I ♥ AUTOMATION

by Eileen Runge

In Maastricht UAC, together with our external partners and the airlines we have developed several automation projects. The main goal is to save time but as there is less room for misunderstandings when communication takes place via information displayed on the radar screen instead of via telephone or R/T, safety benefits as well!

Auto Revision is great! Auto Revision can be a pain!

Auto Revision, the OLDI[17] revision message, is an electronic revision with external partners. Unless the aircraft concerned is too close to the transfer-of-control point, the system sends the revision details automatically as soon as the controller makes the input that the aircraft wants, say, a different flight level. A colored chevron next to the callsign indicates whether the Auto Revision worked or if the controller has to pick up the phone and coordinate the revision the old fashioned way. For the sending party, Auto Revision is a great thing. It literally takes a second! For the receiving party, things can be less straightforward. There is no "accept" function in Auto Revision. Once the data is sent the revision is considered coordinated. There is only a subtle visual alert next to the callsign of that aircraft. It is up to the receiving party to (a) detect that an Auto Revision has been sent for an aircraft, and (b) conduct a new conflict search including the new flight level. If there is a conflict, the only solution is to quickly pick up the phone and try to reach the sending sector before they actually change the vertical profile of that flight. Usually, you are too late. On the other hand I would estimate that only one out of ten flights with Auto Revision used results in a crossing problem and there is enough time to solve things with appropriate headings.

17- On-Line Data Interchange - a means to send information to a neighbouring centre electronically instead of making a telephone call

AMA is handy! AMA is creating more workload!

AMA is an electronic Arrival Management Message sent from Amsterdam ACC to Maastricht UAC. To the controllers concerned, it shows what indicated airspeed they should issue to Schiphol inbound traffic when converting from Mach Number to indicated airspeed. By controlling the speed and thereby the sequence from such an early stage, traffic flows are optimised and become more efficient which saves fuel for the customers. AMA sounds great in theory and it is in practice - as long as the controllers from the sending and the receiving sectors have the same idea about the traffic sequence in their mind. If they have different ideas it can result in chaos! The sending sector has already worked on a sequence for up to ten minutes, speeding up some aircraft whilst slowing others down. #Then, about five minutes before the transfer-of-control point is reached, the AMA comes in. Included in the label for each aircraft is a three-digit number in orange which shows the IAS Amsterdam would like these aircraft to be flying on transfer. In the worst case it shows "MIN" = minimum clean airspeed. Sometimes it shows the complete opposite on what you have been working on over the past few minutes. Sometimes you have three aircraft on top of each other and you have the same IAS displayed for all of them. At the same flight level this is not going to work! That is the moment when the coordinating controller has to pick up the phone and negotiate things the old fashioned way. We have had situations where this has led to a high workload. But the system is improving and both sides are learning as they go along. And one of our projects under development is to create an AMA with Langen ACC for Frankfurt arrivals, so we should be able to take our 'lessons learned' into that.

Big Brother is watching: the use of Mode S-downlinked parameters

We are able to see downlinked parameters for aircraft that are Enhanced Mode S equipped displayed in a window on the radar screen. To me, this is the biggest improvement we have seen in recent years. The link between the selected flight level and our label input of the cleared flight level has made the skies a lot safer. In the case ▸▸

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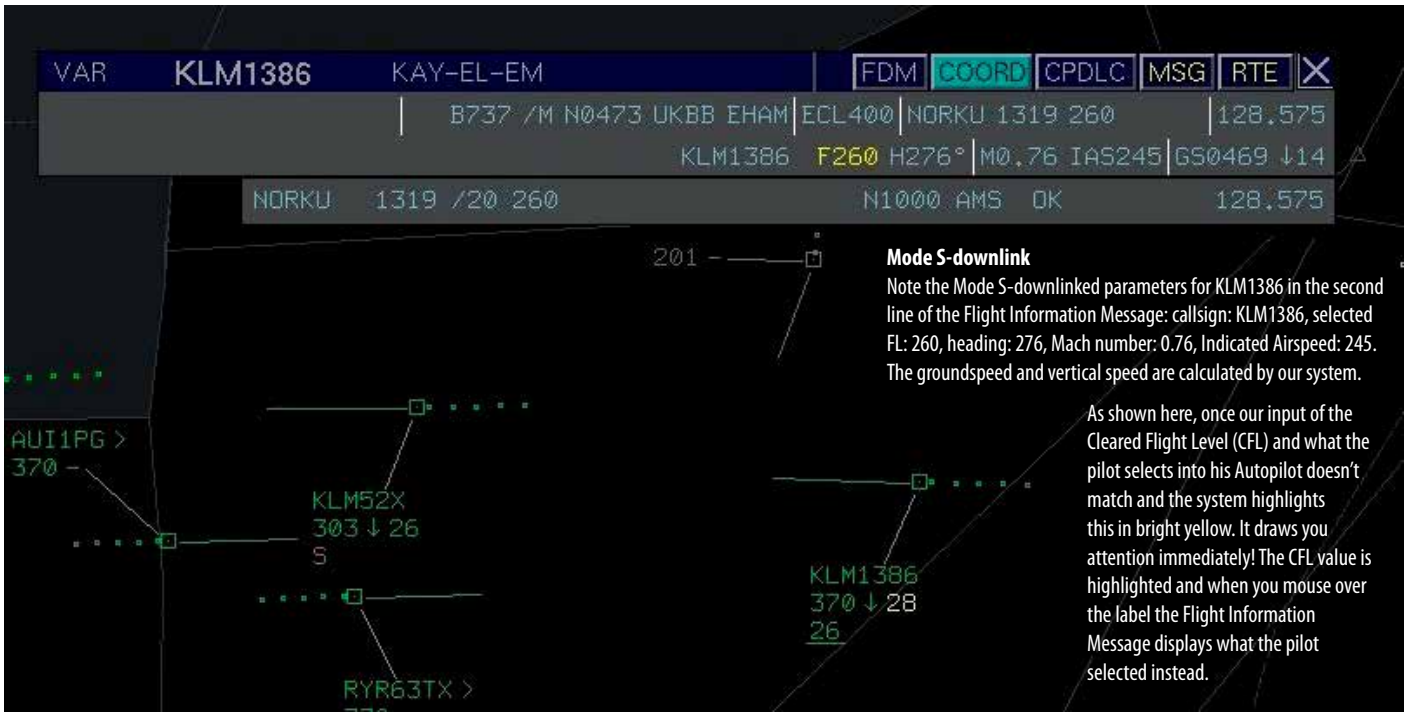
I ♥ automation (cont'd)

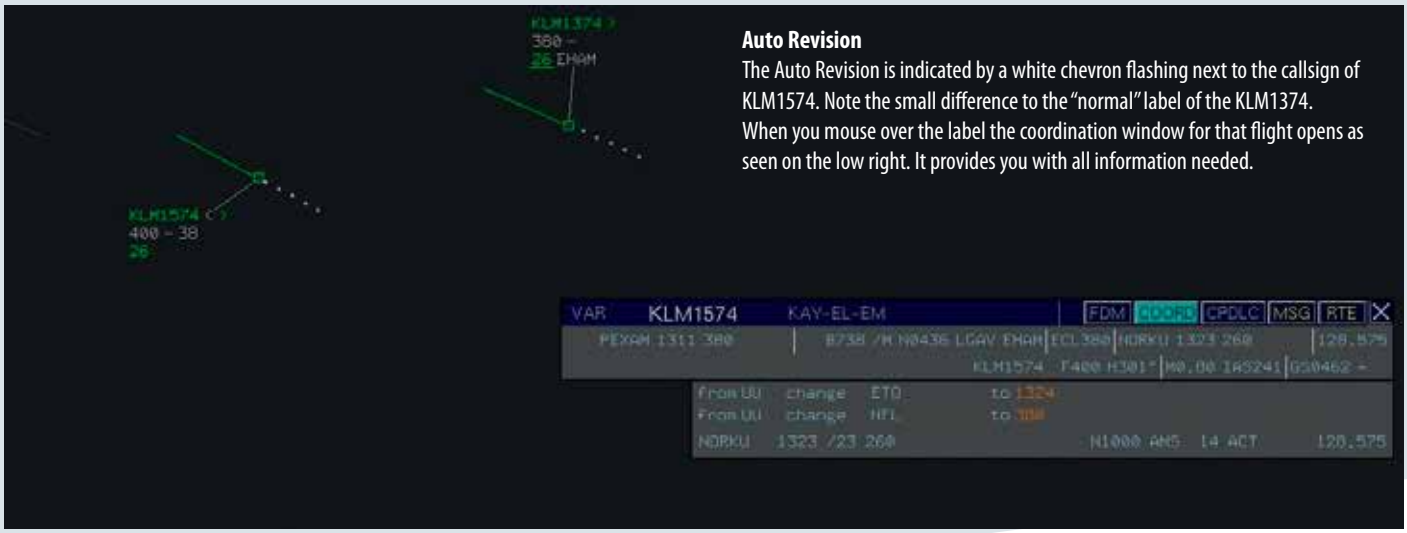
Once you mouse over the label the orange "S" turns into the IAS requested, e.g. "275" (KLM52X). The coordination window shows all information. Note as well the frequency of the next receiving sector being displayed at the far right of the coordination window (128.575).

AMA / next frequency
That a speed request has been sent by Amsterdam ACC is indicated by an orange "S" in the label of the aircraft concerned (KLM52X).



Mode S-downlink
Note the Mode S-downlinked parameters for KLM1386 in the second line of the Flight Information Message: callsign: KLM1386, selected FL: 260, heading: 276, Mach number: 0.76, Indicated Airspeed: 245. The groundspeed and vertical speed are calculated by our system.

As shown here, once our input of the Cleared Flight Level (CFL) and what the pilot selects into his Autopilot doesn't match and the system highlights this in bright yellow. It draws you attention immediately! The CFL value is highlighted and when you mouse over the label the Flight Information Message displays what the pilot selected instead.



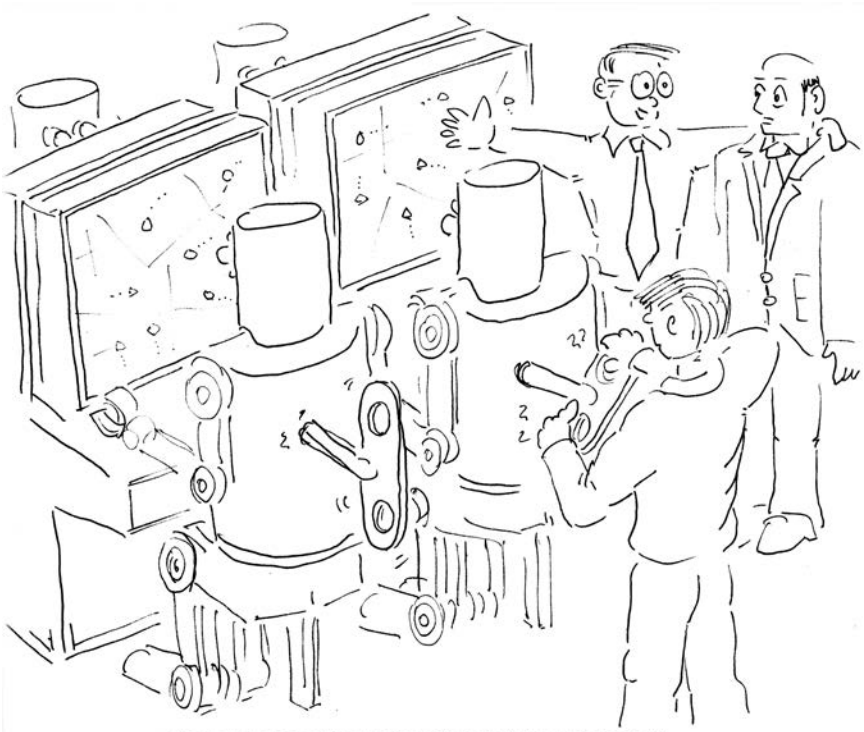
Auto Revision
The Auto Revision is indicated by a white chevron flashing next to the callsign of KLM1574. Note the small difference to the "normal" label of the KLM1374. When you mouse over the label the coordination window for that flight opens as seen on the low right. It provides you with all information needed.

of a detected discrepancy, a bright yellow visual alert is displayed and things can usually be corrected in time. The downside of this is that controllers are not listening that carefully any more to Flight Level readbacks. If there you doubt that the attitude has changed for the worse, try "let's see what they tune in the machine. If it's the wrong level I can always get back to them via voice and confirm." However, there is no question that in general, Mode S-downlink is reducing transmissions "Report heading" or "Report speed" have become obsolete as we can read such values by a simple mouse-over the aircraft label. It has also become much easier to check if pilots are really doing what they were said they would, e.g. a speed during sequencing. The times where a sequence did not work out and you knew one of the pilots was lying but did not know which one are over, thanks to Big Brother!

What's the frequency again?

All controllers know that question… In Maastricht the frequency of the next sector is displayed in the label once you open the transfer menu. Very handy but it has led controllers to rely on simply reading the frequency off the screen. One can argue that as a result there is more free mental capacity to deal with the real ATC challenges. But what happens when one of these colleagues is working a busy sector and we have to switch to the backup system? In the old days all of us knew more than 60 frequencies by heart, so there was no issue. Now this could easily lead to an overload of that controller. Automation can make the brain lazy and we have to be very aware of what the consequences are for every single one of us when automation fails and we are on our own again.

These are just a few examples from our many little helpers. As with all automation and assistance systems, the difficulty is to keep a healthy balance between letting them make your life a little easier and not slowly losing the skill you had before they arrived. Compare it to the parking assistant fitted to your car. And the lane keeping support and the rain sensor and the cruise control or nowadays the adaptive cruise control which keeps the distance to the car in front of you constant. You still want to be able to drive and to park your car safely without them. In ATC you don't want to depend too much on such systems - never forget that the backup system does not feature them!



As you can see the system is not fully automated, the human still has an important role to play.