

## 飛航管制塔台模擬器

### Air Traffic Control Simulator

#### 控制艙台系統

- 教官設計訓練課目及監控學員模訓成果
- 手動操控空中目標物行為
- 具2部GCA教官操控電腦、4個螢幕之GCA機櫃教官及網路介面
- 提供完整GCA席位操作平台
- 彩色雷射印表機

#### Operating Station System

- Training courses design and monitoring operator training
- Manual control aircraft behavior in the air
- GCA Instructor Cabinet with 2 Instructor controller and 4 monitors
- Complete GCA positional operation platform
- Color laser printer

### III 型 簡易型GCA導引模擬器

#### Partial-Function Ground Controlled Approach Simulator

#### 主要特色

##### Main Features

僅具基本航管訓練之單席位GCA導引模擬器  
Only one positional GCA simulator with basic ATC training

控制艙台系統		
功能如同型II 但僅具1席學員之操作平台		
主計算機分系統	雷達顯示系統	音效通訊分系統
功能如同型II	同型II功能 但缺管制人員交接功能	同功能如同型II 具簡單航管詞庫

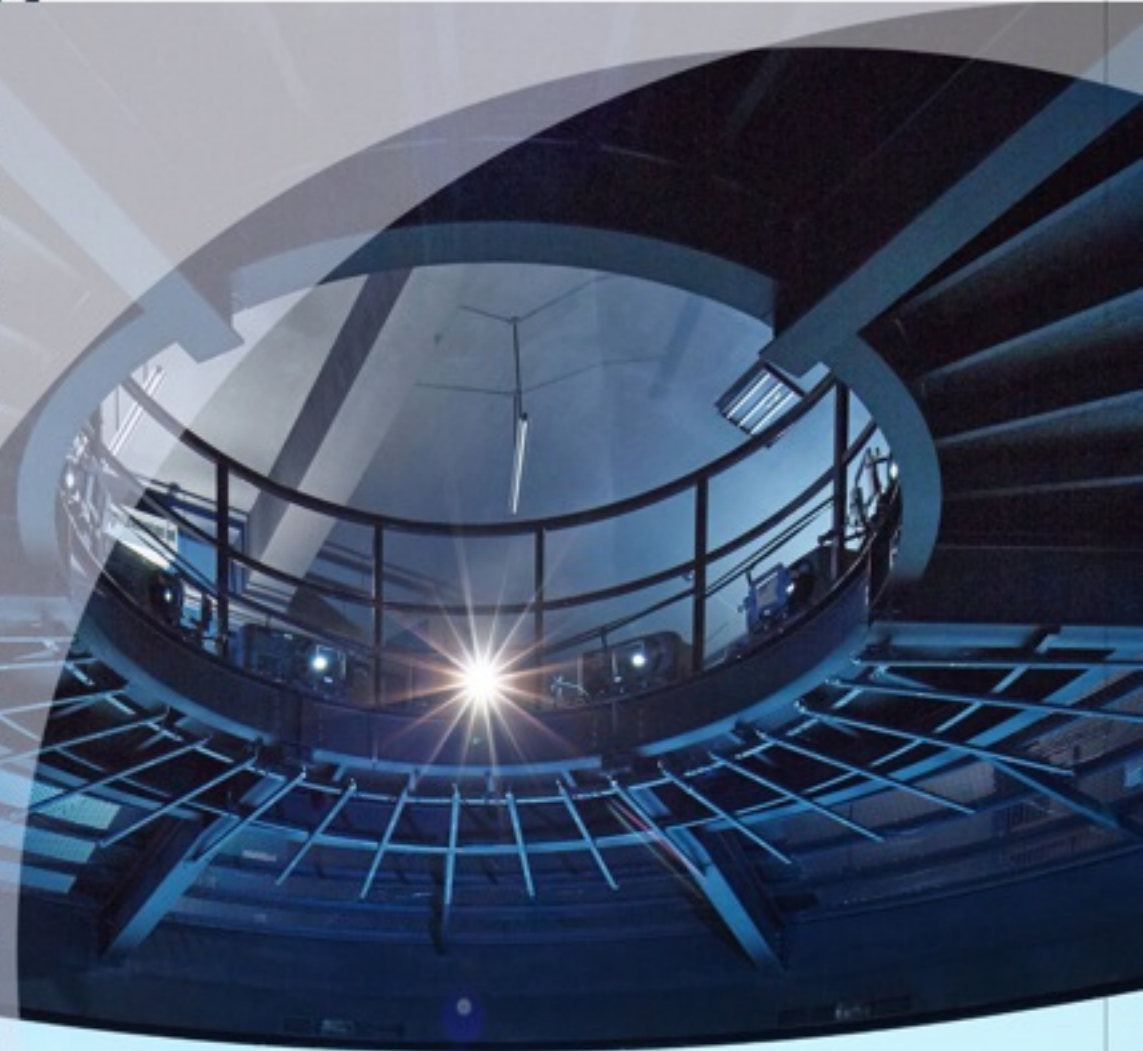
Operating Station System		
Function same as Type II only 1 GCA positional operation platform		
HOST Computer System	Radar Display System	Voice Communication System
Same as Type II	Same as Type II but lack of hand on/off between operators	Same as Type II only with basic ATC database

#### 系列簡介

飛航管制模擬器訓練系統係一高逼真度、易操作及低維護成本之模擬機系統，分為三種系統架構。民國98年至102年間中山科學研究院接受空軍委託，依不同功能需求，成功地完成建置一套「飛航管制塔台模擬器」、一套「全功能GCA導引模擬器」及十四套「簡易型GCA導引模擬器」。

#### Series General Description

The Air Traffic Control (ATC) simulation training system comprises three simulator architectures. It is a high fidelity and easy-to-operate simulation system that requires minimum maintenance. Since 2009, CSIST/ASRD developed the system under the request from the ROCAF, and It successfully delivered a Air Traffic Control Tower Simulator, a Full-Function Ground Controlled Approach Simulator on Nov 2013 and 14 Partial-Function Ground Controlled Approach Simulators on Dec 2011.



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# 飛航管制模擬器系列產品

## Air Traffic Control Simulator Series



### I 型 飛航管制塔台模擬器 Air Traffic Control Tower Simulator

#### 主要特色

##### Main Features

- 提供管制員儀器飛航計畫及目視飛航計畫管制程序訓練
- 提供管制員飛安及緊急狀況處理程序訓練
- 提供與全功能GCA導引模擬器連網演訓功能
- 提供機場管制席、地面管制席、資料席與督導席等席位
- 提供360度全塔瞭望視窗，模擬場景逼真
- 提供GCA雷達操控顯示
- 提供數位語音交換系統
- 提供手動及語音辨識航管指令導引飛行
- 提供機場燈光控制
- 提供天氣即時顯示系統
- 提供虛擬望遠鏡定位系統
- 全系統採用模組化設計，提供良好的修改擴充及構型更新能量
- Instrument flight procedure and Visual approach procedure training
- Emergency situation operation procedure training
- Optional Integrated with Full-Function Ground Controlled Approach Simulator
- Provide airport position、ground position、data information position and supervisor position
- Fully 360° Field-Of-View、high-fidelity simulation environment
- Ground Controlled Approach (GCA) radar display operation
- Digital voice communication system
- Manual / voice identification navigating aircraft
- Airport lighting control system
- Real-time weather display
- Virtual telescope positional system
- Modularized design, easy for modification and upgrade in the future

#### 視效系統

##### Visual System

- 12部高效能影像產生器與一台視效主控電腦
- 12部單槍液晶影像投射器
- 台灣區資料庫，採用40米高程資料疊合2.5公尺高解析度之衛星照片貼圖
- 圓柱形螢幕
  - ▶ 360° 之全景塔台瞭望場景
  - ▶ 正投影半徑：6m
  - ▶ 材質：鋁合金
  - ▶ 背面支撐架：金屬結構
  - ▶ 影像解析度為1400 x 1050條線
  - ▶ 影像更新頻率為60 HZ
  - ▶ 影像亮度為3000 ANSI
  - ▶ 虛擬望遠鏡定位系統
- 兩組6個自由度超音波定位裝置
  - ▶ 2部視景產生器
  - ▶ 解析度：1024 x 768、60Hz
  - ▶ 視野：30°、1.8 arc-min/pixel
  - ▶ 亮度：40流明以上
- 12 image generators with one visual controller
- 12 DLP Projectors
- Taiwan visual database, using satellite images in 2.5 m high resolution
- Cylinder screen
  - ▶ 360° Field-Of-View from the tower
  - ▶ Front Projection with radius 6m
  - ▶ Aluminum compound metal material screen
  - ▶ Metal construction
  - ▶ 1400 x 1050 pixels image resolution
  - ▶ 60 Hz visual refresh rate
  - ▶ 3000 ANSI brightness
  - ▶ Virtual telescope positional system
- 2 image generators
  - ▶ 1024 x 768 resolution、60Hz
  - ▶ FOV：30°、1.8 arc-min/pixel
  - ▶ 40 ANSI brightness at least

#### 輸出入介面系統

##### Input/Output (IO) Interface System

- 機場燈光控制系統
- 攔機設施控制系統
- 失事警鈴控制系統
- 電子時鐘、輕便航行管制燈系統
- 兩組6個自由度超音波定位裝置
- Airport lighting control system
- Bar machine facility control system
- Crash alarm control systems
- Electronic clock、portable navigation lights control system

#### 主計算機分系統

##### HOST Computer System

- 依各機場資訊及航管程序計算各種空中及地面智慧型目標物的運動行為
- 各項空中與地面緊急狀況之處置
- Calculating the behavior of air/ground targets according to airport traffic information and ATC procedure
- Handling all the air and ground emergency conditions

#### 雷達顯示系統

##### Radar Display System

- 模擬13個機場雷達資訊
- 兩個GCA電腦：一為學員使用，一部教官用
- Simulated 13 airport radar displays
- 2 GCA radar computer for operator and instructor each

#### 音效通訊分系統

##### Voice Communication System

- 360度場景音效模擬
- 警鈴與失事等特殊音效
- 數位語音通信系統模擬進場、離場航管程序對話
- 語音辨識導引航機
- 採用真實通訊件
- 提供教官與塔台學員席等6席操作
- 3600 sound effect of air/ground targets
- Special sound effect for alarm and accident condition
- Digital voice communication for departure/approach ATC procedure, voice recognition of flight navigation by
- ATC voice database
- Real communication equipments
- For Instructor and 5 tower positions

#### 控制艙台系統

##### Operating Station System

- 教官訓練課目設計及監控學員模訓成果
- 手動操控空中/地面目標物行為
- 天氣即時顯示系統
- 雙螢幕督導席位機櫃
- 具13組螢幕之塔台席位機櫃
- 具4組螢幕、教官操控系統機櫃及網路介面
- 彩色雷色印表機
- Training course design and monitoring operator training
- Manual control air/ground moving target
- Real-time weather information display
- Supervisor positional cabinet with 2 monitors
- Tower positional cabinet with 13 monitors
- Tower Instructor Cabinet with 4 monitors
- Color laser printer

### II 型 全功能GCA導引模擬器

#### Full-Function Ground Controlled Approach Simulator

#### 主要特色

##### Main Features

- 提供管制員GCA進場、離場與空中交通管制程序訓練
- 提供管制員GCA緊急狀況處理程序訓練
- 提供與飛航管制塔台模擬器連網演訓功能
- 提供航線席、五邊席、協調席、督導席等席位
- 提供GCA雷達操控顯示
- 提供數位語音交換系統
- 提供手動及語音辨識航管指令導引飛行
- GCA approach、departure procedures and air traffic management control training
- GCA emergency situation operation procedure training
- Optional Integrated with Air Traffic Control Tower Simulator
- Support airline position、final position、coordination position and supervisor position
- Simulated AN/MPN-14K(SS)GCA radar display and operation
- Digital voice communication system
- Manual / voice identification navigating aircraft

#### 輸出入介面系統

##### Input/Output (IO) Interface System

- 3D繪圖式雷達控制系統
- 3D graphical Radar control system

#### 主計算機分系統

##### HOST Computer System

- 依各機場資訊及航管程序計算各種空中運動行為
- 各項空中緊急狀況之處置
- Calculating the behavior of air targets according to ATC procedure.
- Handling emergency conditions in the air.

#### 雷達顯示系統

##### Radar Display System

- 模擬13個機場資訊之雷達操控
- ASR、SSR、PAR雷達操控顯示
- 各種雷達模式切換
- 掃描有效距離、垂直及水平掃描範圍
- 目標機所有資訊操控顯示
- 雷達指令熱鍵
- 管制人員交接操控
- Simulated 13 airport radar display
- ASR、SSR、PAR radar display
- Switch radar mode
- Scanning valid distance、horizontal and vertical range
- Target symbol and related information
- Radar keyboard hotkey
- Hand on/off between operators

#### 音效通訊分系統

##### Voice Communication System

- 警鈴與失事等特殊音效
- 數位語音通信系統模擬航管程序對話
- 語音辨識導引航機
- 採用真實通訊件
- Special sound effect for alarm and accident condition
- Digital voice communication for ATC operational process.
- Voice recognition of flight navigation
- Real communication equipments
- For instructor and 4 GCA operators