Out of the SHADOWS

May 2018 Frank Crébas

"...New jet, new missions

While technicians have gained valuable experience of turning spanners on the F-35, the four **Dutch Lightning II pilots** have striven to understand the aircraft from a tactical perspective. 'We worked on getting a better understanding of how we can execute the D-SEAD [destructive suppression of enemy air defenses] mission — it's a new mission set the F-35 brings to the RNLAF,' adds De Smit. 'Additionally, we have been looking at how we can execute mission concepts that are very familiar to us like close air support [CAS]. The new variable message format [VMF] is the new datalink protocol that we use to talk to ground forces. VMF is fully digital and enables us to send, in addition to voice commands, imagery back and forth to the JTACs [joint terminal attack controllers]. In addition, the synthetic aperture radar can make images from a long distance through the weather. This is a whole new aspect in the CAS mission and will be a game-changer in the dialogue between JTAC and pilot because it offers a new way of finding and verifying targets.'

Within the detachment, the 323rd Test and Evaluation Squadron (TES) commander Lt Col Ian 'Gladys' Knight is leading the way when it comes to Dutch experience with the F-35. 'In CAS', he says, 'VMF gives us options for supporting ground forces in a way we never had in the F-16. Instead of using voice radios and getting eyes on the target using a targeting pod close-in, we're able to use the SAR to make images of the target area and generate very accurate target co-ordinates. We pass these to the ground forces and confirm a target location using VMF from beyond visual range, assuring that enemy forces are not alerted to our air presence. All the while we can be flying in pretty bad weather with long on-station times. This would have been impossible to do with our F-16s.'

While a lot of missions are conducted with the JOTT partners, the Dutch F-35s periodically fly with the 148th Fighter Squadron 'Kickin' a$$', the RNLAF's F-16 training unit in Tucson, Arizona, to evaluate and validate new tactics. 'The first time we got to test all these advanced capabilities to their fullest potential was about a year ago, with and against our F-16s in Tucson,' says Knight.

'The initial scenario was that our two F-35s would escort a four-ship of F-16s across a

notional border and protect them against another eight-ship of F-16s simulating a modern adversary. A relatively inexperienced flight leader was in charge of the F-16s on our side and Lt Col Joost 'Niki' Luijsterburg, the Tucson detachment commander, was responsible for the adversaries. Up to this point we had only practised these scenarios in the simulators and while we had a decent game-plan, we were all anxious to see how the F-35 would perform in real life. We figured that the F-35's stealth would keep us out of harm's way for most of the fight, but that we also need to protect the friendly F-16s, maximize the lethality of their missiles and get them to the target.

To make this happen, we planned to initially use electronic attack against the adversary F-16s, see if we could avoid having them detect friendly fighters and datalink the location of the hostile aircraft to our F-16s. This way we could use the F-16s on our side to shoot down the initial wave of enemy fighters and keep our own missiles available once the 'Blue Air' F-16s had to focus on their target attack. The plan worked flawlessly.

'In the debrief 'Niki' told us it was one of the most memorable sorties he had ever flown. Having previously worked in the F-35 program office he was elated to find out how effective the F-35 was, but at the same time he was frustrated by not getting a single shot off the rail against us, while getting killed multiple times. After that sortie it really hit us that the F-35 was going to make a big difference in how we operate fighters and other assets in the Royal Netherlands Air Force.'…"

"…Dogfighting in the F-35…

…'The F-35 is a very different aircraft, and it took pilots a while to adjust and figure out how to max-perform it. What didn't help is that until about 18 months ago we were restricted in envelope, which meant we couldn't pull as much g as we wanted to, nor fly with high-alpha. It was an eye-opener for all of us when those restrictions were lifted and we finally got to see the full potential. Actually, it was an eye-opener for a lot of adversary pilots as well.'

The F-35 is far larger than the F-16, and it carries twice as much fuel and three times the payload. 'Consequently, the F-35 loses energy a bit faster than the F-16 at higher speeds,' continues Knight. 'But the slow-speed handling is amazing. The F-35 pilot has the option to continuously point the nose at the adversary, even at

ridiculously slow speeds, which is a great capability to have in combination with high off-boresight missiles and a helmet-mounted sight. You need to be careful maneuvering the aircraft at higher speeds, because if you keep pulling back on the stick the aircraft will give you as much alpha as it can, but it will bleed a lot of energy in the process. It's up to the pilot to recognize when to try to maintain airspeed and energy and when to give that away to prosecute with missiles or guns. I typically tell new pilots that the F-35 sits somewhere in between the F-16 and F/A-18 when it comes to within visual range maneuvering.'

Knight divulged a little more information about flying basic fighter maneuvers (BFM) in an F-35. 'When our envelope was cleared to practise BFM we got the opportunity to fight some fourth-generation fighters. Remember, back then the rumors were that the F-35 was a pig. The first time the opponents showed up [in the training area] they had wing tanks along with a bunch of missiles. I guess they figured that being in a dirty configuration wouldn't really matter and that they would still easily outmaneuver us. By the end of the week, though, they had dropped their wing tanks, transitioned to a single centerline fuel tank and were still doing everything they could not to get gunned by us. A week later they stripped the jets clean of all external stores, which made the BFM fights interesting, to say the least…

'High-g maneuvering is fun, but having high fuel capacity and the ability to carry lots of stores is great too. During the weeks when we were flying BFM we also needed to drop a GBU-12 [laser-guided bomb] on the China Lake weapons range. Back in our F-16 days we'd have had to choose, since there is no way you can BFM with a bomb on your wing, let alone having the fuel to fly both missions in a single sortie. With the F-35, however, this isn't much of an issue. On one of the sorties, my colleague, Maj Pascal 'Smiley' Smaal, decided he would fly BFM and still have enough fuel to go to the range afterwards and drop his weapon. **During the debrief, the adversary pilot told us he was confused as to why we went to the range after the fight. When 'Smiley' told him that he was carrying an inert GBU-12 the entire time and that he then dropped it afterwards during a test event, the silence on the other end of the line was golden.'…"**