

Interview with Mark Brender

GeoEye

February 3, 2008

Mithat Bereket (I): First of all, can you give us some brief information about GeoEye. What exactly do you do here, what is the purpose of this company, and what are you dealing with?

Mark Brender (S): Well GeoEye is a premier provider of geospatial information. And we own and operate two satellites – one is a high resolution earth imaging satellite, and we also own two airplanes that collect pictures of the earth's surface. So we're in the mapping business.

I: Since you're directly involved in the mapping business, can you tell us about how effectively satellites can see the earth from space? For example, is it like the Tom Clancy books or the Hollywood movies like the "Enemy of the State" sort of thing that you can see anything, all the people, even what they wear in the street from space, even when they look up you can see their faces as well? I mean how close are you to this technology?

S: Well Hollywood has always had a love affair with spy satellites. We're not a spy satellite, we're a commercial earth imaging company. But the word spy satellite was first mentioned in the movie "Ice Station Zebra" in 1968, starring Gregory Peck. Ever since then, Hollywood has had a love affair with the supposed capabilities of our government's spy satellite industry. We are a commercial remote sensing company, and from 480 miles or about 684 km in space, our earth imaging satellites can see objects on the ground about one meter in size. So you can't see, you can't recognize individual people. Now we are going to launch our next generation satellite, GeoEye One, in the coming months. It will be the world's highest resolution commercial earth imaging satellite. And from about the same orbit, 684 km in space, as it moves around the earth, North Pole over to South Pole, we're able to see objects on the surface of the earth about 41 cm in size. So it's a great improvement over existing technology. And the most important part about this technology, besides the wonderful imagery that it produces, is we're able to look down and be able to map the location of something 41 cm in size to within about 3 meters of its true location on the surface of the globe.

I: So it seems that what's important for a satellite is the resolution, is the camera lens, and is the size. What makes a satellite a valuable one, or a high tech one?

S: The GeoEye One Satellite that will be operational in the coming months will have a ground resolution of 41 cm. That's because of the quality of the lens and the size of the lens. But just as important as the resolution of the satellite is the map accuracy, or the metric accuracy of the imaging.

I: What does this mean?

S: That means a satellite from 684 km from space is able to look down on earth and see objects the size of home plate on a baseball diamond or something 41 cm in size, but most importantly be able to map the location of that object to within about three meters of its true location on the surface of the globe. And to make maps, and to make image maps, you need to have this sort of quality imagery.

I: So when you compare your satellites and the GeoOne satellite for example, to the military satellites of the United States government or the Pentagon, what differences are there? Are they better or worse or what is the comparison?

S: Well we're licensed within the Department of Commerce within the US Government to build and launch a system like GeoEye One that'll have such a superb ground resolution of 41 cm. If we, a commercial company, are licensed by the federal government to do this sort of quality work, one must presume that our government's satellites are even better.

I: And who are your customers? Who are you providing these pictures for? Because when I did the research about your company, it seems that one of your solid customers is the National Geospatial Intelligence Agency. So sort of intelligence and defense buddies are involved as your customers, using your images. How much work do you do with them? How much do you do with the private sector?

S: About 45 percent of our revenues are derived directly from the National Geospatial Intelligence Agency within the Pentagon. Keep in mind the US government has had a core competency in using overhead imagery. Ever since the first intelligence collections satellite was launched in August of 1960. So the government has a clear understanding of the value that space imagery brings to the table. Now that technology is moving from the world of intelligence to the world of commerce. In fact in Turkey, we have IntaSpace Turk, in Ankara. And there IntaSpace Turk has a ground station, and when the satellite is over Turkey and over the Middle East, the satellite imagery is down linked directly into that big nine meter dish in Ankara, Turkey, and then that imagery is sold by IntaSpace Turk to the Turkish government and to customers around the region. Turkey has 780,000 square kilometers of land mass. That's about the size in the US of our state of Texas. Turkey has 350 kilometers of land border with Iraq. Turkey has plenty of coastline. Turkey has straits they have to monitor. So satellite imagery can help with all of that. As well as the impact of mining, key minerals are gold and copper. That can help with mining, it can help with agriculture, it can help with land use, land study. It can help your big urban areas like Istanbul or Ankara to better map and monitor urban growth. And for mapping and zoning. So 80 percent of all government management has some type of geospatial context. Commercial satellite imagery can help with virtually all of it.

I: And nowadays, especially with Turkey I think the issue is the use of satellite information or intelligence against the PKK terrorist organization from the states. So the American government is providing some satellite information or intelligence to the

Turkish army, and they conduct operations. Now for example, how does the system work? If the Turkish government or Turkish military wants to buy images from you, do you sell the images to them? Say they want coverage of the images of the Turkish Iraqi border, very close up images, can you provide it to them for a certain cost? Or are there limits to that?

S: You know we operate in non-sovereign space. There are no restrictions anywhere in the world of where we can image. We operate in space, and space is outside of claimed territory. So we can operate in outer space, and according to UN treaties, we can look down on earth and we can collect imagery, and as long as we make that imagery available on a non-discriminatory basis and at reasonable cost, we can image anywhere in the world. And so there are no restrictions. There are no restrictions anywhere over the United States. And we can image any location in Turkey or Iraq. So customers merely have to call us, we will task the satellite to collect imagery anywhere in the region in or around Turkey, and make that imagery available.

I: And what about the real time intelligence, or real time photography imaging. Does it work with your satellites? Can you do real time imaging if the customer wants to?

S: The satellites are in orbit -

I: So you cannot move them according to the desire of the customer –

S: We cannot move it around in space. We go over the North Pole, under the South Pole, and as we're going around the earth, the earth is rotating underneath us. So we're overhead Istanbul or Ankara once every three days, and we can collect imagery anywhere in the region that often. We're really a mapping machine in orbit, and as we go over Turkey we'll make long continuous trips and collect imagery of Turkey, put that imagery in our archive, and then make that available for sale.

I: I think the question then should be has Turkish government or the Turkish military ever bought any images from you, related to the Turkish –Iraqi border for example?

S: You know in our archive we have 300 million square km of the earth's surface over virtually every continent. So we don't disclose who our customers are, but clearly anyone who wants imagery of anything in your region of the world can easily order that imagery from us, or through our regional affiliate IntaSpace Turk in Ankara.

I: What are the rates, for example if somebody, one government or organization wanted to buy high resolution images from you, how much do they cost? Also, what is the price of a satellite?

S: The cost of the GeoEye One satellite which will be coming into service later this year, the cost of the satellite, the launch, the insurance policy, four ground stations,

everything to bring that satellite into service, is about 502 million dollars. Which sounds like a lot of money. But considering the value you get out of this technology, for a democracy not to know what's happening around your borders, for the government not to understand what's happening in the environment in your country, here's a tool to help to better understand, to better map, to better manage, to better monitor the infrastructure and what's going on in a particular country. It's an invaluable tool. And a lot of the search engines like Microsoft virtual earth, google earth, yahoo maps, they're presenting satellite imagery in a very wonderful, favorable way. And nowadays young people, and I'm sure in Turkey also, are not used to looking at cartoon maps anymore with just colors and lines. They're actually image maps where you have a choice of satellite imagery or a hybrid of a map and a satellite image. We and our competitor are the only two companies in the world that provide such high resolution imagery.

I: So how much does it cost if I want to buy images from you, for example? Normally, the approximate price would be how much?

S: The costs vary. The least expensive imagery over the US from our archive is roughly \$7.90 per square kilometer with a minimum order of 50 square kilometers. Imagery overseas is more expensive. I would say that imagery over the Middle East would be roughly 30 dollars a square kilometer with a minimum of 100 square kilometers, so there's 3,000 US dollars for an area of 100 square kilometers. There's a lot of knowledge, a lot of value for such a small price.

I: That's not a big deal, 3,000 dollars for 100 kilometers. Does the resolution change, do you give more high resolution pictures for a higher price?

S: No, that price for Ikonos satellite imagery – we haven't set the price yet for imagery from our new satellite, GeoEye One which will be launched in the coming months, but for the Ikonos satellite which has been operating now several years, the imagery is about \$30 a square kilometer and it's 0.82 meters, or about one meter ground resolution.

I: So to wrap it up, when you think about military usage for example, if any military organization like the army of any country, or the government of any country can ask certain images from you, provided that they can pay the money for it they can buy it? There's no censorship, no regulations about those?

S: I know it sounds unbelievable, but unless you're a country that has been identified by the US government or the UN as a nation that the world should not do business with; Iran, North Korea, Cuba, Sudan, well known countries, for the same reason General Electric can't sell refrigerators to Iran, nor can we sell our satellite imagery. But otherwise we can sell satellite imagery to customers anywhere around the world of any location around the world.

I: And how long does it take, if they want it now for example, when would you be able to give them the images that they want about the region?

S: We have about 300 million square kilometers in our archive, and if someone for example wanted imagery over Turkish airports, Turkey has 117 airports both paved and unpaved. If anybody wanted to do a database of satellite imagery of all Turkey's airports, we can provide that imagery from our archive very quickly. Now if you want a new collect, you want a custom collect, then it may take longer because while a lot of people like clouds, we do not. While clouds bring a lot of good things to people in the form of rain, we have a lot of imagery of the tops of clouds and it doesn't do us much good. So it could take a week or two weeks to get a new image over a certain location. Remember we're only over a specific area once every three days. If it's cloudy, that means another three days. So now almost a week has gone by. So we are really imaging a lot in anticipation of customers' needs. So we're imaging areas of bounty, areas of boundary and borders, and areas of conflict. Because all of those people have requirements to know what's going on the ground, and to have better insight to what they can learn from the satellite imagery.

I: And very lastly, where are we heading towards? How do you think this will develop and this will end up with high tech imagery? Will, a couple of years later, will we be able to really watch people's faces from space when they look up in the daytime?

S: You know the very first maps were etched on clay tablets by the Babylonians in 2300 BC. We've come a long way from that sort of mapping and that sort of technology to where we are today with orbiting, earth imaging satellites. The resolution will get better to a certain point. It will always be outside the threshold of personal privacy. But I think we're entering an age of transparency through the internet and through satellite imagery where we'll have a virtual world at our fingertips able to go anywhere over the internet and go anyplace on earth; areas of peace, areas of conflict. And it will bring great insight into and better understanding of what mankind is doing on the surface of the planet.

I: These types of things are very open to abuse, so do you implement self-censorship to what you do, what you provide?

S: We normally know who our customers are. We deal with a lot of resellers, we deal with IntaSpace Turk, we know them very well, they're a great business partner of ours for the Ikonos satellite. And we always check names on certain lists. The US government provides for example a list of known terrorists, so we're not allowed to sell to known terrorists. But otherwise it's a pretty open world when it comes to satellite imagery, and we don't require our customers to tell us that they're using our imagery for the greater good or the greater evil. Unless there's a prohibition against selling an image to a known terrorist or to a state that is a state sponsor of terrorism, we can virtually sell our imagery to all customers.

I: One more question, how do you control the re-selling of your images to the third parties?

S: Well GeoEye has resellers around the globe. Our resellers in the Middle East are in the UAE, Space Imaging Middle East, and IntaSpace Turk in Ankara, Turkey. They sign documents to make sure they support our policies of our license, and they sell the imagery to the region around them. And who they sell to, as long as they're not known terrorists, or they're not states that sponsor terrorism, they're welcome to sell our satellite imagery to all customers, be it the Turkish general staff, be it the Turkish government, be it the Istanbul city government, and I know IntaSpace Turk does a lot of work with them. And I also know IntaSpace Turk does a lot with using satellite imagery over handheld devices for personal navigation.

I: Mark Brender, thank you very much.

S: Thank you.