• the Italian “F30” sport plane, an all-aluminum version of the wooden Falco from Stelio Frati;
• the compact TP100 turboprop from the Czech company PBS;
• a sleek tandem LSA sport plane, the Slovakian “Shark”;
• an electric-powered aerobatic version of the German Silence “Twister”;
• the Avana Aerospace “Larus”, a luxury 6-place, composite turboprop amphibian from Hungary;
• the German-made TBS jet engine powering the Italian-made “Silent” sailplane;
• from Hungary the Corvus “Racer 540”, an aircraft designed specifically for the Red Bull racing series;
• and the latest version of the award-winning, highly-efficient “Virus” from Pipistrel of Slovenia.
General Aviation and European Air Transport System
Workshop, Warsaw, July 7 - 8, 2009.

Prof. Dr. Jozsef Rohacs
Head of Department
Department of Aircraft and Ships, BUTE Executive, REA-TRECH Ltd.

Introduction
1. Transition drivers
2. Needs
3. Hungarian Results
4. Our key competence
5. EPAN
6. Project ideas
Conclusions
Introduction

- NASA SATS demonstrates – a new market has born
- major different in Europe and US – size
- personal transportation system
- new aircraft, new aiprots, new service required
- pilots with limited practice
- harmonisation required on the European level
- technology and system integration
1. Transition drivers

- traffic volume – increases into third dimension
- personal mobility required personal transport
- it is a new market, new business
- technology is ready
- price of new technologies (like MEMS) is rapidly decreasing
- new safety philosophy required – pilots with limited practice
- integration into the general traffic system – SESAR
2. Needs

- new operational philosophy
- radically new aircraft
- acceptable operational cost
- safe piloting with common „drivers”
- new system of airports
- integration into the air traffic monitoring and control
- new service providing – rent a plane system
3. Hungarian results

- Hungary is very active in small aircraft development
- Corvus is a successful small company
- It produces two seats small A/C
- and sells them worldwide
A new project – Safe Fly

- four seats small aircraft development
- full composite aircraft
- two university departments take part in the project
- it is supported by Hungarian National Office for Research and Technology
- total project cost is 3.4 million EUR
- Hungarian Aeronautical Research Platform
- Hungarian Aerospace Technology Platform
4. Our key Competences - BUTE

- Nobel laureates of BME:
  - Dénes GÁBOR (1900 – 1979)
    - holography, in 1971
  - Jenő WIGNER (1902 – 1995)
    - theoretical physics, in 1963
  - György OLÁH (b:1927)
    - carbonic chemistry, in 1994

- 226 years old state university

- About 250 EU FP projects

- Education
  - Former students of BME:
    - Tódor (Theodore) von KÁRMÁN
      - Aeronautical Engineer & Mathematician
      - (1881–1963)
    - Leo SZILÁRD
      - Physicist
      - (1898–1964)
    - Ede TELLER
      - Physicist
      - (1908–2004)

- Research

- Service
  - Fund raising
  - Contracts

- Knowledge Transfer Model
  - University
  - Business/Gov
    - Development
    - Design
    - Production
    - Sales
    - Services
    - Management
  - Knowledge
    - Innovation channel
  - Publications
  - Public Sphere
4. Our Key Competencies - HARP

**HARP members**

- **Scientific methods**
  - micro fluid mechanics
  - new control methods
  - diagnostic methods
  - morhing
  - mathematical modelling

- **Aircraft**
  - small aircraft
  - regional aircraft
  - UAV
  - helicopter
  - on board systems

- **Aviation**
  - PATS
  - low cost airport
  - air space control
  - environmental impact
  - security

- **New technologies**
  - biological principle based control
  - new materials
  - simulation technology
  - Image processing
  - MEMS technology

- **Management**
  - certification
  - emergency management
  - MBA and EMBA
  - East-European Research center
  - innovation management
Some results of the owners of REA-TECH Ltd.

development of a measurement technology for the infrared radiation evaluation
preliminary materials to Hungarian Aviation Policy development of a CAD, CFD, FEM methods and their application
lifetime evaluation of a small aircraft composite wing emission scattering simulation
development of the emergency technology management
development of a new traffic monitoring system
development of the building security evaluation methods
large eddy simulation of the inside flow for nuclear station
new cockpit instrument development
5. EPAN

- Need recognized by the Commission:
  ”The Commission … is calling on all interested stakeholders to pursue a dialogue on the future of this sector in Europe”

- What is EPAN?
  - European Personal Aircraft Network
    - Hungarian division: HUPAN: founded in 2009
    - European division: looking for founding members

- Organization and participation:
  - SA operators (e.g. personal, air-taxi),
  - SA industry (e.g. Diamond, Corvus),
  - Research institution (e.g. NLR, DLR)
  - Universities
  - International organizations (e.g. EUROCONTROL)
  - National and international regulators
  - Airports operators and service providers
5. EPAN – cont’d.

➢ Objectives:
  ➢ **Primarily:**
    ➢ Catalyze and support the European personal air transportation related actions, programs and R&D
  ➢ Secondly:
    ➢ Establish the channel of communication between the actors
    ➢ Provide an overview of the related activities
    ➢ Widen the scope of the actors coming from different domains
    ➢ Facilitate the European PA operations (from the technical and operational aspects)
    ➢ Assist the integration of PA into the European air transportation system
    ➢ Provide guidelines on the targets and characteristics of the coming air transportation system (e.g. SESAR)
6. Project ideas

6.1. Possible themes


ACTIVITY 7.1.3. ENSURING CUSTOMER SATISFACTION AND SAFETY
AAT.2010.3.3-3. Avionics -- collaborative project

AREA 7.1.6.3. Promising pioneering ideas in air transport
AAT.2010.6.3-3. Personal air transport systems – collaborative project

7.1.7. CROSS-CUTTING ACTIVITIES for implementation of the sub-theme programme
AAT.2010.7-3. Improving passenger choice in air transportation with the incorporation of additional and new vehicles
AAT.2010.7-12. Assessing and further developing the role of small aircraft in the air transport system
6. Project ideas

6.2. Composite Aircraft

Proposal acronym: COMP-AIR
Proposal title: Composite Aircraft
Company/originator: Corvus Aircraft Ltd.

The usage of composite materials in General Aviation and the lessons learned for the European aeronautics industry
What are the techniques used in smaller composite aircraft
How these technologies can be used for larger commercial aircraft
A CSA composing of small studies, survey and workshops
Participation of:
   smaller Central European SMEs,
   Central European research organisations and universities,
   large European manufacturers.
Helped by the newly formed EPAN network
The project is to be serviced under the AeroPortal – www.aeroportal.eu
6. Project ideas

6.2. GA System

Proposal acronym:    EGAS
Proposal title:      European General Aviation System
Company/originator:  REA-Tech

The EGAS proposal aims at demonstrating that small-size aircraft operating on scheduled or non-scheduled flights can play as a component of the air transport system to satisfy the needs of transportation in regions where transport networks are underdeveloped.

The project will identify the technologies necessary to meet the safety, environmental, operational and economic requirements and will provide a study of a road map and a business case. The project will be supported by the newly formed EPAN network.

The project is to be serviced under the AeroPortal – www.aeroportal.eu
6. Project ideas

6.3. Equipment

Proposal acronym: OMEGA
Proposal title: On-board and ground equipment for GA
Company/originator: BUTE (and/or REA-Tech)

The existing certified equipment (avionics, communication, etc.) developed for the civil passenger aircraft reader expensive for the small aircraft. However GA and as specially the personal air transport piloted by the persons having limited practice extremely important in case of increasing the number of small aircraft and integration them into the civil aviation system.

The goal is the development and definition of the joint concept of the ground and on-board equipment system for small aircraft (personal air transport system) for interest of all the Europe.
6. Project ideas

6.3. Equipment – cont’d.

Workplane:
WP1. Definition of the needs in new ground and on-board equipment for the small aircraft (guided from analysis of results of existing projects, systems, and their future development – like EPATS, PPLANE, SESAR, etc.)
WP3. System specification – joint concept (development of the operational concept (from the equipment point of use)).
WP4. Investigation on development of the ground equipment.
WP6. Investigation on development of the aircraft on-board system.
WP7. Economical benefit analysis
WP8. Dissemination and management

The project structure including the horizontal lines as data handling, communication, avionics, advisory systems, etc.

Project size: 2.5. – 3 MEUR.
Conclusions

New market is open.
East and Central Europe have strong interest in EPATS
National projects have attractive results.
EU – US competition – NASA SATS, PAV have not mirror actions.
Now, 3rd call gives shans.
We must be more organised -- EPAN.
There are several good themes for PATS.
We must prepare 2 – 3 excellent project.