Graphics of the Americas Tradeshow (GoA)

Wide format inkjet printers, solvent ink printers, color management and scanners

What is everyone looking at?

Contents

Introduction

Visiting a tradeshow is like being turned loose in a Wal-Mart devoted to digital imaging hardware and software: "Everything under one roof".

So if you would like a quick trip through what printers, scanners, RIPs, and accessories are available today, we hope you enjoy this report by Nicholas Hellmuth. It is based on three full days of notetaking at the "Graphics of the Americas Tradeshow" in Miami in January 2003.

Regarding wide format inkjet printers, this report offers comments on Canon, ColorSpan, Encad, Epson, and HP. It also reviews a host of Korean and Chinese solvent ink printers as compared with Oce Arizona, Scitex Vision, and Vutek. If you are considering purchasing a solvent ink printer, especially lite solvent, you would be wise to consult the FLAAR reports first.

This report lists software that complements Adobe Photoshop; discusses color management instruments, color laser printers, and related digital imaging subjects; and recommends books useful for studying Adobe Photoshop and other topics in digital imaging. It also suggests places from which to buy products where you find honest dealers who provide service after the sale: No P.O. Box, fly-by-night, no-name salesmen.

In addition to the comments about the tradeshow, this report indicates which other FLAAR Report series would be most appropriate for follow-up reading. All additional reading can be ordered directly from www.wide-format-printers.NET

This report is free as a public service from FLAAR.

Canon

Canon had no booth. There was one Canon printer, not printing at all, in the CGS booth. There seems to have been one other Canon printer elsewhere. Most dealers sell HP, Epson and/or Encad, so it is tough to find a dealer who sells Canon.

ColorSpan

The MacDermid booth exhibited a ColorSpan Esprit printer. At $15,000 they compete favorably with the HP DesignJet. The advantage of the ColorSpan is that you can feed it thick and rigid material.

A separate booth exhibited the Displaymaker XII and the X12. The X12 is an updated version of the Mach 12. FLAAR has both the DisplayMaker XII and the Mach 12 at the university in which we have our office. We have free reports describing how they print and anything you would like to know about them. Just fill out the Survey form and our university will send the reports, full color in PDF format, by return e-mail

ColorSpan X12, at GoA tradeshow

ColorSpan knows what kinds of images attract viewers: bikes and babes. Consequently, they displayed a babe on a bike. There was a waiting list of people who wanted prints. ColorSpan also printed handsome portraits and cityscapes (Las Vegas, for example).

I asked how long their colorful dye inks lasted. The answer: on canvas about 20 years, on photo base media about 10 years. Their pigmented inks last even longer. That is more than enough for décor, POP, and almost any sign usage. Obviously, these figures are for indoor use, not for use out in the bright sun.

The output from the ColorSpan printers was outstanding. Even in areas of solid black there was no banding. The black was pitch black, something you do not always achieve with some piezo printers. We know from experience, because we have two ColorSpan printers and two piezo printers.

We use our two ColorSpan printers every day. The piezo printers sit idle, in part due to metamerism, poor color gamut (Epson 5500, Epson 7500), and expensive ink. Besides, most economy media will not work in an Epson printer. We have a DisplayMaker XII and a Mach 12. They print the majority of the signs, posters, GIS, computer-generated art, and other images we produce for the university.

Encad

Encad had no booth. No Kodak media was apparent anywhere except in the corner of one reseller's booth.

A few resellers had Encad printers. One had a 700 model and an 850 model. Both were printing with an excessive ink load. This means long drying time, excessive ink cost, and difficulty for laminating.

Both Encad printers exhibited banding, which is rare for Encad. The banding on the 850 was painfully obvious. The booth person had not noticed, did not seem to care, and was unable to make observations on what caused it. This is precisely the kind of sales rep you hope to avoid.

Scanvec-Amiable RIP displayed the entry level Encad NovaJet 736. Its output was beautiful on an official photo; however, ink load may be high to achieve that output. When they reproduced a non-Kodak photo (a scanned image of a panorama of the New York skyline), the output was awful. The original photo was probably beautiful; the scan was terrible. The print was splotchy with banding and quite a number of defects, as though the printer simply could not handle the image (it must have been over 20 feet long). It's tough to recommend a printer (in this case Encad's economy entry level image) when it reveals it can't handle an actual print job.

The moral of this example is simple: all printers can reproduce the special images that the manufacturer shows you at the tradeshow. But where some printers fail is in being able to reproduce what your client brings in. In this case, the Encad printer failed to reproduce

Scanvec-Amiable booth displaying result of Encad NovaJet 736 print

the mural-sized panorama. We print our own panoramic images with our HP DesignJet and do not experience the defects that were embarrassingly obvious with the Encad.

This is why we have prepared a list of reports entitled the "Survival Series." If you order these reports from FLAAR, it is more than likely you will survive the decision of which brand and which model printer to select.

Epson

Epson had no booth.

There was one Epson America person in the booth of a reseller. We saw handsome output from an Epson 7600, especially B+W, using ColorByte RIP. Reportedly, ColorByte can do a better job of B+W than either the Epson driver or the EFI Fiery RIP.

At most other tradeshows we saw Epson printers all over the floor. It was not the case at this show. The few Epson printers that may have been in resellers' booths were not prominently displayed. Most of them were not printing, so we had no way to see any results.

Creo had an Epson 7600 rebranded as the Creo Integris for proofing. I guess if you are locked into a former Scitex workflow, there are advantages to sticking with their software. Of course, if you buy an Epson 7600 and proofing software off the shelf, it involves a lot less cost.

Hewlett-Packard

We do not usually review desktop-sized inkjet printers, but the sample from the HP business inkjet 3000 caught our attention. If you have ever listened to the litany of an Epson employee about their piezo heads compared with HP's thermal technology, you quickly realize how ridiculous the piezo mantra is. The output from the HP 3000 is absolutely stunning even with only four colors. The output is of full photographic quality; in addition, the user enjoys the speed and reliability of thermal print heads. I challenge the average viewer to distinguish the output from this HP printer from that of a Fuji Pictrography, or of any Epson printer, including the 7-color Epson desktop printer.

FLAAR Archive pictures printed on HP 5500 at GoA

HP had the largest wide format printer booth at the tradeshow. There were about five people from Apple to assure visitors that HP printers are Macintosh friendly.

The HP booth provided DesignJet 5500 printers for several RIP companies, including Onyx PosterSHOP RIP. These RIP companies used eye-catching photographs.

Also on display was the cc800ps copier. We hope to receive one of these to evaluate. Our background is in architecture and archaeology, which means that we have plenty of need to digitize maps and drawings.

HP DesignJet cc800ps copier

Roland

Roland had no booth.

We saw one or two Roland printers at resellers' booths. The word on the street is that no RIP is yet available for the Pro II series. This is because Roland dropped Scanvec-Amiable (ColorChoice for older Roland printers was a light version or an older Amiable RIP which was not always considered adequate).

Xerox

Xerox is offering a version of a low-end, entry level Encad T-200 printer as the Xerox 2260ij. An Encad NovaJet Pro 36 was the first printer FLAAR ever had. The Xerox 2260ij printer looks like a reincarnation of that venerable old Encad.

"High production speed with operational ease of use" would have to be demonstrated. Encad printers are infamous for their basic design which hardly every seems to change substantially. Where the printer would be fast is in monochrome mode. But changing inks with our Encad took up to 6 hours and was extremely messy: ink splattered everywhere. We never had another Encad printer because we found HP DesignJets easier to use, so I can't comment on any possible improvements to the old Encad. Hopefully, the newer models are easier to work with.

Miscellaneous: Creating Positives for Screen Printing

Oyo Instruments showed their Liberator thermal image setter for producing positives for screen printers: but at $98,000, Ouch!

Autotype had a booth to show their "Aspect Quadra System" for producing inkjet film positives. Their brochure pictured a Roland. We would recommend a Mimaki instead. The idea is to use a special, extra-dense, black ink.

We recommend you get a Mimaki; you can buy three Mimaki printers for the price of one Oyo. Plus, with the Mimaki, you can print photos, textiles, and everything else you want.

Synopsis on Wide Format Printers

Given that so many printer manufacturers were no-shows at GoA '03, you can learn more if you peruse the detailed FLAAR Reports on printers. We have a report for every need.

Printers Using Pseudo Solvent Ink

No printers which used oil-based ink were exhibited other than the Roland "lite solvent" printer. But that ink is not the same as that used by Seiko or XES ColorgrafX X2.

Roland SolJet Pro II. There has not yet been, to my knowledge, any fully adequate description of what makes up the "lite" solvent ink. Nor is there any adequate accounting of what media can, and what media cannot, be used with this unusual ink. We do know that one of the Mutoh printers using pseudo solvent ink has left some buyers rather unhappy. The problem with these inks is that the media is too expensive; therefore, you cannot compete with anyone using true solvent inks.

Printers Using True Solvent Ink

Vutek showed a very small version of their printer. Vutek is probably the most popular grand format printer in the world. However, low-end printers from China are competing. Mutoh, Mimaki, DGI, and Eastech are taking up the entry level.

Eastech had the nicest output of the less-than-grand format solvent ink printers at the show. It boasts eight colors. They stated the printer was assembled in Japan using heads which were not specifically Xaar nor Epson. However, the owner, Robert Pan, stated that all piezo heads use Xaar patents under license, even Epson. I wonder if that explains why Epson piezo heads have banding problems. Banding is a generic defect of most Xaar technology. This needs to be checked out. It is rare to find someone like Mr. Pan who actually knows about the technology involved. At other booths, the attendants sometimes had no idea about what was inside the printers they were selling. One booth attendant did not even know what RIP was inside his printer.

Eastech solvent printer

Worth checking out the degree to which this printer is comparable to the Mutoh Toucan

I did not happen to notice any banding on the Eastech. Its color looked great. The regular width model cost $50,000; the 87-inch model cost $90,000. That means that the Mimaki JV3 is much more economical. So far, the Mimaki is the most reasonably priced solvent-based printer yet available.

Digital Graphics Incorporation (DGI), offered their solvent ink printer from Korea. It cost $39,999, offers only four colors, uses Xaar heads, and is rated at 200 dpi. This printer looked better constructed than the Infiniti.

The Infiniti FY 8250 is made in main land China. It costs $39,000, offers 4 colors, uses 8 Xaar heads, and is rated at 185 dpi. It produces fuzzy, splotchy output. It is hard to tell whether the poor quality was the result of a terrible photo or simply bad quality overall. It displayed the worst output of any printer at the entire tradeshow. Nonetheless, they said they had sold 50 units to Mexican distributors.

In the same booth, a different Chinese printer was being shown: the Rasign PosterJet. Its base resolution is listed as 75; its top resolution is claimed to be 370. The quality, at least, looked better than that of the unfortunate Infiniti. A major downside of any of these off-brand printers is difficulty in obtaining spare parts and poor resale value. You have no way of knowing anything about the mother company, how long they may stay in business, or how long this model would be supported. They may be relatively inexpensive, but you run a considerable risk. Besides, they are not that cheap: $118,000. You can buy several Mimaki JV4 printers for that price.

The Oce Arizona 500 is a solidly built machine that produces very nice quality output. Here, at least, is a printer backed by service worldwide.

The Oce Arizona 30-s gets a tad faster and a tad better quality out of its Xaar heads every year. However, we have no way to compare how it holds up relative to any other printer. The advertising is effusive: "near-continuous tone printing." We have rapped Epson's and Roland's knuckles for that claim, which is misleading even for their 1440 dpi quality. The Xaar printheads of the Arizona 30-s are not fully photo-realistic. Not yet. But you don't expect that in most solvent ink prints.

OCE solvent printer

Otherwise Oce ads seem okay.

The Vutek Ultravu 2360FC produced banding in solid brown. Of course, you can't see that on a sign visible from a distance, but banding reduces the quality for point of sale signs.

I did not notice a Mimaki JV3, but this is generally considered the best constructed and potentially the most reliable of all the grand format solvent ink printers.

If the odor is offensive, you know it is true solvent ink. If you have a solvent ink printer anywhere in your building, you can expect health problems as well as potential visits from state regulatory authorities (in California). At least you can get rid of the unpleasant smell by installing Island Clean Air units. We like this idea. Their phone number is (800) 661-6211 (Pacific time zone).

After-market Inks

Van Son was present but not really featuring any after-market ink. That is largely because only old Encads and old Epsons use after-market inks.

Staedtler had a booth with their new distributor, CGS (a RIP company). Staedtler was showing their inks for Hewlett-Packard DesignJet printers. We do not yet have experience with their inks. Staedtler inks are also available for some Epson, Roland, Mimaki, and Mutoh printers. Contact Linda Voge, Linda@cgsusa.com, Tel. (818) 645-9040.

Inkjet Media

Gatorboard is reportedly usable indoors and outdoors and is considered practically indestructible. However, it is not yet inkjet printable. In other words, you have to print on separate paper then mount the paper on the gatorboard.

If you wish to print directly on board, you need an inkjet-printable material, as is available from another company such as Nielsen & Bainbridge.

Two magnet companies exhibited. One was Magnum Magnets. They offer digitally printable magnetic inkjet media.

Rexam changed its name to InteliCoat; InteliCoat then bought what was left of bankrupt Azon. What remains of the original Rexam media company is virtually their entire tradeshow staff (including James Demary and Ilsa Murray), the logo "Magic," and the Magic bus, a vintage VW microbus. Anyone aged 55 to 65 probably remembers the VW microbus. I had two of them, one after another. In their day, they were virtually indestructible.

To get sample swatches, try ilsa.murray@intelicoat.com; or tel. (413) 539-5172. If this contact information is not correct, please let us know.

InteliCoat Magic booth at GoA

InteliCoat is one of the top 10 media producers. In almost every print shop I visit across America I tend to find one or more rolls of Rexam media. This year their focus is on applications: which media for which applications.

Mitsubishi makes a small range of media. I would guess it is of high quality, as you would expect of that powerful brand name.

Arkwright, which is part of Oce, had a small booth. Arkwright media has a good reputation.

RIPs

BEST Color had a large booth but did not enjoy as much attendance as they have had at other types of tradeshows. BEST was represented in the HP booth, documenting that HP printers do proofing quite well.

CGS had booth of healthy size. CGS now offers Staedtler inks for the U.S.A. market. CGS is known for its O.R.I.S. Color Tuner, a highly regarded European RIP.

Color Tuner featured Epson and Canon proofers. Nothing from HP was listed or mentioned relative to proofing.

PerfectProof had a booth and a nice press conference. Alex Nussem did a good job of presenting their current software as well as the next generation Adesso.

PerfectProof brochures were also noticeable at several resellers' booths. We recommend you check out Proof-Master if you seek a RIP for proofing. Tech support is available both in Europe and in the USA.

Onyx PosterShop had two attendants in the HP booth. They kindly RIPed and printed out sample FLAAR prints of indigenous Mayan textiles from Guatemala. These prints were very popular with the attendees of the tradeshow, who were primarily from Latin America.

I noticed a few miscellaneous RIPs in some resellers' booths.

PerfectProof RIP booth

Color Management

Ihara had a booth. They had all their instruments on display. But the person at the booth said they do not really support their instruments for color management. He said they (meaning Ihara) are unable to provide tech support in the sense of training and admitted that people who had bought their products needed help using them.

This in and of itself is a good reason to skip Ihara densitometers and spectrophotometers for color management relative to wide format inkjet printers.

If you need training in color management, we recommend Cromaticity, fax (413) 254-4433, tel. (616) 361-7773.

GretagMacbeth had neither a booth nor a major distributor. They displayed a small sign with not much behind it at a miscellaneous booth.

X-Rite had a fully staffed booth. X-Rite offers a wide range of color management instruments, precisely the size, shape, and technology you need for color management with ICC color profiles. FLAAR has the X-Rite DTP41UV. Since many inkjet papers have artificial brighteners, we opted for the UV version. The College of Technology on our university campus has the same X-Rite DTP41 but not in the UV version.

If you need to read backlit material, you need a transmissive version of the DTP41. You can get all the X-Rite products from Parrot Digigraphic, jlorusso@parrotcolor.com. We use X-Rite tools every day; in fact, we could not do color management and ICC profiles without them. We use them with Monaco software, which is also available from Parrot.

X-Rite Color Management software

Integrated Color Solutions showed their BASICColor software suite at the Cromaticity booth. We discuss all the potential features of this software in our FLAAR Report on color management (included in the FLAAR series on RIPs).

Pantone makes such a wide range of color reference color chip libraries that you need to look at their offerings. We list the options in the FLAAR Report on Color Management. That document describes all Pantone products appropriate for color management relative to inkjet printing.

Beta Industries makes basic color tools. I had not previously heard of this company. Since all software is connected with X-Rite or GretagMacbeth, I guess these other brands such as Beta Industries must emulate one or the other leading brands. We recommend you stick with the industry standards, namely X-Rite and GretagMacbeth.

GTI, Graphic Technology, Inc, showed their viewing booths.

Scanners

Agfa and Heidelberg no longer offer scanners. Fuji and Microtek were not present at the tradeshow. One reseller had some low-end Umax scanners. One other reseller had one Imacon scanner.

Screen USA and Creo were really the only corporate booths with scanners of pre-press quality.

The Screen Cezanne Elite was on display. Two years running a Cezanne scanner did well in the Seybold comparative test of scanners. That was several years ago, however.

FLAAR has no products from Screen at either of its offices; hence, we are not able to comment on any feature of this scanner. Also, we do not know of any specific place which sells this scanner.

Screen Cezanne Elite scanner

Several years ago we had a Scitex EverSmart. That was before OXYGEN software was available, so we are unable to comment on that feature.

FLAAR initially used digital imaging in the scanning of color transparencies. We have a comprehensive report on scanners that resulted from this experience. FLAAR served as a consultant for the National Museum of Japan to set up their scanning, asset management, and digital storage solutions. We have condensed that six-month study into a report for people who use scanners to produce images for wide format printers.

Regarding wide format scanners, now that Contex bought Vidar, there is not as much competition other than ACTION (which did not exhibit). Contex has a new catalog. FLAAR has a Contex scanner on order: the model that sits atop the HP 800 to create a dedicated HP cc800ps copier.

Laser Printers

Xerox-Tektronix had a booth with a wide variety of printers on display.

Xante had their current line of equipment in their own booth and in at least one reseller's booth. We were curious about the specification of being able to print 12.9 wide by up to 47.24 inches long. Sure would eat up toner, but if you happened to not have an inkjet printer, it would be an interesting alternative.

HP showed a variety of color lasers including their HP Color LaserJet 5500.

FLAAR offers a report on laser printers. Just fill out the Inquiry-Survey form and our staff will be glad to send you the report at no cost.

Digital Cameras

Imacon Ixpress was on display at one reseller's booth. There was no Leaf studio at the Creo stand. PhaseOne was not represented. Whichever division of Kodak handles their digital cameras was absent. It was as though the companies recognized that the market for expensive digital scan backs does not include Latin America.

If you need professional help in selecting a digital camera, lighting for a digital studio, or anything related to digital photography at a professional level, request the FLAAR abstracts and syllabus as instant downloads, at no cost, in full color, via Adobe Acrobat PDF format.

Digital Imaging Software

Nik multimedia offers nik Color Efex Pro Complete, nik Sharpener Pro, and now nik Define. Nik Define reduces noise in digital photographs. For information, telephone (888) 284-4085, fax (619) 725-3151.

We feel that Nik software is among the best available to complement Adobe Photoshop. It is reported that some of the nik modules are better than the corresponding modules of Photoshop itself. Nik is a respected German company.

Nik Color Efex pro Complete software

Accessories

BBA Nonwovens

BBA Nonwovens exhibits at a number of tradeshows. I believe this is a European company; hence, their standards are high.

Their Photex Anti-Static Scanner & Screen Wipes can be used for cleaning off the surfaces of flatbed scanners. They remove the greasy fingerprint marks from your monitor.

You will constantly need to wipe down the innards of your wide format printer. Even the cleanest of such printers requires occasional internal cleaning. If you have an early Encad you will need Photex by the bale.

You might also consider their Webril wipes and pads or KleanWipes for wiping in delicate cleaning applications.

Books

Even in this age of the Internet, a traditional book is still usually more educational than a pile of miscellaneous pages off the Internet. Thus, we highly recommend you check out the following books.

GATF offers
- *Scanning Primer*, by Richard Adams.
- *The GATF Guide to Desktop Publishing*, 3rd edition, Hal Hinderliter.
- *Color and its Reproduction*, 2nd edition, Gary Field.
- *The GATF Practical Guide to Color Management*, 2nd edition, Adams & Seisberg.
- *Understanding Digital Color*, 2nd edition, Phil Green.
- *Principles of Color Reproduction*, John Yule, intro by Gary Field.

To order, call toll free: (800) 662-3916, fax (412) 741-0609.

Digital Graphics Books booth

DGB, Digital Graphics Bookstore, offers books on digital graphics. Rather than the impersonal Amazon.com, DGB has people who know the individual books. We recommend the following titles:

BARGH, Peter, *Photoshop 7.0*. Outstanding visual effects.
BLATNER, David and Bruce FRASER, *Real World Photoshop 7*, looks better than earlier editions on Photoshop 6.
BUSCH, *Photoshop 7: Photographer's Guide*.
CAPLIN, Steve, *How to Cheat in Photoshop*.
DENNIS, Anita, *Real World PDF with Adobe Acrobat.*
KIERAN, Michael, *Photoshop Color Correction*, **looks very nice.**
McCLELLAND, Deke, *Photoshop 7, Pro Edition.*
RAND, Glenn and David LITSCHEL, *Black & White Photography,* 2nd ed.
ROMANO, Frank, *Delmar's Dictionary of Digital Printing & Publishing.*
SHAH, Vika, et al. *Photoshop 7 Professional Photographic Techniques.*
STEUER, Sharon, *Creative Thinking in Photoshop*. Useful if you are an artist.

Contact for Digital Graphics Bookstore: Rick Smith, e-mail rick@dgbooks.com. Their website is www.DigitalGraphicsBookstore.com.

General Comments on Graphics of the Americas

The representation of scanners has been weak at most tradeshows. At least Screen and Creo were available. It would have been nice to see a Fuji booth.

The lectures at GoA appear to have been poorly attended. Combining a tradeshow and a lecture program has not been very successful. DPI and BigPicture failed; this is too bad since BigPicture had great lectures, albeit a weak tradeshow.

This tradeshow will probably survive, especially since Miami is a popular attraction in itself. However, if the big players like Epson continue to be no-shows, it will diminish the experience. If HP and ColorSpan had not been present, wide-format printers would not have been adequately represented.

Next on the Horizon

ISA Tradeshow '03: Major Changes in Wide Format Printer Technology and Manufacturing.

Although the ISA printer tradeshow (and hence the FLAAR report) will not happen until the first week of April, already during February we learned of monumental and far-reaching changes in the overall industry. If even half of what we were told about actually takes place, the entire alignment of name brands will change in several sectors of the industry.

Major changes will happen in solvent ink printers. One company with older models is going to be shaken to the core by the aggressive pricing of the new models from bolder companies.

The other major shake-up is also in piezo-electric technology, but for aqueous inks.

Since Canon is the only major printer manufacturer in the world to lack pigmented ink, we can expect it's about time for an ink update on their line of printers. Otherwise, the printers themselves are okay, but the resellers get more points selling HP or even Encads. In essence it is very hard to find a local dealer who can provide personal service on a Canon. Same in our facilities. We have nine printers, but zero Canon products.

HP has not had a totally new front-line printer now for several years (HP 5500 was just an upgrade to the 5000). However they usually use Seybold to present new models. But there may be some new facts by the time of ISA. No matter what, all the upcoming changes will impact the industry leader (HP) one way or another.

Same with Encad: the Kodak 5260 was finally cancelled last year. The Encad direct-to-substrate (vinyl) printer failed to be unpacked at SGIA (late October 2002). Hopefully Encad will be able to get a new printer to market by April.

Expect some major shake up from Epson. Now that Epson has taken over the photography, proofing, and giclée market from competitors, Epson will seek to use all the profit from those easy conquests to attack competition in even larger markets. The difference is that the larger markets are well defended by capable products already installed.

FLAAR remains the most widely read source of factual reviews on wide format inkjet printers, so we will continue to assist thousands of individuals and companies during 2003 who seek help on our recommendations for what printers they should select.

Return to any FLAAR web site in March to get Nicholas Hellmuth's report direct from the floor of PMA tradeshow. Then return again in April to learn all the major news of the new alignments in wide format printer manufacturers that will be either announced or leaked by then.

And remember, you got your first hints of what's happening from an independent institute dedicated to providing helpful information on what to expect in digital imaging hardware, software, scanners, digital cameras, and related equipment.

Click to view each FLAAR Network site

www.wide-format-printers.org	www.FineArtGicleePrinters.org	www.large-format-printers.org
www.digital-photography.org	www.flatbed-scanner-review.org	www.laser-printer-reviews.org
www.FLAAR.org	www.ctpid.ufm.edu.gt	www.wide-format-printers.NET