



Flying Excavators

A FAMILIAR sight around Nelson in recent times has been a cleverly designed flying excavator, a collaborative project between Heslop's Engineering and Reid Helicopters.

Lloyd Heslop says the idea arose from frequently observing crews at the end of roads disassembling excavators with tales of back strain and difficulty, while waiting for a helicopter bound for remote places to pick up the pieces. These would then be re-assembled in a river bed somewhere using numbers of people, lengths of wood as levers and blocks, and sheer determination. Often the parts being transported would be right on the limits of allowing safe operation, even stripped as far as possible and with operations occurring in ideal conditions. As well, this typical approach meant that even small jobs would often take several days due to the time required for breakdown and reassembly for both legs of the trip. As Lloyd says, "it wasn't a very efficient use of resources".

Working with Toby Reid, of Reid Helicopters in Nelson, Lloyd took on the challenge to address these issues in regards to remote operation of a 1.8 tonne IHI excavator. Their goal was that it needed to be safely and efficiently transportable with the company's FX Squirrel, then assembled by one man on any reasonably flat piece of ground in one hour.

Lloyd first set about the task of reducing the excavator to flyable packages. "We stripped everything off the main base unit including counter weight, cab, floor mats, tracks, boom, battery, fuel and still it weighed 1.3 tonnes. It was obvious the machine needed to be split in a unique way to overcome this problem. The base had expanding tracks and it seemed logical that if we could split the machine through the slew ring, the right weight combination could be achieved. After unbolting everything and weighing all components we found the base unit to be 850kg. To make the split we fabricated another base unit raising the main body about 120mm and attached them together by pins and bolts. The hydraulics separate by quick couplers. To separate the track assembly from the main body, we fabricated some skids that slotted into the original track frame.

For disassembly, we lift the machine with blade and bucket, then lower it onto the skids to take the weight. After uncoupling the hydraulics on the base, an extension of hydraulic hoses is installed so that with



Driving the tracks out with extended hoses.



The canopy rotates onto the track unit.



Ready for sling loading in three packages.



At site, awaiting re-assembly.



On the job within an hour of arrival.

pins and bolts removed, applying pressure down with the boom then rocks the body back and this allows the track assembly to be driven out from beneath. Rotating 180°, the canopy is unbolted and turned upside down on the track base and pinned in place. Rotate 180° again and the bucket is placed and pinned to the blade. At this point, the main lift ram is unpinned and relocated to a bracket inside the canopy roof extended to carry the boom weight. With all the quick couplers on the boom uncoupled, the pin is removed and the track base, boom and canopy are driven clear of the base unit. Then we place the seat inside the canopy and all panels, tools etc. inside the box.

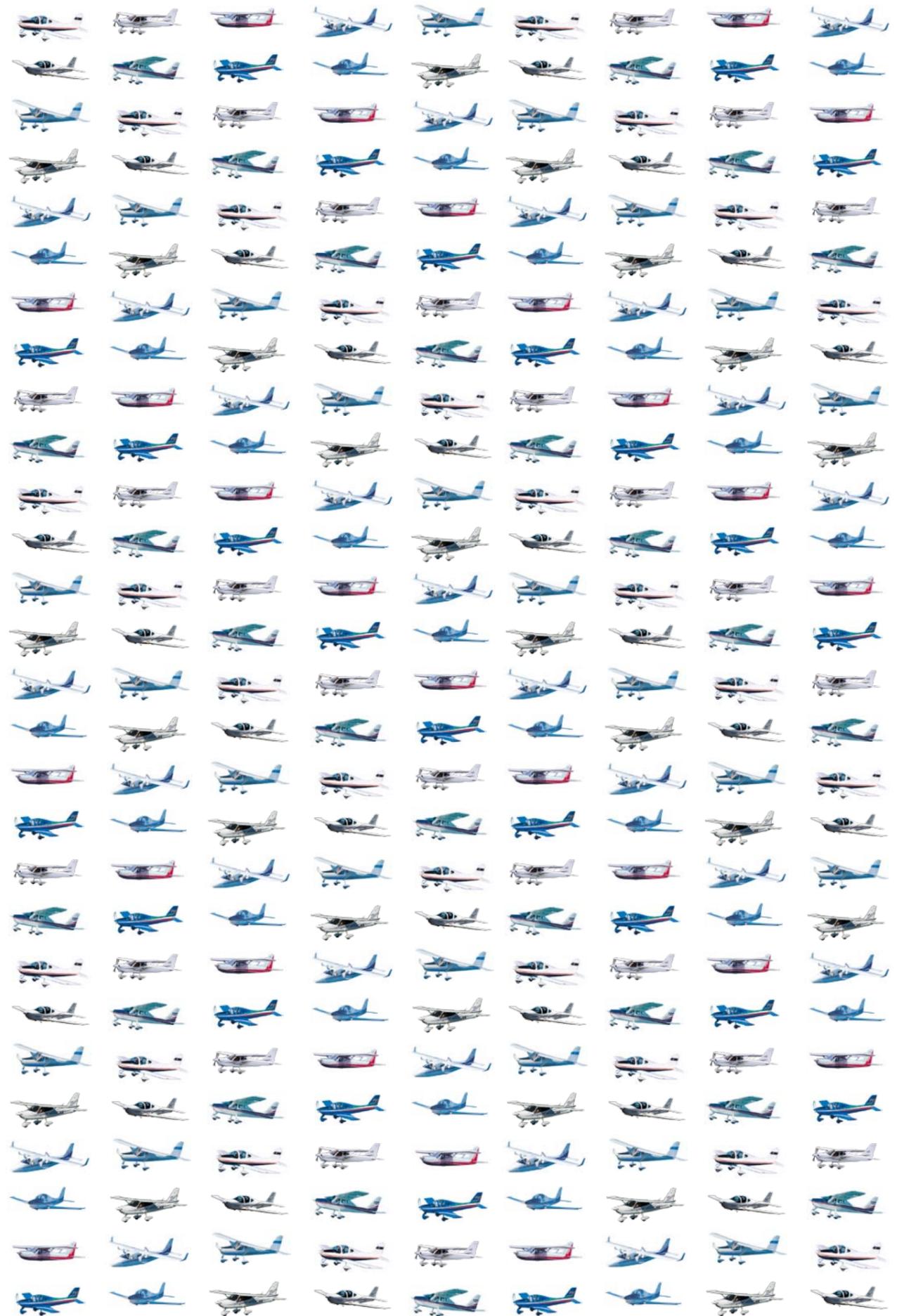
The sequence of flight is to carry a sling load with tool box, fuel, counter weight, additional buckets, ripper plus up to 3 people to the job site. Next we fly the track assembly, placing it at the front and lastly fly the main body placing it so that it is within reach of our hydraulic extension hoses. With 2 people, the machine is operable within 45 minutes of landing. Often, these loads are transported as part of flights already required, allowing the machine to usually be operable within one return cycle of the helicopter.

All assembly and disassembly can be done by one man without any excessive lifting causing body strain. Also due to the ease of assembly/disassembly, it is possible to fly in, do a job and return all within one day if necessary. It's fairly straight forward, but we've found that having our staff do the assembly/disassembly is far more efficient and we do this for a minimal additional charge as part of the operation."

Potential uses of Lloyd's flying excavator include drill site preparation, sewerage tank installation, house foundations in coastal areas, disaster relief in isolated areas, bridge construction, hut foundations, cycle track construction - and any need to excavate where access by normal means is restricted.

Lloyd says that Heslop's Engineering Ltd specialise in challenges of this type and have also been working on a light weight gravel skip for aerial use. Reid Helicopters Ltd offer a range of services including heavy lifting, fire fighting, tourism, fishing, flight training, power line stringing and more, matching a machine to suit your needs. They also welcome the opportunity to solve customer's logistical problems.

Visit www.helicoptersnelson.co.nz for more information on Reid Helicopters or contact Lloyd at Heslops Engineering, Ph: 0800 437 567, E: j.aberhart@heslops.co.nz or visit www.heslops.co.nz



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