

Clued^{up}

GA Update

February 2021

WEIGHT & BALANCE





WEIGHT-WATCHING

It can be easy to become complacent about weight and balance checks over time, but excess poundage can creep up on anyone

"So, there's a course near the hotel... let's take the golf clubs, should get a game or two in during the week; it's a four-seater so we'll be okay with full fuel as it's just the two of us." Really, are you sure?

How much does a set of clubs weigh? — the average is 30lb/14kg, so that's around 28kg of extra weight and what about any extra luggage, and is the aeroplane really a true four-seater or more of a 'two-plus-two'?

There are few genuine four-seat aircraft that can carry four adults, some limited luggage and enough fuel for a two-hour flight plus reserves. And that's assuming the adults average out at 12 stone/76kg — perhaps a bit of wishful thinking there in some cases...

Are the passenger weights really correct; are they when fully clothed or just after getting out of the shower and before breakfast? What about the mobile phones, tablets and any other electronic equipment being carried? They might only be a few

ounces/grams but it all adds up to lots of lbs/kgs. It's a good idea to allow about 9lb/4kg extra for each person's ancillaries. Then there's the headsets and how much does your packed flight case actually weigh — you get the picture?

The Aircraft Flight Manual (Pilot's Operating Handbook) might indicate a useful load of XXXX but that's for a basic aircraft — if you check the actual Weight & Balance Schedule, with all the avionics and other extras the useful load is likely to be considerably less.

Here are a couple of examples of common four-seater aeroplanes with standard fuel tanks; in a well-equipped Cessna 172 with full fuel you could have just 510lb/230kg for pilot, passengers, flying kit etc; a PA-28-181 can be slightly better allowing you to carry around 630lb/287kg.

Then there are the LSAs which have a maximum all-up weight of just 600kg/1320lb (land); taking just the basic aeroplanes with full fuel and without

any extras, a SportCruiser for example will carry 340lb/156kg; a Breezer will take 385lb/175kg and the Eurofox is somewhat better with a carrying capacity of 450lb/205kg.

So, what if the aircraft is a few pounds overweight? Well, for starters the flight would be illegal and a potentially prosecutable offence, the insurance would be invalid and you'd need to consider how its performance would be affected, especially the take-off distance: A 10% increase in aircraft weight increases take-off distance to clear a 50ft obstacle by 20% — but that certainly doesn't mean 10% overload above Max Take-Off Weight is okay if you have a very long runway, and some low-powered aircraft wouldn't even take off at all if 10% overweight.

Think back to the hot summer weather we had this year with temperatures in the high 20s to low 30s; an increase of 10°C in ambient temperature increases the take-off distance by a further 10%. Then