For this issue's Company Biography I've decided to talk to John Wise, the head of Optical Systems Design.
Optical Systems Design is one of the pioneers of fibre optics technology in Australia and South-East Asia, producing specialised CCTV and broadcast fibre optic equipment as well a variety of other systems used in industrial and telecommunications applications.
I paid them a visit one sunny afternoon at their Warriewood factory, near some of Sydney's best beaches.

Vlado: *John, for readers who are not familiar with OSD, could you tell me who are Optical Systems Design, when did you start your business and how ?*

John: It all started many years ago when I worked for Telecom Research Labs in Melbourne. I was given a project to produce a very simple, short distance (at that time that was 15~20 m) fibre optic link. This was around 1973/74. It was very basic fibre technology, and the electronics was pretty straight forward. Shortly after that I did some travelling and ended up in the UK. This was in 1976/77. I was offered a job with Canada Wire and Cable in Toronto as a systems engineer and there I did a lot of work related to all sorts of fibre optic field trials. It's horrifying for me to think that I have been involved with fibre for over 23 years now (...laughing).

Vlado: *I remember you mentioned earlier that you have worked in the US, is that correct?*

John: *Yes, after about a year and a half in Canada I went to Virginia in the US to work for ITT, and spent about 3~4 years there primarily on military and semi-military projects.*

Vlado: *I assume those were the years when most of the interest for fibre optics was shown by government agencies.*

John: *Ah yes, people like the National Security Agency as well as almost every part of Defense. After that I returned to Australia and started working for an engineering consulting company Crooks, Michell, Peacock and Stewart (CMPS) where in 1983 I started a subsidiary manufacturing company called Integral Fibre Systems. Then I left CMPS and in January 1987 opened Optical Systems Design. Initially it was primarily consulting and we kept the wolf from the door by presenting a 3-day training course. Eventually I started designing custom equipment for some customers with specialised requirements. It all started from one person working in a garage to what you now see: about 30 people working in a 5000 square feet factory . We expect to expand or move soon because it's getting crowded.*

Vlado: *I noticed while driving to Warriewood that you have some spectacular scenery around. There is a river not far from you*

feeding into the Ocean, and some really nice beaches around. Do your workers go for a surf?

John: *Well it never happens, we are just too busy (laughing). But you are right about the beaches around, they are by far the best around Sydney. Of course, I am biased!*

Vlado: *What was the hardest decision made in the development of your business that eventually progressed the business to this stage?*

John: *I don't think that there have been any specific decisions as such apart from the huge one of deciding to actually do it. Some of the more important decisions have been to decide to develop products or special systems to satisfy various customers. Often these "specials" formed the basis of standard products. If I had to choose a single decision in our business so far, maybe that would have to be the decision to go overseas to Singapore in 1991. This led to a fair bit of work, and since that time we have done a lot of exporting. The next similar decision was my first visit to Beijing, China in 1994. It's a big market there and China is our biggest export market now.*

Vlado: *You mentioned earlier in our unrecorded conversation that the longest fibre links you have with your products are in China where signals are transmitted up to 130 km in one go, without any repeaters in between. Tell us about that.*

John: *In this particular project the fibre was already in use between two points 130 km apart. This was used for some dedicated telecommunications signals and there was no possibility of adding more fibre, so we had to hop onto the same fibre, without disturbing the existing communications.*

We have quite a few systems in China going over 50~60 km, and 50~60 km in rural China is a long drive, believe me.

Vlado: *When in your opinion did the CCTV industry start picking up on fibre optics technology?*

John: *I think the CCTV industry is now quite comfortable with fibre optic technology. In the late eighties and early nineties there were only a few people like Co Smit from Pacific Communications, who was the first to ask me to produce a PTZ control interface for their matrix. Since then, fibre optic understanding has matured in the CCTV industry. There still might be a few installers who are reluctant because of their fear of not being able to easily see what they are doing with the fibre which is after all only a hair thickness.*

There is a very strong argument that although you don't need to do it, you need to

Vlado: *But aren't there specialised fibre optic installation companies which specialise in termination? In many cases you don't have to even touch the fibre and a subcontractor like that will terminate it for you and even give you a report on the losses. I think some of them charge something like $80 per end.*

John: *Yes, but I also want to point out to you that there is a very strong argument that although you don't need to do it, you need to know how it is done. As you know, I have been conducting seminars on fibre technology over the past several years (the next one is in February 2000). The objective is to get people familiar with the pros and cons (and dos and dont's) of the technology. Once a person overcomes his fear of the "invisible" fibre he becomes more receptive to this method of communication and can make an informed decision as to whether fibre is the correct technology to use on any particular installation.*

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Vlado: *What are your main products for CCTV?*

John: *We can divide them into three or four groups of increasing complexity. First of all we have single video channel fibre links, such as the OSD361 and OSD363. They are simple and low cost, and perform well in most applications. The next group is slightly more complicated and has wider bandwidth, more dynamic range and includes automatic gain control, such as models OSD381 and OSD383. Then we have the combination group for*

PTZ control, where video goes one way, data the other, or both ways, some of them have audio as well. We also have models with duplex video for applications such as genlocking or video conference links. The final grouping is the multiplexing equipment. We have everything starting from two channels up to 16 channel multiplexers.

Vlado: Perhaps I should interrupt here and mention that the multiplexing you are talking about is not the time division multiplexing as used with video multiplexers. A lot of CCTV people would associate the term multiplexing straight away with the time division multiplexing. You are, of course, referring to frequency division multiplexing, where all multiplexed video signals are real time and sent via single fibre.

John: Yes, that's right, these are FM multiplexers, with full fields, real time video, the whole lot. We are currently working on all digital real time multiplexers.

Vlado: Do you mean multiplexers that will convert the video signals into digital format for the purpose of transmission?

John: Oh yeah. We are looking at both the MPEG-2 standard and wavelet compression. We may eventually produce digital fibre multiplexers with both of these formats since each one of them has its own benefits. We are looking at a variety of digital multiplexers and see wavelet as a simple robust technology offering good performance at a reasonable price whereas MPEG-2 can provide much higher performance at similar data rates. MPEG-2 also has the advantage that it is an accepted standard which allows a wider range of applications than just fibre optic systems.

Vlado: And I guess I should not ask, but in such a multiplexer you will still provide channels for data and even audio?

John: Definitely. That is a very minor addition to the bandwidth.

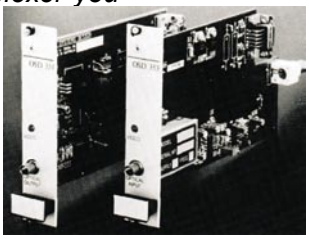
Vlado: How do you design your products, how long does it take from the idea to the product and what is the hardest part in the process?

John: Well, firstly, about 70~80% of the design ideas originate from customer requirements. A customer may have a brief specification which we then take and try to "generalise" as much as possible, so that we can sell it to other people later on. For example, a classic case of a customer's requirement was one of the very first video products I designed which was initiated by Paul Firkin from the RTA. This was back in 1987/88, and the product is still in use with only a few failures over this period.

A similar situation was the requirement for PTZ control data by Co Smit from Pacom, back in the late eighties, early nineties. So what happens is we basically get all the requirements that the customer has, and this eventually becomes the basis for a specifications sheet. Then from the specifications sheet a prototype is produced and analysed. From that we then have modifications and corrections to the design and finally we come out with a final pre-production model which is also extensively tested.

For example, when we designed the multiplexers, we brought in a variety of cameras, VCRs, test generators, VDAs, etc, so that we could test all the channels.

With complicated systems, such as our OSD725 multichannel digital audio link, which is our latest development, this process takes longer and requires more engineering effort. But like any other manufacturer, we do try to test all aspects of the product before it goes to the production line and eventually to the customer.



Vlado: Does that mean that you have never experienced unexpected problems after the product has been installed?

John: I wish! We do try to test everything in the factory as much as we can. But as with most other manufacturers sometimes things catch you out. You send the product out, you'd swear blind in a court of law that you have done everything possible to test every aspect of the product, and then the customer finds something odd.

You go out on site and many times you see he is right. For example, a power supply that copes with voltage fluctuations between 200 and 260, and it turns out that a product was sold in China where the voltage can drop down to 170 Volts and then it's quite obvious why the unit behaves strangely.

Vlado: *What about the electronic components? Getting all of them and having stock all the time to keep up the production must be a difficult task.*

John: *Well, as you know Australia doesn't make very many electronic components. We typically buy components through their various distributors in this country, but also import some more exotic devices. Sometimes, even a trivial component like a capacitor or a resistor may not be available from anywhere. You just simply cannot get it. So this is why many manufacturers, including ourselves, must often maintain significant stocks of raw materials. So much for "Just in Time"!*

What happened in Australia is that in the mid 1970s the Government decided to remove many of the tariffs on just about anything electronic. Consequently much of the industry producing volume electronic products, such as TV sets and the like virtually died out.

Vlado: *And what about the rest of your products, such as the cases, PCBs, etc.*

John: *We design almost all of it. Obviously enclosures, and raw PCBs etcetera, are made outside but we do all final assembly and test. We also have our own small surface mount assembly line which is very important for small production runs. We have found that it is very important to consider all aspects of the product when it is in operation. Therefore a housing design can be as important as the electro/optical circuit itself. The access for service and adjustment, measurement points and visible indicators are all important aspects of a good design. Also, the physical size of the fibre transmitters or receivers is important. We make both stand alone boxes and Euro rack cards for our 19" racks.*

Vlado: *Who are your biggest customers, or perhaps I should ask, what are the systems for which you can proudly say "we've done this"?*

John: *Over the past twelve years we have supplied equipment and designed systems for a lot of interesting and important sites, both in Australia and overseas, especially South-East Asia. These include Sydney Opera House, Department of Defence, RTA of NSW, Parliament House in Canberra, BHP, State Rail Authority of NSW and so on. Overseas we have many important customers too, but very often they are taken care of by our distributors. Our responsibility is then to train the distributors for a good in-depth understanding of fibre optic technology and our products.*

Vlado: *As a last question John, I would like to ask about your opinion on where fibre technology is heading at the moment and what do you think the future will bring?*

John: *Well, everything in electronics, without any doubt, is going digital. Today digital processing electronics is more affordable and faster than ever. Handling video signals using extremely complicated and efficient compression techniques is now technically and economically practical. This ultimately gives us the tools to design affordable, high quality digital fibre optic equipment. I expect the camera manufacturers will eventually produce CCTV cameras with digital video outputs. If there was a market for it they could do it right now, since almost everybody is using DSP chips inside, but they then convert the digital video back to analog when they deliver the video signal at the BNC output. As I mentioned earlier, OSD is already working on digital video multiplexers and the CCTV industry should be able to use these pretty soon.*

Vlado: *John I appreciate your time and hospitality, and on behalf of the CCTV focus readers, and myself, I thank you very much for this interview.*