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# Contraails

## Newsletter of the Christchurch Aviation Society

CAvSoc

### Modern Aircraft Instrumentation

Our first talk for 2017 was by Ernie Ball in which he took us on a journey from the first very basic dashboards to the latest 'glass' cockpits. The early cockpits were very simple affairs



with perhaps half a dozen gauges covering the basics of height, turn and slip, speed, fuel quantity, rev counter, oil pressure with a few valves and levers to complete. This was

compared to a Spitfire cockpit with the now more organised layout of the well known standardised military 'T' comprising Air Speed, Attitude Indicator, Climb and Descent across the top with direction indicator centrally below flanked by altitude and side slip indicators. Engine and other instruments and controls, apart from throttle, were spread around in sometimes a haphazard manner depending on the manufactures whims. On military aircraft this layout continued through the



jet era albeit with the addition of a Mach meter. Whilst single or twin engine military aircraft could retain a certain amount of simplicity and logic the multi engine and twin pilot civil aircraft produces

a bewildering array of instruments and controls – for example the cockpit of a Viscount has quadrupled engine instruments set centrally for both pilots to see but then complemented by each pilots basic six along with airfield approach and radio aids, propeller controls, fire handles flaps etc . The addition of a flight engineer at least meant that all the supplementary work entailed with a 'modern' airliner was handled independently and the engineers panel looked equally bewildering to the uninitiated. Up until the '80s the instruments were analogue with round dials but a revolution was around the corner.

We were introduced to the cockpit of a typical modern light aircraft where the standard 6 instruments were recognised but with improved artificial horizon and a separate panel dedicated to radios and navigation. Airliners were moving on with a 737-200 panel exhibiting a flight director which incorporated

the turn and slip into the artificial horizon and the compass now called a horizontal situation indicator and a radio magnetic indicator showing the aircraft direction and linked with navigation aids and supplemented by a radio altimeter. A 'mild' revolution occurred



when the flight engineers were deemed unnecessary because automation and simplification was progressing but of course this work was

transferred to the pilots who now had an extra panel above their heads with all the supplementary controls such as air conditioning to handle. Also the introduction of computerised systems and 'TV' screens were changing the face of the cockpit. Typically by the time 737-700 all circular instruments had gone with two screens per pilot, central screens for items such as engine instruments and the computerised flight navigation panels and FMS - Flight Management System. We were now in the world of the EFIS cockpit –



Electronic Flight Information System. Each panel could show multiple items of information and the central panels could be switched to

show aircraft systems. The pilots main panel (Primary Flight Display) now incorporated the artificial horizon with a vertical strip either side showing speed and height respectively, with vertical speed indicator and compass so negating the need to 'scan' several separate instruments.

The latest evolution is to follow the military with head up displays so that pilots can maintain real world awareness whilst monitoring all the flight essential data in digital format on the windscreen.



Picture from Flight 21Jan55 of the hookless prototype flown by 'Jock Elliott' during 'touch-and-go trials' with HMS Albion

### Meetings - at Druitt Hall commencing 8pm

Wed 03 May - AGM then Whittle and the jet Engine - by Steve Robson

Wed 06 Sep - Air New Zealand DC-10 crash in Antarctica by Dr James Mason

**Friends of the New Forest Airfields** has their first open day on 19 March (10 - 4) at their new museum at Sopley, via the new housing estate BH23 8EB, turn first left on entering the estate.

**From Forest Field to Western Front** is about East Boldre airfield priced at £15. Meet the authors at a book fair and signing on Saturday 4 March from 10.00 am - 4:00 pm at the Lyndhurst Community Centre. [www.eastboldre.org](http://www.eastboldre.org)