Sequoia Aircraft Corporation
900 West Franklin Street
Richmond, Virginia 23220
804/353-1713

February 10, 1981

Dear Falco Builders:

We have a lot of things for you this months, so here we go, in no particular order.

You will note from the enclosed kit information and prices that there are a few changes. We are raising the price of Kit No. 801 to $400.00 effective April 1. As I have mentioned in the past, this kit was under-priced relative to our costs. It is still under-priced, and you can expect a further price increase later in the year. We will accept all orders received before April 1 at $350.00. Little River, as you should know, has raised their prices as of the first of the year. Trimcraft Aero will have price increases of 15% in a month, and the new prices are listed in the kit information. Also, Western Aircraft Supplies has come out with a kit of all the spruce needed for the Falco.

Ron Rickabaugh at Aero Cabinet reports that they are now working on the wing spar kits, and the first shipments should be in 4 weeks. They just moved into a new building -- note their new address and telephone number.

Bob Esau's Falco is in limbo and can still be purchased. Ray Purkiser made an offer on it, which was their price, but the estate is in some turmoil with Bob's young daughter trying to handle the estate, which may be in litigation with the lady who was riding with Bob at the time of the accident. She was badly hurt and ran up some large medical bills -- Bob had no insurance. If any of you are interested in the Falco, they are prepared to take $8,000.00 for the woodwork, with an additional $3,100.00 for the parts we have supplied Bob (actually we supplied more than that, but they are planning to return the nose gear strut and a few other parts for credit.) This price would not include the engine, prop or engine mount, for which they have an $8,000.00 cost. The engine is an IO-320-B1A, and they had a custom engine mount made to fit the type 2 dynafocal. The engine has less than 50 hours on it. The constant-speed propeller is a fully feathering one, and the pitch limits should be changed for a single engine aircraft. They have two custom tanks of 50 gallons, for which they would like $500.00. They also have about $3,000.00 in radios and instruments, but I understand that the Cessna radios might be "hot", so I would have nothing to do with them. If any of you are interested in the Falco, contact Juan or Sandy Olivera, 3148 Redwood Court, Castro Valley, California 94546. Telephone: (415) 537-8210. The litigation would not affect a purchaser, since the airplane must be sold in any case. Sandy's main interest is

in seeing that the airplane that her Father spent the last year of his life building be taken over by someone and finished. When the estate is settled, there will be nothing left for them after debts and litigation are taken care of. It's all very sad, but I would still like to help in finding a new home for the airplane.

We now have the oleo shock absorbers in stock, and they are available separately for $283.65. I have changed the semi-finished main landing gear leg. Originally, we planned to weld the washers and plates to the upper tube, turn the large bearing surface and send the rest of the parts out to be welded by the builder. Since most of the builders who are making their own gear are doing some machining as well, we eliminated this welding and machining from the kit, and the price is reduced accordingly. We also have all of the stampings for the gear and other components in stock. We have assigned part numbers to each part but have not yet made the changes to the drawings, so you will have some difficulty in telling what the part numbers represent. I'll try to clear this up on the drawings as we go along, but I don't have the time to get all of this done right now.

I expect to have to raise the price of the nose gear kit in the near future. We still have to make the trunnion, and I'll take a look at it when it all work is done. In the meantime, we will honor all orders received at the existing price.

I would like to offer some tips on the construction of the Falco. First, it is a very good idea to build the fuselage in one piece and saw it apart after the skins are on. Mr. Frati suggested this, and many of our builders were already doing it on their own. You would use 2 AN970-4 washers (as 3mm spacers) between the two No. 8 frames. The longerons would be in one piece, and this would make the construction easier.

I am now working on a drawing of a fuselage jig that George Nueman made for his Falco, and we will have the drawing out shortly. It is the simplest and best idea I have seen to date. John Harns made a similar jig with a piece of pipe, but I like the box beam that George Neuman made better.

When it comes time to put the ailerons and flaps on the wing, you will have to shim under the wing hinges (or bend the hinges slightly) to get the hinges lined up properly so that the controls work smoothly. The best way is to put the hinges first on the aileron and flap spars, and then fit the other hinges on the wing. After this is done, glue in the aileron and flap ribs. George Nueman has another good idea, and that is to make the ailerons and flaps as a single unit with the wing (that is with the spars of the aileron and flap as a single unit, and with a single trailing edge strip for the aileron, flap and wing). When everything is done, you saw it all apart and your trailing edges come out perfectly in line. I know Bob Esau had a problem with all of this, and if he had done it this way, everything would have been right on the money.

I have recently done some work on the control cables and their installation. As a consequence, there are a few changes required in the holes in the wing ribs, and I will have drawings to you within the next couple of weeks. I had hoped to have them with this builder letter, but I have not been able to catch up with that work. After those drawings are out of the way (they are all large drawings) I am going to make it my first order of business to get the large number of smaller drawings printed, after I check them one last time.

I do a lot of thinking about the best and easiest way to put a Falco together, and I have been coming to a number of conclusions that might not suit all of you builders. Most builders are building the tail, then the fuselage and then installing the wing. When all of this is done, then the fittings are installed. It requires more space, and it requires purchasing more kits in the early stage of construction, but I think that it is preferable to install as many of the fittings as possible before assembling the aircraft. I would install all elevator and rudder hinges on the spars before gluing in the ribs. I would drill frames No. 7 and 8 for the tank straps early on. I would install the elevator bellcrank supports on frame No. 6. I would install the aileron bellcrank support, the landing gear mount and side load strut mounts on the main wing spar while the spar is still loose, then I would glue the spar to frame No. 4 and install the seat belt fittings and the landing gear retraction housing. I would install the landing gear mount fittings on the forward wing spar (you have to have an accurate drill jig for this to maintain the same location as the ones in the main spar), then I would glue the forward wing spar to frame No. 3, then I would install the rudder pulley brackets and control stick support brackets before I installed the whole thing in the fuselage. You should have the landing gear when the fuselage is assembled to double-check the alignment of the gear, and naturally all of this requires a large workshop. I would also install the rudder pedal mounts on frame No. 1 before I put everything together. I would install the aileron pulley brackets on wing rib No. 2 before installing the rib in the plane. I would try to install P/N 717 as soon as possible, since that is a tricky thing to get in a position to drill the holes. This might make the installation of the lower side longeron at frame No. 4 more difficult (you may have to "slide" it in place), but I think a lot of time and effort could be saved by thinking things out well in advance. Bob Esau used to swear a lot about the difficulty of getting into all of the nooks and crannies to install the various parts.

I will also point out a potentially troublesome area, and that is that the rudder pulley bracket must be installed on the aft face of the forward wing spar and frame No. 3 before the nose gear side wall is constructed. The channel-nut for this bracket is buried within the side wall, and on the right side, you will have to install a block of wood (fitted around this channel nut) for the bolts for P/N 717 to pass through. You do not have the drawing for P/N 717 yet as we still have some work to do on it. This is a 3mm thick aluminum angle that supports the nose gear screwjack. Originally, it had only a bronze shoulder bushing as a bearing for the shaft. While no accidents have been directly tracable to this, it did have some problems that might have contributed to the problems with the upper drag strut bending or

breaking. There was no provision for lubrication, so all you could do was stuff grease at it. Since this was located in the nose gear bay, dirt and dust would get mixed with the grease, making an excellent grinding paste. As a result, the bronze bushing would wear, and introduce a certain amount of slop. The Aeromere Falco that belonged to Charlie Yates had the bronze bushing worn away to the point that the I.D. was 16mm for a 12mm shaft. We are going to use a sealed ball bearing, which will be far superior. Also at Mr. Frati's request, we are going to use MS20271-B14 universal joints for extra strength. As you might remember, the universal joints on the production Falcos were custom-made for the airplane. The B-10 universal joints that we had planned to use are rated for the loads, but Mr. Frati felt might have some risk of fatique with the B-10 and would have a greater margin of safety with the B-14. (During 6 g aerobatic maneuvers the universal joints are subjected to about 796 lbs in tension, and the B14 universal joints are rated for 3,500 lbs ultimate load.) These larger universal joints made for some challenging clearance problems with P/N 717, but we have this worked out now. Also we wanted to check the clearance between the rudder cable and the bolt heads for the bolts holding P/N 717 in place, and they clear. Also involved in this was the installation of the control stick and rudder pulley brackets since we wanted to use standard pulleys (the Italian companies made their own) and there was an interference problem with the pulley and the control stick. Even with the original pulleys, there was some interference, and Aeromere solved it by putting a block under the control stick support brackets, and we have done the same thing. This may only take a few lines to explain, but it has taken me four weeks and much lost hair to check it all out. Along the way, I lost some sleep over the screwjacks, but we have that worked out too.

Those of you not familiar with making things may not be aware that this is a problem with any device. All plans have some errors, and it is up to the shop to report them back to the engineer or designer, and what cures were taken. Apparently, Aeromere never bothered. I think that we now have all problem areas identified, and the problems solved. So far there has been no real effect on you builders out there. I can count on one hand the number of parts that have had to be made over by one of you, although a few builders have not been keeping up on the revisions and my other hand is needed to count those parts as well. There are plans that you can buy for aircraft that have been sold for 30 years that still have these kinds of mistakes in them and no effort has been made to correct the errors. That will not be the case here.

Also you may be interested to know that Charlie Yates' Falco has been sold to a local machinist, Travis Edwards. Charlie owned a Falco in Luxembourg which he completely rebuilt and flew for a few years all over Europe. He sold that Falco when he came back the the U.S. and later bought another Falco that was a basket case and had it shipped back to the U.S. for a rebuild. The airplane sat in his factory for a couple of years and when we started to sell plans Charlie started to work on the airplane. He hadn't got up the energy to start work on it, but after reading our brochures he said he fell in love with the airplane all over. In addition to being a state senator, Charlie is

President of Yates Industries, a NYSE listed company. He was making good progress until a larger company, Square D, bought Yates Industries. Since then, he has been at the beck and call of the Square D management, and he just hasn't had the time, so he sold it to Travis. The trucking company did a beautiful job on the airplane, ramming a fork-lift truck into it and smashing the aft end of the center section, along with the control surfaces. I now have a real Falco within 15 minutes of my office, and that is a help.

Speaking of help, you will never be able to comprehend the enormous contribution that Charlie made to the Falco. Despite being a busy executive with a large company to run, he was always available to explain little things about how things were made on the Falco, but which weren't shown on the plans. We were able to use his shock absorber struts to make our drawings. One of these days I mean to publish a list of all the people who have made a contribution to the Falco project. The list is very long, but no one has done even a fraction of what Charlie Yates has done.

When the work load eases up around here, I still plan to publish a thing we will call "The Falco News". This will four to eight page newsletter which we will send out to everyone who has purchased the information package. It will have the latest information on the kits, and we plan to "visit" a builder in each issue, to tell something about him and his project and to show photographs of the airplane being built. We would also like to have a section on all of you builders, so if you will send in photographs of your projects with some comments we will try to get them all in.

It's time to start planning for the annual Oshkosh show. We will have our booth in the usual place. We will have our usual builders dinner on Tuesday, August 4, at 8:00 PM at the Midway Motor Lodge in Appleton. Neil Johnston, a Falco owner from Ireland, is planning on being at Oshkosh, and he can be found in and around our booth. We had about 6 Falco owners stop by last year, and I suspect that this coming year will be much the same. I think it is very likely that we will have a Falco flying by then and at the show. My money is on Larry Wohlers, who stands the best chance. Bill O'Brien could make it too. Tony Bingelis would be flying by then except that Tony makes many of his own parts and that slows him down. Sid Jensen, in New Zealand should be flying by the end of the year. Mike Rielly might also be flying by then. There are a number of other builders who are making very good progress: George Neuman, Dave Aronson, Larry Black, to name a few. Ray Purkiser has been making good progress but his pace should pick up somewhat. After working on his Falco for about a year, Ray decided he enjoyed building it more than his job. He is taking early retirement in March, and he is moving to the Grants Pass, Oregon, area where he will build Falcos full time. As you can see, this building-of-Falcos is a painful experience!

Many of you will be happy to see the enclosed plans index. I have been adding to this as I have gone along, and I have gotten tired of answering letter about when it will be available! I tried to get the appropriate revision letter next to the sheet number where we have issued a new drawing, but I am sure I have missed some.

I want to thank all of you who have filled in your builder questionaire. It is a great help to me to know where you are in construction, and what your plans are. I know that many of you are not sure of the precision of your answers and that is not at all critical. I can get a very clear picture of what the majority of you plan to do and when, and it makes it easier for me to plan our production so that we will not have to keep you waiting when you want your parts.

I would like some feed-back on a few additional areas. The first is the subject of fuel tanks. I have done very little on the tanks at this time, although we can quickly have some tanks made up for any builder that wants them. The first question is that of capacity. You can increase the capacity of the tanks slightly without hurting things, although you must always be careful to load the aircraft within the limits. I think 40 gallons is a reasonable capacity for a 150 hp airplane. I have that in my Messerschmitt, and it is ample for the type of flying I do. If you go above that, you will start to push things, prehaps a bit farther than they should. You should be particularly careful about adding too much to the aft end of the airplane. As all of you should know, moving the CG past the aft limits results in an unstable aircraft. If you must have 50 gallons, I would suggest that you think in terms of putting the extra capacity in the wings, where it will affect the CG less.

The second question is whether you will want an inverted system. We can do this, and there are two ways that it normally done. The first involves putting a flop tube in the front tank. Most aerobatic aircraft are done this way, but it means that the tank has to be redesigned to accomodate the flop tube. The other method is to use a header tank, a small (usually one gallon) tank below the front tank, with a flop tube in it. The front tank feeds fuel into the lower front of the header tank during normal flight, and during inverted flight the fuel cannot run out (there is a small vent return line with a check valve). This is preferable in that all of the fuel is usuable, as is not always the case when a flop tube is used in the larger tank. You still have to contend with the matter of the caps and the overboard vent lines. The production Falcos were vented through the caps, and although there was "cup" around the tank filler neck, they frequently leaked so that the cockpit smelled of fuel. Some people run these overboard lines to the bottom of the fuselage, but I don't care for the idea of a vent line aft of the exhaust pipes. It would be better to run it out the wing and out there. It is one thing to run the drain from the overflow cup to the bottom of the fuselage (as was done on the production Falcos), and another to run a line directly connected to the inside of the tank. Also the production Falcos had threaded caps that were screwed on the filler neck, and some people prefer the thermos bottle type that would normally be used with the type of filler neck shown in the plans. These are some of the considerations that I have not yet resolved, and it would help me if I knew what sort of tanks you are looking for, so that I can come up with one or two standard models.

Speaking of standard models, there seems to be some confusion in the minds of some of you builders about the windshield and canopy. We will be offering both the standard version and the Nustrini

modification. From your letters, it looks like about one half prefer the Nustrini mod, and the other half is adamant on the standard version!

I would also like some feedback from you on the subject of the seats. There is a possibility that I can have them made up fully upholstered. We would be limited to about 8 different colors. Would that be of interest, or do you just want the seat frames?

From time to time, I hear talk of some of you making changes to the Falco. The two that concern me the most are changing the retraction system or trim tab control to some scheme of your own. I think both of these are foolish areas for experimentation. The retraction system is a very good one (and very similar to the system on the King Air). There have been two areas that are identifiable trouble spots. The upper drag strut has had a pattern of failure. I don't know if this is a matter of workmanship or design, but the result is there. It is a difficult part to make without introducing a number of internal stresses, and expensive, so we have made it as an aluminum casting, and the part is now designed for greater strenght (about twice). The other problem area is the electric circuitry; it was what you did in 1955 and is adequate to actuate the gear. What it does not do is protect the pilot from himself or from some failure in the system. We are working on some changes to this to include all the bells and whistles you could want. We plan to use dual limit switches for retraction and extension, squat switches, and we are looking into the possibility of pitot air switches, which sense the speed of the aircraft and prevent the retraction of the gear below flying speed (on the ground, even over bumps in the runway) and warn to lower the gear if the speed gets too low along with other landing conditions: partial throttle, flaps extended, etc. What we have is a system that is extremely light, extremely simple and with a couple of identifiable problems. If you recognize the problems, the cures are simple. If you come up with your own system, you may be successful or you may have a problem. In either case you are developing your own new system. Did all of you see that article in Sport Aviation by the guy who put a "reliable Mooney-type" lever system in his Silkie? I can't remember how many times it collapsed on him! A lever system is fine, but it is far more sophisticated in design than it looks. Mr. Frati put one on the Falco prototype. He said it didn't work very well, and he went to the screwjack system we now have. We have a hydraulic system in the Sequoia and the hydraulic pump (a standard Prestolite unit used in all Pipers) weighs more than the entire Falco retraction system. With hydraulic systems, you also have to have downlocks. I think messing with this system is very foolish.

The other area of modification that concerns me is the trim control system. Model airplane servos are not strong or rigid enough to do the job. I am sure that they have been installed in other homebuilts, but this airplane has a 240 mph VNE. You are asking for flutter problems, and I am going to be very reluctant to fly in one of these Falcos without looking the system over very carefully for rigidity. The risk with modifing the retraction system is that you might damage the aircraft. The consequence of a poorly designed trim system is likely to be fatal.

As for our kits, we have kits 801, 802, 803 in stock now, and we are making deliveries on a next day basis. We have most of the parts for the flap kit in stock, except the torque tube, and I want to double check that the angle of flap movement is correct for the actuator we have before I commit to quantity production. We have almost all of the parts for the control system done now. We have worked out the cable lengths but want to check these against a number of aircraft before making them up. Kit No. 806 should be shipped in two weeks; we have all but a few parts in stock now. We have made the first of the windshield and canopies and have shipped them to Larry Wohlers for him to fit to the aircraft, trim and return so that we can use it as a master fro trimming all production canopies. After this is done, we will then have to get to work on fitting a canopy frame to it and producing them. We have the engine mounts in stock now for both the conical and the dynafocal mounts. The fuel tanks are awaiting some feedback from you, although we can have custom tanks made up for the first builders. We have most of the other parts in stock now. The main landing gear arms are welded. They need only final reaming of the holes, and painting. The components for the main landing gear legs are all done. The tubes are being slit now and should be in the welding jig in two weeks. After that is done they must have all holes reamed, and then painted. We have shipped the first set to Tony Bingelis already, and we should be ready to ship in a month or so. All other parts for the main landing gear are in stock. I should mention that you can expect a small price increase in this kit in the future, since we had not earlier figured in the cost of the welding fixture for the arm. Almost all parts are complete for the nose gear strut. The trunnions are being cast (we have a couple of first articles from the foundry now), and they still have to be machined. Also the rocker arm must be welded. We have many of the parts for the landing gear retraction kit now in stock. We have to machine the upper drag strut, the lower drag strut (which will be machined aluminum), the gearbox housing, and we have to weld the upper side load struts. We have done relatively little with the motor and reduction unit since we want to get a torque reading off a Falco so that we can get the gear retraction time down as low as possible. We have the reduction unit designed and can easily change the ratios. We have the cowling plug complete now. We were going to try a "splash" off of it on Bob Esau's airplane, but he was killed the very week this was scheduled. We would like to do this with a Falco with an engine on it before making the final mold, which can be done easily now, and we can have parts out on short order.

We have done relatively little with the seat kits. First, we have been doing some work with an expert on crashworthiness on the design of the seat belt system in the hopes of coming up with something really good. We would like to use the Pacific Scientific rotary buckle five point harness, although some of you might have a problem with the price -- it's expensive. The Christen system is a good sturdy system, but it is not very convenient to use. You have to thread everything together, and everything comes apart if you take the shoulder belts off after take-off. Then if you need the shoulder belts in a hurry (or just to land) you have to take everything apart and thread everything back together. With the Pacific system, you insert the end of each strap into the buckle one at a time, and the buckle has a release for just the shoulder belts. It is the best system available without any question

(every airline pilot has one). Due to it's cost, not all of you will go for it, so we will also have a standard Christen system, or the Pacific version of it. I feel strongly that a five point harness should be used, and we will only offer the two five point systems. There will be some of you who may want to use two and three point systems, but we only want to be involved in state-of-the-art restraint systems.

That's all the news for now.

Sincerely,
SEQUOIA AIRCRAFT CORPORATION

Alfred P. Scott
President