LandArte –
Giant Art in Switzerland's Rhine Valley

In Ancient Greece, the concepts of art and technology were not yet separated. The term "tekhnae" stood for technology, art, crafts and handiwork. On another continent, and long before our epoch, a completely different culture, the Nazcas, laid down huge lines in the Peruvian highlands, the true extent of which is only revealed from the air. In present time, the year 2003 was the bicentennial anniversary of canton of St. Gallen – which includes the Alpine Rhine Valley where Leica Geosystems' Swiss headquarters are located. This was the setting for 13 gigantic crop images, which sprouted and changed their appearance with the course of growth: LandArte.

"Earth Signals" in Rüthi by the Vorarlberg artist Herbert Fritsch. In its style of the culture of the Walser people this artwork, 1.2 kilometers in length, symbolises an eye, wherein the Moorhof farm of Bernhard Schneider represents the pupil.

Stake-out made easy: Assisted by the Leica 530 GPS system, surveyors transferred the artworks into the landscape on the Moorhof farm in Rüthi. Based on the 1:10,000-scale project sketch, project manager Kuno Bont (right) followed the plotting of the Earth Signal together with artist Herbert Fritsch.

Right: "Mother Earth" in Salez, formed by five inmates of Saxerriet prison as part of a supplementary individual support program.

The Leica technologies of GPS500 and GS20 assisted the LandArte artists from Switzerland, Liechtenstein, Austria and Finland to transfer their designs from paper sketches onto the landscape. 200,000 visitors have walked along the slopes of the valley or travelled to the mountains by cable railways to view the artworks. However, it was only possible to fully appreciate LandArte by ascending into the skies, and only with airborne sensors could these artworks be made visible to the broader public, allowing them to be precisely documented for viewing by future generations. These tasks were accomplished with Leica Geosystems' digital ADS40 aerial imaging sensor, the RC30 aerial photography system, Ikonos satellite data, and Erdas Imagine™ software.

Nature, Art and Technology

The valley carved by the alpine Rhine glacier has been a cultural landscape for millennia. The river is canalized just before the mouth of Lake Constance and the flood-ravaged valley floor shows diverse patterns of watercourses, trees and hedgerows and fields, making it an imposing

"tekhnae" work. For the last few months, the LandArte project has added the expressions of artists to this landscape. None of the 13 LandArte artworks expressed this aspect of the Rhine Valley's actual cultural landscape in a more fundamental way than the oeuvre by Spallo Kolb: "Defining the Orientation": While at first glance appearing to be minimalist yet profoundly effective on a conceptual level, he created three oblong fields facing due north and thus cutting deep into the now familiar "melioration patchwork".

As part of their thesis work, and in addition to local surveyor FPK & Partners, the landscape architect students Daniel Baur and Urs Haerden of Professor Peter Petschek from Rapperswil University of Applied Sciences were particularly active in transferring the artists' drawings to the landscape, using Leica GPS systems GS20 and GPS 500. For several of these plant pictures the seed was sown in the fields by guiding the agricultural machines with a Leica Dozer GradeStar Indicate system.
Social scientists from the University of St. Gallen were also involved by undertaking a research project in line with a supplementary individual support program at which five inmates at Saxerriet prison joined forces to create the work "Mother Earth".

Earthling, Tiger and Space Contact

Nearby Bad Ragaz, at the southernmost point of the 13 LandArte projects, visitors were greeted in Vilters by artist Sepp Azzola's giant "Earthling" which had an armspan of 350 meters. In June, this

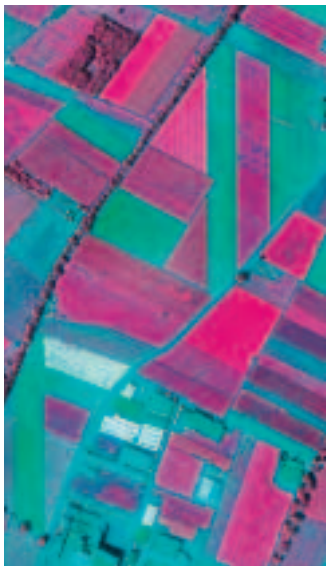
"Humans Leave Tracks – Adam/Eve" in Gams by Erna Reich. The large figure at Gams, more than a kilometer long, symbolizes both Adam and Eve. The footprints of the figure at Gams (see picture left) extend three kilometers. This picture is reminiscent of works by the artists and Bauhaus teachers Paul Klee and Johannes Itten.

Left: Two LandArte works in one image, taken at a distance of 600 kilometers by the IKONOS satellite. Bottom: "Humans Leave Tracks – Footprints" by Erna Reich between Frümsen and Gams. Center: "Mother Earth" in Salez. These satellite images transformed by the Erdas-Imagine™ software have a ground resolution of 1 meter. © Leica Geosystems / LandArte / www.mfb-geo.com / European Space Imaging, 2003

"When the Beetle Seeks the Tiger" in St. Margrethen by Jonny Müller. Using strips of green corn and grains, the artist modeled a structure based on a tiger hide in the fertile Rhine floodplain. The "beetles" were sown as ovals surrounding three fruit trees in the meadow at the upper right.

Right: "Defining the orientation" in Kriessern by Spallo Kolb. Three fields were aligned along a precise north-south axis. The Leica ADS40 image shows the near infra-red band captured with this first aerial digital sensor.

Below: "Emergency Exit" in Diepoldsau by Sunhild Wollwage. The globe can't cope.



Visualization using the world's leading high-performance systems

As soon as nature made the LandArte pictures visible, they were documented from planes and satellites using the most up-to-date and most powerful systems in use today: the Leica RC30, Leica ADS40 and the Ikonos satellite. Over the last few years, Leica Geosystems in Heerbrugg, Switzerland, has developed the Leica ADS40 — the world's first digital aerial image system capable of handling tasks in remote sensing and photogrammetry. It simultaneously records the overflown area on ten channels covering various spectral bands including infra-red. In addition, simultaneous frontal, lateral and rear views are recorded. With the combination of GPS and inertial systems, and the use of the Leica ALS50 Lidar system, exact recording position data and precise topographical data on the earth's surface can be ascertained. Since this data is immediately available in digital form, the creation of three-dimensional landscape models and remote sensing analyses can be performed quicker and much more simply. With a ground resolution of 15 centimeters, the Leica ADS40 produces much more precise information than satellites. It is used in agricultural and

Leica Geosystems' ADS40 is the world's most powerful digital aerial imaging sensor. It records the landscape and its objects for environmental and cartographic purposes with a ground pixel resolution of 15 centimeters. A total of ten channels include infrared and forward, lateral and rear views for three-dimensional interpretation.

forestry documentation for the entire United States, in Japan for tracking maps of large metropolitan areas as well as in Russia for creating land property documents. In addition, slides measuring 9" x 9" were produced for the LandArte works by Swisstopo with a "classic" Leica RC30 aerial imaging system. The slides document high-resolution ground details to the centimeter. The Ikonos satellite sensor also recorded the entire Rhine Valley in St. Gallen with the artworks on July 22, 2003, at 10:25 a.m. from a distance of 600 km using a object resolution of one meter. Leica Geosystems converted the satellite data into images and animated 3D video sequences using Erdas Imagine 3D remote sensing software – the leading product world-wide in this area – to produce a virtual flight through the Rhine Valley and the LandArte works of art.

Earthman was gazing at the heavens in green, in July he turned wheat yellow, and, during the middle of this year's once-in-a-lifetime heat wave, he gazed heavenward

> "A unique combination of art, man, nature, and technology!"
>
> LandArte-Besucher Alfred Gächter

with blue lupin eyes. Forty kilometers downstream, where the Rhine flows past St. Margrethen, is the most northerly artwork in this "astronaut's gallery". Here, near the Ruderbach rest stop on the A1 highway, Jonny Müller created a fascinating artwork entitled "When the Beetle Seeks the Tiger". Oval scarab beetles appeared poppy-red and cornflower-blue around three fruit trees. Equally impressive was the "Emergency Exit" symbolism by Liechtenstein's Sunhild Wollwage in Diepoldsau. Any passing extraterrestrial observers would have focused on the floral imagery of artist Kuspi: he set up his symmetrical UFO docking station "Space Contact" in the wine-growing village of Berneck. LandArte was impressive in many ways – the largest work "Humans Leave Tracks" by Erna Reich, incorporated the villages of Frümsen, Sax and Gams and extended over a distance of more than three kilometers. Thanks to purchase commitments negotiated early on, the plants used for the growing images could eventually be sold, used for personal consumption by the farmers, or used for selective soil fertilization. For example, the marigolds, cultivated for the first time in the Rhine Valley especially for the LandArte project are used in naturopathy, the corn is the main ingredient for the local dish "Ribelmais", and the violet and blue *Phacelia* are ecologically stabilizing agents for soil.

Setting out made easy

The setting out was easy work for the landscape gardening students of Professor Peter Petschek from the Rapperswil Technology University. After digitising the artworks and transferring this data into the local grid, students Urs Haerden and Daniel Baur performed the staking out together with the farmers. Student Daniel Baur said: "We had never worked with a GPS instrument before, but after two hours of training we were able to easily stake out all of the LandArte. We especially enjoyed working with the handy and light Leica GS20 which was able to provide us with accuracies to the decimeter. It was only for very fine structures in the artworks, where centimeter accuracy was required, did we have to use the GPS 500, but this was very seldom. When we complete our studies in 2004, we would highly recommend to our future employers to have such a device available – to speed up work and make landscape gardening more accurate. For example, with a Leica GS20 it is possible to design far more precise plans and undertake more accurate calculations about the quantity of land to remove, ultimately enabling work to be completed in less time."

"Space contact" in Berneck by Kuspi. The diagonal of this landing sign measures 250 metres.

Coordinated Progress

Artists, farmers, engineers, economists, social scientists, prisoners, the unemployed and students were in constant communication for LandArte, coordinating their requirements and solutions together with project initiator Bernarda Mattle and project manager Kuno Bont. For example, in Autumn 2002, Austrian artist Herbert Fritsch set about procuring the seed for the Winter wheat in Rüthi. The golden yellows were evident in his work of Summer 2003, better contrasting the optical effect of his 1.2-kilometer long Earth Signal from the green meadows around it. Following digitalization of the artist's drawing, the surface calculation produced a much larger wheat acreage than Bernhard Schneider's farming family actually needed. Instead of reducing the work's dimensions, artist Herbert Fritsch "downsized" the line widths of his Earth Signal lines, which is reminiscent of the old master builders' signs of Walser people culture, by over twenty percent. LandArte was the anniversary project with the largest number of visitors (200,000), its images radiating far beyond national borders and the timeframe of its occasion.

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