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| Elite External Visual | | |
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1 Elite External Visual System

1.1 OVERVIEW

Up to six visual systems („channels“) can be connected to Elite and display different camera views of the outside world. The cameras can be positioned anywhere relative to the aircraft and rotated in any angle. Moreover the viewing angles (zoom) can be adjusted to fit any rectangular display device.

The physical connection is a network cable. Every visual regularly broadcasts a packet containing connection information to initiate the communication. Any Elite Prop in the network can read this broadcast and ‘capture’ the sending visual system. There is no need to configure IP-addresses in Elite nor in the visual.

Once the channel parameters are set and stored, a connected visual does not require further user interaction. If a configured visual channel is already running when Elite starts, it is automatically connected to the simulation. If the visual is started during a running simulation the connection button on the visual manager page must be pressed to connect and activate the visual. When Elite shuts down the visuals return to a standby mode. A button on the visual manager page can be used to terminate all visual systems including the visual computers.

Access to the visual manager page can be protected with a password. To choose a new password press the ‚Set Password‘ button on the visual manager page. Initially no password is set. The password mechanism provides protection from inadvertently configuration changes, but no security. The password is stored without encryption in the file ‚VisualTCPIP.INI‘ in the pref-folder and can be changed or deleted there as well.

1.2 INSTALLATION

1.2.1 Setting up the network

This chapter describes how to install a small network dedicated to the visual systems. If the computers already are in a network, ‘see’ each other and the TCP/IP protocol is installed, this chapter can be skipped.

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Required hardware:

standard situation:

- Network cards for every visual generator and the elite computer.
- Network Hub
- Network cables to connect every machine to the hub.

direct connection situation (for one channel only):

- one cross-over network cable connecting elite computer and visual generator

Installation steps:

- Install the network hardware and physically connect the network.
- Install the needed network hardware drivers.
- Add NetBEUI and TCP/IP protocols.
- Configure the TCP/IP protocol; specify a unique IP address for each computer in the network.
- Disable DNS service and WINS service; verify there are no gateway IP addresses specified.
- Enable MS File-Sharing and share a folder on each computer.
- Check that every computer is „seen“ by every other computer in the network.

1.2.2 Read Me

```

=====
ELITE Visual Engine (v1.3) for Windows                      March 2001
Read me first!                                           Initiative Computing AG, Switzerland
=====

```

Dear Customer,

Thank you for purchasing this ELITE add-on.

This file describes the installation steps for ELITE Prop/PCATD in combination with the ELITE Visual Engine. Please take time to read it!

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IF YOU WISH TO PRINT THIS DOCUMENT, INSERT THE MAIN DISKETTE INTO YOUR DISK DRIVE AND OPEN THE FILE "README.TXT" WITH A TEXT EDITOR OR WORDPROCESSOR, AS YOU WOULD A STANDARD TEXT FILE, AND USE THE PRINT COMMAND.

An ELITE external Visual setup involves a computer that runs the ELITE Prop or ELITE PCATD (the 'ELITE system') and one or more computers running ELITE Visual Engine (the 'Visual system').

Required media:

- * CD1: ELITE v.6.1 CD
- * FD1: ELITE v.6.1 Installation Disk
- * PA1: ELITE Patch to Version 6.1.1

- * FD2: ELITE External Visual Add-on Disk (FD2PROP/FD2PCATD)
- * FD3CHX: ELITE Visual Engine Installation Disk Channel X (one for each channel)

- * CD2DB: Database Add-on CD (e.g. ELITE GenView Europe)
- * FD4DB: Database Add-on Disk ELITE v.6.1
- * FD5DB: Database Add-on Disk Visual (one for all channels)

A) Installing software on the ELITE system

A1) Standard Elite Installation

Installing automatically from Windows 95/98/NT:

1. Before installing the Software, connect the Universal Control Interface (UCI), Control Yoke and other purchased Hardware to the appropriate connectors. Insure that the UCI's green light is on and the yellow light "flickers". See also Hardware Installation Manual for connections.
2. Start Windows.
3. Insert the ELITE v.6.1 Installation Disk (FD1) into your disk drive (FIRST).
4. Insert ELITE v.6.1 CD (CD1) (SECOND).
5. The program should auto launch to the Main program installation.
(if the DEMO program launches, then the diskette was not recognized in the floppy drive and you should manually start the SETUP.EXE on the diskette.)
6. Follow the onscreen installation instructions.

7. Patch 6.1.1 (PA1) installation: The patch for 6.1.1 can be downloaded from the web site (www.flyelite.ch/download/download.html) and is also included on the US GenView Database CD.

A2) Elite External Visual Add-on

1. Insert the External Visual Add-on Disk (FD2) into your disk drive.
2. Start SETUP.EXE on the diskette.
3. Follow the onscreen installation instructions.

A3) Database Addon

1. Insert the Database Add-on Disk ELITE v.6.1 (FD4DB) into your disk drive (FIRST).

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2. Insert Database Add-on CD (CD2DB) (SECOND).
3. The program should auto launch to the Main program installation.
(if the DEMO program launches, then the diskette was not recognized in the floppy drive and you should manually start the SETUP.EXE on the diskette.)
4. Follow the onscreen installation instructions.

B) Installing Software on the Visual systems 1-6

B1) ELITE Visual Engine

1. Insert the ELITE Visual Engine Installation Disk (FD3CH1) Channel 1 into your disk drive.
2. Start SETUP.EXE on the diskette.
3. Follow the onscreen installation instructions.
4. If you have more than one channel repeat steps 1 through 3 for each additional channel.

B2) Database Add-on

1. Insert the Database Add-on Disk Visual (FD5DB) into your disk drive (FIRST).
2. Insert Database Add-on CD (CD2DB) (SECOND).
3. The program should auto launch to the Main program installation.
(if the DEMO program launches, then the diskette was not recognized in the floppy drive and you should manually start the SETUP.EXE on the diskette.)
4. Follow the onscreen installation instructions.

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1.2.3 Installation components

On the Elite computer

- Perform a standard Elite installation and test it.
- Insert the Installation floppy disc 'External Visual Prop'. Run 'a:/setup.exe'. Follow the instruction on the screen.

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- The installer adds the following files to your Elite installation:
 - Vis4.edl in (Elite)/plugins/all
 - El40.edl in (Elite)/plugins/all
 - El4.edl in (Elite)/plugins/all
 - VisChan.mod in (Elite)/images
 - Visual.mod in (Elite)/images
 - Updated Prop.exe or PropPCATD.exe in (Elite)/

On each Visual computer

- Verify the OpenGL-capabilities of the system; install current drivers if necessary.
- Insert the Installation floppy disc ‚External Visual Vis‘ and the CD ‚External Visual System‘. The installer should start automatically, if it does not, please run ‚a:/setup.exe‘. Follow the instructions on the screen.
- The System installer installs the following core files:
 - Visual.exe in (Visual)/bin
 - Hwsettings.ini in (visual)/resources
 - CommJobs.ini in (Visual)/resources
 - SceneSelect.ini in (Visual)/resources
- For every channel a different installation disc is needed, because a different communications file (EliteVisual)/Resources /CommJobs.ini has to be created:

Sample content:

```
ID = 101
Num = 1
Type = Elite
Com = EthernetServer
Port = 13101
```

Every channel has a unique value of ID and Port in the network.

Databases:

Every database has three components:

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- NAV Database
- Visual Database
- .VIS file

The Elite system needs the **NAV** Database and the **.VIS** file, the visual system needs the **visual** database and also the **.VIS** file.

Therefore the same database CD is used on both the elite system and the visual system, but with a different installer disk that installs only the required datasets.

First time startup and configuration:

- Start all visual generators
- Start Elite.
- Go to the visual manager page (Ctrl-X)
- For every available visual system in the network this page should contain a window displaying properties of that visual. Click the ‚CONNECTION‘ button in each window to connect and activate the visual.
See chapter □ on how to adjust parameters for the visual system.
- Elite stores the communication settings in a configuration file („(elite)/pref/VisualTCPIP.ini“) when it terminates.

Standard startup

- Start all visual generators
- Start Elite.

1.2.4 Installcreator selections

Elite Prop/PCATD Installation Disk (FD1)

The Elite installation must not include integrated GenView. Exclude the GenView-Program flag in the creator – the GenView manual can be included, because for the most part the content also applies to the external visual.

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Other than that any standard Elite installation can be upgraded to drive the external visual system. The Nav-Database selection is limited to those areas that are available in the visual system.

Elite Prop/PCATD Patch 6.1.1 (PA1)

The Visual Addon requires Elite Prop or PCATD Version 6.1.1. The patch is included on the US Database CD or it can be downloaded from www.flyelite.ch/download/download.html.

External Visual Addon Installation Disc (FD2PROP)/(FD2PCATD)

Installs the communication plugins and the channel license file in an ELITE Prop or PCATD installation.

Because the Elite executable is updated as well and space on the floppy disc is very limited choose a Prop or PCATD floppy disc depending on the target installation.

Options:

- **Prop or PCATD:** Updates the main executable
- **Visual Add-ons:** the communication edls
- **Channel 1:** supports two visual channel
- **Channel 2:** supports two visual channels
- **Channel 3:** supports three visual channels
- **Channel 4:** supports four visual channels
- **Channel 5:** supports five visual channels
- **Channel 6:** supports six visual channels

Elite Visual Engine Installation Disc (FD3)

Installs the visual kernel including communication configuration file. For every visual channel a different installation disc must be created – a different configuration file is used to identify each channel.

Options:

- **Visual Engine:** the core visual system

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- **VisualChannel 1:** Installs configuration for channel 1
- **VisualChannel 2:** Installs configuration for channel 2
- **VisualChannel 3:** Installs configuration for channel 3
- **VisualChannel 4:** Installs configuration for channel 4
- **VisualChannel 5:** Installs configuration for channel 5
- **VisualChannel 6:** Installs configuration for channel 6

Database Installation Disc ELITE (FD4DB)

Elite needs the .vis files and the nav-databases.

Options:

- vis configuration file 'database'
- Nav file 'database'

Database Installation Disc Visual (FD5DB)

The Visual needs the .vis files and the visual databases

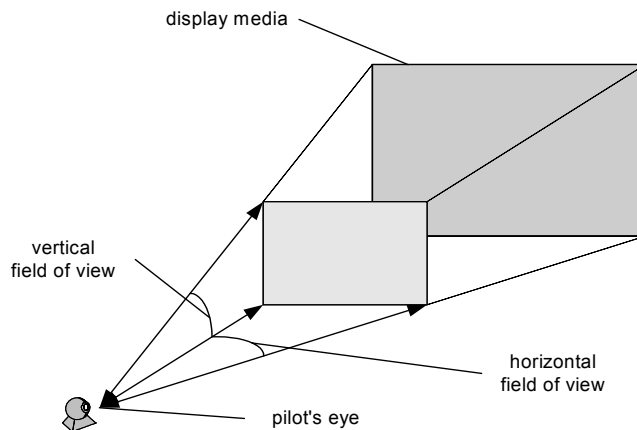
Options:

- vis configuration file 'database'
- visual database file 'database'

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1.3.1 Configuring the Views

The visual can be understood as a camera that records a certain portion of the simulation scenery. The camera can be rotated and positioned relative to the aircraft position and attitude. The position is described as an offset from the pilot's eyes: the distance in meters along the longitudinal, lateral and vertical axis of the aircraft. After changing the position of the camera, the rotation can be set as an additional heading, pitch or bank angle to the aircraft angles.



The 'zoom' of the camera can be adjusted – it's called the field of view. The horizontal field of view is the angle spanned from the left side to the right side of the picture; the vertical field of view is the angle spanned from the bottom to the top of the picture (insert picture...). To find the correct angle one should measure the angle from the pilot's eye to both sides of the display media.

Caution: make sure the ratio between the horizontal and the vertical view angle is the same as the display screen ratio (typically 4:3), otherwise the displayed image will be distorted.

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1.3.2 Sample Setups

1.3.2.1 Three projectors (LCD)

Projector model: InFocus LP 435Z

Display resolution: 1024x768 pixels

Brightness: 1000 lumen

Contrast Ratio: 400:1

Size of the displayed image of each channel: 1.56 m x 1,17 m

Frame size: 0 cm

Distance from the projection surface to the pilot's eye: 1.9 m

Vertical viewing angle: 33,7 deg.

Horizontal viewing angle: 45 deg.

Position offsets: all three cameras have zero offset

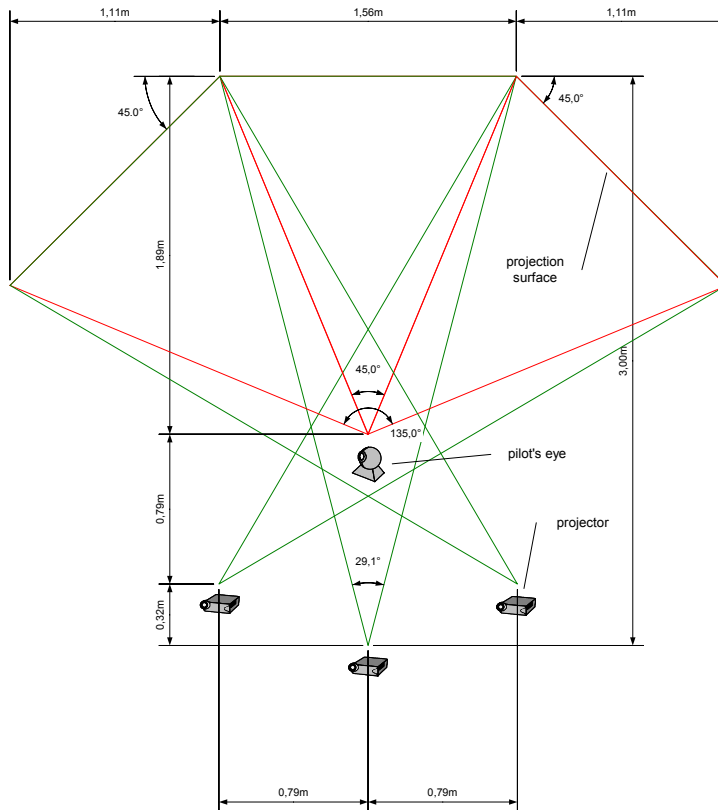
Rotation offset (hdg/pitch/bank):

Left camera (-45 / 0 / 0)

Center camera (0/0/0)

Right camera (45/0/0)

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1.3.2.2 Five CRT monitors

Monitor model: Black Trinitron 19"

Display resolution: 1024x768 pixels

Brightness: ???

Size of the displayed image of each channel: 0.38m

Frame size: 4 cm

Distance from the display surface to the pilot's eye: 0.7 m (?)

Vertical viewing angle: 15 deg.

Horizontal viewing angle: 20 deg.

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Position offset: all five cameras have zero offset

Rotation offset (hdg/pitch/bank):

Far left camera (-46/0/0)

Center left camera (-23/0/0)

Center camera (0/0/0)

Center right camera (23/0/0)

Far right camera (46/0/0)

(picture setup)

1.3.2.3 Three plasma screens

Model: Sony 42" ...

Display resolution: 1024x768 pixels

Brightness: ???

Size of the displayed image of each channel: 42" .. calculate 16:9 ?

Frame size: 4 cm

Distance from the display surface to the pilot's eye: 1.3 m (?)

Vertical viewing angle: 30 deg.

Horizontal viewing angle: 40 deg.

Position offset: all three cameras have zero offset

Rotation offset (hdg/pitch/bank):

Left camera (-44 / 0 / 0)

Center camera (0/0/0)

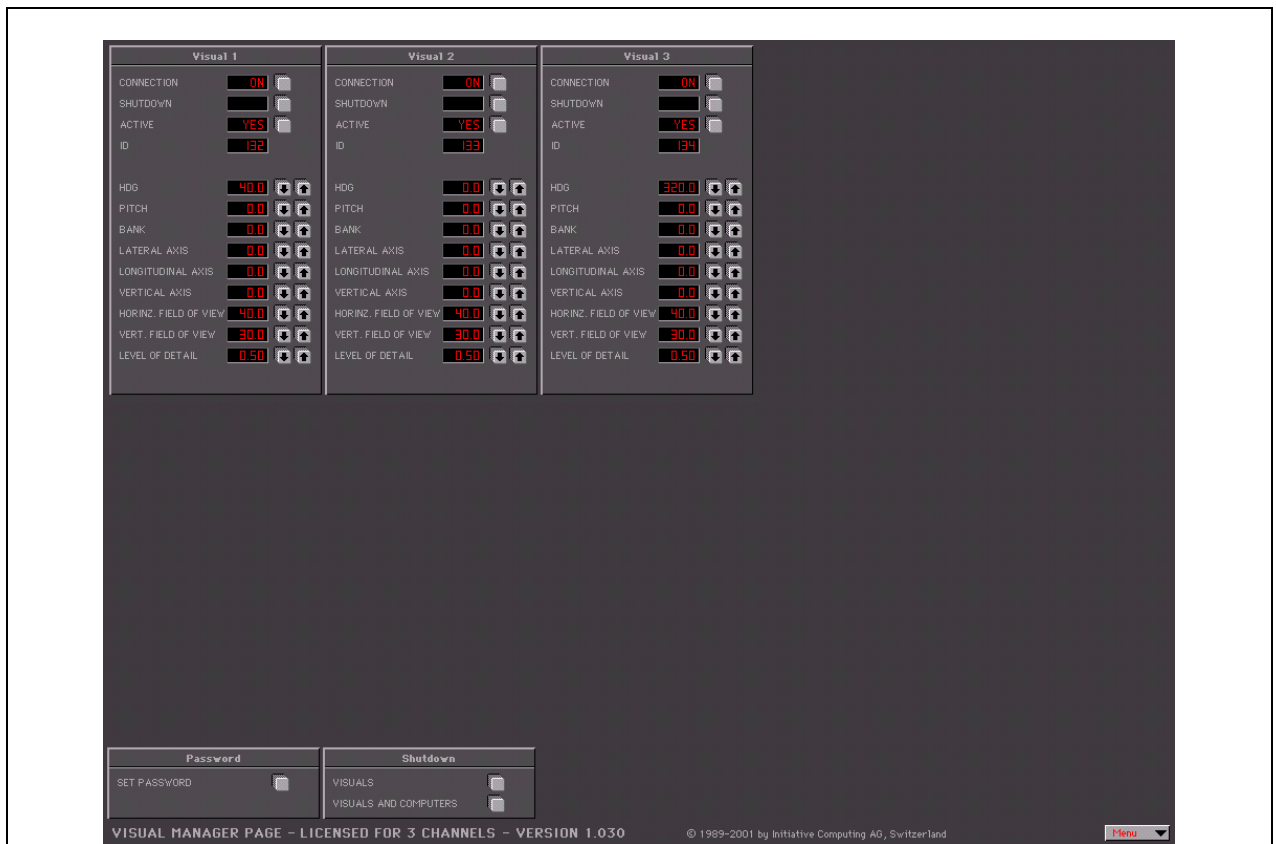
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Right camera (44/0/0)

(picture setup ...)

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1.4.1 Manager Page



The Visual Manager Page contains a panel for each channel (up to 6) and two additional panels for setting the password and system shutdown.

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1.4.2 Channel Panel

On the Elite visual manager page (Ctrl-X) the parameters for each connected visual system can be adjusted.

CONNECTION: (Toggle) Initializes or terminates the communication with the visual. Only connected visuals are stored in the configuration file.

SHUTDOWN: Press this button to quit the visual application.

ACTIVE: (Toggle) The datastream to the visual can be interrupted by deactivating the visual.

ID: The identification number of the visual.

HDG, PITCH, BANK: camera attitude offset relative to the aircraft attitude (in degrees).



LATERAL AXIS: camera position offset in meters from the aircraft center along the lateral axis. The positive lateral axis is on the left wing of the aircraft.

LONGITUDINAL AXIS: camera position offset in meters from the aircraft center along the longitudinal axis. The positive longitudinal axis is forward on the fuselage of the aircraft.

VERTICAL AXIS: camera position offset in meters from the aircraft center. The positive vertical axis is straight up.

HORIZONTAL FIELD OF VIEW: The left-to-right opening angle covered by the camera view in degrees.

VERTICAL FIELD OF VIEW: The bottom-to-top opening angle covered by the camera view in degrees.

LEVEL OF DETAIL: Allows adjustment to the level of detail of the visual (range 0-1). At a high level (1) the size of the drawn scene and the image quality is greater but the framerate is lower.

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1.4.3 Additional panels

Password

Access to the visual manager page can be protected by a password. The password can be set or changed by pressing the 'SET PASSWORD' button. If a password is set, the user is prompted for the password before every access to the page. Initially no password is set.

Shutdown

When Elite terminates, the visual returns to standby mode. The shutdown panel holds buttons to terminate the visual systems.

Button VISUALS: Terminates all connected visual channels - only the application.

Button VISUALS AND COMPUTERS: Terminates all connected visual channels -stops the application and shuts the computer down; quits ELITE.

