

SPACE
IMAGING^{TM/SM}

OSS SPEECH as presented by Tish Vajta-Williams

The theme that I have been asked to talk about is what Space Imaging will do for you. I have somewhat modified that to present what I see as a mutual challenge between you as a potential user of our remote sensing data and we as a provider of that product. But first, I would like to show you a three minute video that briefly introduces Space Imaging Inc. (SII).

Before I expand my thoughts on our mutual challenge, I would like to start with a brief status of where Space Imaging is today.

The SII business is earth information. Our intention is to provide a new source of remote sensing data. We have been working for over five years in getting this business started. In early October we announced a major milestone in that in addition to the investment committed by Lockheed last April, E-Systems (ESY) Board of Directors approved their commitment as a major investor in SII. The Lockheed commitment amounted to an investment of \$150 Million. ESY has committed to \$100 Million. The combination of this commitment provides SII the basis for proceeding with the initiation of our contracts for delivery in late 1997 of the capability required. Lockheed will be the prime contractor and will subcontract to ESY for the entire ground segment. Lockheed will provide the system integration as well as be the integrator of the spacecraft and payload. ESY will be the integrator of the ground segment, providing the receipt of the satellite data, image processing functions and customer service support. Eastman Kodak has been selected as the contractor for the optical telescope integration including the optics, focal plane and electronics. We are working with Kodak to establish a strategic alliance and extend their

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support to us in other areas of relevant interests such as digital technology. We hope to have the SII Board of Directors formally close the first round of investment this month. This milestone obviously has been very important for us and we are elated that it has been met within the schedule and investment commitment originally planned. Our next milestone will involve obtaining our regional affiliates committed. We have strong interest in several regional areas and are close to closing those commitments.

My first chart pictorially displays Space Imaging's remote sensing data as the new source providing a base layer for other information layers required relevant to specific applications. We would like to partner with those entities that are currently using remote sensing data, and support their applications as well as create new markets. However, our intentions are to reduce some of the labor intensive efforts which exist today in using available remote sensing data by applying our high throughput digital image processing experience. Our efforts will concentrate on timely delivery of our data. We will establish a streamlined process for users to understand what might be available in our archives and if not, the potential for new collection, which on the average can be collected within 1-3 days anywhere in the world. We will be creating browse imagery data bases containing "thumbnail" or "snippets" of our imagery that will be available through distributed communication paths, such as 1-800 numbers, Internet, or Imagenet. Our ground stations will be receiving a 320 Mbits/sec data stream. Our image processing capability will be designed to provide a throughput for this data stream in real time. This is four times the data rate capability of today's commercial systems. We believe that this capability will provide new and

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revealing remote sensing data about our earth to the private sector, governments, and the public.

Why is this a challenge?

The onslaught of the information "flood" is already upon us. How many of you end up with a stack of magazines, papers, and articles piling up on a week to week basis. Isn't it wonderful to subscribe to the Washington rags: Washington Technology, Space News, Electronic News, GIS Publications. But how can we keep up? I remember discussions I had with CIA's organization FBIS not very long after the demise of the Soviet Union, when every former Soviet bloc country's broadcasts were suddenly available. It became very difficult for them to keep up with the new flood of data, and to be able to extract that which was of intelligence interest. Our mutual challenge is to clearly define the data requirements pertinent to the desired information.

What is information? Information is data placed in context. Of increasing interest, is the time aspect of information. This then requires relating time and space in context. For SII the attributes of our data is spatial and spectral in a universal time domain. Thus we believe our data has the potential to provide you information-- if your requirements for information have been translated correctly. This can only be done in partnership with the users of our data. We want to provide information--not flood the market with extraneous data. You as members of Open Source Solutions clearly understand finding the kernel in the vast amount of open source information being made readily available today. We want to provide this "kernel" as directly as possible.

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What will Space Imaging provide?

Our intentions are to provide better than 1 meter panchromatic and 4 meter multi-spectral resolution remote sensing data. We have developed a list of standard products that we believe will meet the market segment applications we have projected. The list of our products are described in the chart. By standard products we mean those products that lend themselves to being produced via highly automated processes. By standardizing we believe our efficiencies will increase--allowing a lower cost product to our users. Our metric accuracy and image quality will be able to meet the 1:2400 map scale with limited ground control points. Without ground control points we will be able to meet the 1:24000 map scale. Our world will be digital. We want our digital product to be compatible with your business environment. We want to facilitate you being able to ingest our products, display and fuse other information into your applications.

Since aerial data represents the resolution most compatible with our market interests, we are interested in partnering with existing aerial channel distributors. We will be collecting and using aerial data in prototyping our products and functions. How you as our customer want to make use of our capability is critical to our mutual success. We solicit your feedback, and will offer the results of our prototyping. I have examples of one of the products we intend to create--the 1 meter pan sharpened product. As a background, we conducted an aerial collection of 1 meter panchromatic and 1 meter multi-spectral digital data to use as our test image data for prototyping our standard products. The first image shows two multispectral scenes, one at 1 meter and the other at 4 meters. These images clearly show the additional blurring of the image in the lower resolution scene. The second image scene displays the

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RGB multispectral data at 1 meter, and the 1 meter panchromatic data fused with the 4 meter multi-spectral data. Notice that there is almost no discernable difference with the fused product using lower resolution (4 meter) multispectral data and 1 meter panchromatic with that of the scene using 1 meter multispectral data only. This 1 meter pan sharpened product can therefore take advantage of the resolution of our panchromatic data with the spectral content of our multispectral data.

The timing of Space Imaging is opportunistic. It is the right time.

There is a convergence of motion. My next charts describe activities that relate to this motion and convergence.

- 1) The changes in the world order are allowing movement worldwide. Countries are taking over their destinies and people are taking over their lives. Changes in world order are demanding worldwide information and sharing of that information. The need for information is growing. Changes in our domestic society are demanding choices. These changes are creating "edge" cities. Cities that are making decisions relative to their own interests but reside as suburban entities to major metropolitan areas. These changes are also creating people choices-to work at home and thus to have information available locally and more readily as well.

- 2) This in turn is changing the business dynamics. Businesses are increasingly expanding their presence into many countries and are including diverse cultural interests. Businesses require up to date worldwide information to provide distributed services. Information is power. It influences business decisions. It provides the competitive edge.

- 3) These changes in the world order and the resulting downsizing of the defense/intelligence budget has

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created the need for changes in government policy allowing defense contractors an opportunity to compete competitively. The government's willingness to reduce export barriers and approve licenses such as those of Space Imaging has allowed us to make business decisions to pursue such opportunities.

- 4) There is a blending of military/commercial applications, particularly regarding remote sensing data. The military support for non military crisis and the unpredictability of these crisis demands new sources of data and the relevant information. Our timing is right here as well. We can take advantage today of knowledge, experience, and mature technology obtained through past defense/intelligence contracting and apply it to the commercial world-- but in many ways technology development today is being driven by the commercial and public interests. Therefore the opportunity for transfer of what we learned as defense contractors is a narrow window of opportunity that may not present itself again as commercial technology leaps forward.
- 5) Today the availability of low-cost high speed computing networks are providing extremely capable low cost platforms. In addition, low-cost image manipulation software is readily available. Twenty five years ago when the microprocessor was first conceived--the idea of a computer on a chip--has resulted in what is estimated as 10 Billion processors and micro controllers are in use today in everything from an appliance to automobiles. Faster cheaper chips will continue to drive down pixel processing costs. These will combine with devices to store, print, communicate, and edit digital images. Our Kodak friends will help us with their digital cameras, compact discs, and digital tape.

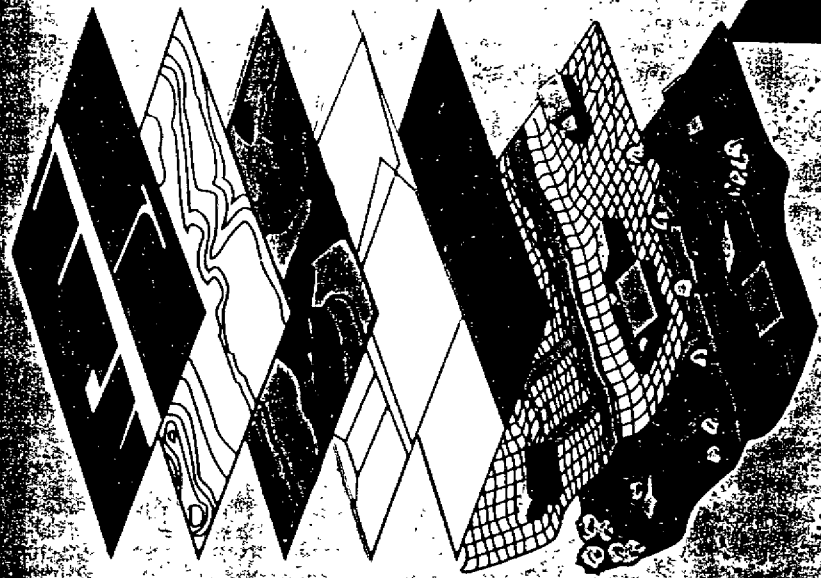
- 6) Finally, but not least is the exploding information market. The potential for the information highway to increase the bandwidth available to be able to move uncompressed digital imagery is being aggressively worked. Bandwidth is certainly in high demand. Last week in Chicago, hundreds of companies and universities discussed the converging telephone, computer, and television business as well as other issues of the information age. They were discussing the "Information Overload". Thirty three emerging technologies, applications, and new products were ~~on~~ display, each promising to help manage the information overload.

In summary, it is the right time for Space Imaging. My final chart describes our vision for the future. The opportunity is there for both of us. The challenge is to work together to achieve what can truly be a unique Open Source Solution.

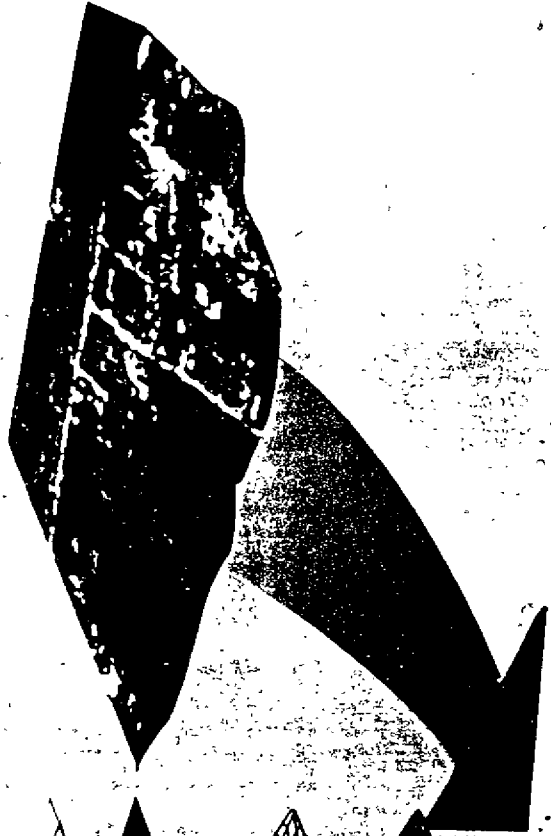


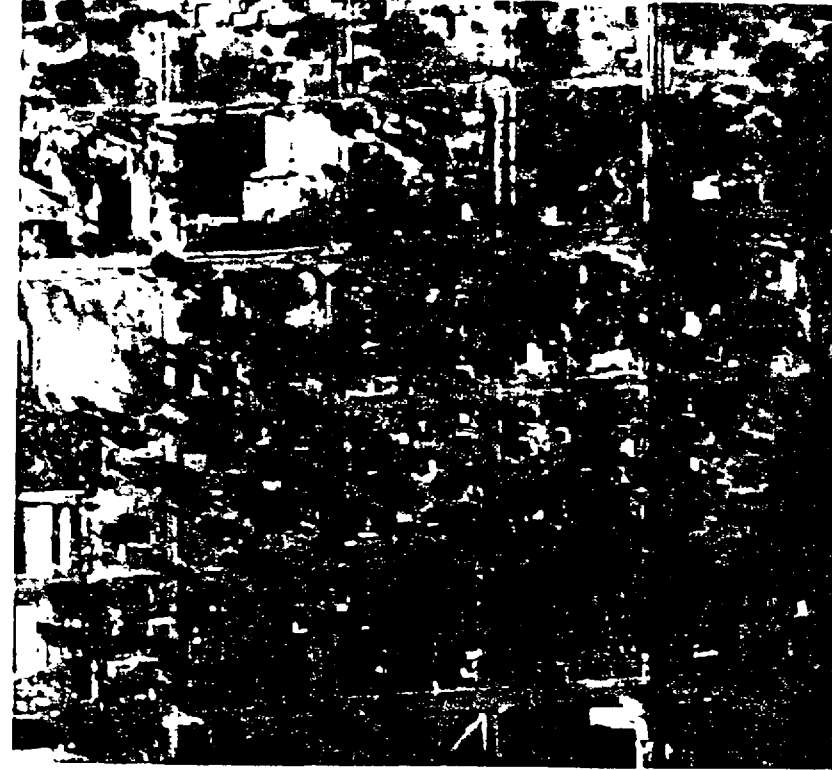
SEARCHING

Seeking Partners

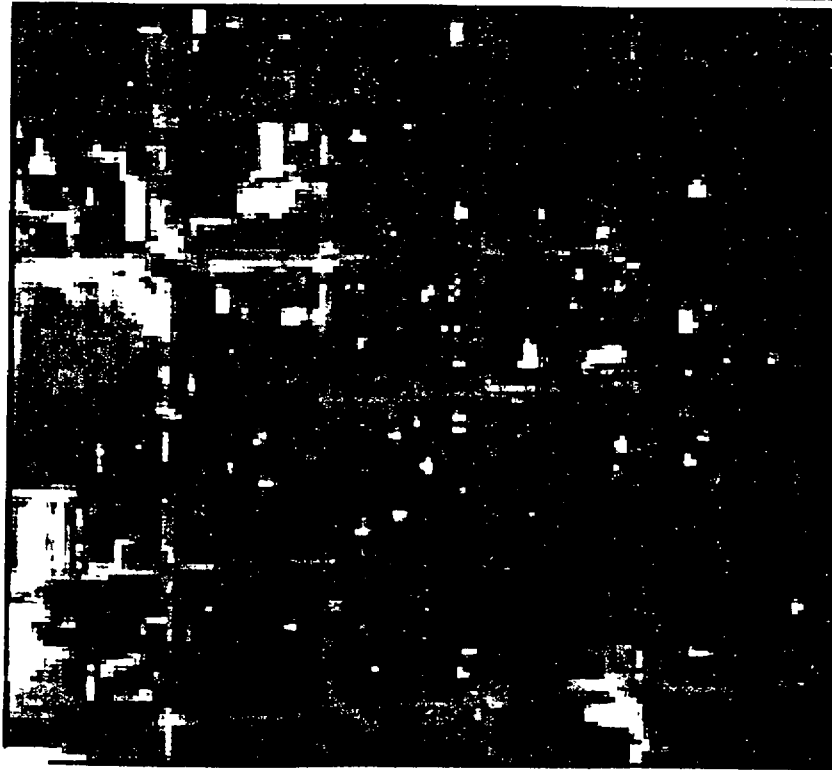


A new source





1m Multispectral Image



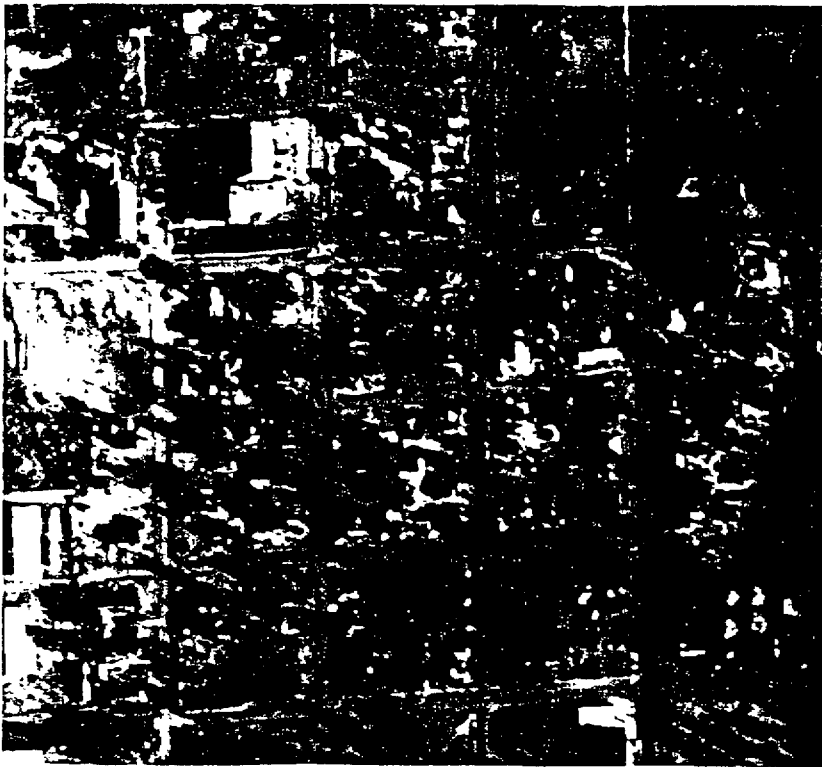
4m Multispectral Image

MULTISPECTRAL IMAGE MSE SHARPENING

Advanced Decision Systems
a division of Booz-Allen & Hamilton



1m Original Multispectral Image



1m Sharpened Multispectral Image

MULTISPECTRAL IMAGE MSE SHARPENING

Advanced Decision Systems
a division of Booz-Allen & Hamilton

SPACE IMAGING PRODUCTS FAMILY



RADIOMETRICALLY CORRECTED IMAGE

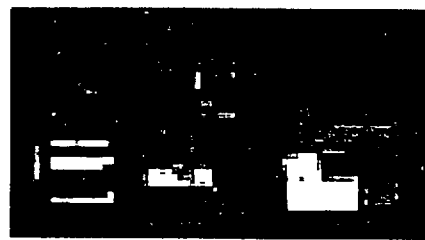
PANCHROMATIC

MULTISPECTRAL

GEOMETRICALLY CORRECTED
Angular distortion removed



STANDARD ORTHOPHOTO
Elimination of elevation effects



PRECISE DIGITAL ORTHOPHOTO
Matched to map coordinates

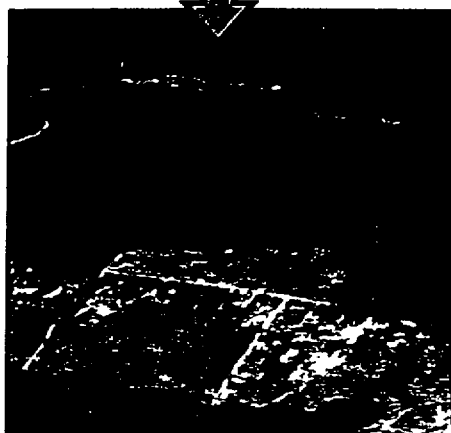


STEREO PAIR



DIGITAL TERRAIN DATA

3D-TERRAIN MODEL

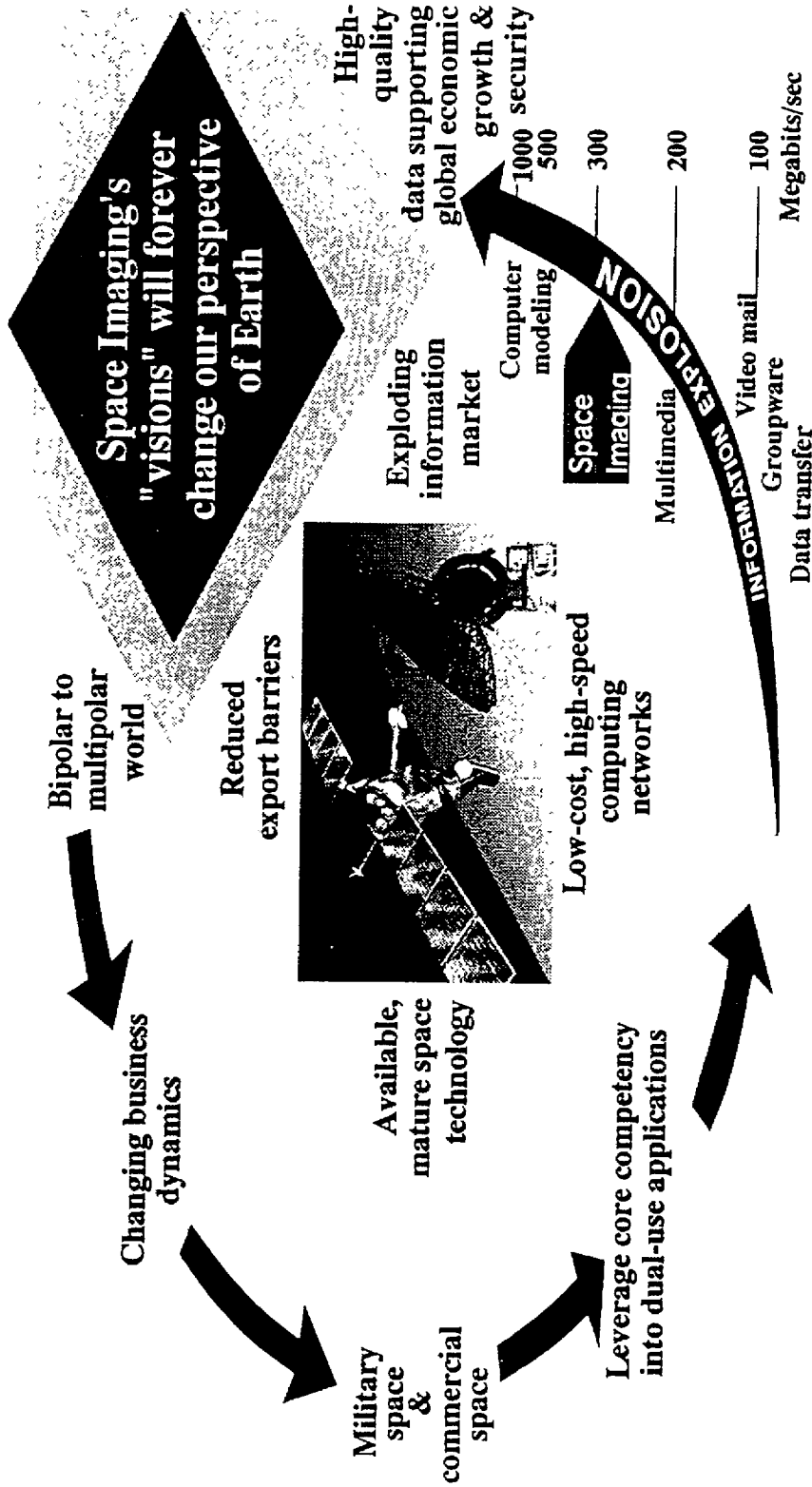


PAN-SHARPENED MULTI-SPECTRAL





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Vision

Preminent global supplier of high resolution Earth Image Data and a leading spatial information service company.

- ... A 1-m resolution, high positional accuracy
- ... satellite digital imagery system, including multispectral
- ... augmented by value-added data processing
- ... meeting the remote sensing and geographic information needs
- ... of commercial and government customers

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