

TES Aviator: The Flexible Multi Media Platform

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Introduction

This paper describes the new AVIATOR platform from TES. The TES Aviator is a flexible multi-media platform for a wide range of applications. Based on the Texas Instrument's Davinci™ DM3730 and the successful MAGiK module, the engineers of TES created a reference design to derive various devices from. Using the TI OMAP gives a perfect balance between cost and performance.

Today's form factor of the AVIATOR meets the automotive 2DIN standard. Versions in tablet format and 1DIN are in the development pipeline. TES used the Android 2.2 operating system to allow the use of the large app store behind it. Multimedia players, picture viewer, navigation, phone, internet access and many more are easy to implement and use. Alternative OS are Windows versions or Linux.

Technologies

Electronics Hardware

The electronics hardware of the AVIATOR is based on the Texas Instrument's Davinci™ DM3730 processor. TES has a broad experience with the TI product lines. The TES MAGiK modules are used in various products ranging from computing devices to outdoor GPS applications. It is used as a high end and field proven basis for the AVIATOR. The 2DIN AVIATOR version contains a 4*50W amplifier based on technology of Texas Instruments. This allows media playback with an enhanced audio experience. A power supply board according to automotive standards, including load dump and fuse protection, completes the powerful package.

The use of all automotive certified components on all boards makes it easy to meet the automotive quality standards. Target is to fulfill quality levels of all relevant industries.



Fig. 1: AVIATOR Platform

Connectivity

Core of the technological concept of AVIATOR is the connectivity. Bluetooth and WiFi allow wireless data transfer with a variety of devices. This provides the ability to integrate the AVIATOR in various networks and use case scenarios. Android was modified by TES to support 3G via an external USB modem to provide a better Internet experience. With the 3G modem wireless data transfer, internet applications and downloads are possible. The integration of WiFi provides another channel for wireless connectivity, just like the use of Bluetooth.

The use of a GPS module enables location and navigation services. The latest version of AVIATOR uses the Google Maps application to realize location based services and route guidance. The route guidance experience is enhanced by integrated compass and accelerometer. Analogue camera connections allow the use of surveillance cameras for various purposes.

For wired data transfer 5 USB ports and Ethernet are implemented. These standards bring the capability of connecting amongst others data storage devices of many kinds. To allow a seamless integration of the AVIATOR into automotive environments, a CAN-bus connection is provided. High resolution video screen can be fed with the HDMI output installed.

HMI and Housing

The HMI technology used is a 7" capacitive touch screen with all the latest features modern devices offer. This includes 2-finger zooming on the map, sliding, and swiping. At the moment the HMI concept of Android and its apps is used to give a known look & feel to the user. For other use cases other HMI solutions will be available and customized to customer and user needs and expectations. The entire technology is at the moment integrated into a metal housing matching the automotive 2DIN standard.

Software and Operating System

The operating system implemented is Android 2.2. This Linux based open OS brings a broad range of features and functions. Connectivity like 3G, Bluetooth, or USB is implemented and tested. Navigation, media players or picture viewers come with the package. Other functionality will be available through the huge Android web store. Other OS will be possible. Linux and Windows implementations are either realized or in the development pipeline.

All standard multimedia players for audio, video and pictures are realized. The video out HD ready, screens with up to 24" can be fed with a high end video signal through the HDMI output.



Fig. 2: MAGiK module

Features

The open AVIATOR platform comes with a large and highly flexible feature set. The use of the operating system Android 2.2 allows the access to a large amount of apps to realize a high functionality. The modular approach allows an exact fit of the features to the customer requirements.

The implementation as of today contains:

- Media players for audio and video
 - All standard media formats for audio and video may be played using respective players out of the Android app store
- Picture viewer
 - Pictures can be viewed, zoomed, sorted and shared with an app
- Internet including internet radio
 - Using 3G or WiFi data connectivity the internet can be accessed. This includes apps allowing access to millions of Internet radio stations
- Navigation (Google maps)
- Games
- Audio amplifier

HMI Solutions

The human machine interface (HMI) of any product plays a vital role in safety, acceptance, and market success. In mobile environments the driver distraction issues are a critical problem. Certain environments and industries have legal restrictions the influence the possibilities to set up an HMI solution. With its highly skilled HMI engineers, psychologists and graphic designers, TES can offer for the AVIATOR HMI solutions driven by usability and user experience. Application and user group specific HMIs will be developed based on customer requests. From very first scratches and ideas down to final specifications and style guide, TES support the HMI development for all application areas of the AVIATOR.



Fig. 3: HMI screen designs



Fig. 4: HMI proposal on the AVIATOR

Application Areas

Due to its high flexibility in features, hardware, software, housing, and HMI, the AVIATOR serves in many industries and use cases. In transportation we see areas like

- Infotainment head unit for niche vehicles
- Rear seat entertainment unit
- Entertainment unit for campers and yachts
- Control panel for additional functions in taxis, trucks, agricultural machinery, and medical cars
- Entertainment unit in coaches, trains and planes

The AVIATOR is also a perfect fit for industrial controls, home control, and mobile entertainment

About TES

TES Electronic Solutions is a leading full-spectrum global Electronics Design Services Company with headquarters in Germany. TES operates 10 design centers worldwide, 7 of which are in Germany, one in the UK, Serbia and India. We provide Hardware, Embedded Software, Mixed-signal & RF ASIC and FPGA Design as well as Industrial Design services on system, sub-system or chip level to our broad global customer base that spans from highly specialized mid size companies to multibillion dollar revenue corporations. Our customers appreciate the large variety of reference platforms, ODM products and own IP that enables reduced TTM.

Our focus areas include Multi Media for professional applications, Wireless solutions up to 60 GHz and Power Electronics for power supplies, chargers and green energy. Furthermore, TES is a leading supplier of 2D & 3D rendering solutions as well as services & IP for embedded graphics applications.

In the area of Human Machine Interface, TES is a full service provider from concept and human factors design to implementation services of animated GUIs using our own licensable GUI framework and tools.

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