



F-16基礎/全功能模擬機

F-16 Unit Level Trainer/Full Mission Trainer

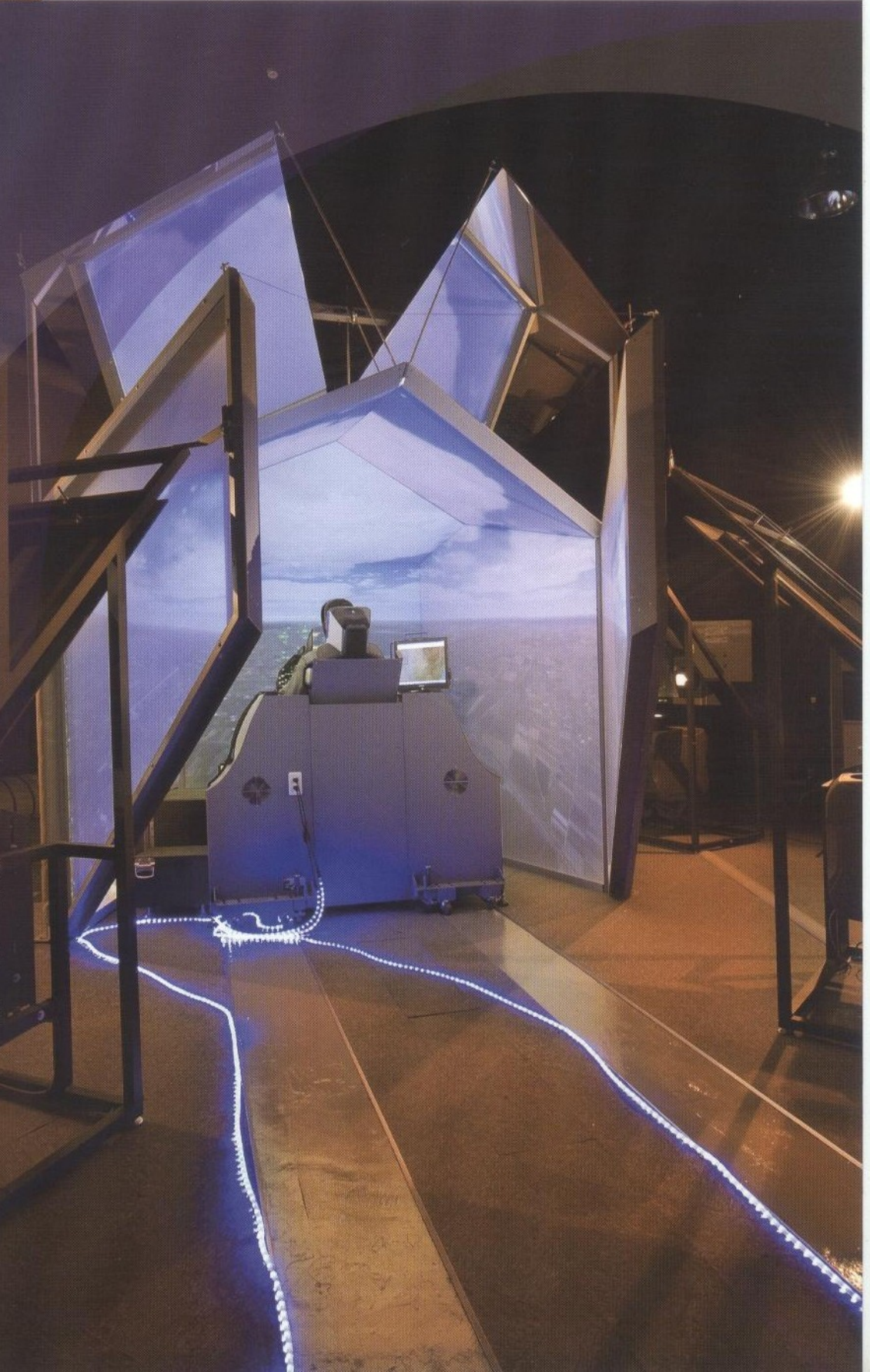


主要特色：

- 基本及儀器飛行訓練。
- 緊急操作程序訓練。
- 對空及對地任務訓練。
- 多機連線戰術訓練。
- 具錄製及重放功能。
- 採用F-16戰機原廠提供之氣動力、飛操及引擎性能數據模擬。
- 採用F-16戰機真實空電軟體。
- 座艙配置符合實機構型(Tape5/Tape 6)。
- 採用標準商規件，裝備維持與零備件籌補無虞。
- 系統操作自動化，三分鐘內可以完成系統開機。

Key Features

- Basic and Instrument flight training.
- Emergency and Abnormal procedures training.
- Air-to-Air and Air-to-Ground mission training.
- Multi-ship tactical training.
- Record and Playback function.
- Accurate aerodynamic, flight control and propulsion model.
- Avionics function simulated by real OFF.
- All the instruments, control panels and mechanism are identical with those of the real aircraft (Tape 5/Tape 6).
- Use of Commercial Off-The-Shelf (COTS) hardware and software.
- The system can be brought up in 3 minutes.



F-16基礎/全功能模擬機

F-16 ULT/FMT

主計算機分系統:

- 執行飛操、空電及武器操作即時模擬。
- 採用一般商規電腦。
- 1000 Mbps乙太網路。
- Linux開放式作業系統，設計具可擴充性。

圖像電腦系統:

- 執行抬頭顯示器、多功能顯示器、威脅警告及電子水平情況儀之繪圖顯示。
- 採用一般商規電腦。

資料鏈結電腦系統:

- 執行Link 16資料鏈結功能模擬。
- 採用一般商規電腦。

戰術環境系統:

- 負責戰術威脅環境模擬。
- 採用一般商規電腦。

教官台系統:

- 可執行全系統之開關機與系統備便測試。
- 提供視窗操作環境，可執行任務選取、武器掛載及環境參數設定等操作功能。
- 提供電子地圖及3D地形地貌之戰術環境顯示。
- 提供四合一座艙圖像顯示。
- 提供座艙控制面板電門位置顯示。
- 採用一般商規電腦。
- Window作業系統，設計具可擴充性。

HOST Computer System

- The host computer is responsible for the real time simulation of flight control, avionics and weapon operation.
- Commercial off-the-shelf PC.
- IEEE802.3 1000 Mbps Ethernet network.
- Linux Open Operation System, Upgradeable for the future.

Graphic Computer System

- The graphic computer is responsible for the symbol rendering of HUD, MFD, RWR and EHSI.
- Commercial off-the-shelf PC.

Link 16 Computer System

- The Link 16 computer is responsible for the simulation of Link 16 data link function.
- Commercial off-the-shelf PC.

Tactical Environment System

- The TES computer is responsible for the simulation of tactical environment.
- Commercial off-the-shelf PC.

Instructor Operation Station

- System power up/down control and Daily Operation Ready Test.
- Flexible and user-friendly means for training management, including mission selection, weapon store and natural environment setting.
- Provides tactical situation display by electrical map and 3D terrain.
- Provides graphic repeater of HUD, MFD, and RWR in a screen.
- Provides virtual control panels that synchronize with the physical control panel inside the cockpit.
- Commercial off-the-shelf PC.
- Window Operation System, Upgradeable for the future.

座艙系統:

- 依實機構型仿製艙內控制盒、模擬儀錶及各控制機構。
- 控制盒面板採用LED燈光照明。
- 附設艙邊教官台。

輸出入介面分系統

- 工業標準19吋工規機箱、多插卡式背板。
- 提供即時/離線輸出入界面狀態監控與偵錯。
- 每日開機測試。

音效通訊系統:

- 採美商ASTi公司音效產生器。
- 模擬環境音效、VHF/UHF通訊及語音警告音響。

檔案管理系統

- 集控式管理模擬機系統操作任務與戰術威脅資料。
- 採一般商規電腦。

高階聯網架構

- 可任意選取基地內之模擬機，執行聯網演訓。
- 採MAK公司之RTI。
- 採美軍標準之RPR FOM。
- 採惠普公司pro-curve網路交換器。

任務支援系統

- 提供任務場景、戰術威脅及視效資料庫編建功能。
- 提供任務資料卡匣讀取功能。

任務歸詢系統

- 可重現或即時監看任務訓練操作過程之OTW影像及HUD/MFD/RWR圖像，提供教官與學員執行任務歸詢與檢討。

After Action Review system

- Provides the OTW image and HUD/MFD/RWR display for mission debriefing and live monitor.

Cockpit System

- High fidelity replicas of F-16 cockpit with fully simulated instruments, panels, and controls.
- Utilizes LED light source to illuminate the control panels.
- Provide cockpit-side IOS.

I/O interface system

- Industrial-grade PC with multi-I/O control cards.
- Provides online/offline system diagnostic and trouble shooting.
- Provides Daily readiness test.

Sound and Communication system

- Utilizes ASTi audio system.
- The sound system is responsible for simulating the environment sound created by the aircraft, VHF/UHF communication and voice warning message.

Archive Computer system

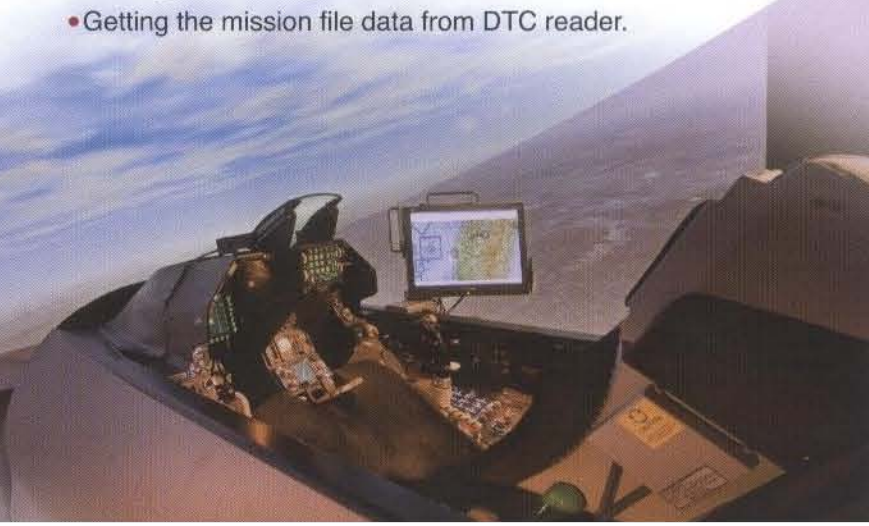
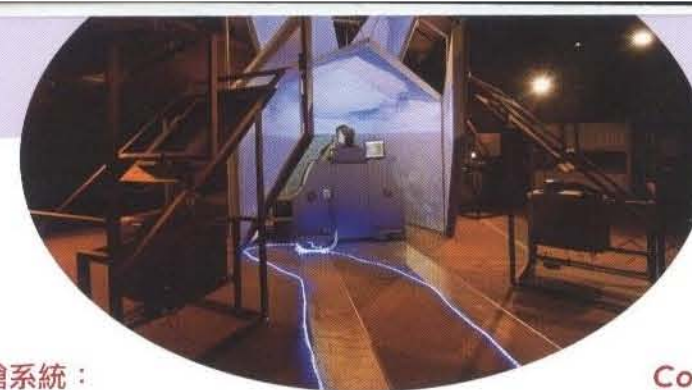
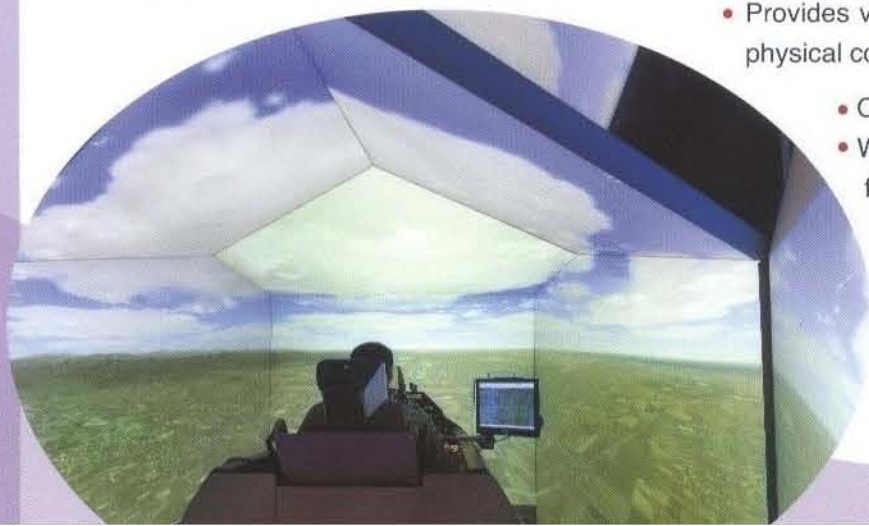
- Provides the concentrated management of mission files and tactical threat data.
- Commercial off-the-shelf PC.

Network system

- The Multi-ship training can be executed by any combination of the trainers in the site.
- Using MAK Technologies' RTI version 3.1.2-HLA1.3
- FOM Mapper for MTC-fed v 1.5.0
- Using HP pro-curve switch HUB.

Mission Support system

- Provides mission scenario generator, tactical entity editor and database management system to support the mission training.
- Getting the mission file data from DTC reader.



F-16

TRAINING SIMULATOR SYSTEM RESEARCH DIVISION TRAINING SIMULATOR SYSTEM RESEARCH DIVISION

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視效系統：

- 基礎模擬機採用3部高解析度DLP投影器，以正投影方式成像於半徑3米、視角 $180^{\circ} \times 60^{\circ}$ 之弧形銀幕。
- 全功能模擬機採用8部高解析度DLP投影器，以背投影方式成像於8片蜂巢式銀幕，具有 360° 全空域視角。
- 系統影像解析度為1400點 X 1050條線。
- 採用Presagis之Lyra影像產生器，具有影像變形處理與多頻道影像接合平滑化功能；其視效資料庫採用衛星照片或空照圖，以材質貼圖方式整合DTM數位高程資料可產生高解析度現地重現之動態視覺影像。
- 具白晝、夜晚、星辰、太陽的模式設定。
- 具備反鋸齒 (Anti-Aliasing) 功能。
- 具能見度改變及設定。
- 影像解析度：可達1400X1050條線以上。
- 影像更新頻率：達60Hz。
- POLYGON容量：每channel可處理16,000個POLYGON
- 全台視效資料庫採用高解析度(2.5m)衛星照片圖資。
- 機場鄰近地區採用50cm航照貼圖。

Visual System

- ULT utilizes three high resolution DLP projectors, forward projection, to produce the image on a curved screen with $180^{\circ} \times 60^{\circ}$ view angle.
- FMT utilizes eight high resolution DLP projectors, backward projection, to produce the 360° image on a DART with 8 screens.
- The system resolution is 1400 x 1050 pixels.
- The image Generator uses Presagis Lyra rendering engine. It provides Dynamic Distortion Correction function for projection on screen. It also incorporates Edge Blending for multiple projector application. It uses full color, high resolution Geo-specific Aerial Photography and Satellite Imagery, to produce high fidelity scenes.
- Day/Dawn/Dusk/Night or continuous Time of Day operations.
- With Anti-Aliasing function.
- Adjustable visibility.
- Resolution : Up to 1400 x 1050 pixels (@60Hz).
- Update rate: ≥ 60 Hz
- 16,000 polygons per channel.
- The visual database covered entire Taiwan area, utilizes high resolution (2.5m) satellite imagery to enhance the realistic vision.
- All the airports utilize the aerial photography which resolution is as high as 50cm.



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