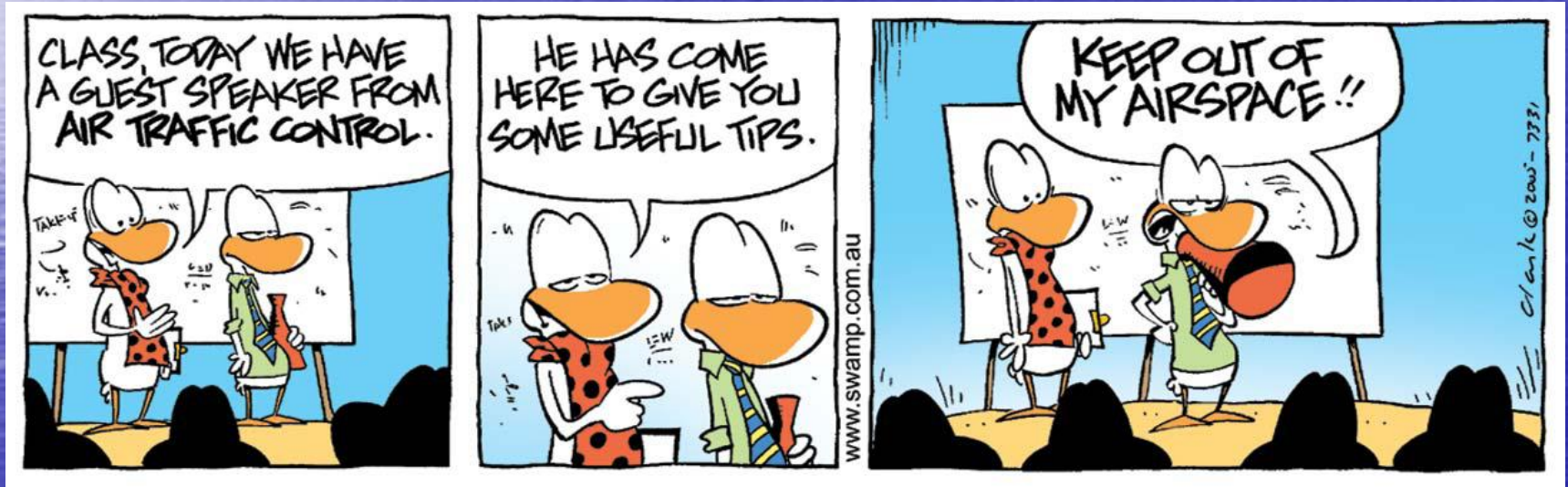




# Hvem er jeg?



- Roe Nerem, 31år
- Flygeleder ved Oslo Kontrollsentral, Røyken
- Tidligere ved Tromsø og Kristiansund Tårn og Innflygingskontroll
- Privatflyger – ca 200 timer
- Formann Møre Flyklubb
- Flygesjef Sandefjord Motorflyklubb
- Medlem i konkurransekomiteen NLF





AVINOR

# Airspace Infringement

Flyging i kontrollert luftrom  
uten klarering

# Hva er problemet?



## NATS

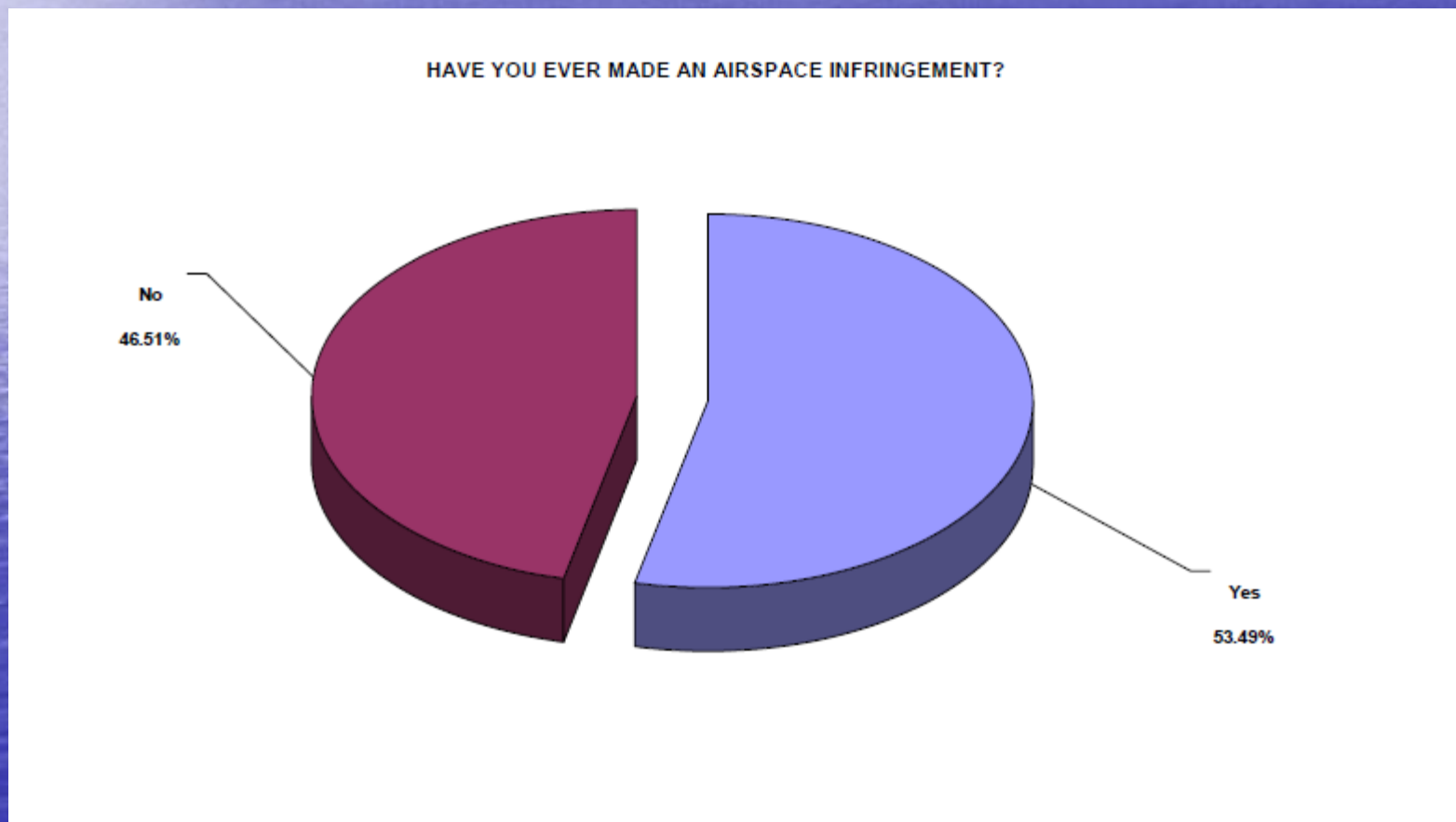
Controlled Airspace Infringement

Example video



AVINOR

# Hvor ofte skjer AI?



- Eurocontrol-undersøkelse blant mer enn 1000 piloter i Europa



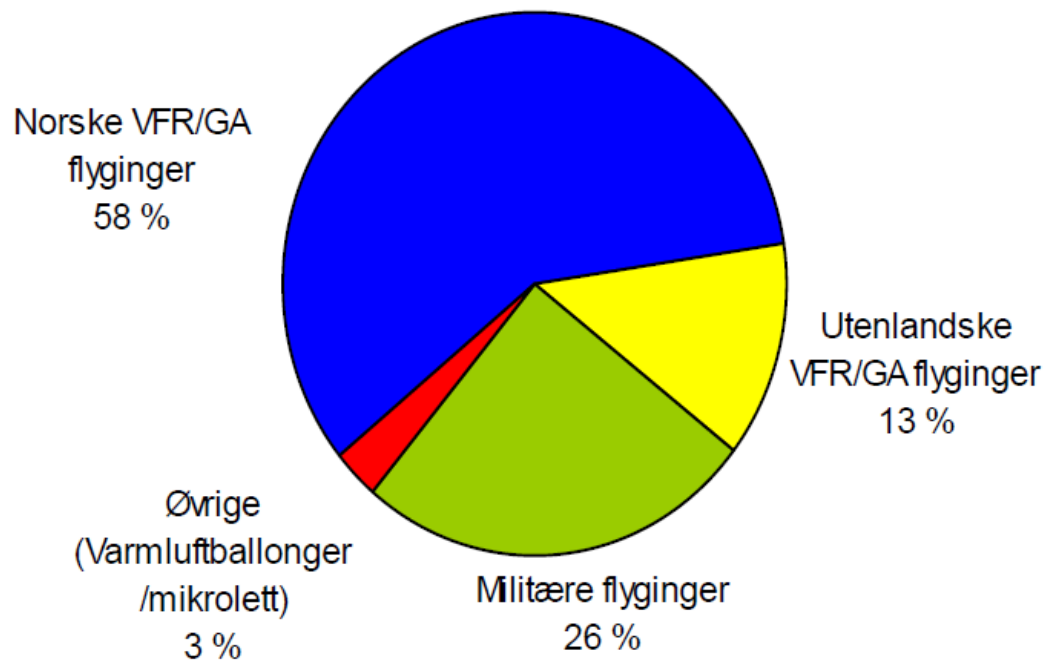
AVINOR

# Hvor ofte skjer det her hjemme?

- Oslo kontrollsentral har minst to rapporter i måneden
- Stor underrapportering, mistanke om 2-5 pr uke i høysesongen.
- Mest GA trafikk, noe militært og kommersielt – lite skolefly

# Rapporterte AI fra Norge 2004-2006

## FORDELING AV HENDELSER PÅ TYPE FLYGING



# Hva kan AI – føre til?

- Sikkerhetsrisiko / Usikkerhetsmoment
- Annen trafikk må vike
- Større arbeidsbelastning for annen trafikk og ATC
- Nærpassering / Airprox
- MID-AIR

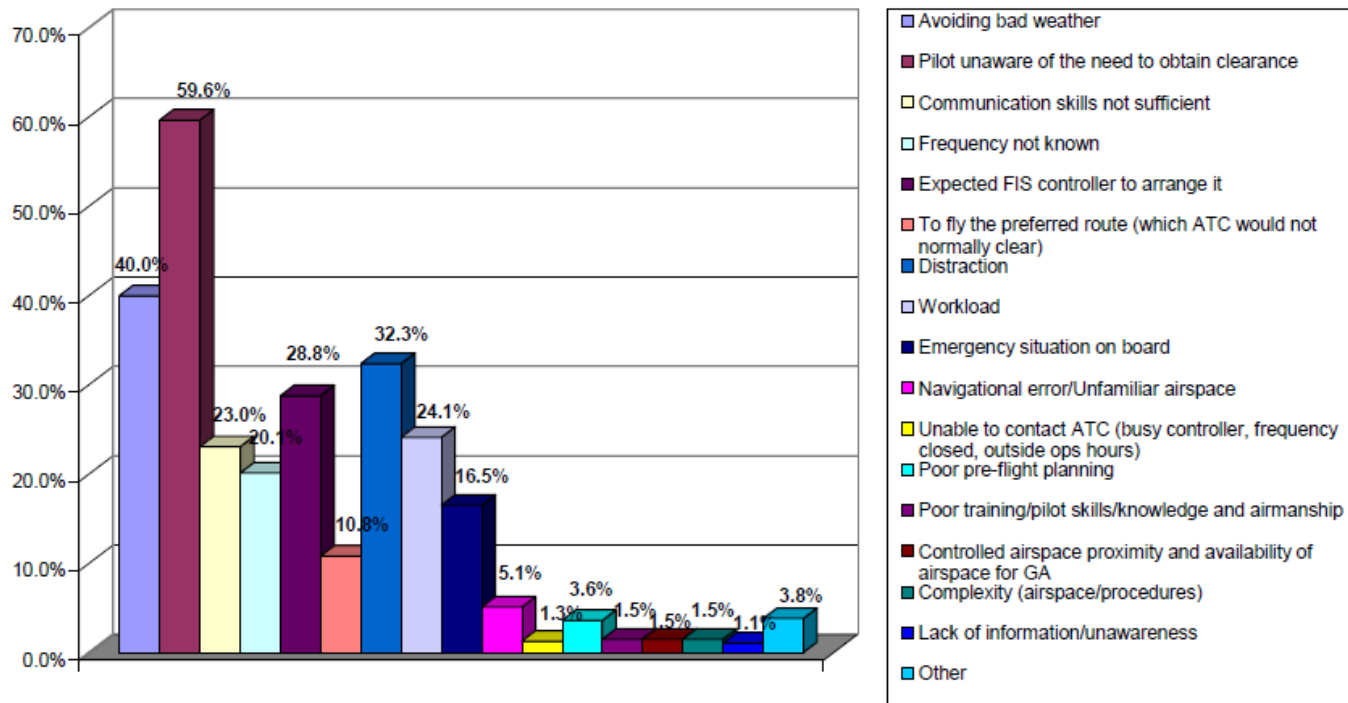




# Hvorfor skjer AI?

## PILOT ENTERS CONTROLLED OR RESTRICTED AIRSPACE WITHOUT ASKING FOR AND OBTAINING CLEARANCE FROM ATC OR THE MILITARY

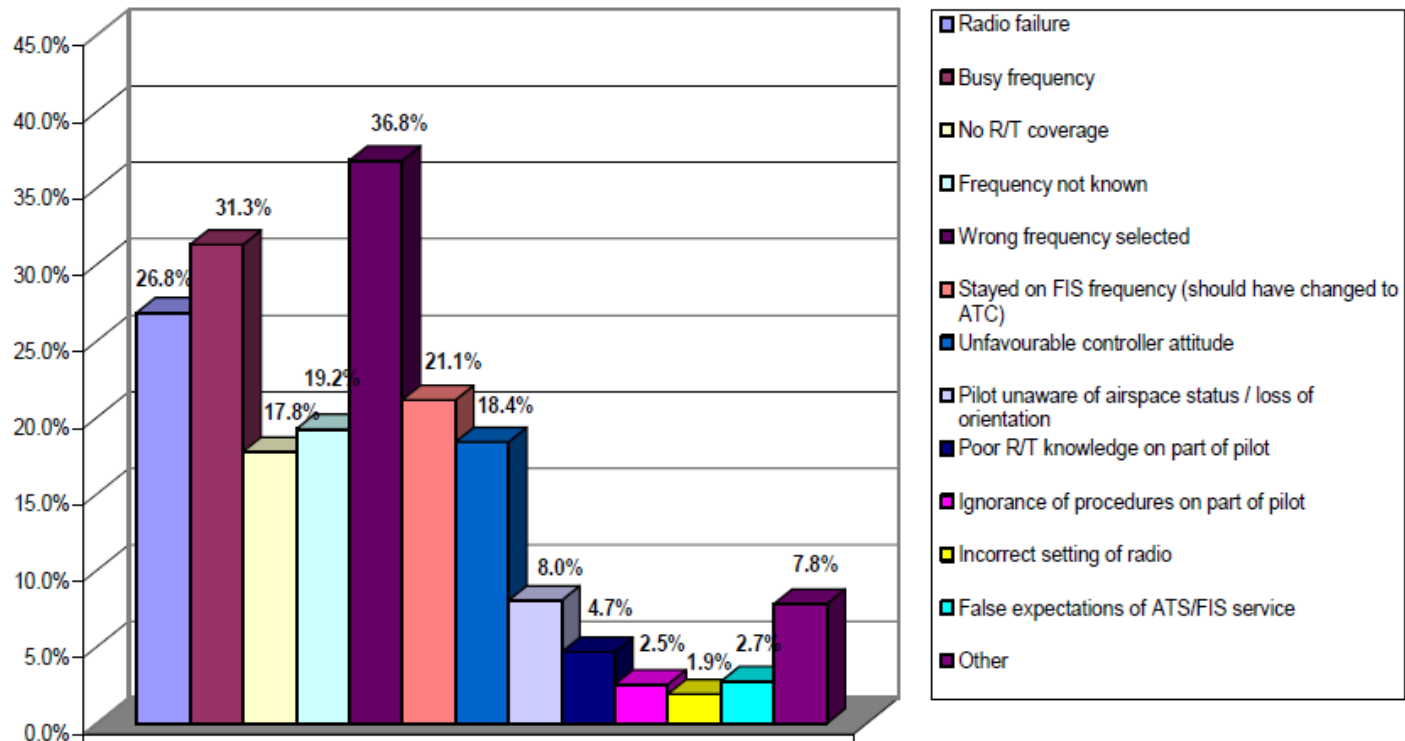
What could be the explanation? (more than one choice possible)



# Hvorfor ikke radiokontakt?

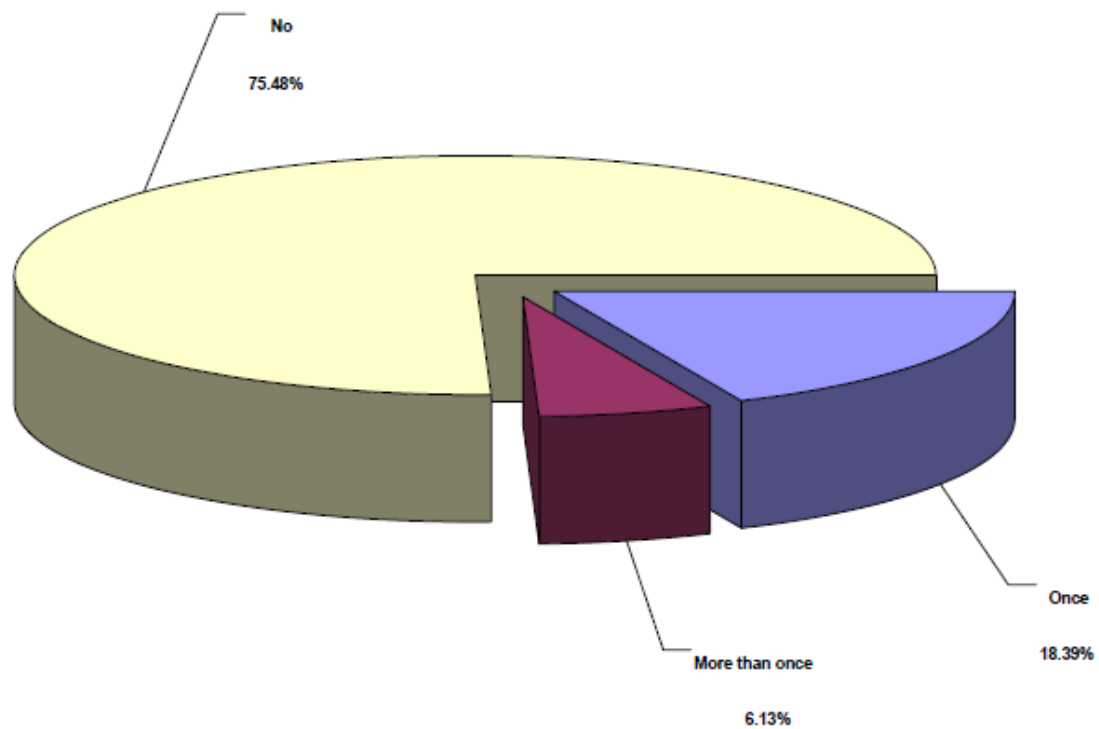
## PILOT FLIES WITHOUT RADIO CONTACT WITH ATC DESPITE THE FACT IT IS NEEDED OR REQUIRED

What could be the explanation? (more than one choice possible)



**PILOT IS UNSURE OF AIRSPACE (he/she is flying in) OR OF AIRCRAFT POSITION OR IS LOST**

Have you been in such a situation in the last 12 months?

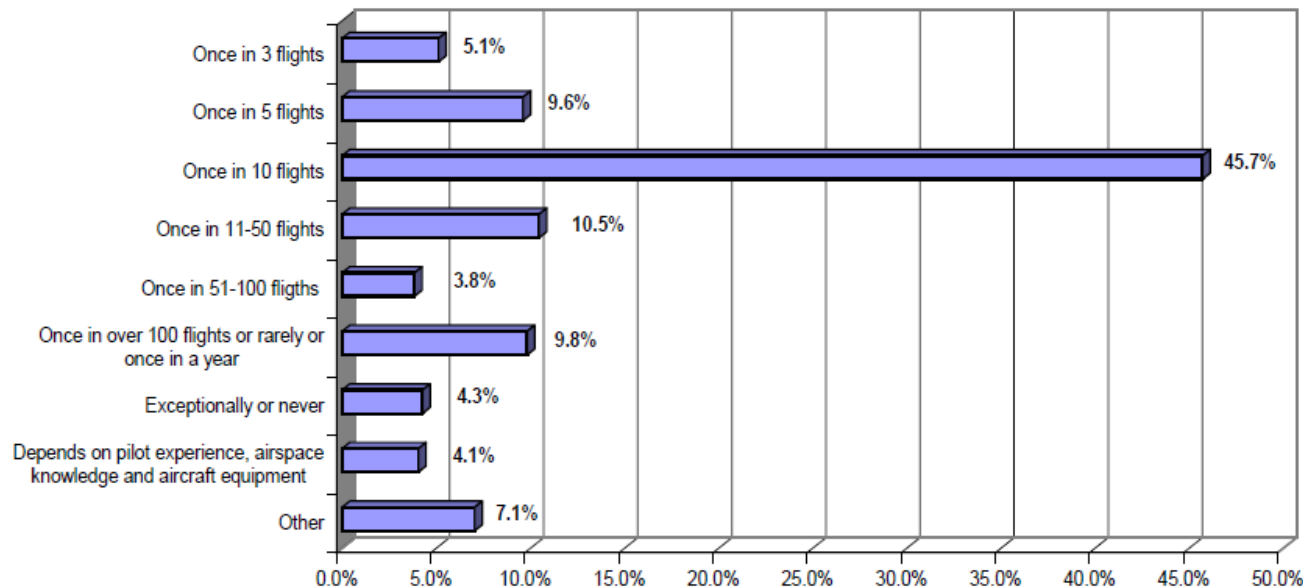




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# Har vi alltid kontroll på kartet?

**PILOT IS UNSURE OF AIRSPACE (he/she is flying in) OR OF AIRCRAFT POSITION OR IS LOST**  
How often could this happen to a GA pilot?

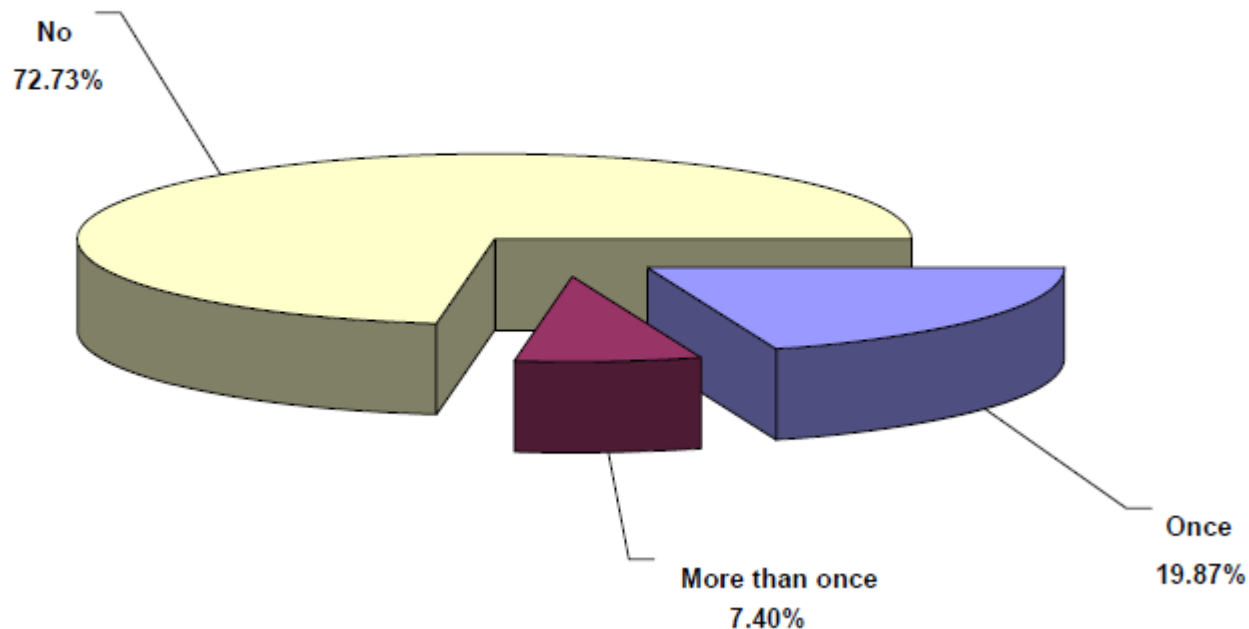




AVINOR

# Hva med utstyret?

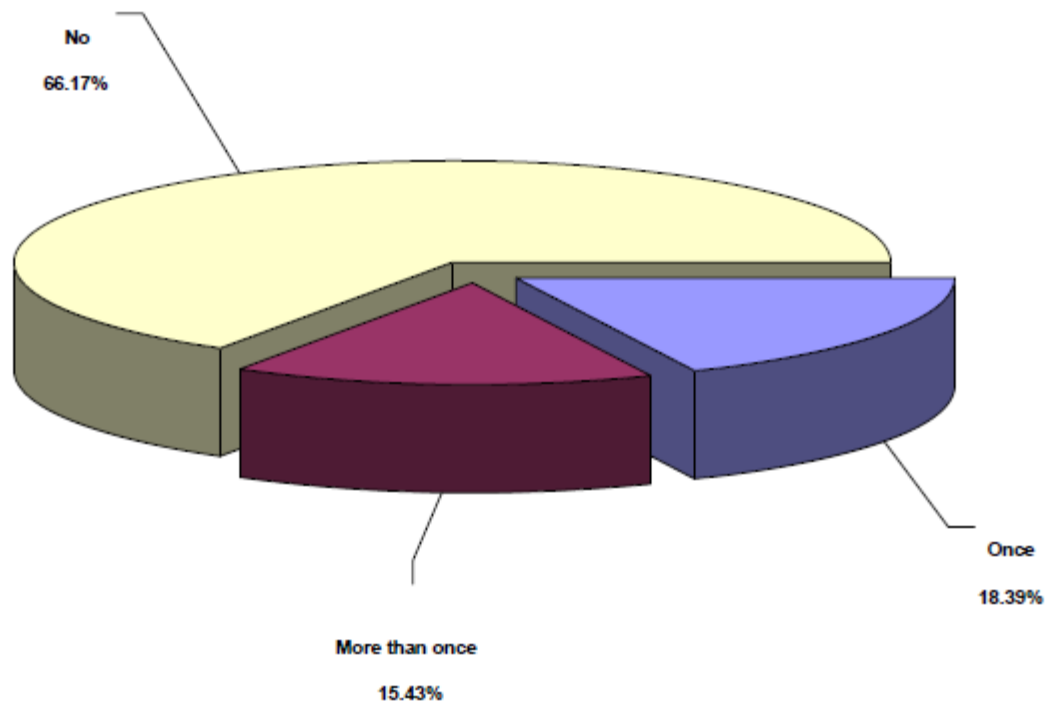
**NAVIGATION EQUIPMENT FAILURE**  
Have you suffered navigation equipment failure in the last 12 months?



# Har vi kontroll på radioen?

## PILOT MISUNDERSTANDS AN ATC CLEARANCE OR FLIGHT INFORMATION

Have you been in such a situation in the last 12 months?



Hva kan vi gjøre for å  
bedre sikkerheten????!?!?!?

# Luftrommet i Norge

Luftromsklasser og struktur



# Luftromstyper

- **Kontrollsoner (CTR)**
  - ❖ Fra bakken opp til 2500ft, rundt stamruteflypl.
- **Terminalområder (TMA)**
  - ❖ Over CTR - fra 2500 FT opp til CTA (9500 FT)
- **Terminal Informasjonssoner (TIZ)**
  - ❖ Små soner rundt AFIS plasser
- **Terminal Informasjonsområde (TIA)**
  - ❖ Over TIZ fra 2500 FT opp til CTA (9500 FT)
- **Kontrollområder (CTA)**
  - ❖ Over 9500 – 13500 FT og oppover

# Norske luftromsklasser

- **Klasse C**

- ❖ Atskillelse mellom både VFR og IFR.
- ❖ Flygeleder følger med på Radar hele tiden.
- ❖ Farris og Oslo TMA
- ❖ Husk å overholde klarering høyde/rute

- **Klasse D**

- ❖ Atskillelse IFR – IFR (følger med på Radar)
- ❖ Informasjon VFR og IFR (*kan* bruke pos. rapp.)
- ❖ CTR og TMA
- ❖ VFR night må ringe og spørre om lov!

- **Klasse E**

- ❖ Under Airways i Nordvest av Oslo AOR, 9500ft – 13500ft
- ❖ Krav til to-veis samband for IFR, IFR trenger CLX, ikke VFR

- **Klasse G\***

- ❖ Krav til to-veis radiosamband. Ingen Radar
- ❖ TIZ og TIA (Bruk AFIS frekvensen)

- **Klasse G**

- ❖ Ikke krav til radiosamband. Ingen Radar
- ❖ Husk: Om man kaller opp i G-luftrom og får for eksempel "LNALU no reported traffic 4000', squawk 4732, qnh 1010" og flyr mot Farris TMA, er det fremdeles fartøysjefs ansvar å kalle opp Farris for klarering til å entre TMA!!

# Kontrollerte plasser

## CTA



TMA

9500

2500

CTR

# AFIS plasser

**CTA**



9500

**TIA**

2500

**TIZ**

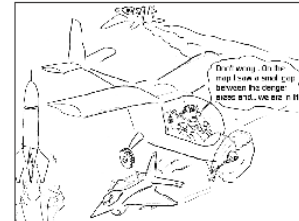


1. Plan your flight
2. Pilot workload increases in bad weather
3. Call ATC, use the Radio
4. Have alternative routes through controlled airspace
5. Call ATC if you need assistance or to pass necessary information

## TOP TEN TIPS for GA pilots

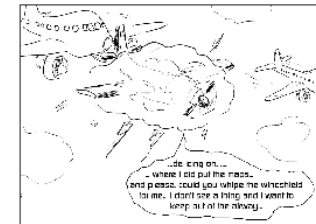


Ten ways to avoid an infringement, largely based on good airmanship and common sense:

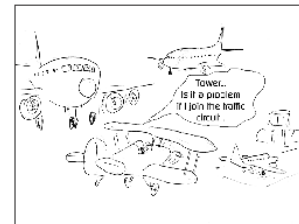


**1 Plan your flight!** Where possible, avoid flying close to controlled airspace boundaries. A small navigational error or distraction of any sort can lead to an infringement – and it doesn't take much to ruin your day.

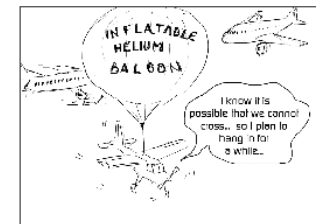
**2 Pilot workload rises rapidly in bad weather - and so do infringements. If the weather starts to deteriorate, consider your options early and if necessary divert or turn back in good time.**



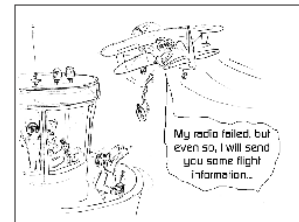
**3 If you wish to transit controlled airspace call the appropriate ATC unit well in advance. This gives the controller time to plan in your flight.**



**4 If you plan to cross controlled airspace, remember that a crossing clearance may not always be possible. Be ready with a 'secondary' plan how to avoid controlled airspace - and don't forget to make your overall time and fuel calculations using the longer route.**



**5 Don't hesitate calling ATC to pass information about your flight or ask for assistance.**





6. Tenk, trykk, tal
7. Ta hensyn til andre på frekvensen
8. Standby – betyr vent – det er ingen klarering
9. Vær forberedt på andre instruksjoner enn de du venter deg.....
10. Bruk alltid Mode C txp – også når du flyr no-plan VFR i klasse G luftrom!!!!

## TOP TEN TIPS for GA pilots

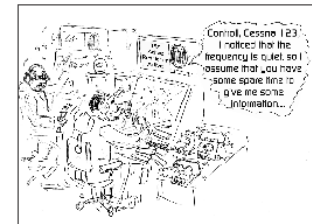


Ten ways to avoid an infringement, largely based on good airmanship and common sense:

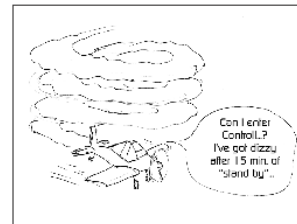


**6** Think about what you are going to ask before you press the transmit switch and **use the correct Radio phraseology**. It helps air traffic control to help you - and sounds more professional.

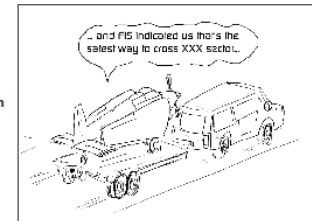
**7** Be aware that ATC may be busy when you call them - **even if the controller doesn't talk at the frequency at that moment.**



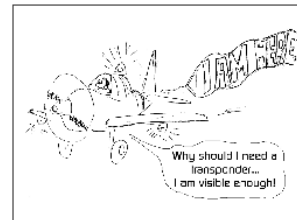
**8** Remember - the instruction 'Standby' is **not an ATC clearance and you shall fly around the controlled airspace, unless the controller issues a crossing clearance.**



**9** Be prepared for a **crossing clearance** that does not match your planned route but will allow you to transit safely.



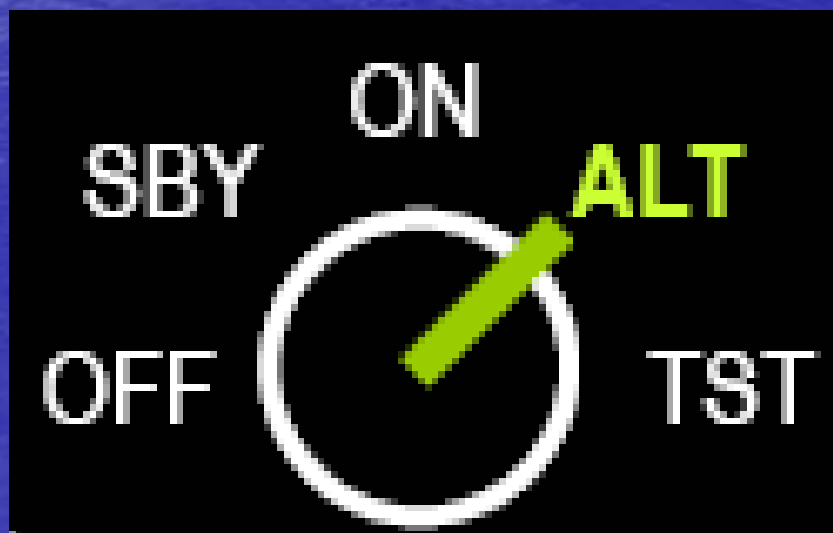
**10** Use the **transponder**, if equipped. It will help ATC identify you in case you need navigation assistance and **may prevent an infringement** which may in turn prevent a dangerous proximity to other aircraft or worse.



# Its Good To Squawk!



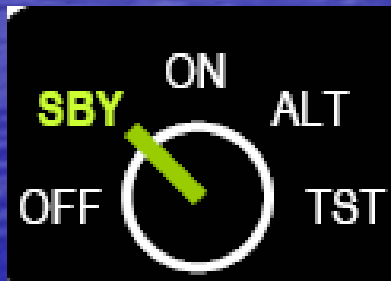
Why YOU should always  
Squawk Mode C



# If You Get Close To An Aircraft Equipped With TCAS II



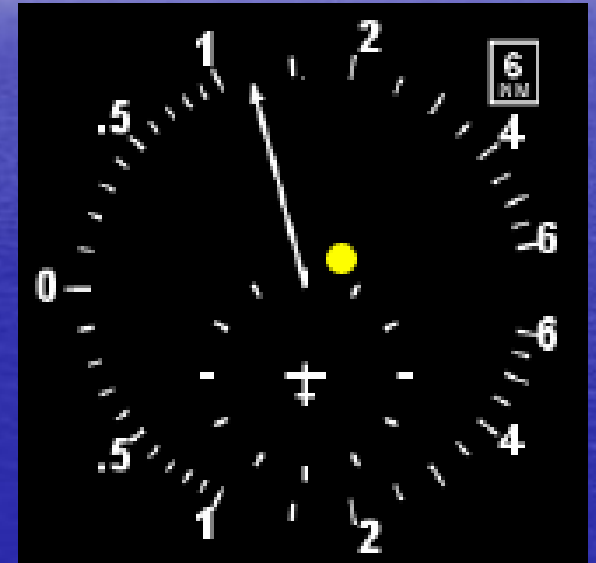
And your SSR is **OFF** or on **STANDBY**



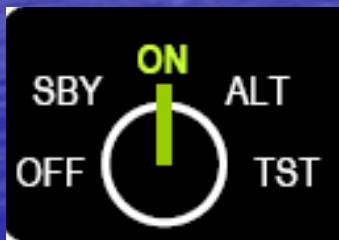
**= No indication on TCAS !  
(no warning of your presence)**



# If You Get Close To An Aircraft Equipped With TCAS II



And your SSR is just **ON** (ie no Mode C)



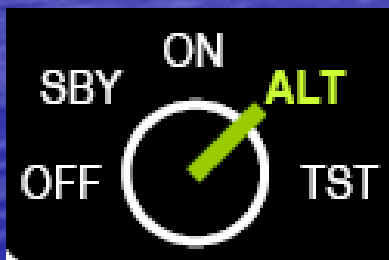
= Traffic Advisory (TA) without  
Altitude

(may help their attempts to gain visual  
contact with you)

# If You Get Close To An Aircraft Equipped With TCAS II



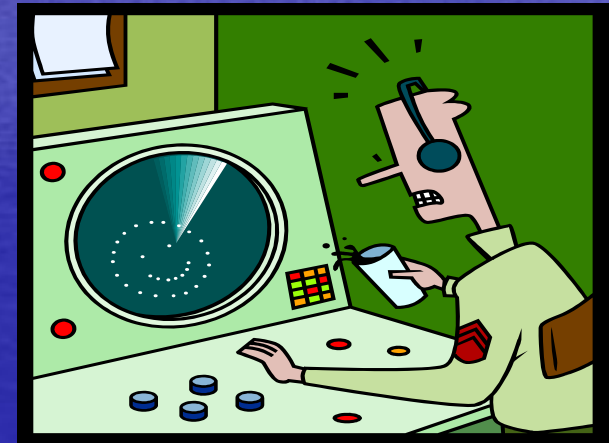
And your SSR is on **ALT** ✓



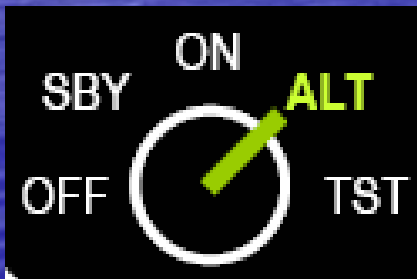
**= Full TCAS Protection including Resolution Advisory (RA)**

**(TCAS generates vertical Resolution Advice so they can avoid you)**

# Other (eg ATC) Conflict Alert Systems Depend On Use Of Mode C Too.



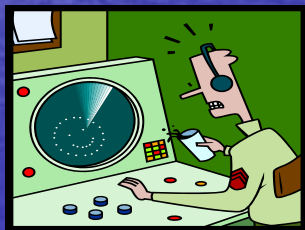
And your SSR is on **ALT** ✓



= Also seen by other Safety Net Systems (Including Conflict Alert systems used by ATC) ✓ ✓

# And.....

Another advantage of squawking Mode C is that this can allow ATC to apply vertical separation rather than providing unnecessary lateral avoiding action.



075

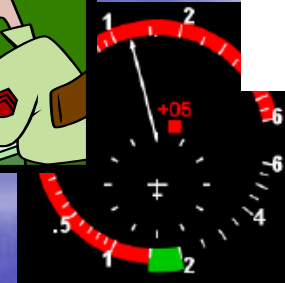
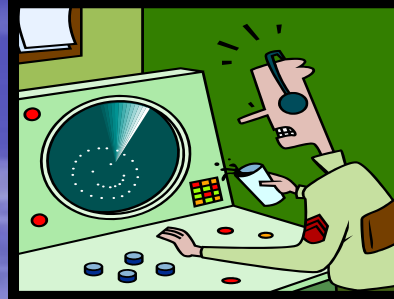


030

075



This benefits aircraft under the appropriate radar service in Class G airspace, (and that could be you).



So – Even though **YOU** Are Not Equipped With TCAS II – **YOU** Are Also Gaining Additional Safety Benefit By Squawking Mode C



**The Message  
Is Clear**

# The Message Is Clear





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# Lufttrafiktjenesten

AVINOR



# Informasjon FLL har tilgjengelig

- Radar, trafikk informasjon, om du har filet FPL hjelper dette veldig! (men husk å bekrefte (fax el. Ippc), åpne, lukke)
- Vær og lokale forhold ved de forskjellige flyplassene
- Muligheten til å innhente annen assistanse
- Direkte kontakt med HRS, Politi, Brann, Ambulanse osv.
- Kan hjelpe deg!!

# Spørsmål og rapportering

- Ring Oslo Supervisor / kontrollsentral ved spørsmål eller andre ting du lurer på i forbindelse med din flytur i Oslo AOR.....

31 28 69 81

- Hva skjer ved rapport-skriving i forbindelse med AI?  
[www.luftfartstilsynet.no](http://www.luftfartstilsynet.no) – rapport innen 72t.
- "None punitive reporting". Ved spm. Kan dere kontakte Fredrik Bye ved luftfartstilsynet tel. 98 26 17 60 eller FBR@CAA.no



AVINOR

# Hva ser en flygeleder på radar?





# AVINOR

DH8C M N0270 6473	RVSM-UNK 833-UNK		TUNIX 0826	INTEL 0835	ENBR 0839	FA 1 W
<b>WIF406</b>			SKI SOROX			
RNAV-OK DAT-NON RVR-300	ENTO 0740 ENBR 0839	SOROX1E	F180 F180			

MD82 M N0424 0152						FD 2 WAR
<b>SAS336</b>						
RNAV-OK DAT-OK	ENBR 0520 ENGM	SOPAR3C	F270 F270	SOPAR SIG		

A109 L N0130 0102	RVSM-UNK 833-UNK			ENBR 2036	FD 1
<b>LTR106</b>				VFR	
RNAV-UNK DAT-NON	ENBR 1951 ENBR 2036		VFR	DCT FEDJE DCT	

Flight Progress strips



Roe Nerem

roe.nerem@avinor.no

