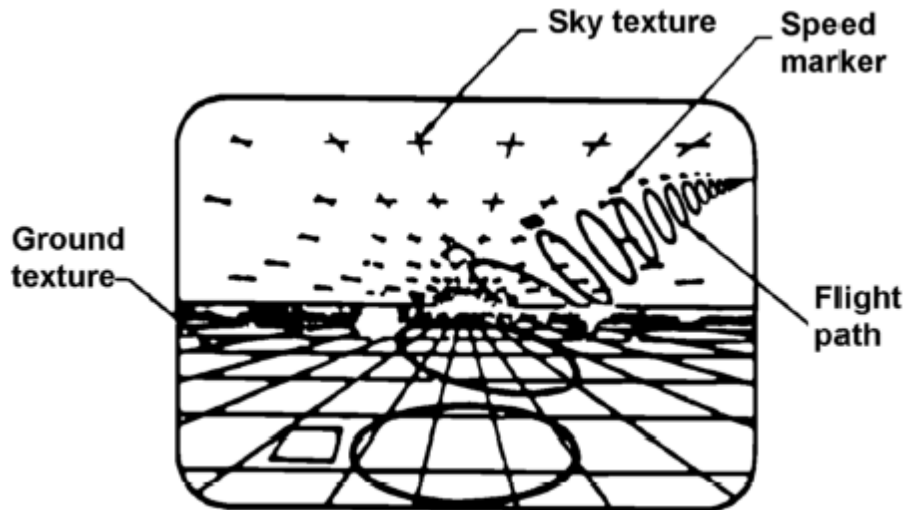## Analysis of Theunissen

Jed Margolin

Figure 4. Spatial display format concept proposed during the U.S. Joint Army-Navy Aircraft Instrumentation Research (JANAIR) program in 1963 (from Theunissen and Etherington, 2003).

{Company} has provided this figure without context. It has not provided the Theunissen and Etherington reference. It has not provided the JANAIR document that the figure is alleged to have come from.

It shows circles depicting a flight path over a flat grid. A flat grid. If it had used the Digital Elevation Database JANAIR made a poor choice of terrain to showcase their accomplishment. It is not known what is meant by "Ground Texture" any more than it is known what "Sky Texture" is or how these "Textures" were created. There is no Digital Sky Database for the Sky Texture to come from.

The following is another example of a flat grid in a 3D Universe with Ground Texture and Sky Texture.

It is from the prototype coinop game TomCat by Atari Games that was not produced.

The points in the sky are "Sky Texture."

The runway on the ground is "Ground Texture."

It is not Synthetic Vision because it does not use the Digital Elevation Database. It also does not use GPS or any other way of determining the User's location or orientation. It was designed in the middle 1980s.

Unless {Company} is forthcoming about producing the prior art it alleges to exist, it must be assumed that the alleged JANAIR reference is in the same league as TomCat.

Neither one is prior art.

An example of an inexpensive realtime 3D system of the late 1980s is the coinop (arcade) game Hard Drivin' by Atari Games.

While it would be considered crude by today's standards, it was remarkable in 1988 when it was produced. The cost to the arcade operator was around $7,500 and included the cabinet, the seat (on a novel swivel that reduced the cabinet's footprint), the monitor, and force feedback steering where the steering wheel was mounted on a ¼ HP motor controlled by a 400 Watt amplifier.

The force feedback was controlled by the Car Model, which mathematically describes the physics of how the parts of the car (engine, transmission, springs, shock absorbers, tires, etc.) react to each other, to the road, and to the driver's inputs.

The Car Model was developed by Software Engineer Max Behensky and Consultant Doug Milliken. The pioneer in the field of automotive simulation (in the 1950s) was William Milliken of Milliken Research. His son, Doug, continued his father's work. Doug is probably the world's leading expert in car modeling. Doug and his father wrote the book on car modeling. And I mean that literally. Go to Amazon.com and check out

"Race Car Vehicle Dynamics (R146)" by William F. Milliken, Douglas L. Milliken.
http://www.amazon.com/Race-Vehicle-Dynamics-book-workbook/dp/0768001218/ref=sr_1_1?ie=UTF8&s=books&qid=1257381219&sr=8-1

Here is a link to a video of Hard Drivin': http://www.jmargolin.com/tomcat/rd1990_track1.wmv . The video is from Race Drivin', a 1990 upgrade to Hard Drivin' which added additional tracks and a PC board containing a faster DSP to improve the Car Model. Race Drivin' Track 1 is the original Hard Drivin' track.

I was the Project Engineer for the game. I designed most of the hardware and developed the core 3D graphics. This is the 3D graphics taught in the '073 patent. If the game had used a digital elevation database for the terrain instead of making it up, it might have been prior art for '073.

It is not anticipatory prior art for '073.

Jed Margolin
Virginia City Highlands, NV
November 8, 2009

Update - As of March 2011:

{Company} never provided the JANAIR reference and I was not able to find it.

{Company} never provided or even specified which Theunissen and Etherington paper referred to the JAINAR program and I have not found a Theunissen and Etherington paper that referred to the JANAIR program.

A picture (Like the cited Figure 4) is worth a thousand words, especially when it is supposed to be prior art. You can just make up whatever words you want.

.end