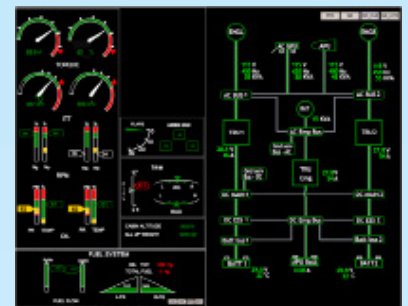


Aerospace Electronics and Systems

Symbology Evaluation Facility

Salient features:

- Developed using VAPS and SCADA tools
- Symbologies designed as per ARP 4102
- Simulation can be done with stored flight data or from the real Avionics instruments
- Configurable displays
- Cursor control device interface
- High Speed data communication between application and server
- 15.1 inches diagonal displays
- Single Mouse controlled for all the displays
- Wide screen 15" displays
- Industrial AMLCD sun light readable displays
- Pilot in Loop Simulation interface ready
- Pilot Symbology evaluation platform
- Short Symbology Turn-around time of one hour

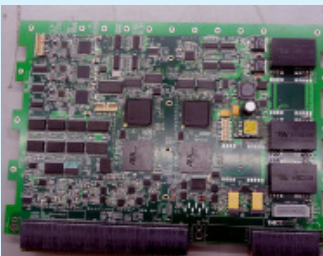


Integrated Global Bus Avionics Processing System



Salient features:

- Integrated Modular Avionics based architecture
- ARINC 653 based time & memory partitioning
- Dual Processing node with hot standby feature
- Dual redundant ARINC 664 communication
- Support upto five ARINC 818 based display
- Support Weather radar data (ARINC 708) and RAW camera input (RS170A)
- Supports multiple application simultaneous execution without affecting the safety
- Dual redundant VPX based backplane
- Reconfigurable I/O system
- Dual hot standby power distribution modules
- State of the art thermal management scheme
- ARINC615A compliant data loading scheme

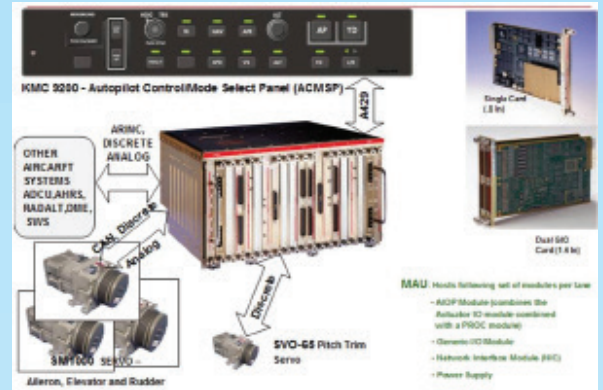


Digital Autopilot

Expertise developed for the Limited authority three axis flight control system for SARAS is a closed loop control system. The system is designed on a Modular Avionics Unit which hosts the application software and DEOS operating system.

Established Independent Verification and Validation activities as per RTCA DO 178B level A for:

- Verifying and validating the registries for configurable modular architecture, configurable gain tuning parameters, and flight test parameters
- Object code verification
- Establishment of build procedures and IV&V metrics



Vision System Technologies for MAV

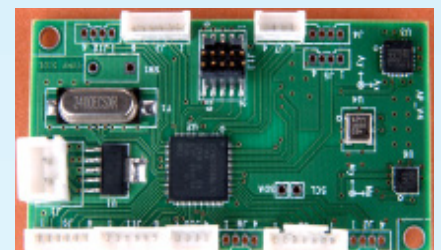


Research in the area of vision for unmanned aerial vehicles (UAVs) is conducted at the Signal Processing and Systems Group of the Division. The activities are intended to support improvements in flight controls and usability of the UAV for its primary tasks, such as surveillance, while maintaining the low weight and power requirements to allow the UAV to be small and inexpensive with relatively long flight times. applies its diverse engineering expertise and facilities to address challenges in autonomous system technologies such as Image processing, Sensor fusion, Embedded computing, Navigation, Path planning, Command and control in building applications such as

- First Person Viewing Systems
- Vehicle Recovery Systems
- Vision Based Enhanced Autopilots

Autopilot Hardware for MAV

Parameter	Description	Range
Processor	ARM CortexM3 CPU core	32 - Bits
Clock	Operating Frequency	24 MHz
ROM	Programmable memory	256 Kbytes
I2C Interface	Internal interface (2)	100/400 Kbps
UART Interface	Serial Communication (1)	9.6/57.6 Kbps
SPI Interface	6- pin connector (3)	>1 Mbps
USB	Mini USB (1)	1.5 - 480Mbps
PWM Control signal	7- pin connector (8)	3.3 V
Sensors	3 Axes Gyro, Accelerometer, Magnetometer + Static Pressure	



Active Noise Control System (ANC) for Helmet

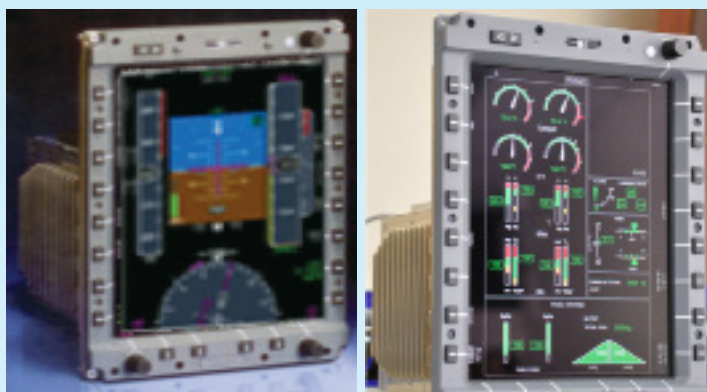
ANC for helmet is the state of the art system designed & developed to reduce the fighter aircraft noise inside the helmet. This DSP based adaptive system reduces noise without interfering with the voice communication signals.

Salient features:

- Noise reduction of about 14dB
- Frequency range 80Hz – 2000Hz
- Battery operated with 4 hrs. backup
- Inbuilt recorder for off-line data analysis and pilot communication analysis
- Easy to use micro switch on cable
- Generic design enables the system to be integrated with any aircraft helmet
- Dimensions 120mm X 90mm X 25mm
- Weight 350g



Display System EICAS and PFD



- Atom Based Processor
- 22 channels of ARINC 429 digital interface
- Multi window display pages
- DO 160G proven qualified hardware
- DO 178B Level A application
- Do 254 Level A hardware certification

Salient features:

- 8 X 6 inches smart display
- Application swap mechanism through single button press
- DO 178 Level A application software
- FAA certified Hardware
- Quad redundant displays
- Cross communication between displays
- Auto reversion feature to critical failures
- Configurable application for different aircraft
- Dual redundant power supply
- RS 170A video input
- Multi CSCI on single processor resources
- Inhouse capability for symbology design and development

Enhanced Fatigue Meter (eFM)

Enhanced fatigue meter is the latest state of art system with a microprocessor and MEMS accelerometer, which monitors the fatigue life of aircraft by computing the 'g' crossings and the fatigue index.

Salient features:

- Senses the 'g' peaks and troughs for determining the fatigue index
- Configurable to accept 'g' input from both internal as well as external accelerometer
- Onsite flight configuration by authorized crew using the system or PC
- USB interfaces for data milking and communication between Unit and PC
- ARINC429 and RS422 for communication between eFM and other LRUs
- Capable of storing minimum 300 flight data (2 GBytes) and expandable

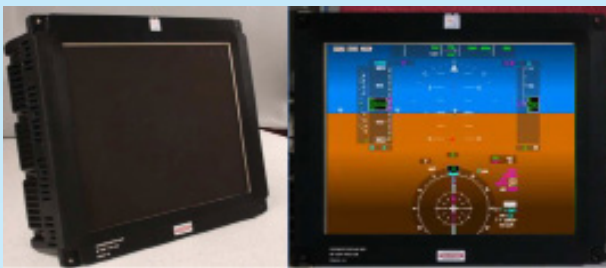
The system finds its application in Civil, Combat, and Unmanned air vehicles



Dimension : 135 x 96 x 115 mm Weight : 1.2 Kg
Color : Black Anodized Material : Aluminium Alloy



15" 818 Display



Advanced Display Unit (ADU) is the state of art display technology with dual ARINC 818 input source for cockpit displays.

Salient features:

- 15 inch, 1400x1050 pixels
- Dual redundant ARINC818 input.
- Fault log and communication through A429

The system finds its application in Civil and Combat vehicles cockpit display.

NALFOQA Software

Flight Operations Quality Assurance (FOQA) is a software tool developed by National Aerospace Laboratories (NAL) specifically to analyse the quality of flight operations.

Salient features:

- FOQA can be configured to analyse all possible aircrafts
- Easy to install, configure and use; can be made operational within a week
- Wide variety of reports can be generated
- Will lead to significant reduction in aircraft insurance costs
- Possible to view flight path animations
- Can analyse all flight 'exceedances'



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