry cargo out to a fire for fire fighters, is that a good use of a helicopter?

RJ Sure, yeah it's uh... there again it's dependent on what kind of conditions you're in, but if you're working right on the fire itself and sure maybe the helicopter is limited on its payload capability, but if you've got just uh... 400 or 500 pounds to fly from point A to point B and it only takes you ten minutes, do it, it's much more economical and faster than say using a fixed wing to drop it by parachute takes an hour to get out there. So that's the cost value. Sure some people say, well, the aircraft, a fixed wing is so much cheaper. Well, it is but you figure the total time to take a light aircraft to fly clear out to the fire, round trip he's going to get two hours and maybe he's only $20.00 an hour, helicopter maybe $130.00 an hour, but he can do, the helicopter that does it in five minutes so the hourly rate is, things that uh... you have to look at it by the job.

DH How do you decide when you're, when you're approached with a job? How do you decide if it's more economical to use a helicopter or, what kind of factors do you think about?

RJ Well you just look at the job to be done, the distances and that sort of thing. How far and cost and like I say there's a variety of methods, but primarily that's it.

DH Have you ever decided that in a certain situation maybe a helicopter wasn't the best thing to use?

RJ Oh sure, there's times I've seen people try to use it as an
aerial limousine when they really didn't need it. It wasn't designed to be something that flew people from airports to airports cause it's such a slow moving vehicle.

DH Well I think I've about exhausted by list of questions. Is there anything else that you want to add that, about the use of heli-attack that I've missed?

RJ No you covered it pretty good.

DH O.K. thanks.

RJ O.K. thank you.

END OF TAPE