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# Analysis of Pilot's Visual Scanning Characteristics under Normal and Extreme Flight Conditions

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**Abstract:** Pilots must effectively scan the necessary instruments in flight deck from the moment that the airplane takeoffs until it safely lands. A small scale experiment was performed to investigate whether the visual scan characteristics would differ between novice and expert pilots under normal and extreme flight conditions. six pilots with different experience levels (i.e. novice and experienced) participated in flying the B52 military aircraft from Glasgow in Scotland to Leeds in England under normal and extreme (i.e. severe thunderstorm accompanied by engine failures) conditions using a medium fidelity simulator. The results show that the eye fixation numbers, durations and visual transition characteristics were significantly different between the novice and experienced pilots. In addition, we were able to observe that the experienced pilots increased the visual scanning complexity compared to the novices. The finding might lead to a deeper investigation of how the experts' visual scanning patterns can be used to train the novices.

***Keywords**:* visual scan, fixation numbers, fixation durations