Industrial organization relies essentially on four companies: Dassault Aviation, Thales Airborne Systems, Sogitec and Thales Training & Simulation.

Aside from the infrastructures, Sogitec will supply the entire display system – image generation with the associated database – and the retro-projection system.
It is also responsible for the networking of the student, instructor and briefing/debriefing stations in the two centers.

The tactical servers and instructor stations are made in cooperation with TTS. Sogitec is involved in the front-end system opto-electronics (OSF) imaging – a 2-band system in the infrared range for viewing the tactical situation until targets are identified – as well as in the imaging for the RBE2 radar (electronic scan radar).

These two imaging systems use a database provided with information required for real-time calculation of the images seen by the aircraft's sensors.

Sogitec will provide, in addition, part of the integrated logistical support and, so as to respect the Navy's concern for complete autonomy, will train its personnel for maintenance. And finally, maintenance and operating documentation will be supplied for the purpose of implementing the centers via the instructor stations.
An additional challenge to be met: partial integration (two student stations) will be carried out in Sogitec's Bruz center while complete integration will take place on the final site.

AN EXCEPTIONAL VIRTUAL TRAINING CAPABILITY

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The intrinsic design of the CSR F2 simulation center allows it to be Landivisiau centers, each being ters. This will be the case, at first, between the Saint-Dizier and able, moreover, to adopt the configuration of its counter-part coupled to other simulation cen-(Navy or Air Force version).
Other air bases will be able to be equipped and coupled in the future, in France as abroad.

One condition: that they comply with the HLA (High Level Architecture) international standard enabling them to converse.

The tactical server can thus be shared among several simulation centers dedicated to other types of aircraft, the Mirage 2000D and 2000-5 for example.

The capability of coupling the simulators together will consequently provide the French armed forces with an exceptionally powerful virtual training capabilit

IN DIRECT LINE WITH THE CEC (AIR COMBAT TRAINING CENTER)

The future Rafale F2 Simulation Center will incorporate the experience acquired by Sogitec in the installation of high-power tactical servers associated with trainers and simulators installed on one or more sites. Designed to determine the way in which Air Force combat aircraft are used, MONT-DE-MARSAN air base already houses the combat training center (CEC).
This Center, already much greater in size (larger number of student stations) and having a different physical configuration (internal sphere projection system), foreshadows the CSR's "fundamentals":multi-mission capability, complex-situation management, high-level imaging, coupling between simulation centers…

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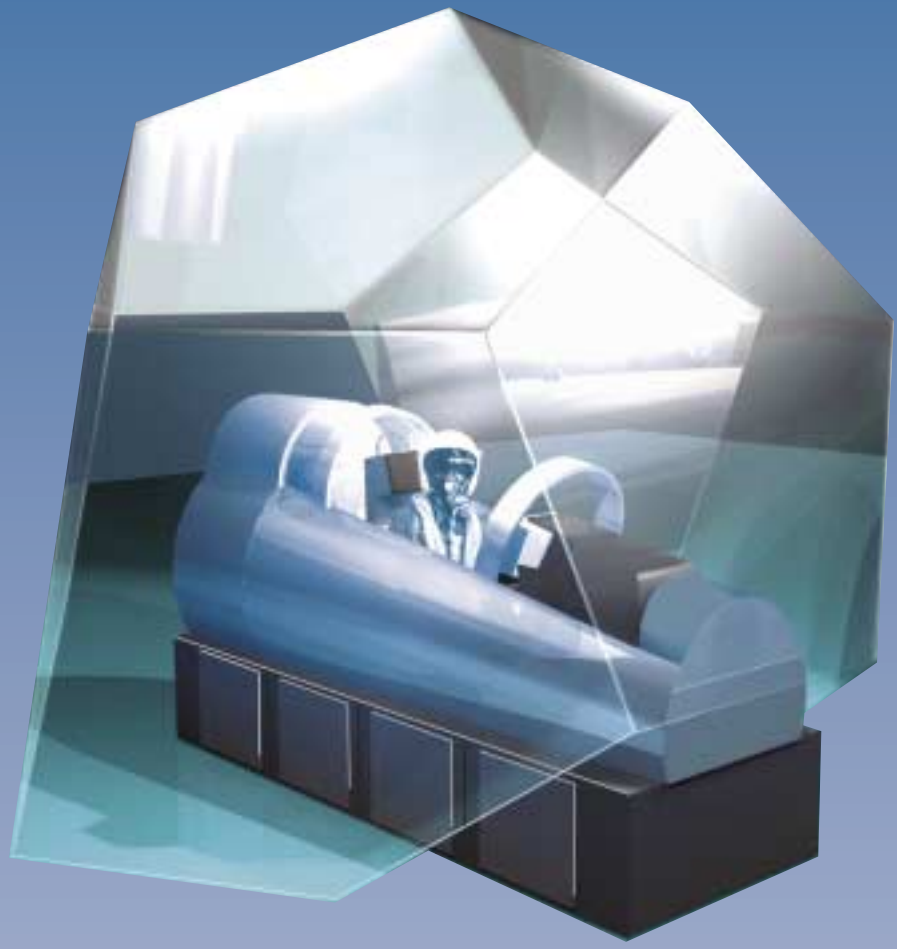
RAFALE SIMULATION CENTER STANDARD F2



RAFALE F2: THE SIMULATION WILL BE READY TO GO

Delivery to the French Air Force and Navy of two Rafale F2 Simulation Centers (CSR) will be carried out at the same time as deployment of the new version of the aircraft. Sogitec will be the prime contractor for the infrastructures, will design the center's architecture, the visual systems (generation and display of images), an important part of the Tactical Server and the Instructor's Station, the Briefing/Debriefing Station as well as the G-seats.

Designed from the very beginning to be the sole spearhead of French aviation, Air Force and Navy combined, it seemed logical that the Rafale should benefit from joint developments for the training of pilots in operational exercises. This will have been accomplished at least for the F2 version of the aircraft which will be deployed in 2004 or 2005 and for which Sogitec will deliver two simulation centers, one to the Saint-Dizier air base (Air Force), the other to the Landivisiau air station (Navy).

There is in fact a certain degree of urgency, considering the nearness of due-dates, and the supplying of simulators designed for training flight crews in taking control of the aircraft, handling of the weapons system and carrying out tactical exercises, shortly after the aircraft has been placed in service. This will even be a first in France…

SOCCER BALL - LIKE PSEUDO-SPHERES !

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The future centers will be built around four networked pilot stations, with multi-mission capability, reconfigurable to either Air Force or Navy versions, and to a front seat / rear seat version via the virtual coupling of two cockpits.
Each station will be provided with a tactical server reproducing a complete theater of operations, deploying in particular nearly a hundred surface-to-air systems and about fifty friend/foe aircraft with their associated weapons systems.

It will thus be possible to carry out either a mission common to the four stations (individually or grouped) or up to three separate missions.

Graphotec


Deodex

Note that the magnitude of the virtual tactical situations implemented will involve more than fifteen years of Sogitec experience in weapons system design.

The design of the display systems uses a particularly clever system of retroprojection of high-resolution images on a pseudo-sphere composed of flat screens, something like the sewn-together faces of a soccer ball. Perfectly joined, these faces offer the pilot sitting inside the pseudo-sphere a wide-field vision (330° horizontally, 130° vertically), with good contrast, of the entire national territory and of various moving targets programmed by the tactical servers.
The cockpits are provided with real equipment: levers, various sights, as well as with the new Rafale G-seat 30° inclined, by Sogitec, consequently offering optimized reproduction of the sensory environment (load factors, roll, pitch, vibration…).
The reproduction of sound will undergo special development with the capability of establishing dialogue between the pilots and the virtual systems by means of synthesizers and voice recognition. Three instructor stations start operational implementation with one station per mission. In this way, in the case of a common mission, it is possible to have two opposing sides face each other, each side monitored by an instructor, the third instructor supervising the entire mission.

Two briefing/debriefing stations equipped with monitors complete the setup. Installed in two rooms one of which is fitted with large screens redisplaying the images on the monitors, they provide the means of clearly explaining the tactical situations to the pilots, either as a preplay or as a replay, and to tell them what is expected of them in terms of behavior and initiatives.
The parallel use of pilot/instructor stations and briefing/debriefing stations favors the succession of tasks making possible the very high future throughput of the Rafale Simulation Center.

Consequently, at the same time, up to twelve students can be trained simultaneous: four with simulators, four in briefing, four in debriefing, and all this in an almost steady stream! The scenarios are prepared using an operational tool – the SLPRM (local system for mission preparation and reproduction for the Rafale) – and can then be downloaded to the instructor station and the aircraft.

They will contain, in particular, the description of the theater of operations, entry corridors, aircraft navigation, possible counter-measures identified, etc.

And finally, the installation would be incomplete if it did not use the airborne computer, the very heart of the aircraft's information system, the EMTI (modular data-processing system).

SOGITEC, THE ARCHITECT FOR THE CENTERS

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The physical content of the Rafale simulator contract is taken in the broad sense of the term and is another first for Sogitec as the latter is in fact responsible for creating all of the building infrastructures for both centers, including the concrete structures.
Another innovation, the qualification of a center will be conducted in accordance with the AUO method (capability for operational use): a panel of Air Force and Navy pilots and the aircraft manufacturer will carry out seven operational missions (day and night interception, flight-deck landings, etc.) which should obtain a compulsory, contractual satisfaction level from the pilots.

An approach comparable in every respect to qualification of the aircraft itself by the armed forces.