

JAA Administrative & Guidance Material
Section Six: Synthetic Training Devices (STD/FSTD), Part Three: Temporary Guidance Leaflet

LEAFLET No 13: **OLD VISUAL SYSTEMS AND NEW VISUAL SCENES FOR FSTDs**

NOTE: The material contained in this Leaflet has been issued in accordance with Chapter 9 of the Administrative & Guidance Material Section Six: Synthetic Training Devices (STD), Part Two: Procedures (JAR-FSTD). The purpose of this leaflet is to provide guidance on old visual systems and new visual scenes for FSTDs.

1. INTRODUCTION

JAR-STD 1A simulator requirements for visual systems are 3 fully simulated airport scenes (so called “real” scenes). Older visual systems are beginning to experience the limitations of these visual systems in this respect, that they cannot simulate the number of polygons and light points necessary to fully simulate the current large airports expanding to sometimes 5 or more runways, complex taxi routings etc. Since these large airports do have real training value to airlines they are requested by them to be modelled so they can be used for flight training. The simulator operator therefore models these scenes up to the limitations of the visual system, but they cannot fully comply with all JAR-STD 1A requirements for these scenes to qualify them as “real”.

2. PRESENT SITUATION

Due to the advances in computer and display techniques, modern visual systems can simulate complex real airports in full detail. All available runways and lighting systems can be simulated including environmental lights in the airport vicinity. Older visual systems are less capable. They are limited in the number of light points, polygons and texture they can display. At the time of initial certification in the 1980's and 1990's these systems were compliant with the regulations of that time. The real scenes of those days were less complex modelled due to system capabilities. These older, grandfathered, visual systems are not able to simulate the modern large airport scenes of today with sometimes 5 runways or more, complex taxi routings etc. Customers however, still want to use those simulators to perform their flight training and want to use these complex visual scenes because it happens to be their home base or major destination and request simulator operators to simulate these scenes. The simulator operator therefore models these scenes up to the limitations of the system, but is unable to fully comply with the current JAR-STD 1A requirements for visual scenes to qualify them as “real”.

Of course, this issue is not restricted to the geographical area of JAA and/or EASA.

The FAA, in 2003, addressed this issue in their document “Flight Simulation Device Qualification Guidance” in the part “Flight Simulator Airport Simulation Requirements”.

For example, in note 2, they point out the systems to be known to have limitations when displaying runway details are systems which lead up to the following in the series:

- Flight Safety VITAL IV (formerly McDonnell Douglas VITAL series)
- Rediffusion SP3 and SP3T
- Link-Miles Image II
- Link NVS and DNVS
- Novoview 2500 and 6000

The typical limitation of these previously described older systems is the number of runways that can be simulated and the level of detail. Alternatively, smaller airports can be fully simulated but are sometimes less valuable for training purposes. The simulator operator can then decide:

JAA Administrative & Guidance Material

Section Six: Synthetic Training Devices (STD/FSTD), Part Three: Temporary Guidance Leaflet

- To simulate all airport content (runways) but in less detail, by (drastically) reducing the number of light points, textures and polygons used. This can result in less taxiways, no environmental lights etc.
- To simulate only part of the airport, but in full detail. This could result in simulating fewer runways with their associated taxiways and light points.
- To simulate only less complex visual scenes, which will fulfil the JAR-STD 1A requirements, but are hardly ever used by the simulator users, because they do not simulate their operational destinations.

Whatever decision is made, either the resulting requested simulated visual scene will not be fully matching reality and so the requirement for three fully simulated airports will not be met according to the modern standards, or these complex scenes will not be modelled at all.

3. PRACTICAL

In order to prevent the operator from designing and maintaining airports he does not need for the simulator users, but only to satisfy the authorities when they (re-) qualify the simulator, it shall be allowed to use models which do satisfy the requirements in parts of their model and lack them in other areas. For example, when an airport has 5 runways it should be allowed to simulate only 4 of them. The operator shall, when agreed by the authority, state this limitation in a rationale, which will form part of the approved MQTG of the simulator. Of course, the user shall also be aware of this limitation and agree to this in writing and also state this in their application for the user approval.

Previously mentioned older visual systems or other visual systems manufactured before 1994 shall therefore be allowed to display only part of the JAR-STD 1A required visual details for the scenes offered for evaluation by the authority. The detail to be provided shall be correct within reasonable limits, up to the decision of the certifying authority.

For these specific scenes, the requirements to have at least one dedicated taxi route from the gate to a specific runway (single designated route) that can be followed using the appropriate airfield charts, taxi lights and taxi signs (also under low visibility conditions) remain valid. Also, the prevention of runway incursions (safety) is paramount, therefore stop bars shall be correctly modelled and switchable on/off. If no switchable feature exists, then they shall be modelled "on" where the instructor will grant clearance to cross.

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