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Air Traffic Controllers' Associations

Practical hints of how to reduce the risk of airborne conflicts – helping to prevent mid-air collisions

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ATS-Service provision (of a given airspace)

The ATS-service provision depends of:

- **The amount / number of traffic**
- **The nature of the traffic (commercial - or private traffic)**
- **The traffic complexity (climbing, descending, crossings)**
- **Safety monitoring (past experience, feed-back)**

The airspace classification is adapted to all the factors above

The ATS-service provision / airspace class selected is often a cost-issue (full ATS-service is expensive)

The lower (higher class) the airspace class - the ATS-service provision becomes more expensive (e.g. ATC-staffing – e.g. full separation)

ATS-Service provision

- **Traffic information** by ATC for an airspace (e.g. TMA or CTR) can either be:

  - Partial
  - Full (a known traffic environment)

-In airspace of **class ECHO** not all traffic is known to ATC (e.g. VFR)

- Pilots must always be aware of the airspace (airspace class) and the rules attached to this airspace (situational awareness)

- Always look-out for conflicting traffic and try to follow as well the communications on the frequency («Party line»)

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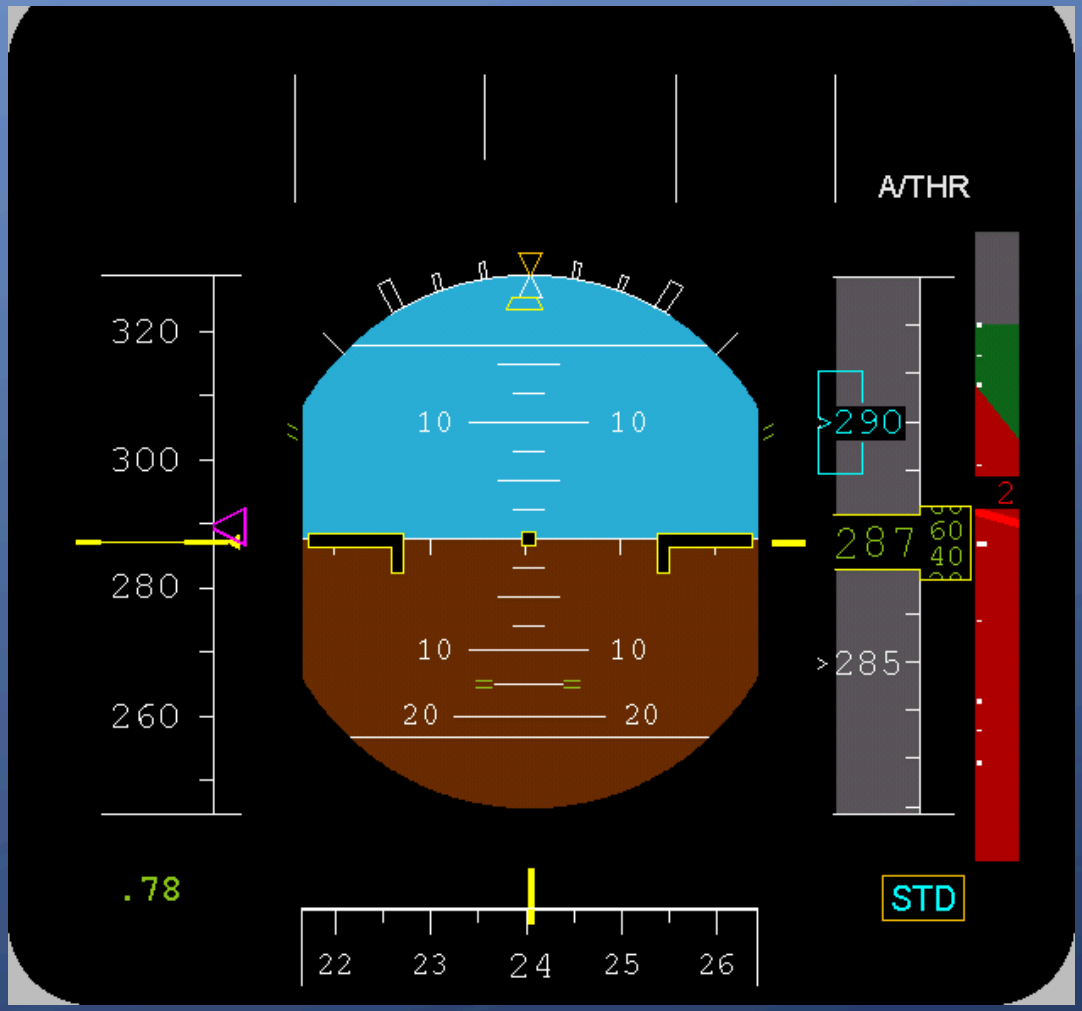
Safety Nets assisting to avoid mid-air collisions



The Safety Net interactions

TCAS II is the airborne Safety Net
STCA (Short Term Conflict Alert) is the ground-based (or ATC) Safety Net

Both work with SSR-Transponder data (Mode A/C) and/or Mode-S

Both SNETs cannot detect conflicts and/or issue alerts when the Transponder is off (or on stand-by), so if Mode A/C or S is not functioning

Both are independent stand-alone Safety Nets (non-coordinated)

Inconvenience:

- STCA and TCAS II do often sound alarm at more or less the same time (be potentially conflicting)

- ATC might be reacting with an ATC-clearance at exactly the same time a TCAS RA is triggered

TCAS – procedures

- TCAS II is a coordinated system (TCAS-TCAS coordination) - but not all TCAS-RAs triggered are coordinated (e.g. RA with a VFR carrying Mode A/C)

- Manoeuvring against the sense/direction of the TCAS RA shown is very dangerous (and forbidden by procedure)

- Pilots must refuse ATC-clearances issued in contradiction to a TCAS-RA shown in the cockpit

- **Use phraseology: "UNABLE TCAS RA"**

TCAS Facts

ATCOs (Air Traffic Controller Officers)
ANSPs (Air Navigation Service Providers)

- Once a pilot has announced a TCAS RA (via radio) ATCOs must not intervene. Remain hands-off ("SAS100 - Roger")

- ATCOs shall not try to alter the flight path of an aircraft that is subject (or involved) in a TCAS RA manoeuvre

- Traffic information for the TCAS-equipped aircraft reporting a TCAS via R/T is not required

TCAS-Facts for VFR-pilots

Operating close to airliners or biz-jets in busy TMAs/CTRs of classes DELTA or ECHO – e.g. in the traffic circuit (or entering or exiting that circuit) where no IFR-separation is required (between IFR- and VFR-traffic), **consider the following:**

- Do not operate too close to this IFR-traffic (even if ATC issued traffic information)

- This might trigger a TCAS-RA (during TCAS RAs, ATC loses control over the aircraft involved (as ATC must remain hands-off)).

This may trigger NON-DESIRABLE PROCEDURES (safety-wise):

- Bad cohabitation between VFR- and IFR-flights in a CTR (e.g. of Class DELTA) can official publications (Swiss AIP, Ref VFR AIP LSGG 10, 02/14 06) mandating actions to disable the Safety Nets and Transponders:

*8.2 Use of transponder **Aircraft** and **helicopters** transiting via Geneva CTR or operating from/to LSGG **must not activate their transponders** (Mode A/C/S) in the **Geneva CTR** unless specifically requested by ATC.*

TCAS nuisance RAs are of concern - but to resort to such restrictive measures is for the least questionable (from a safety point of view).

The de-activation of a Safety Net is never a "good" idea. All efforts must be undertaken to reduce the number of TCAS RAs so that the additional safety layer of TCAS II is still present (if needed). To de-activate it is not safe.

Suggested actions for ANSPs

- Eliminate TCAS hot-spots (high frequency of TCAS RAs)
- Re-organize the VFR-routes – especially close to the IFR-axis
- Manage well (by procedure or charts) the altitudes as well as the interception tracks/headings of the VFR-flights in CTRs/TMAs
- Better manage the position of the VFR-circuits (e.g. distance to the runways – distance to IFR-traffic)

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Issues of concern (feed-back)

- Handling of **legal encounters** between VFR- and IFR-flights where no ATC-separation is required (not mandatory):
  - E.g. in airspace Class DELTA between an IFR- and a VFR-traffic (but traffic information is required);
  - In airspace of Class ECHO between IFR- and VFR-flights

IFR-pilots are often surprised and so not prepared for conflicting traffic

VFR-pilots believe talking to ATC is enough (all fully safe)

Issues of concern (feed-back)

Points often noted during official AAIB-investigations:

- The knowledge of IFR-pilots about the airspace class applicable is not sufficient (situational awareness);
- IFR-pilots do often neglect the look-out (surprised);
- VFR-pilots are not aware that they evolve in airspaces where IFR-traffic operates and/or where IFR ATS-routes are published
- VFR-flights should plan well their route ("de-confliction")

IMPORTANT points for all pilots

- Always have a constant look-out for proximity traffic and for conflicting traffic (apply See and Avoid)

- IFR-pilots (**EVEN** in airspaces where ATC is fully "protecting" you, e.g. in the airspace classes ALPHA to DELTA), it is essential to perform a continuous look- out for traffic, as:

- ATC can possibly loose track of a flight

- Be late with traffic information

- Not detect a conflict (no traffic information)

- Traffic can be invisible on radar as well as on TCAS (no Transponder – e.g. a glider or a hang-glider)

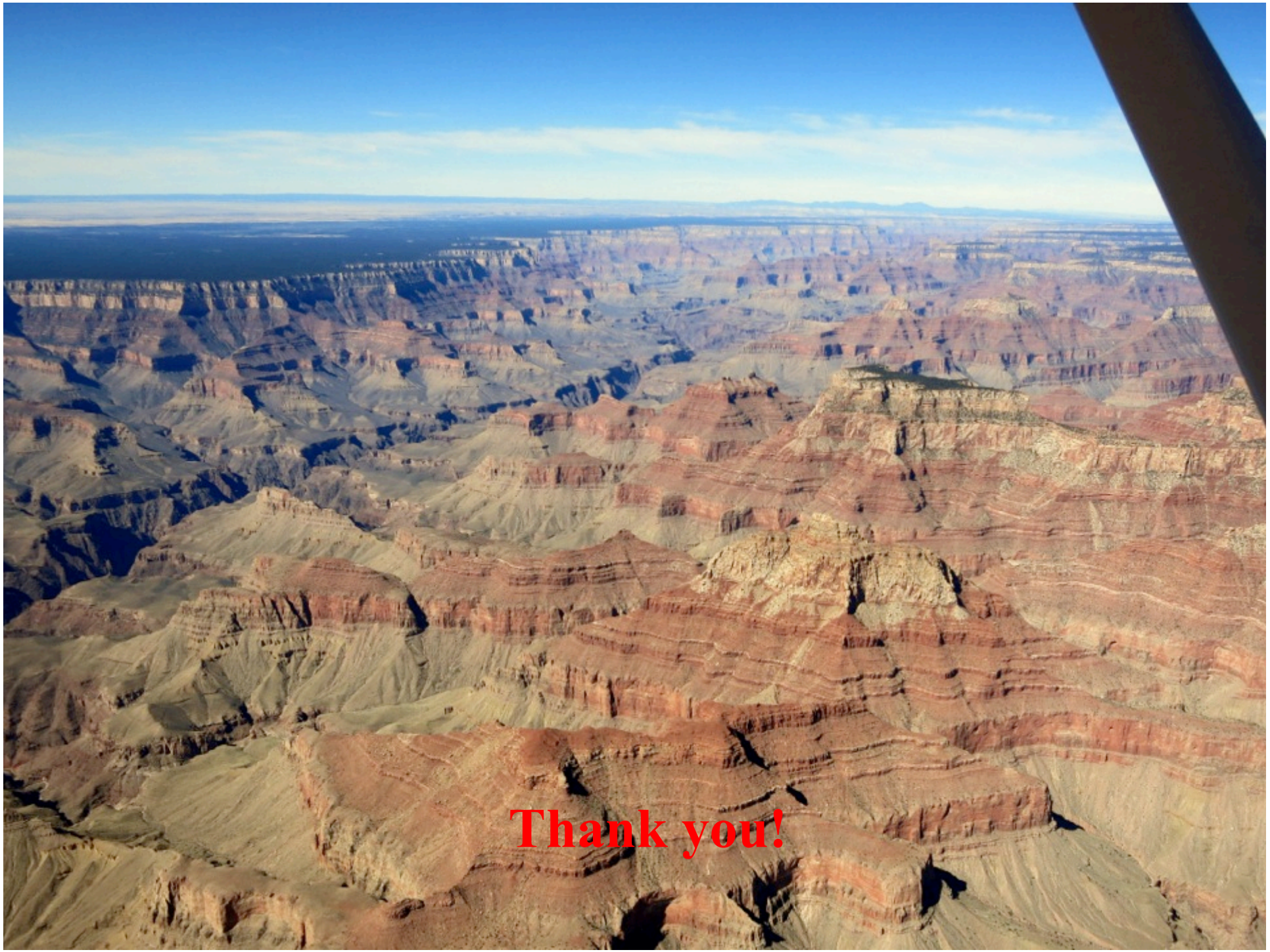
- Traffic is unknown to ATC (airspace penetration)

Hints for Air Traffic Controllers (ATCOs)

- Issue clear and unambiguous clearances and instructions (in particular to VFR-flights) – avoid implicit clearances

- Refrain from local clearances and from using non-official check-points (not on the chart), in particular for visiting aircraft

- Don't remain passive. Don't just issue traffic information (even if the legislation permits this ("legal encounters" VFR - IFR)). Time and work-load permitting try to achieve a spacing


Thank you!