Space War

The type of game to be described is a space war game based on a game I saw implemented on the University of Michigan Physics Department computer system several years ago. The idea is to build it for a reasonable cost.

Each player has his/her own display. On it the player sees the projection of a realistic 3-dimensional star field as would actually be seen from a ship in space. Each player has full control of his ship (roll, pitch, yaw, and accelerate); the screen display changes as the ship undergoes these motions. For example, rolling the ship clockwise causes the screen display to roll counterclockwise. The object of the game is to destroy the other ship. Ship energy is finite and must be carefully managed to avoid running out of energy and losing maneuvering power and photon torpedoes.

To add to the realism of the game I would isolate the players from each other and from the environment. If possible, this should be in the form of a mockup of a space fighter cockpit. The cockpit should be essentially closed with some cockpit illumination (red?) to prevent eyestrain. This focuses the player's attention on the screen which is the main source of action. The cockpit should be accustically isolated. Sound effects should be of high quality. (And how about having the ship's engine sound come from a separate speaker mounted behind the player?) Player controls should be patterned so that the player can quickly learn to associate them with their result. Although a player control can be devised which performs all control functions and is operated with one hand, requiring both hands may help integrate the player into the ship.

Other Comments

The simulator may be operated alone with a computer generated enemy. The preferred mode would be two human players with the simulators linked together. It would theoretically be possible to link several together allowing dogfights between "patrols".

(This would require ship-to-ship communications) The link could even be through a telephone interface.

The game should have two operating modes:
Where the enemy is distant the display concentrates on the star field;
Where the enemy is near, the display concentrates on the image of
the enemy ship with enough stars to enable the player to guage motion.

(For this mode a stroke display would be a good choice.)

Games other than space war could be simulated although the programming may be more difficult. Examples: Tanks (running amok through the countryside); jetfighters; submarines; surface ships; etc. Ultimately it is expected that computing power will be inexpensive enough to link large numbers of vehicles of mixed types.

A speech synthesizer could be used to give the player status and battle damage reports. ("Captain, sensors report an unidentified vessel approaching from Sector 4.")

A closed cockpit may not be feasible in a typical arcade environment.

Computing - The number crunching required for a game of this type is formidable. The new generation of 16 bit mp's will be useful. Several mp's could be used in parallel, especially if 8 bit mp's are used.

Possibilities for Displays

- 1. Raster Scan 256*256 (minimum) using the memory scanning technique. Although this technique is currently expensive, this will change. According to a recent article in <u>Electronics</u> (a copy of which is attached) by 1982 a 64K dynamic memory is expected to cost less than \$10. This technique may be used with a standard receiver or monitor. The method is self-refreshing.
- 2. X,Y using a small (3") electrostatically deflected CRT with an optical projection system to give a screen size of approximately 20" * 20". The brightness may be acceptable if the display is used in a semidark cockpit. The resolution is determined by the D/A converter and can easily be 10 or 12 bits. This method can be used as a stroke display. Not inherently self-refreshing. Not readily used as a consumer product because of cost.
- 3. X,Y using a magnetically deflected CRT. Requires a special yoke (low inductance and therefore high current) for acceptable writing speed. This can be offset somewhat by decreasing the acceleration not voltage since the display will require maximum brightness if the CRT is to be viewed under low ambient light as in a semidark cockpit. The resolution is likely to be limited by deflection settling time or by hysteresis due to nonlinear magnetic effects in the deflection system. May be used as a stroke display. Not readily used as a consumer product because of cost.