Honeywell’s Businesses

Aerospace
Phoenix, AZ headquarters
$12.1-12.3 billion sales*

Automation and Control Solutions
Minneapolis, MN headquarters
$16.4-16.6 billion sales*

Performance Materials and Technologies
Morristown, NJ headquarters
$6.9-7.0 billion sales*

Transportation Systems
Rolle, Switzerland headquarters
$3.6-3.7 billion sales*

*2013 guidance
Aerospace

Thousands of Honeywell Aerospace products and services are found on virtually every commercial, defense and space aircraft worldwide.

AEROSPACE FACTS

- Headquartered in Phoenix, Ariz.
- Approximately 38,000 employees
- Nearly 100 worldwide manufacturing and service sites
- Revenue of $12 billion in 2012

STRENGTHS

- Global leader in the aviation industry
- Developing innovative safety products
- Driving modernization of global air traffic management
- Revolutionizing combat technology
- Committed to improving operational efficiencies
Connected Aircraft

A/C are more interconnected
- Cockpit avionics interconnected
- Collecting Mechanical / sensor data
- Performance collection, trending, fault detection/prediction

Multiple Pipes on/off Aircraft
- High bandwidth and lower cost communication links for all phases of flight
- New Ka Band Satcom in development by Honeywell – with exclusivity agreement for providing the airborne avionics

Applications and Services
- Big Data Analytics
- Flight planning improvements
- Database (nav, airport, SVS terrain)
- Value-added prognostics/diagnostics services for HON products/systems

Perfect Storm of On Board Data, Connectivity, & Analytics enabling Innovative Solutions
Connectivity During All Phases of the Flight
Connected Aircraft Use Cases

- **Flight Safety**
  - Improved situational awareness. Next Gen Air Traffic Management
  - Focus on actionable data only and avoid distractions.

- **Improved Uptime**
  - Remote diagnostics, Dispatch maintenance crews

- **Fuel Savings**
  - In flight traffic flow optimization. Directed Route changes due to upcoming weather. Reduces Fuel Burn – the airlines largest cost.

- **Maintenance Operations**
  - Engine Data/APU monitoring, Fault forward, Trending Analysis
  - Just in time preventative or remote diagnosis.

- **In-Flight Entertainment**
  - Enables passenger connectivity for real time applications.
  - Mobile Office in the sky. Creates airline revenue stream.
Data and Voice Communications On-Board

- Cockpit Satcom to transition to SB-Safety
- New prioritized cockpit IP data pipe available
- Broadband Cabin GXa for IFE
- And now we can provide access to other Aircraft data realtime

Pilot information in the cockpit:
- Autopilot
- Electronic Flight Bag (EFB)
- Aircraft Operations Center (AOC)
- Weather radar

Passenger information in the cabin:
- IFE
- Internet
- Email
- Pico-cell

Honeywell Products:
- Satcom, Flight Management System (FMS), Computer Management System (CMU)
- VHF Radio, Cabin Router/Server

Inmarsat I3/I4 satellites
- Cockpit Satcom (L-band only)
L-Band Core Technology

- Software Defined Radio technology provide future proof solutions
- Core antenna capability bringing smaller solutions to all segments

AT&R

B&GA

D&S
New Satcom Technology Developments

• Enhancing Inmarsat Services
  – Increasing Cabin Performance – Q1/2014 - Channel Card Upgrade
    • New Waveforms for SBB (LDR/HDR)
    • Up to 800 kbps/channel
  – Increasing Cockpit Performance 2015 – Inmarsat / HON dependent
    • SB-Safety - Support ACARS and Cockpit Voice on SBB
    • Additional bandwidth available for Cockpit/Cabin applications
    • Fewer channels \(\rightarrow\) more capability \(\rightarrow\) smaller equipage

• Enabling Global Coverage for our Product Line
  – Global Satcom coverage
    • Polar routes covered by other networks
    • Redundant system allows removal of HF

• Inmarsat Gxa
  – More capacity and higher data rates available for Cabin
  – World wide coverage
MCS/HSD SBB Backup for Cabin Ka

- SBB for Cockpit EFB & Safety Services
  - plus growth to ~800kbps/channel via HDR
- SBB backup for cabin Ka
  - Covers Ka link degradation at lower altitudes and during outages and failures
- Classic Aero Services

**Ultimate Cockpit/Cabin Solution for Capability/Availability**
COTS Satcom Product Roadmap

Today

--- | --- | --- | --- | --- | --- | ---

**High Speed Satcom**
- 15+ MB/s
- 1+ MB/s

**Cockpit/ Cabin Satcom**
- 500 KB/s
- 10+ KB/s

**Cockpit Satcom**

**Commercial Antennas**
- AMT-3800
- AMT-3500
- AMT-1800
- AMT-700

**Cabin Networks (CNX/CG/nWAP)**
- CNX
- CG-710
- nWap
- FS-4240

**Speed**
- 15+ MB/s
- 1+ MB/s
- 500 KB/s
- 10+ KB/s

**Products**
- MCS-7200
- MCS-7120
- MCS-7147
- Aspire 200
- Aspire 100
- Aspire 300
- AMT-3800
- AMT-3500
- AMT-1800
- AMT-700
- CNX
- CG-710
- nWap
- FS-4240

**Dates**
- 2013
- 2014
- 2015
- 2016
- 2017
- 2018
- 2019+

** Technologies**
- HDR/LDR
- Phase 5
- SBB Safety Dev
- GX Aviation
- Aspire 250/400
- Inmarsat
- Ka FMA
- Ka TMA
- Refresh
Equipment for all needs

- **GX Aviation**
  - Antenna and terminal
  - Cabin and cockpit services

- **SwiftBroadband**
  - Antenna and Terminal
  - Cockpit safety services and cabin backup

- KRFU
  - Antenna Amplifier/Interface

- KANDU
  - Antenna

- MODMAN
  - Terminal /Modem

- Antenna
  - Radome

- AMT-3800
  - HGA L-Band

- MCS-7200
  - L-Band Terminal

- Aspire 400
  - L-Band Terminal
Alphasat Operation

- Terminal testing against simulator is almost complete
- Some terminals may require an ORT change to maintain correct operation
GX Aviation Update
GX Aviation Air Transport Equipment

**Antenna**
- Positioner and Radiating elements
- Pointing algorithms and positioner infrastructure used from existing programs

**KRFU**
- High power amplifier and up/down converters

**KANDU**
- Antenna Positioner and Controller

**Ka Modman**
- Router and interface software and hardware
- idirect modem
Radomes and Accessories

Drag:
- 50 to 80 lbs est.
- Depends on location
- Dimensions:
  - 74”l x 44”w x 14”h

Weight:
- 101 lb (46 kg)
- Combined radome, fairing and adaptor plate

- 2 options will be available
- Aftermarket solution
  - Radome skirt and fairing
  - Antenna mounts to fuselage
  - Lighter and less expensive than ARINC 791 solution

- ARINC 791
  - Boeing and Airbus solution
  - Radome and baseplate
  - Antenna mounts to baseplate
GX Aviation Equipment for B&GA

**MODMAN Terminal**

**KRFU**
Block up / down conversion of Ka band frequencies

**Tail Mount Antenna**

**KANDU**
Provides power and control (Ethernet/Discretes) to the Outside Antenna Equipment
Summary

• GX Aviation Program on track
  – satellites
  – ground segment
  – regulatory
  – terminal

• Continued L-band investment and focus

• Cooperative solutions to meet cockpit and cabin requirements

• All supported by Honeywell’s Worldwide Service Network
Thank You!

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