SLC-4 East Operations Manual
VandenbergAFB

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Sources
Outstanding launch photos by
William G. Hartenstein at
www.ktb.net/~billmeco/space.html

GoogleEarth.com

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DESCRIPTION

Two hundred Titan missiles were launched Space Launch Complex 4 (pronounced "slick four") at Vandenberg Air Force Base. The Titan I and Titan II were launched from SLC-4 West. SLC-4 East was configured to launch Titans with strap-on solid fuel boosters: Titan III, Titan 34 and Titan IV. The last Titan IV was launch from SLC-4 East on October 19, 2005.

At SLC-4, the Titans were assembled on a fixed launch platform, within the Mobile Service Structure (MSS). A couple of hours prior to launch, the MSS bay doors opened up and the entire structure rolled back away from the launch platform. A Fixed Umbilical Tower (FUT) continued providing electrical connections up to the moment of launch.

INSTALLATION

1. Copy the zipped files into the corresponding Orbiter folders. Preserve the directory structure.

2. If you have my VandenbergAFB-2006 add-on installed you will need to remove the simplified "space holding" structures for SLC-4 East by editing the configuration file:

   For **VandenbergAFB-2006** v2.0
   CONFIG/EARTH/BASE/Vandenberg.cfg

   For **VandenbergAFB** v1.0
   CONFIG/Vandenberg.cfg

   Open the .cfg file with a plain text editor. Delete the block of text under the heading "Space Launch Complex 4E." Maintain the **.cfg** extension when you save the edited file.

OPERATION

The *VandenbergAFB SLC-4 East* add-on is configured as two Spacecraft3 "ships". Because SLC-4E is initiated entirely through the scenario file, a user can relocate the launch complex anywhere on Earth by simply changing the co-ordinates on the POS line. The launch complex meshes are centered on the launch platform, so the rocket booster, FUT and MSS will all have identical POS lines. The FUT mesh includes all of the immobile portions of the launch complex. The MSS is animated by these key commands:

[LShift]+[1]$_{numpad}$ - Opens lower sliding bay doors
[LShift]+[2]$_{numpad}$ - Opens upper swinging bay door
[LShift]+[3]$_{numpad}$ - Rolls the MSS back to location for launch

After roll back is complete, F3 to the Titan and begin your flight!

The add-on includes one scenario setting up the last Titan IV launch, with SLC-4E accurately located at Vandenberg (requires prior installation of CVEL Titans). Edit the Ship and Payload lines of this scenario to set up realistic West Coast launches for any of the CVEL Titans. *VandenbergAFB SLC-4 East* also furnishes realistic-looking launch structures for the X-20 or X-15 Delta, although in real life SLC-4 was never configured to support manned space flight.

SCENARIOS

The VandebergAFB add-on includes the scenario file **VAFB Position Master.scn** which places a standard Delta Glider at VAFB, Runway 30. Open up the scenario file with a plain text editor and look at the BEGIN_SHIPS section. POSition lines are included for several of the Space Launch Complexes, and for each end of the runway. All but one of the POS lines are "covered up" by a semicolon. Orbiter will not read a line of text following a semicolon. Try covering up the POS line for runway 30 with a semicolon, and uncovering a different POS line by deleting its semicolon. Save the file, start Orbiter, and the Delta Glider will appear at the new location. Be careful -- uncovering more than one POS line (or uncovering none at all) may cause Orbiter to crash to desktop.

To place another ship at a Vandenberg runway or SLC, simply open up the ship's scenario file and copy the appropriate POS line from VAFB Position Master. Delete any other POS or BASE lines from the scenario (or cover up the lines with semicolons) and save the file. You may also need to alter the ship's vertical location in the Scenario. Refer to your ship's own documentation.

A second scenario file that comes with VandenbergAFB is for use with Kev33's K-SLC-6 add-on, described in the Add-on section below.

[The ship definition portion of VAFB Position Master.scn]

```
BEGIN_SHIPS
GL-01:DeltaGlider
 STATUS Landed Earth
 POS -120.56755 34.72100        ;VAFB Runway 30 (southeast end)  HEADING 316.75
 ;POS -120.60077 34.75014       ;VAFB Runway 12 (northwest end)  HEADING 136.75
 ;POS -120.6230320 34.7541900  ;SLC-2W launch table coordinates - Delta II
 ;POS -120.5893715 34.6391721  ;SLC-3E launch table coordinates - Atlas V
 ;POS -120.6101125 34.6310700  ;SLC-4E launch table coordinates - Titan IV
 ;POS -120.6151950 34.6320580  ;SLC-4W launch table coordinates - Titan II
 ;POS -120.6265787 34.5804914  ;SLC-6 launch table coordinates - Delta IV, STS, MOL
 ;POS -120.6325320 34.5757555  ;SLC-8 launch table coordinates - Minotaur
 HEADING 316.75
 PRPLEVEL 0:1.000 1:1.000
 NAVFREQ 402 94 0 0
 XPDR 0
 NOSECONE 0 0.0000
 GEAR 1 1.0000
 AIRLOCK 0 0.0000
END
END_SHIPS
```

CONFIGURATION

The **Vandenberg.cfg** file begins with three meshes that place mountains at the south end of the base. The mountains are high-polygon count, so they are covered with semicolons. You can uncover one, two, or all three -- as many as your computer's memory will handle. They do add something to the look. I would be happy for other developers to create mountains that maintain the look, but have a lower impact on computer memory. The mountain mesh is edited from Kev33's K-SLC-6 add-on (K-SLC-6 includes Kev's 3ds files and an invitation to add and modify - much appreciated). I created two version of a replacement texture file (K-Mount-1.dds) to make the mountain colors blend in with the surface tiles, one with Orbiter HiRes colors and another with Level 9 colors.

Vandenberg.cfg also models a well-developed airport -- runway, taxiways and buildings. The Space Launch Complexes are more simply modeled, using standard Orbiter block shapes and textures to represent the essential above-ground structures. A typical SLC has a foundation slab, launch table, fixed umbilical tower and a mobile service tower located in its roll-back position. I regard these structures as "place holders," opportunities awaiting detailed treatment by other add-on developers. I would only ask that all developers respect the POS line of the launch tables. The center point of each launch table matches the POS coordinates in the **VAFB Position Master.scn** scenario, and the launch tables are correctly located on the base surface tiles.

ADD-ONS

To install an add-on launch complex you must first edit CONFIG\EARTH\BASE\Vandenberg.cfg to remove the "place holder" structures. Cover up the structures with semicolons or delete the lines altogether. The Space Launch Complexes are well-labeled in the Vandenberg.cfg file, and separated with triple spaces. It should be hard to go wrong, but do back-up the original before you edit.

Installing K-SLC-6

To the best of my knowledge, Kev Shanow's **K-SLC-6** add-on is the only Vandenberg Space Launch Complex to be developed thus far. It is a beautiful piece of work, with animated service structures and umbilical arms, but you will need a mid-range to high-end computer to make it work. To install K-SLC-6 with VandenbergAFB:

1. Delete the SLC-6 "place holding" structures from CONFG\EARTH\BASE\Vandenberg.cfg. See above.

2. Copy the K-SLC-6 files to the appropriate folders, but DO NOT copy the K-Mount-1.dds texture file. Use the replacement K-Mount-1.dds texture file that comes with the VandenbergAFB add-on. This provides correct color matching between the K-SLC-6 mountain and the VandenbergAFB surface tiles.

3. The Atlantis scenario that comes with K-SCL-6 places the launch complex several kilometers east of its actual location. Use the VandenbergAFB scenario:

   Atlantis-VandenbergAFB & K-SLC-6.scn

OPPORTUNITIES

In addition to the launch complexes, VandenbergAFB offers opportunities for developers to create some new spacecraft www.calspace.com is the web site of Spaceport Systems International. It has a wealth if detailed information on their new SLC-8 and the Minotaur rocket. Information on the Pegasus rocket system can be found at www.orbital.com The privately launched Pegasus delivers small satellites to low earth orbit using a winged, air-launched missile carried aloft by an L-1011 carrier ship. Flights have originated from several locations around the world, but primarily from Vandenberg.

It would also be neat if some Orbiter developer could come up with historical documentation on SLC-6, from the mid 60s, to compliment the existing Manned Orbiting Laboratory and the X-20 add-ons.

OPEN LICENSE

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