creative • *adj.* **r**elating to or involving the use of imagination or original ideas in order to create something • *n.* a person engaged in creative work.

– From the Concise Oxford English Dictionary

Dear Reader,

Ipex marked a turning point for the industry, demonstrating that where there is imagination and passion there is life and a future. Not every sector in our industry is using their imaginations, but nowhere is this so obvious as in newspapers. Jens Velin, CEO of the Nordic division of the international media agency Starcom, summed it up: "A disadvantage compared to other media is that newspapers are slow to adjust to creative media solutions and collaborations. This inertia stems from how newspapers have traditionally been run. Particularly during the 1970s, journalists were cut off from all commercial aspects of the business, and the newsroom and sales department were completely separated from each other. In contrast, in newer media such as commercial TV, the Internet and in free newspapers, this airtight separation does not exist. Unfortunately, in newspapers this culture lives on in that they are slow to adjust to creative media solutions and collaborations between the newspaper and its advertisers." The rest of the printing and media industries is building platforms that encroach bit by bit on newspaper markets, whether its Google, television, magazines or whatever. Newspapers clearly still believe they've got it right but as they continue myopically along a road to nowhere, the rest of the media world is building routes to transport customers somewhere altogether elsewhere.

It's clear in this month's news: acquisitions, divestitures, technology investment, imaginative new print applications, suggest rebirth. Neither printers or technology developers are the industry's dinosaurs. That sad honour goes to the rising number of newspapers clinging desperately to outmoded and despotic media perceptions. The future of the media industry is in business models that revitalise advertising, leverage media fragmentation and use print in all its guises effectively. There is room for newspaper businesses, but they must create it. For the world where deadlines are everything, time is starting to run out.

Enjoy the read!
The Spindrift crew,
Laurel, Cecilia, Paul and Todd

In This Issue

Halfway to heaven

Hybrid screening technologies are on the up, not least because they can improve print quality without making life an FM-hell for printers. Writes Paul Lindström: "Hybrid screening technologies all ensure that the dot size isn't less than what can be safely reproduced for a given printing process. In the highlights and shadow areas hybrid screens therefore are calculated with FM or FM-like screening algorithms. For the midtones most of hybrid technologies use conventional AM or AM-like screening technology, to avoid the risk of graininess. Printing characteristics will thereby also be very similar to conventional AM-based screening, that is solid prints and midtones should not be grainy, and dot gain behaviour should be similar to that of conventional AM screening." Read the whole story…

see page 9

CTP as seen at Ipex

Laurel Brunner post-Ipex: "Tempting as it is to believe that the entire print industry is preparing for an imminent leap into digital printing, advances in both platesetting and press control systems suggest that plenty of people are still looking rather than leaping. They see a world where conventional print models are thriving, and these people are both developing and purchasing equipment to fuel an increasingly greedy beast." For those still putting their money on offset, there was a lot of encouraging news in the form of CTP developments at Ipex. Laurel Brunner takes a closer look at the offerings…

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Regular Columns

News Focus

ECRM is set to acquire Esko Productions' polyester CTP product line, including the manufacture and sale of DPX 4, DPX System, DPX Lite, the WorkMates software suite, and all associated software products, consumables, spare parts, and related products. Financial details of the agreement were not disclosed and are to remain confidential.

Dainik Jagran, the most widely read Hindi newspaper in North India and one of India's major daily newspapers, went shopping for CTP at Ipex. The buyers left Birmingham having ordered 18 engines from Krause and 22 from Screen, to join the newspaper's six existing Screen engines. This mixed herd of thermal engines will image plates supplied by Indian plate manufacturers Technova.

Xerox has reported that it sold 65 digital printing systems at Ipex. Given the money Xerox must have spent in and around Birmingham of late, is that enough one wonders?

Kodak's Graphic Communications Group took twice the number of orders expected at Ipex recently. GCG don't say what they were expecting, but hopefully it was a reasonably ambitious number. Kodak also announced that 150 companies are using its Thermal Direct processless plate. Some way to go before customer numbers reach those of Agfa, but steady progress at least and a vote for processless.

Presstek has reported consolidated revenues of $70.6 million for the first quarter of 2006, its highest ever. The company recorded an operating profit of $3.6 million, which is about 5% of turnover. The company's digital business contributed nearly two thirds to revenues and is growing rapidly.

Screen has sold its first Platerite Ultima 24000 VLF CTP system to SB + Imprimerie in Aulnay-sous-Bois in France. Imaging Fuji plates the machine is producing plates for large format 120 x 160 posters and a wide range of high-volume packaging and commercial applications.

Picdar has installed its Media Mogul Workflow system at Mortons Media Group. This publishing company specialises in heritage transport magazines, and is using Media Mogul to eliminate hidden costs and streamline the publishing workflow. The publisher will use the technology to organise and control production and to achieve cost efficiencies throughout production, without compromising established publishing workflows.

Inca is introducing a new version of its Spyder technology. The six colour Spyder 320e is an entry level version for high quality output at medium level speeds. Inca also has a new version of its Spyder Run software for driving its engines at up to 80 square metres per hour, for an overall production speed of 65 metres per hour.

PODI has announced the sixth edition of its Best Practices in Digital Print report. The report includes 46 new digital print case studies as well as best practice principles for creating effective digital print solutions. The new edition costs $495 and has best practices guides for marketing and service providers, based on data derived from PODI's database of 265 case studies. Mostly this is relevant for the American market, but it could also be of interest to companies working elsewhere.

Icelandic media group **Dagsbrún** is making a bid valued at some €100 million for UK's Wyndeham Press Group. Dagsbrún has extensive operations in media, entertain-

ment, telecommunications, print and related sectors in Iceland and the Faroe Islands. The Dagsbrún board has now taken a strategic decision to expand the reach of these core sectors outside of its home market. As of the 18th April, Wyndeham shareholders had accepted the bid for Dagsbrún to acquire 51.03 per cent of the total of 77.07 per cent of Wyndehams issued share capital. Acceptance of the offer for the balance of the shares had not been received at the time this issue went "off stone".

A newly formed print consortium is starting to make inroads into the international market, providing print services for publishers and printers alike looking to develop or expand capacity beyond their home markets. **Print India** is a group of twelve independent Indian printers offering design, content, prepress and print services for book, print on demand, commercial, security, output and packaging markets. Members of Print India are selected on the basis of production standards and the high level of their printed output, with many ISO 9001 certified.

Ultimate and **Enfocus** are joining development efforts to integrate Ultimate's Impostrip on Demand imposition software into Pitstop Automate. Ultimate is the fourth development partner to sign up with Enfocus to co-develop their technologies. The others are Perfectproof and ICS for proofing technology, and Alwan with its CMYK Optimiser colour management technology.

McClatchy, recent purchasers of the Knight-Ridder newspaper group in the US for $4.5 billion, has announced its intention to break up the group. The assumption is that if the group is broken up and sold, the sum of the parts will be greater than the total purchase price. Wisdom indeed. If it goes through, the current sale of four titles will net McClatchy $1 billion and there are a further eight titles that the company has said it will sell. Once these are sold, McClatchy will be left with some 50 non daily titles, and 32 dailies. Does this point to a move away from consolidation and towards a new era of small but beautiful publishers in the newspaper industry?

Has **MAN** gone down a similar path with its sale of the MAN Roland press division? Probably not since the purchaser here was Allianz, a massive German financial company. But why? Does Allianz really want to get into the printing business? Or is it planning a preening and pruning exercise for MAN Roland? Once MAN Roland gets the support it needs to reinvent itself, shedding for example its sheetfed division, Allianz will doubtless have some-

thing of much greater value than it started with. That's the point at which the company will inevitably question its involvement in heavy metal.

Fujifilm Graphic Systems have announced that West Bromwich-based Hill Shorter is the first customer to sign up to use the company's processless thermal CTP plate, Brillia HD PRO-T. Hill Shorter uses Fuji's Brillia HD PRO-T thermal CTP plate on its Fuji Luxel T-9000 CTP platesetter to print high quality fine art reproduction work for the music industry and university and school prospectuses.

Global Graphics has announced that Peter Camps, the founder and chief executive officer of Gradual Software, has been appointed a non-executive director. He replaces Stephen Temple, the technical director of Xaar, whose mandate had come to term.

Printing World and **Seybold** are both on the skids. Printing World's publishers, CMP Publishing, which recently acquired Media Live, current owners of Seybold Seminars and Seybold Publications, has sold Printing World to Haymarket. Haymarket plans to ditch Printing World as a weekly and publish it instead as "a quality in-depth monthly read in June". According to a news item in Printing World, current editor Rod Hayes is retiring, but that is far from the truth. Rod has told us that he will be continuing to work for the trade press as a freelance. The new editor of Printing World monthly we have heard is to be Barney Cox, currently technical editor of Print Week. We can't tell if that's sideways or upwards, but good luck to Barney either way.

And it seems that unless someone steps in at the last moment, CMP intends that the final issue of the Seybold Report will be published on the 24th of May. If it happens, we'll have more to say about it in our next issue.

Spindocs

Prosperity is as Prosperity Does

This sounds almost too good to be true. Prosperity is an employment management company that specialises in tax services for contract employees. One of the benefits for contractors signing up with Prosperity is, according to one of their advertisements, that contractors can:

"spend up to £24 (about €35) on food, and you don't have to keep proofs of purchase. So the days of the spherical, receipt stuffed wallet are over. And for every day that you're working, your food will be the tastiest kind of all: the tax free variety. It's said that there's no such thing as a free lunch, but the tax savings mean your food's effectively free twice a week."

It might be true but if it isn't, a nasty addition to your annual tax bill will be in the offing!

Driftwood

(Useful stuff washin' in on our shores)

Contextual advertising

Advertising is no longer about paying a lot for a few millimetres for an often hit-and-miss exposure in a newspaper or on a website. For small, niched businesses there is another option – ads linked to internet searches. Instead of paying for having a banner exposed to an unknown audience, with keyword advertising, or contextual advertising, you pay for exposure to a much more defined group of consumers.

The providers of contextual advertising schemes are the big Internet search engines, most notably of course Google. Yahoo is another player. In 2003 the company acquired Overture, an Internet search service provider, and now offers contextual advertising under its Search Marketing brand of services. Yahoo Search provides ads for other search engines as well, including MSN, Alta-vista and CNN.com. And obviously search advertising is working for these companies: according to online market researcher eMarketer, Google's share of global online ad revenues is predicted to be nearly a quarter (23.8%) this year, while Yahoo Search is expected to get just over 11%.

Broadly speaking, there are two types of contextual advertising. The most widespread is so called keyword advertising, where an advertiser pays the owner of a search engine a price to have his ad shown in conjunction with search results involving specific keywords or combinations of keywords determined by the advertiser.

Keyword advertising can be a very cost efficient alternative for an advertiser, as he gets access to relevant potential customers, and only pays for when people actually click on his advert. The advertiser also determines what he will pay for the ads. Google's search-based advertising service is called Adwords, Yahoo's is called Sponsored Search. To set up as an advertiser, both Google and Yahoo Search charge $5. With Google this is a straight fee, with Yahoo it's a deposit, and any subsequent click-through charges that the advertiser incurs are deducted from it. Once the advertiser has set up an account, he chooses the search term or terms for which he is going to pay, or bid. With Yahoo it's straightforward: the person who pays the most for a search term gets the highest placement on the search results page. Google's model is a bit more complex. Their ranking is based on a combination of the clicks an ad actually gets and its cost per click (CPC – i.e. what the advertiser is paying). So, if two ads have the same CPC, the one that generates the most clicks gets listed first. If, as an advertiser, your offering is very specific, you have every opportunity of getting your ad listed high up for a very small cost, as there are likely to be much fewer others competing for your search term. With both search engines you can set a monthly maximum cost so that you know how much you will be paying (your exposures are then spread out over the period).

The other kind is content based advertising, where search engines provide a service to content providers, such as newspaper websites, and place ads related to

the content on the page on the actual page. The content provider then gets a share of the search engine's ad revenue when a user clicks on one of them to get to the advertiser's site. Another option, offered by Google, is for a content provider to put a Google search box on their site. When a user does a search, the result pages show up with ads, and if the user clicks on one of these, the content provider gets paid.

In both cases, the advantage for the advertiser is of course that he gets access to users with interests which very specifically match his offering. From a content provider's point of view it's a way of turning pages into revenue streams, without having to put any resources into selling ads on those pages.

Google offers website owners a service called Adsense and Yahoo recently launched an equivalent programme called Publisher Network. These services allow content providers to display ads on their web pages without actually having to sell the space. In these instances the search engines use words in the content on the content provider's web page, and through sophisticated technology are able to put the words into context. The ads selected for display on a given page are chosen based on this context – so the content provider becomes a context provider for the advertiser.

Boomerangs
(Your feedback fed back)

From: Margaret Motamed <Margaret.Motamed@efi.com>
To: Laurel Brunner - Spindrift <lb@digitaldots.org>
Date: 11, April 2006 7:06 pm
Subject: RE: Next Issue

Thank you laurel,

Yes, I would like to subscribe again. My job function has changed again and in the new position it would be good for me to stay up to date. As you know, Seybold publica-

tions is pretty much just press release info - they are down to no staff. You all are the best going!

with many thanks,
Margaret

We're glad to welcome Margaret back into the Spindrift fold, but sad that the venerable Seybold has drifted so far off course.

Say What?
(Iffy Writing Award Presented in the Ether for Obfuscation, Confusion, Misinformation or All Out Pretentiousness)

HP Indigo, along with its competitors, spends a fortune on promotion and marketing. But we have yet to be convinced that all these sheckels get spent with any real wisdom. An unbelievably lovely and incredibly expensive piece of promotional material that arrived in the post in the run-up to Ipex has only convinced us that slick and sexy print is all well and good, but without a bit of intelligence behind it, it's just landfill.

HP Indigo sent a 46-page magazine featuring pages with variable data printed on all manner of stocks and substrates, including lenticular stuff and metallic silver film. It must have cost an absolute bomb and the idea was to sell the quality and flexibility of the Indigo engines. As far as the print goes, this mag is a triumph of seduction, swooningly irresistable in every respect, except one. Unfortunately that one, the variable data bit, is the single most compelling reason for investing in a digital press. Cock-up or what?

The variable data bits were all personalised to Laurel, which is fine. But rather a lot less fine, they were addressed to Laurel, editor, Seybold. There are six references to Seybold very cleverly integrated into the texts that ran throughout the book. But was Laurel impressed? What do you think?

It's generally accepted that people immediately bin printed mail, if their name is spelled incorrectly. Personalising and customising material to someone using data that is at least 12 years out of date, probably yields much the same response.

Surely getting right the database part of variable data print is self-evident?

For the record, Laurel ceased to be an editor for Seybold in the early nineties when Ziff Davis bumped her elsewhere into management following its acquisition of Seybold. She was made redundant from Ziff in 1994 and has been floating about since then under her own clashing colours, and those of Digital Dots and Spindrift since 2003.

If anyone in marketing at HP is interested and is reading this, Laurel's details are horribly accessible to anyone with an Internet connection and a basic knowledge of search engines!

Acrobites

(Something to get your teeth into)

GSA

Google Search Application is a new enterprise search application that allows companies to use Google for finding data. The interface is, of course, familiar and this technology has been developed in collaboration with Oracle (databases), Cisco (networking) and SAS (business intelligence). People can access databases, archives, customer relations systems and other systems via a familiar front end and with a technology that doesn't care where it searches, so it doesn't matter how many different databases a company has.

GSA is far from an asset management system, but this technology could provide an interesting overlay to some content management systems, particularly for preliminary content searching.

USB

Yes we all know what doodads fitted with a USB connector can do, but do we know what USB actually means? Universal Serial Bus is an input/output protocol that allows higher speed data transfers and so that all sorts of peripheral devices can be plugged into a computer, from memory sticks to hot (well, tepid) plates to keep your cup of tea toasty warm. And the word bus has nothing to do with the double decker variety, but everything to do with a shared channel between different devices such as a computer's central processing unit and its memory.

Expandocs

(In this section, we aim to cast some extra light on a particular recent news story.)

Next Generation Superheroes

We described Adobe's PDF Print Engine and briefly mentioned the new Fujifilm workflow system in our last issue, but we suspect the significance of Fuji's introduction might have been more or less drowned in the Ipex news flood. So what are the implications of the PDF Print Engine and Fuji's Sentai?

The Japanese term "sentai," meaning "task force," refers to a team of colour coordinated, costumed and bespangled superheroes – generally five – who battle sinister presences bent on conquering the world with hordes of generic foot soldiers and marauding monsters. Sentai has its origins in a 1975 childrens' television series, Goranger, which was the basis for the Power Rangers. Sentai's traditions were originally borrowed from earlier ideas in Japanese filmmaking, known as tokusatsu, a term referring to special effects shows in general and superheroes in particular. Obviously, production workflows and superheroes have a huge amount in common, from the colour coordination to their hidden powers, hence Fuji's choice of name for its new workflow system.

At Ipex Fujifilm gave a technology preview of Sentai, a RIP and workflow system that will eventually supercede both Celebrant and Rampage. Users of these systems will not be abandoned: Fuji is putting in place a migration path that will gradually move both communities into the new environment. Fuji's goal with Sentai is to avoid the blind spots of many workflow systems which don't provide full details, process and content visibility throughout production. The technology is based on the Adobe PDF Print Engine (APPE), but that's the least of its charms: this is a workflow system that takes operators away from fiddling with PDFs, to making plates without having to get

involved or even have cognisance of what is going on in the background.

There are two extremely important features in APPE which mark a new era in publishing workflows, not only for Fuji, but also for Agfa, Heidelberg, Screen, et al. The first, and most obvious, is that it's now possible to process native PDF files in the RIP, without reverting to Postscript commands at any stage in the processing. Designers can confidently submit PDF 1.6 files as is to the workflow, including transparency and overprint settings for the intended appearance, without worrying whether the files will process accurately or not. The days of anxious guesswork and nail-bitten worry about whether the print will work or not should soon be over!

At least that's the idea. The second important point is that APPE expects and assumes all production related data to be formatted as JDF. However although Acrobat 7 in CS2 can already import and edit JDF data, this is not the case for the whole Creative Suite portfolio. It's not a desperately wild guess to expect advances in this area in CS3, probably to be launched by Adobe in late 2007.

Anyway, at Ipex Fujifilm demonstrated a scenario to take advantage of both of PDF Print Engine's major design strengths: a designer is about to finish the layout of some documents, and needs to either create the job intents as JDF, or get the job intents from elsewhere. Instead of re-keying this data into a JDF based order bag from a paper based order form, the data is either imported from the ad agency's MIS (yes, ad agencies use MIS), or from the MIS system at the publishing house. Jobs can be moved about, either through drag and drop to hot folders or via http. They can't yet be moved using email, although email is used for sending preflight and PDF profiles to users. In common with many competitors, Sentai lets operators predefine workflow paths and the tasks attached to a given stage in the production processes. In Sentai this predefined map is sourced directly from the MIS to provide a very easy way of managing files using drag and drops or hot folders automated using naming conventions. The assignment of tasks to files is moving to be part of the job profile or intent, rather than assigning set

steps within the workflow, but this is still under development. Although the Sentai user interface is reminiscent of Agfa's Apogee, Sentai adds little animated icons, which are either engaging or irritating – we can't decide which. It's probably a male/female thing.
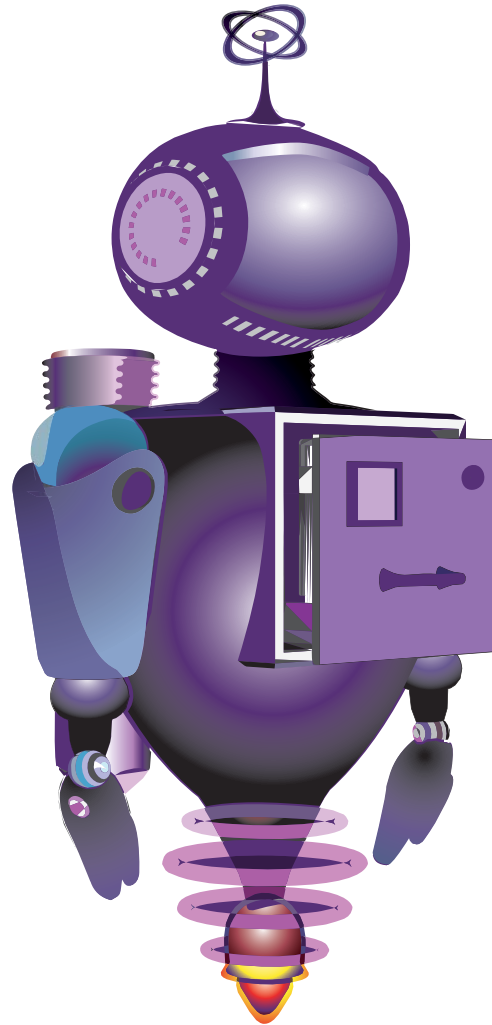
One of Sentai's animated icons.

When a job is initiated it is very likely based on a prior estimate, so besides the process flow most of the job intent data can derive from the printer's MIS system. Much of this data will probably also reside in the print buyer's MIS, if present, as well. So the designer should be able to import all relevant JDF data into whichever JDF editor is being used. The printer can provide JDF data describing the preflight and ICC colour profiles to use, determined according to paper, press and production parameters. Colour conversions are done using Fuji's Smart Colour management module for accurate colour conversions.

This includes black channel preservation, which is still not possible with Adobe's colour management module.

As is the case with competing systems, it isn't possible to make changes to jobs, such as adding pages or revising them, in this release. Changes require the job to be reinitiated in the MIS, but ultimately Fuji plan to make it possible to add new pages within the workflow system using JMF messaging to update other systems such as MIS. The JDF file will also have information about where to deliver the print-ready PDFs. In Fujifilm's demo a URL was provided in the JDF file and, together with the actual order number, all files could be routed to the correct folder in the printer's server. Correctly preflighted PDF-files, straight into the expected folder on the server – who could ask for more!

Files can be proofed as complete 3-D projects using Fuji's very snazzy new proofing viewer. A double click on the impositions shows the pages, and the 3D viewer includes colour intensity controls, lighting controls, and can show the effects of coating, varnishes, and different paper types. Fuji is also considering the addition of costing information and pricing to this interface, so that print buyers can use the view for job and project management rather than just single page proofing. Remote softproofing is in the works and will be provided when Sentai is ready for release, but it's still too early to say when that will be.

The viewer provides an animated prototype on screen of the final project, however gimmicks aside, this viewer is also a powerful soft proofer for checking dots, individual separations, progressives and the composite page images. It is possible, via the viewer, to even make changes to the screening on the rasterised file once it has been processed by APPE. Fuji's proofing view can show the real dots as they will appear on plate, taking advantage of the rendering engine built into APPE, plus some Fuji additions.

Other changes such as switching the output path to a digital press for short run versions of a conventional job, or automatically reworking jobs for different papers or fin-ishing, happen with a click of the mouse. It all really looks quite mind-blowing and Fuji has gone from mild mannered workflow drone to workflow Superhero in a single, dazzling leap.

We know that all the Adobe OEM partners are working flat out to implement the APPE as we speak, and we fully expect to see more stuff to blow our minds in the coming months. But we believe Fuji is currently the only developer to have developed its own hierarchical database, mimicking JDF's hierarchical structure, to provide the foundation of a workflow system, based wholly on APPE and JDF. It will be very exciting to see where all this leads, for the different workflow systems on the market, both existing and the ones yet to be invented.

Hybrid screens – the best of two worlds?

Printers are constantly looking for new ways of adding value for customers through quality improvements. Screening technology adds value to print because accurately screened high resolution print yields a visibly better printed result. However it can also provide a means of protecting margins, differentiating a printing company from competitors and providing new business opportunities.

Over the last several years, many printers have been working with stochastic or FM ((Frequency Modulated) screens, often with great success. But not all printers have been convinced, preferring to stick with traditional AM (Amplitude Modulated) screens instead. The view for the first group is that FM's benefits outweigh the work and strict process control required to get good, reliable results. Of late, more and more vendors of CTP devices are promoting hybrid screening technologies as a viable middle of the road offering, perhaps to convince the sceptics, or perhaps because hybrid screening really is the way of the future. Will these new hybrid screening technologies replace both AM and FM screening, or is this a too simplified approach?

The technique of using a screen to trick the brain into believing that gradual tonal changes are present in a printed image is as problematic as it is clever. All screening technologies have their advantages and drawbacks, so it's not surprising that there is such variety and innovation in screening experimentation. Developers have been messing about with screen types, screen angles, screen frequencies and dot shapes ever since conventional analogue screens were replaced with their digitally created equivalents. The crucial differentiator lies in how the actual calculations of a screened bit map are done using dedicated screening software, operating in the RIP to prepare data destined for output on an imaging device.

The emergence of hybrid technologies is another approach to the established methods for these complex calculations. As is the case with AM and FM screening, there are various different approaches used to create the algorithms that produce a hybrid screen. It's tempting to simplify things a little by saying that a hybrid screen is a mix of conventional AM and FM screening algorithms and for some technologies this is close enough to the truth. However in other solutions it's perhaps more correct to state that the hybrid screen is a further evolution of a high frequency AM screen, inspired by some of the advantages of FM screening. In yet other solutions the base technology is predominantly FM, with overtones of AM. Which approach yields best results? Perhaps it's worth ▶

While hybrid screening is relevant for most printing applications, it's probably in newspapers and packaging that the benefits are the most obvious. In flexography, which is also used for newspaper printing, disappearing highlights is a persistent problem.

looking first at the advantages and disadvantages of conventional AM and FM screening.
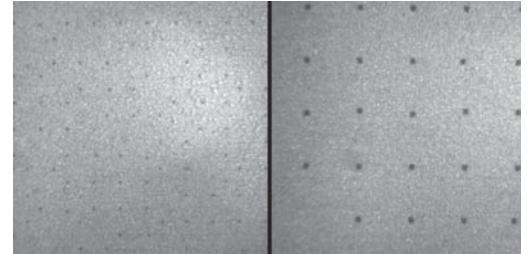
AM Screening

In a classic AM screen the screen dots are placed at the same distance apart from each other, but they vary in size. They produce even and smooth flat tones, especially for midtones. At medium screen frequencies, such as 150 lines per inch, an AM screen is also quite robust and able to withstand the wear on the plate for long print runs. The dot gain is generally lower than is the case with FM screening, and stays within predictable values that printers are comfortable working with.

Agfa was among the first companies to launch a hybrid screen, with Sublima. Highlight and shadow details are rendered with technology borrowed from FM screening, while the mid tones are rendered with conventional AM screening. To the left 1% density with conventional AM screen: a dot size that normally is difficult to transfer to paper. To the right 1% dot density with sparsely placed dots using Sublima. The smallest dot size is 20 micron, the equivalent to a 2% dot size at 175 lpi, and this should be able to transfer to the printed paper.
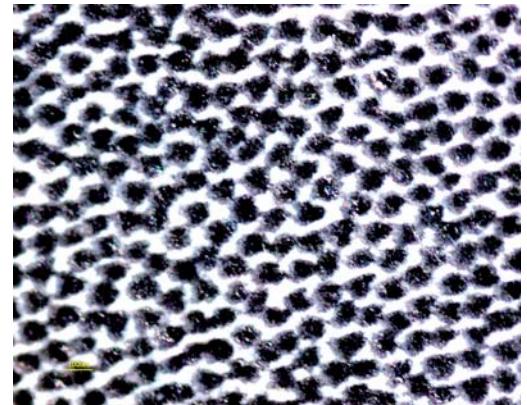
Among the weaknesses of AM screening is the problem of maintaining dots in the highlights, where tone values are from 1 to 5%. Each screen in a four colour set must be positioned at a specific and fixed angle relative to the other three, with a slight rotation in screen angle. Because we have to carefully overlay four screens, it is vital that these angles are accurate and printed precisely, using this idea of a slight rotation in order to avoid the patterning that is inherent to the AM screening process. The rotation of screen patterns by 30° from each other minimises visible moiré and this minimised moiré is what we generally see as a characteristic printed rosette under the loupe. Moiré could be either purely screen related or image related, such as can occur with many fabrics where the pattern in the textile interferes with the dot pattern. Moiré is a phenomenon that we have almost accepted as a natural part of printing, but it's really unwanted. The very small dots in the shadow areas have a tendency to clog up, a similar but opposite problem also occurs in the highlights. For medium screen frequencies, say 133 lpi, AM screens can be limited in their capacity to reproduce fine details in the image.

AM screen technologies are of course constantly being developed to overcome these limitations with clever manipulation of dot shapes and screen angles. Dot shapes vary, with different shapes more suited to different types of reproduction, because its shape determines a dot's visual and printing characteristics. Most commercial print is produced with round or square dots, but an elliptical dot is often preferred for the printing of smooth tones. We still see new, and sometimes radically different, dot shapes suggested, such as for example the "saw tooth" shaped screen dots from Sandyscreen (see image).

The dot shape can differ quite a lot in second order FM screens, here the mid tones in Screen Spekta 2. Although a hybrid screen with much in common with FM screens, the worm like pattern in the mid tones has a lot in common with patterns in AM screening. This is a 500 X enlargement from a digital microscope from a greyscale image in the test form.

Dot shape obviously influences screen angles, but for the most part printers try to avoid having the black screen too close to a 90 degree (vertical) angle. The human eye is better at detecting the grey scale than it is colours, especially in the vertical axis. Because it is the most obvious when it's wrong, the black separation is normally put at around 45 degrees, where the chances of tricking the eye are the best. The other separations are then placed at 75° for cyan, 105° for magenta, with yellow, the least critical, at 90° – we humans are quite useless at detecting and separating yellow tonal values, unless we have a tendency to colour blindness.

FM Screening

An FM screen's dots are all the same size, but their number and place-ment varies, so appears to be random. Experiments with FM screens started more than twenty years ago. FM screens are often referred to as stochastic screens because the dot positions in them are random and im-possible to predict.

Back then CTP was in its infancy and not widely used. Printers working with film struggled to transfer the relatively small dots from the film onto the plate and matters were even more tricky with FM screening, despite its promised quality enhancements.

Among the advantages often listed for FM screens is the smooth highlight rendering, with no sudden shifts. Since an FM screen doesn't place the dots with fixed frequency, it is theoretically impossible to create moiré, neither screen related or image related. It is for this reason that FM screen-ing is often suggested for printing with multiple colours, such as Pantone Hexachrome with its six colours: cyan, magenta, yellow, orange, green and black, or FM Six, which uses six of a possible seven colours: cyan, magenta, yellow, red, green, or blue and black, and Opaltone which of-fers users seven colours. Several vendors of CTP devices and RIP systems offer their own multicolour solutions, for example Agfa's Alterno, Esko's Inkswitch, Kodak's Spotless and Screen's Spektacolor. In fact colour the-ory says that printers should never need to mix more than three colours with multicolour print, and with the proper algorithms even with AM screening printers can for the most part steer fairly clear of moiré. Using an FM screen makes things substantially easier however.

One of the test forms, used before by us when testing digital printers and proofers, is a page from the ECI Altona Test Suite. It contains several types of images to evaluate visually, as well as a control strip for spectral measurements.

The pattern of FM screen dots is very similar in appearance to the way silver halide grains appear in photographic film. This, combined with the on average smaller dot size of an FM screen, results in what appears to be a more detailed and sharply printed image. In this way, high resolution images really come into their own, particularly when compared to their equivalents printed with a medium frequency AM screen.

But a technology seldom carries with it only benefits: there is almost al-ways a flip side. First generation FM screens had a tendency to produce too grainy an appearance, especially in the mid tones and flat tint areas. In a way, this graininess was a kind of moiré, since it occurred because of interference between the randomly placed dots forming patterns. Another factor that had to be resolved was the inevitably higher opti-cal dot gain, a phenomenon common to all high resolution, small dot based, screens. While it's fully possible to compensate for this, it imposes a heavy demand for tight process control on printers and of course on the people in prepress. Printers experimenting with early FM screens in a film-based workflow often found that they had to increase the time to reach vacuum when copying film to plate. This was not very popular, nor was it a particularly good use of precious time. The printing parameters

One of our main objectives was to test and evaluate if the hybrid screens and second order FM screens would manage to eliminate moiré entirely. This image, used before in our scanner tests, contains a lot of objects which suits our purpose well.

often needed to be adjusted for FM screens, and the smaller dots were more sensitive to wear in long print runs. All in all, FM screens have had a questionable reputation within some sectors of the printing industry, and many printers have reverted to using conventional AM screens.

However developers didn't give up and several manufacturers of image-setters and CTP devices, as well as RIP vendors, continued to enhance their FM screening technologies. In the last two to three years several second generation FM screen technologies have been introduced. They are often referred to as "second order" FM screens, because the dot placement is controlled to avoid the graininess characteristic of some first generation FM screens. Among those new second order FM screens are Fujifilm's curiously named Taffeta, Heidelberg's Prinect Stochastic Screening, Kodak Staccato and Rampage Segundo.
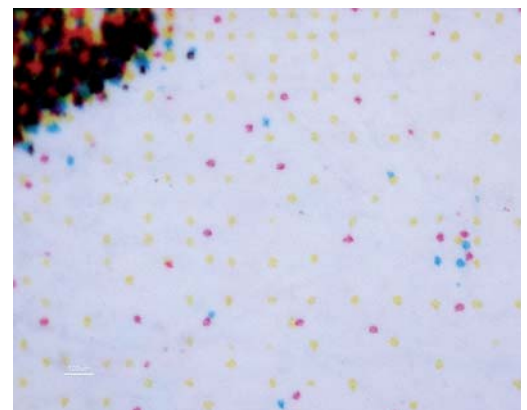
Hybrid screens

Accepting the shortcomings of first generation FM screening, and with the experience gained, engineers and programmers have stubbornly continued to improve FM screening technologies. One approach has been to combine AM and FM, to get the strengths of both, while avoiding their weaknesses. One way to avoid visible screen clashes is to increase the screen frequency in an AM screen imaging smaller dots. This is tempting when using CTP, since CTP's first generation dots are placed more precisely and are sharper than with a film to plate process where dots are transferred in a two-step process. But there is a limit to how small a dot can be without compromising its ability to do its job, which is to safely be imaged onto a printed surface. This limit is generally accepted to be the equivalent of a 1% dot at 175 lpi using conventional AM, depending on press type, paper used and of course the plate and CTP used.

A 1% screen dot at 175 lpi is roughly 10 microns, which is one millionth of a meter, or a thousandth of a millimetre if you prefer. Ideally, this single dot should be created from several exposure dots. Hybrid screening technologies all ensure that the dot size isn't less than what can be safely reproduced for a given printing process. In the highlights and shadow areas hybrid screens therefore are calculated with FM or FM-like screening algorithms. For the midtones most of hybrid technologies use conventional AM or AM-like screening technology, to avoid the risk of graininess. Printing characteristics will thereby also be very similar to conventional AM-based screening, that is solid prints and midtones should not be grainy, and dot gain behaviour should be similar to that of conventional AM screening.

While hybrid screening is relevant for most printing applications, it's probably in newspapers and packaging that the benefits are the most obvious. In flexography, which is also used for newspaper printing, disappearing highlights is a persistent problem. The problem is exacerbated by the unstable behaviour of the dot gain in the near highlight areas. These
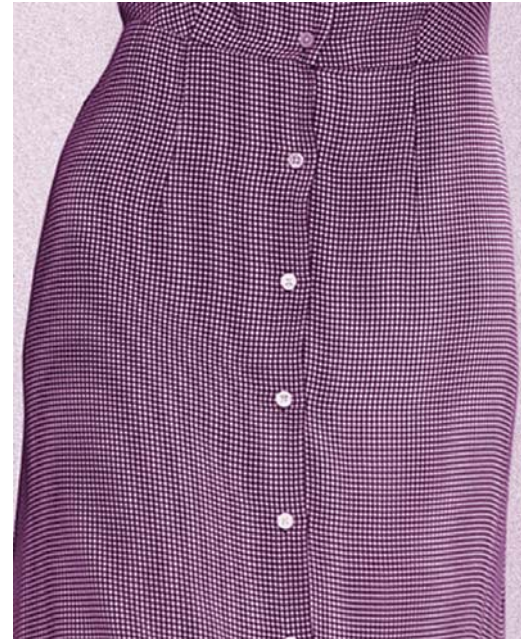
One of the images in the Altona Test Suite is this skirt, which normally, printed with an AM screen introduces heavy moiré. This was not the case when using high resolution hybrid screens, and the second order FM screens had virtually no moiré. When moiré was still visible, some of it could be explained with an slight moiré in the original image.

One of the promises with hybrid and FM screens is that screen dots in the highlights should always be present in print, and this was fulfilled in most of the print samples. Here a close up image from the buckle on the belt, a 500x enlargement done with a digital microscope, from the print sample made with the Kodak 10 micron Staccato screen.

problems are less serious for newspapers, where quality expectations are reduced.
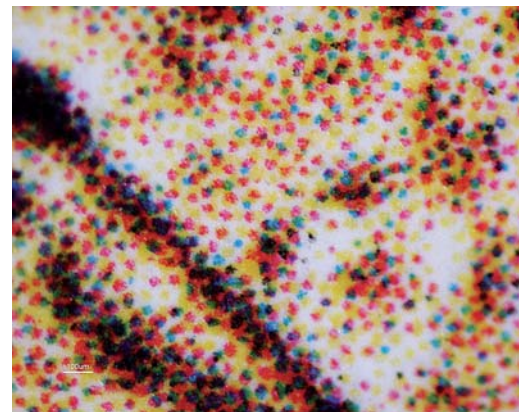
Hybrid screens with screen rulings of 300 lpi and higher are being used for sheetfed offset printing environments, and some technologies even work with plates that have not been certified for fine screen rulings. While with conventional AM screens this high line screen would require very small, even too small screen dots, hybrid screens use an FM-like screen in the highlights. So while keeping the dots to the set minimum size, they are now "thinned out" in the highlights so it's possible to have tone values of 1% and lower, without losing the screen dot. Midtones and shadow areas are screened using conventional AM algorithms, according to the demands of the content.

Image details are beautifully rendered with the high frequency screens. This is a close up from the watch in the image, from the print sample made with the Fujifilm Taffeta screen.

Thus a hybrid screen combines the strength of both worlds: AM and FM. Does this mean that these technologies will quickly replace the established digital screening methods? It looks at least as if the hybrid screens can replace conventional AM screening for many production purposes, however second generation FM screening still has one clear advantage: these technologies are the ones that can avoid moiré in virtually all print production. The hybrid screens reduce the tendency of moiré by using higher screen rulings than conventional AM screens, but most hybrid screening technologies are still AM at heart. For printers experimenting with multicolour printing, FM screening is still the safer choice for avoiding moiré. But for rendering images with high image details and sharpness, high resolution hybrid screens do an equally good job.

The new hybrid screen from Heidelberg, called Prinect Hybrid Screening, uses the IS-screen technology in the mid tones (an AM screen), and a "FM-like" pattern in the highlights and shadow areas.
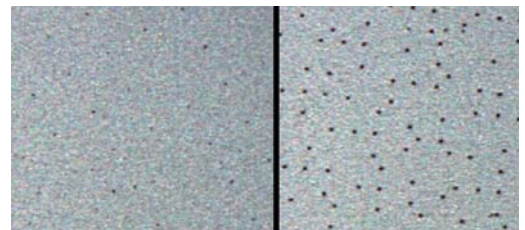
There is another small issue to keep in mind with regard to FM screens. The ISO 12647-2 standard assumes AM screens, so target values for density (or CIELab target values), as well as standard ISO profiles, might not be 100% valid when working with FM or hybrid screens. The AM-like hybrid technologies are more likely to work without any changes on press or in prepress, but this is a factor that needs to be carefully investigated. The fine-tuning done in RIPs and/or the press control systems should be pure science involving the interaction of many and varied control parameters. However, it is often considered a kind of black magic, and to what extent it is or isn't and why, is a discussion we will leave for another day.

In the course of our look into new generation screening we have tested some of the leading hybrid and second generation FM screen technologies. In the next issue we will present the results of this work.

– **Paul Lindström**

CTP advances at IPEX

Amidst the excitement of workflow and digital printing engulfing Ipex, it was easy to forget about new CTP developments. However tempting as it is to believe that the entire print industry is preparing for an imminent leap into digital printing, advances in both platesetting and press control systems suggest that plenty of people are still looking rather than leaping. They see a world where conventional print models are thriving, and these people are both developing and purchasing equipment to fuel an increasingly greedy beast.

Press manufacturers at Ipex made several important introductions undermining many of the short run arguments for digital printing and substantially enhancing the economics of conventional print production models. Heidelberg's latest B2 Speedmaster 74 prints 18,000 sheets per hour, and the company's Anicolor technology has reduced make-ready to a matter of moments (see Spindrift volume 4, issue 1). Automatic plate changing technology on Komori's B2 Lithrone S40SP Series can change plates on a ten unit press in a scant five minutes and the first of these monsters has already been sold to FM Print in the UK. With press manufacturers intensely focused on automation, the blistering speed of some of the new CTP engines and rapidly evolving processless plate technologies, it's clear that conventional offset still has a long future and is far from pining away.

Heidelberg has introduced a new version of both the Suprasetter (shown) and the Prosetter.

How Sharp That Digital Edge?

What conventional offset doesn't have going for it is of course the ability to image variable data. This is the one true and unassailable advantage digital print has over its competitors. However given the volumes of static data print still produces, it will take years before that advantage turns into a truly lethal weapon, ready to strike deep at the heart of conventional offset. And by then perhaps static data print will have established some new value propositions. What can be said with absolute certainty is that however it is produced, the future for print lies utterly in its production economics. CTP and associated technologies are fundamental to this, so the future of CTP lies in its scope to support effective production economics, regardless of market, technology or what colour the laser is.

How Far That Future Horizon?

And the scope for future development of some of the new CTP engines introduced at Ipex is truly awesome. We've covered most new developments in our Ipex previews, and developers are moving in mysterious ways, their wonders to recoup, building machines with considerable design flexibility, so that the technology can be redeployed for different market sectors. For example, Agfa's new Avalon LF-Violet engine uses HD Grating Light Valve technology configured with either single or multiple diodes. Also this machine can be switched to thermal imaging with ▶

The Lüscher Xpose UV Conventional family of five internal drum devices uses a 32 violet diode imaging head to image conventional plates, the only competitor in this market to Basysprint.

just a head change, as well as being able to image Agfa's new processless violet plate.

Fuji is taking a systems view of platesetting, having designed its new B1 Luxel V-8s and Brillia consumables to work well with competitors' media and platesetters. However used together, Luxel V-8 and Brillia plates are designed to create an optimised platemaking environment. Image reproduction benefits from a cleaner laser beam, with a dot profile imaged for maximum quality and high speed. The V-8 and Screen's Ultimas are setting new speed expectations. We haven't tested the claims yet, but Fuji claim the HS engine can produce a set of four colour plates in 3.5 minutes, including processing. This equates to 50 plates per hour at 2400 dpi. Screen's Ultima 24000 images 29 plates per hour, or 50 when imaging two B1 plates at a time at 2400 dpi. Screen has described response at Ipex to these engines as "ballistic".

Both Screen and Agfa are developing their platesetter lines to incorporate all forms of platesetting from newspapers to commercial and everything in between. These two have had by far the most comprehensive range of products, with both thermal and violet offerings right up to VLF. However Fuji has recently taken a similar stance with three new platesetters for newspapers. The violet imaging Luxel News 80, 100 and 120 (denoting plates per hour at 1270 dpi) are configured with dual lasers based on existing technologies and image plates up to 1162 x 960 mm at up to 2400 dpi. Fuji also announced new ranges of B1 and B2 thermal engines. The Luxel T-9 is a line of six B1 engines for commercial printing, configured either for speed or for quality, or both. The T-6300 is for B2 output. These engines are optimised for Fuji's new plates.

In addition to its previewed announcements, Screen has introduced its first digital flexo imager. The Platerite FX870 is the first of a family of flexo engines and images Dupont Cyrel or Asahikasei plates at 2400 or 2540 dpi, for up to 200 lpi and up to 870 x 735 mm. To provide suitable front-end support Screen is working with Artwork Systems to develop the Packstudio SE module for Trueflow.

Screen is not alone in its move into new markets. Krause is revamping its violet technology for newspaper platesetting to make it suitable for commercial printers, with the Laserstar Precision V series for 8-up and VLF. Krause also has new violet imaging LaserStar LS 140 V, a semiautomatic VLF violet imaging platesetter for the commercial market. Krause is one of several developers focusing on what amount to single purpose technologies: the LS 140 V is specifically designed to image large format photopolymer plates that can be baked for long runs. Lüscher's new Flexpose is also designed for a single purpose, but has scope to do more. It is based on direct laser ablation and mask ablation systems for imaging positive and negative plates, and can also engrave flexo, letterpress and dry-offset plates, flexo sleeves and rotary screens. It is the first commercially available hybrid system for imaging flexo, offset and dry-offset as well as letterpress plates.

Automatic plate changing technology on Komori's B2 Lithrone S40SP Series can change plates on a ten unit press in a only five minutes.

Rather more surprisingly, Lüscher has also announced a violet diode based imaging system for conventional UV plates. No longer will Punch Graphics till a lonely furrow with its Basysprint technology, which is probably good news and bad news. The Lüscher Xpose UV Conventional family of five internal drum devices up to 1600 x 2080 mm, uses a 32 violet diode imaging head to image conventional plates. The Xpose 130 images a 700 x 1000 mm plate in less than two minutes, outputting around 20 plates per hour. Lüscher claims that printers using 20,000 square metres of consumables per year can break even within a year, if they invest in the 8-up version of its technology. The idea is to provide printers with an entry point into CTP without incurring additional consumables expense. All models can be switched to thermal devices for imaging digital plates later. Basysprint may not offer this option, however Basyprint engines can now image processless UV sensitive plates, which throws yet another spanner into the wheels of market musings.

How Slick That Platesetter Makeover

Developers are of course also working on reengineered versions of existing technologies, generally to simply up their performance. This is the case with Agfa's Acento and Palladio engines. Heidelberg is doing the same with new versions of both the Suprasetter and Prosetter, as is Kodak with its new 8-up version of its Magnus technology, which will succeed the Trendsetter 800 and Lotem 800. Technologies are also being reconfigured for new applications as is the case with Screen's Platerite 6600 line and Basyprint's UV-setter 646, both of which image up to 6-up impositions for new presses from Ryobi, Goss and others.

How Low That Price Can Go

Prices are falling at a quite incredible rate. There are some obvious reasons for this, most significant of which is the increased competitiveness of the market. The cost of competing however is rising, so we should not expect to see prices drop below a certain threshold unless buyers are also prepared to pay a premium for consumables or for support. Some of the most impressive hardware deals will come from smaller companies which don't have massive infrastructures to support. ECRM, Highwater and Tecsa are all offering very low cost CTP designed to capture the small format market. ECRM has updated its violet imaging MAKO 2, and claims it is the world's most cost effective platesetter for press formats up to 560 x 670 mm. It costs around €45,000. The new MAKO 4x images plate formats from 228 x 252 to 660 x 960 mm at 1200 to 3556 dpi and is specifically designed for imaging processless plates. It costs only €55,000 including ECRM's CTServer.

Eschergrad doesn't do much to promote itself or even share much about its products, however this company is the only company exclusively developing violet engines. At Ipex Eschergrad introduced the Cobalt 2, a B3 violet engine imaging from 1000 to 3600 dpi and that costs an astoundingly low €45,000, including RIP. The Cobalt 3 can produce a two up plate in 48 seconds at 1200 dpi and can image up to 400 x 510 mm. According

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to the company, this price virtually halves the cost for printers of getting into CTP, although what the basis is for this assertion isn't clear.

Highwater has introduced a midget machine for newspapers. The 2-up Cobra News is a 60 mW violet imaging engine designed for regional newspaper Berliner output at speed. The engine has a 54,000 rpm spinner to image a Berliner plate in less than 20 seconds. Add in manual loading and unloading and Highwater claims to be able to easily produce 60 plates per hour on the device. The engine should be available in June and will cost around €45,000.

Although better known as a developer and supplier of copydot scanning systems for newspapers, Tecsa has started to distribute American company RIP It's violet imaging platesetters. The new Speedsetter VM4 is for 4-up output and was being offered at Ipex for under €30,000 including the RIP and server!

How Far That Horizon, Still

And innovations aren't likely to stop here, whether it's in business creativity or technology. Partnership is the way of the future for all areas of the business: Citiplate and Ipagsa providing manufacturing capacity for plates, Kodak working with an as yet unnamed partner to supply suitable violet machines for newspaper and commercial output, Screen and its countless OEM deals, and of course so many more. For buyers, partnering is generally good news, because with every press advance we can confidently expect to see improved speed, format and cost flexibility for platesetters, either from individual developers or cooperative efforts. We can also expect to see further process automation on press, particularly for colour management using spectrophotometers and JDF based job and costing management. It all combines into a bold and promising future for conventional offset, despite the hullabaloo around digital output. That too has its place, but it isn't entirely in the realm of what we already know and understand. The world of variable data digital print is only just being shaped, and although there is light, all the rest of this new world is still in the making.

–**Laurel Brunner**

Krause is revamping its violet technology for newspaper platesetting to make it suitable for commercial printers, with the Laserstar Precision V series for 8-up and VLF.

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