

Virtual Vermont Air National Guard Airfield for F-16C Simulation Training



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View from one of the 4 cockpit simulators at the new F-16 Mission Training Center (MTC), located at the ANG base at the Burlington International Airport, Burlington, VT. The VRSG multi-channel synchronized view is rendering the VT virtual terrain built by MetaVR. Photo courtesy of SSgt. Dan DiPietro, 158 FW, Vermont Air National Guard.

The Vermont Air National Guard (ANG) uses over 90 MetaVR™ Virtual Reality Scene Generator™ (VRSG™) licenses in their four-ship simulators at the F-16 Mission Training Center (MTC) located at the VT Air National Guard (ANG) facilities at the Burlington International Airport, Burlington, VT.

As part of the delivery MetaVR built 3D terrain of the ANG base facilities and airfield at the Burlington International Airport; the terrain is used in F-16C simulation-based training.

About the database

The 6-geocell Metadesic-formatted 3D terrain, is comprised of 47 GB of data of Vermont and upstate New York, with 60-meter post spacing, 1-meter imagery with a 0.5-meter imagery inset of the Vermont Air National Guard airfield and base facilities. The virtual terrain also contains the commercial air terminal within Burlington International Airport.



Image on the cover: Real-time VRSG renderings of an F-16C entity approaching the runway of the virtual VT ANG airfield, and scenes on the virtual terrain.



To geolocate many of the elements on the airfield terrain to match the ones on the actual airfield, an interactive panoramic view was created from photos taken at the site as a reference, using photo-stitching software. This panoramic view was then mapped onto a 3D cylindrical model, resulting in a 360-degree virtual view, or model (shown below) that could be examined as a reference for placing models on the terrain.





MetaVR Terrain Tools for ESRI ArcGIS was used to create the terrain mesh, which includes a high resolution representation of the Lake Champlain coastline. At runtime, VRSG Metadesic generates multi-textured, animated, normal-mapped water surfaces in the cutout regions identified as water. The terrain tiles seamlessly match with the water tiles generated by VRSG.



For simulating night scenes, the terrain has over 250,000 cultural light points of the Greater Burlington area. VRSG features an ephemeris model to predict moon position and phase, and populates the sky with a 40,000 light-point star field. The cultural lights, moon disk, and star field enable trainees in the cockpit simulator to fly the area at night with accurate celestial references, and provide realistic stimulation of actual night vision goggles.



About the models

The virtual terrain contains approximately 45 high-resolution, geolocated models of hangars, offices, storage facilities, and other buildings in the area, a high-resolution F-16C aircraft model, and the runway. In addition, the virtual terrain includes the commercial air terminal, and approximately 40 other models of elements at Burlington International Airport, such as trees, geospecific runway lights, street lights, and signs.

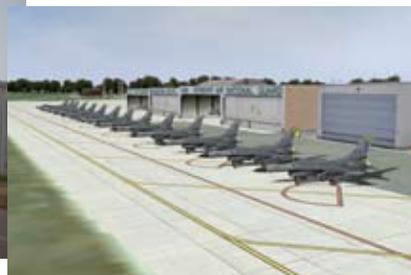
The delivery to the Vermont Air National Guard included a collection of 19 photo-specific F-16C models, each with a unique call sign. Each model is comprised of 12,085 polygons and 9 texture maps.



All site-specific models were created with textures derived from high-resolution photographs taken at the site at ground level with a 10-megapixel camera. The models were built with industry standard 3D modeling tools such as Autodesk Maya and 3ds Max. Content from MetaVR's 3D model libraries is also used on the terrain.

Actual and simulated views of the Vermont Air National Guard's airfield

Below is a series of images of the Vermont Air National Guard airfield and base facilities. For each pair of images, you can compare actual photographs of the area on the left side with the VRSG screen captures of the simulated view on the right. The models of buildings and other structures are photorealistic; the models were created from high-resolution photographs of the air base and the larger Burlington International Airport area.



The MetaVR Vermont database is available free of charge to all US Government agencies and contractors (for official use only) and requires VRSG version 5.7 or higher.

For more product information, pricing, and ordering, see MetaVR's web site at www.metavr.com or contact sales@metavr.com.

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