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L.J. Wackett,  
Care Pratt & Whitney,  
East Hartford,  
Conn.

May 3rd, 1937.

The Secretary,  
Commonwealth Aircraft Corporation,  
422 Little Collins Street,  
MELBOURNE.

Dear Brown,

Following the finalisation of the negotiations for the Pratt & Whitney license, copies of which have no doubt reached you, I duly arrived at East Hartford to study the matter of plant and materials for engine manufacture.

Just at the time of my arrival I duly received your telegram of April 16, which set out certain suggestions for future policy and additional licenses. After much consideration I duly replied on April 20, and I wish now to amplify somewhat on the recommendations which I have made. In your reply of April 28 you indicated that these matters were still under consideration. As it will be possible for you to receive this letter by June 7th, the date upon which I plan to arrive in England, you will be better informed to consider the matter prior to my taking any definite action in England, so I propose to explain my recommendations more fully.

In spite of the criticism of the NA.16 in Australia and the statements that the Government will order British machines for the next order, I predict that no such action will be taken, because the Air Board is certain to order additional improved NA.16 aircraft. People in Australia have no idea of what this aeroplane really is, and instead of finding it obsolete it will be found to be in the first rank. This is because we will be building a more advanced model than previously proposed, and because I now find that we can get the conversion of the Wasp Engine to 700 or 750 H.P. with very little alteration, and with this extra power the new NA.16 will not only have all the manufacturing advantages claimed for it, but will have a better performance than the Westland machine with the Mercury Engine, which the R.A.F. in England will not get till June, 1938.

Our own Air Board will, therefore, find itself at a great advantage, and is certain to order many more. This will mean that there is no likelihood of a gap in production following the first 40, as further machines will be ordered long before we finish the first 40.

Nevertheless, I fully agree that we must take action to make a small trainer as soon as possible. It is quite unnecessary to spend money on another license, as we can produce ourselves a better machine than a Miles Hawk (which is poorly made). If the Miles Hawk is favoured we can buy one and so ensure that we incorporate all its advantages short of an outright copy. To produce a machine in this way is quite legitimate ethics in the aircraft industry. Everybody does this sort of thing, and every nation too. Britain bought a Northrup outright and produced the Rainier Battle on similar lines, and better.



Since arriving in U.S.A. on this occasion I have realised what a fundamental necessity the V.P. propeller is to the future of aviation. With our Aeroplane and Engine Licenses we will create the nucleus of an up-to-date aircraft industry, but there is still one big gap of fundamental importance.

After a study of the situation I was surprised to find that it would only be necessary to add three large fundamental machine tools to our engine plant to enable us to produce a V.P. airscrew. We could do it very completely and conveniently with less than 10 extra tools.

Rather than take on any additional aircraft or engine licenses for the present I think it would be wiser to consolidate our position as regards making Australia independent in case of war. Money spent on an airscrew license would be better than spending money on more engines and aircraft. On the other hand it is fundamental that we should build a small engine for training requirements. Rather than pay De Havilland's £5,000 for a license for a series of six small engines, I suggest it would be better policy to take a license for the only really fundamentally necessary small engine, the Gipsy Major, for say £2,500, and take up an airscrew license for say £3,500 for the airscrew required for our NA.16 aircraft. We could arrange options to cover other types later, but in the meantime we could get the experience, and train the personnel, and what is more we would be taking on as much as we could handle at the moment.

I find also that we must take steps to produce our light alloy forgings and castings, and I would sooner spend money on establishing these essential departments, and so consolidating rather than extending to cover more aircraft and engines immediately. If we consolidate, we can produce any type of aircraft, for which a sample, and, or drawings, could be obtained, and without any license at all. The license business was essential at the start, but I am satisfied that to take up further licenses for aircraft, involving royalty payments, will be sheer waste of money. In the case of these first licenses we are getting a foundation and the chance for our personnel to learn many things that we will not need to learn again. I feel that I could easily persuade the Directors not to take up additional aircraft licenses in the immediate future. We will have our hands full as it is, and it would be better to consolidate with airscrews and light alloys. V.P. Airscrews are wanted for all modern transport and Military aircraft, and as they are a monopoly of a few firms, there is a great shortage. At present they are the crux of the situation, and neglect to take up this essential component will cripple our scheme as at present planned, if we cannot import V.P. Airscrews, as seems certain in the event of any emergency.

After arriving at East Hartford I immediately got down to a study of the plant requirements. I was given a list which was supposed to be capable of producing 125 engines per annum and which I estimated would cost £250,000.

I spent two weeks concentrated on the job of seeing what was essential. Finally, I got down to the lists sent herewith, as being essential and costing about £100,000. I had the P. & W. engineers work out the capacity of this plant, and it is now agreed that it is ample for 100 engines per annum plus all our machinery work for the aeroplane factory, working one shift only. I was so pleased to get something which approximated to our original



estimate, that I decided that I should get the information cabled at once. This made a very long cable, but I estimated that this would acquaint the Board for the first time of the essential plant required, and would advance matters fully 6 weeks as regards ordering and delivery. I fully expect to improve on this list somewhat as some of the newer tools, although more expensive, eliminate others and finally show an economy in outlay.

I am sending two sets of lists. One sets out the actual list of plant arranged classified as types of machines, lathes, drills, etc.

The other list gives the tools required to make each essential component, and individual machines appearing on the classified list appear several times perhaps under the headings of the second list.

In such cases it is estimated that the one machine, for instance, would do all the work required for several components.

I am enclosing also estimates which have been made of the machine time necessary for the various components, together with machine times necessary for the requirements of the aircraft factory.

I have Carroll and the three others fully engaged at Pratt & Whitneys.

Carroll at the moment is working on the lists of material and parts which we will need. After much consideration I have decided on the following plan:-

1. A complete set of completed parts sufficient to assemble one complete engine, and to give one sample part of each component as a model for manufacturing and inspection.
2. Sufficient completed parts to assemble 5 engines, less cylinders, pistons, gudgeons, valve gear, etc., with raw material to build these parts.
3. Sufficient completed parts to assemble 5 engines, less cylinders, pistons, gudgeons, valve gear, con rods, master rods, oil pump, tappets, etc., with raw material to build these parts.
4. Sufficient completed parts to assemble 5 engines, less cylinders, pistons, gudgeons, valve gear, con rods, master rods, oil pump, tappets, crankshaft gears and drives, and with raw material to build these parts.
5. Sufficient raw material, forgings, castings, bar etc. for 34 engines.

If this material and parts can be supplied we can organise our production as follows:-

1. Assembly line and tests.
2. Cylinders and Pistons.
3. Con rods, master rods and some accessories.
4. Crankshafts, gearing and miscellaneous.
5. All outstanding parts.

In other words we can get some progressive output without, and before we succeed in making, everything. This is the only sound



I hope this letter will let the Board get my point of view on several aspects.

I send my best wishes to all:

Yours faithfully,

(Sgd.) L.J. Wackett

P.S. Have just received your cable re difficulties with Customs. Will do my best to get every possible substitute, but will not overlook difficulties arising through tooling to do the Pratt & Whitney Engine.