FLIGHT TEST SAFETY WORKSHOP

Situation Awareness and Highly Integrated Avionics Systems

Presented to: Flight Test Safety Workshop
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Date: April 29, 2009
Significant changes in Avionics

Three areas of change

– GPS navigation
– System integration
– Pathway presentation
Systems Integration

– Flat panels doing everything

Attitude
Airspeed
Altimeter
Heading
Fuel

Nav/Com
Clock
Engine gages
Temperature
Other
Integrated Avionics Suppliers

Partial list

Aspen
Blue Mountain
Garmin
IS&S
NARCO
Rockwell Collins
Shadin
Avidyne
Chelton
Honeywell
L-3
OP Tech
Sagem
Tru Trak
Becker
Dynon
Insight Instruments
Lowrance
Panasonic
Sandel
Universal
Aspen
Blue Mountain
(for Experimental Category Aircraft)
Is this the Ultimate Panel?

Cirrus SR22 GTS p. 62
Garmin G1000 Displays

Pathways in the sky.
Rectangular pathway “windows” spaced no more than 1,000 meters apart help pilots visualize and follow their intended route of flight. Guidelines in each corner of the pathway windows point in the direction of the active flight plan leg.

Seeing red?
Terrain alerting with Garmin SVT is totally unambiguous. Potential terrain conflict areas are indicated by a color overlay on the topography: Amber for caution, Red for WARNING.

Watch for oncoming traffic.
Using familiar TCAS symbology in a three-dimensional form, Garmin SVT makes it easier to spot moving traffic. You can see if they’re above or below your altitude. And as intruders get closer, the symbols get larger.

Identify that runway.
When flying into an unfamiliar airport, SVT helps simplify the approach. Airports are shown with identifier signs. And runway surfaces, numbers and thresholds are clearly depicted in 3-D. Also, the destination runway in your active flight plan is outlined in white – just so there’s no confusion.

Persistence pays off.
Inadvertent entry into an unusual attitude situation can be tough on pilots and airplanes. But with Garmin SVT, a “persistent” strip of color on the display shows “which way the ground or sky went” – to aid in orientation and recovery.

Obstacle alerting.
When visibility is low, it’s reassuring to have Garmin’s Tower and Obstacles database looking out for non-terrain structural hazards. Color-coded 3-D symbols are depicted on SVT if the highest point is within 1,000 feet vertically of the aircraft.
Honeywell APEX
L-3 Smartdeck
Sagem
Sandel
So the Real Question Is

• The new integrated cockpits improve situational awareness and, therefore, improve safety.

• But can the pilot effectively cope with the new avionics in all situations?
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