



STANDARDS IN SAFETY AND SECURITY FOR AVIONICS



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OVERVIEW AND HISTORY OF AVIONICS

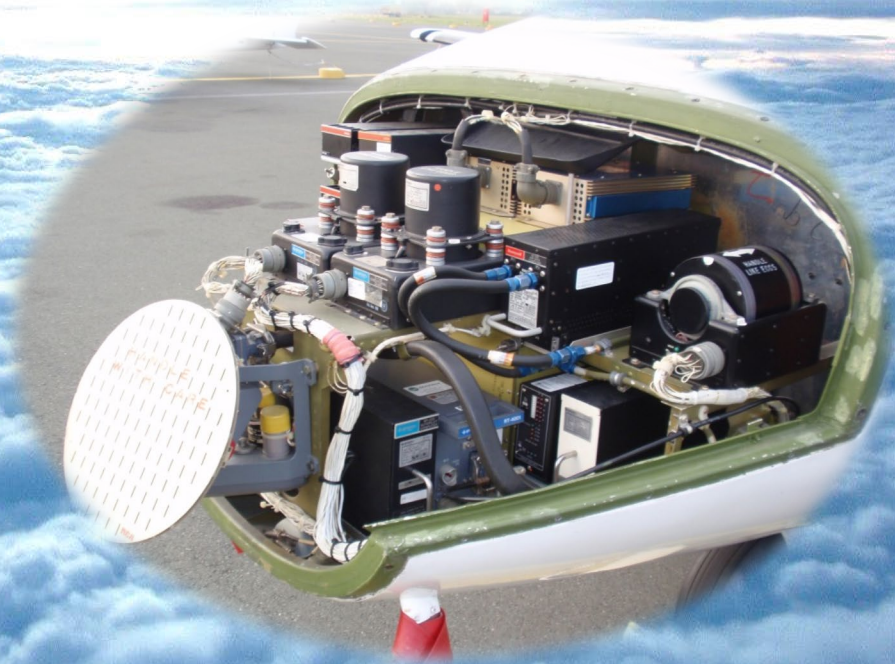
- ✗ NEED FOR AVIONICS
 - ✗ To enable the flight crew to carry out the aircraft mission safely and efficiently.
 - ✗ For civil airliner the mission is carrying passengers to their destination.
 - ✗ For military aircraft the mission is intercepting a hostile aircraft, attacking a ground target, reconnaissance or maritime patrol.
- ✗ Advantages ☐
- ✗ Increased safety
- ✗ Air traffic control requirements

DEFINITION

Avionics = aviation + electronics



electronic systems
used on aircraft,
artificial satellites
and spacecraft



HISTORY

18th century

a barometer
an anemometer
magnetic compasses
fuel-quantity gauges

altitude
airspeed
heading
fuel levels
to measure

1920s

first blind flight and landing

1930s

radio navigation and landing aids

1940s
(WW2)

radar for aircraft detection
VHF
UHF communications

1960s

autopilots
automated warning systems
integrated flight instruments

1970s

digital computers
glass cockpits



MAIN AREAS OF AVIONICS FOR SAFETY AND SECURITY

- ✗ The cockpit of an aircraft is a typical location for avionic equipment, including control, monitoring, communication, navigation, weather, and anti-collision systems.
- ✗ The majority of aircraft power their avionics using 14- or 28-volt DC electrical systems; however, larger, more sophisticated aircraft (such as airliners or military combat aircraft) have AC systems operating at 400 Hz, 115 volts AC.

MAIN AREAS OF MODERN AVIONICS

- Communications
- Navigation
- Monitoring
- Aircraft flight-control systems
- Collision-avoidance systems
- Black Boxes
- Weather systems
- Radar
- Sonar
- Electro-Optics
- ESM (Electronic support measures)
- DAS (Defensive aids)
- Aircraft networks



COMMUNICATIONS

connect the flight deck to the ground
and to the passengers

The main type



Very High Frequency (VHF)
communication systems

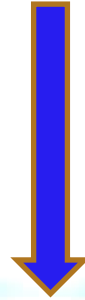
- controlling air traffic
- line of sight communication



NAVIGATION



Inertial
Navigation
Systems
(INS)



Radio
Navigation
Systems



Satellite
Navigation
Systems
(example: GPS)



MONITORING

Glass cockpit

airplane

space shuttle



- multi-function display
- primary flight display
- navigation display
- mode control panel
- engine indicating and crew alerting system

Need for Avionics

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Some of the Advantages of Avionics

- Increased safety;
- Air traffic control requirements;
- All weather operation;
- Reduction in fuel consumption; and
- Improved aircraft performance and control and handling and reduction in maintenance costs.

■ There are several major vendors of flight avionics, including:

- ✗ Panasonic Avionics Corporation;
- ✗ Honeywell (which now owns Bendix/King);
- ✗ Universal Avionics Systems Corporation;
- ✗ Rockwell Collins (now Collins Aerospace),
- ✗ Thales Group;
- ✗ GE Aviation Systems;

- ✖ UTC Aerospace Systems (now Collins Aerospace);
 - ✖ Selex ES (now Leonardo S.p.A.);
 - ✖ Shadin Avionics; and
 - ✖ Avidyne Corporation.
- International standards for avionics equipment are prepared by the Airlines Electronic Engineering Committee (**AEEC**) and published by Aeronautical Radio, Incorporated (**ARINC**).

THANK YOU
FOR YOUR
ATTENTION!

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PITALKIES

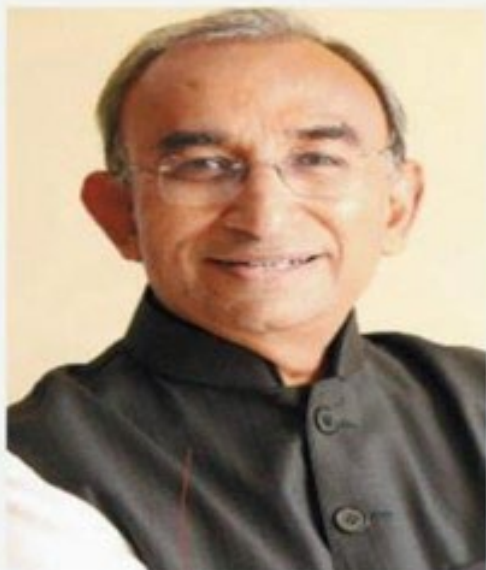
THE BRIDGE ON THE RIVER CHOLUTECA

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AVE YOU HEARD of the Choluteca Bridge? I hadn't either, until not so long ago. It's a 484-metre-long bridge over the river Choluteca in Honduras, in Central America. A region notorious for storms and hurricanes.

So when they decided to build a new bridge over river Choluteca in 1996, they wanted to ensure it would withstand the extreme weather conditions. A Japanese firm was contracted and they built a solid bridge, designed to withstand the powerful forces of nature. The new Choluteca bridge – a modern-day marvel of design and engineering was thrown open to the public in 1998. And as people drove from one side of the Choluteca river to the other, they couldn't help but admire the new bridge. It was Choluteca's pride and joy.

And in October that year, Hurricane Mitch hit Honduras. There was 75 inches of rain in four days – the equivalent of what they receive in six months. There was devastation all around. The river Choluteca swelled and flooded the entire region. 7000 people lost their lives. All the bridges in Honduras were destroyed. All, except one. The new Choluteca bridge remained unaffected.



Choluteca Bridge is a terrific metaphor for what can happen to us – our careers, our businesses, our lives – as the world gets transformed

relevant to us today than ever before. The world is changing in ways we may have never imagined. And the Choluteca Bridge is a terrific metaphor for what can happen to us – our careers, our businesses, our lives – as the world around us gets transformed. Adapt to change. Or else.

As you look at your career, think again before you take one more course that makes you even more of an expert in your area of specialisation. That role, that expertise might soon become redundant. Before spending money on refurbishing your old office, pause. Thinking of opening more branches in every nook and corner of the country? Think again. Physical office spaces could soon be a thing of the past.

The challenge for us is that we get focused on creating the best solution to a given problem. We forget that the problem itself might change. We are all focusing on building the strongest, most sophisticated product or service. Without thinking of the possibility that the need could vanish. The market could change. We focus on the bridge. And ignore the possibility that the river underneath could change course. Think about that too. 'Built to Last' might have been a popular mantra. But 'Build to Adapt' could be the way to go.

You might want to add a picture of the Choluteca Bridge to the paintings that adorn the walls of your office. To remind you to build a business and a

**Thank You as I
Await your Kind
Comments and
Questions**