FLAAR Reports

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Scanning Medium Format and 4 x 5 inch Transparencies

for Photographers who wish to print on wide format printers: inkjet and/or laser-light digital imagers

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Caption for cover page: Fujifilm FineScan 2750 shown at IPEX trade show

Scanner Selection

There are two equally valid approaches to scanning. You can indeed get some rather good scans from an economy scanner. But that is not our approach. FLAAR is non-profit so we can't afford a million dollar scanner anyway. Thus we ignore the price and instead concentrate on ascertaining what is the best scanner for outputting your image at large format or with any digital printer. If you worry about the price that clouds the issue of which is the better scanner.

Thus don't be surprised that your favorite scanner (that probably got rave reviews in a popular magazine) is either not included at all, or does not get such a hot review. This is because we have had an opportunity, over several years, to visit all the major international trade shows such as Photokina. We also get detailed information from a myriad of sources such as insider tips. Furthermore, we do actual tests with the best scanners that we find at these trade shows. If the magazine writer whose review you just read has had the opportunity to see what a Heidelberg or Fuji flatbed scanner did with the same images, then perhaps he or she might not have been so enthusiastic about the lesser scanners that populate the reviews in popular magazines.

We do not always comment on manufacturer's claimed specs. Some of the specs simply take the most meaningless numbers and pump them up. They don't explain to the user that the crucial measures of true quality are blissfully omitted from the scanner spec sheet. If your scanner claims a high dynamic range, such as 4.2, but gives little other measure of actual quality in the shadow areas, be suspicious. Either a scanner does a good scan or a cheap lousy scan. All the specs in the world can't make a good scan out of a turkey. We do not comment on unreleased products though the specs on the new Nikon scanners are most politely described as "too good to be meaningful."

If you check the established prepress companies that are successful, most are using a good drum scanner[1] or a flatbed scanner such with 5000 true optical dpi such as Aztek, Creo(Scitex) Heidelberg, Fuji, or Agfa. Scanners are covered on www.cameras-scanners-flaar.org and www.flatbed-scanner-review.org.

Update on scanner brands

Heidelberg abandoned the entry level scanner market at IPEX tradeshow in April 2002. Shortly thereafter Heidelberg abandoned the scanner market all together.

By that same April date Agfa had also abandoned rebranding Microtek scanners. However Agfa lingered on with their model 5000 as well as their older XY-15 rebranding of the Fuji Lanovia C-550. It is my impression that Agfa has since let those scanners fade into the sunset as well.

At Photokina 2002 people began to ask if Umax was on the skids. Neither Umax nor Microtek exhibited at PhotoPlus Expo in November 2002. I am guessing that at least Microtek will continue.

Polaroid continues under bankruptcy protection. Their rebranded Microtek scanner was still available recently, at steep discount.

Although the following report mentions brands which no longer exist, thousands of the actual scanners are still floating around, especially on e-Bay. Just realize that you may not be able to get spare parts or technical support for old scanners. In some cases the new people working at the companies weren't even employed there when those scanners existed.

[1] We distinguish between a low-cost drum scanner (which twice produced unacceptable scans) and a good professional drum scanner (cost three times what the cheap one did, but the scanned transparencies were awesome). Like anything else in life, you get what you pay for. You may get a better scan in many respects from a good flatbed scanner than from an inadequate drum scanner. But a really good drum scanner will beat anything else.

SilverFast scanner software is alive and well, indeed has grown into the #1 scanner software worldwide. So you can still get fresh software even for discontinued scanners such as Heidelberg or Umax.

What scanners does the FLAAR Photo Archive use?

We do photography and digital imaging with material from two art museums on the campus of a university where we are headquartered. We started out with Umax scanners but prefer a better scanner for top quality. We are looking forward to acquiring an ICG drum scanner when we need superlative quality. Unfortunately ICG disappeared when Global Graphics got out of hardware. In our Latin American office (where we can't afford the $44,000 CreoScitex or the $50,000+ drum scanner), we use Heidelberg Linoscan equipment. We have another Heidelberg scanner in our office in Germany. For scanning 3-D and deep-relief objects we prefer the Fuji flatbeds, especially when we need something to print the size of a billboard then we opt for the Fuji Lanovia C-550. We would gladly use a Heidelberg Nexscan, but do not have one available.

Creo Scitex scanner

How did we know which scanners to select? We went to countless trade shows and asked lots of other people what they found was best. Then we practiced with a variety of scanners until we found the most appropriate models.

If you are scanning color negatives, these are tough due to the orange tone. You need either a professional scanner software such as that used by CreoScitex EverSmart flatbed scanners, or try SilverFast. We have used the color-neg mode in the Scitex software but have not yet tested the similar mode in SilverFast. If you are still taking photographs, stop using color negative film and use slide film.

If you want to produce quad-tone black-and-white images, don't use black and white film anymore. You get far superior B+W images in the digital era by starting with color. Switch mode (in Photoshop) to Lab mode; do your corrections and sharpening here, then go to multi-channel and do a RGB-color multi-channel change to monochrome. In this manner you can work with all the color channels in black and white. No, don't ask us more details, its all explained in the books that we already review.

For wide format inkjet printers do not scan into CMYK, instead leave your image in RGB and then let your printer translate the image into CMYK by its own software. For traditional printing, of course you need CMYK.

Ilford makes a monoKrome (sic) "4 color" black inkset for inkjet printing as do other companies. Check out www.FineArtGicleePrinters.org as we will have reviews of black inksets by next year. There are several other black quad-tone inksets. We hear mixed reports. Its like politics and religion. Every method, every ink, every kind of art paper has its own supporters. And of course every printer. We prefer not to become immersed in arguments. Just realize that certain Epson printers and some Epson inks, and evidently other piezo printers such as Roland, may produce black-and-white images with a green tint when viewed in certain light.

Most photographers suggest you scan the original negative, not a print. There are many reasons for this. The main reason is if you scan the print you are only scanning an interpretation of what is in the negative. Every kind of different photo paper, every exposure, will be different. If you have a cheap scanner, of course you won't rescue much from the negative because a cheap scanner can't "see" into the shadow areas. Naturally this is especially tough on a black-and-white image.

Of course if your original B+W negs are 35mm, then you definitely need a really good scanner (such as Creo(Scitex) Fuji, the top Heidelberg LinoScan models) in order to get the needed resolution for an enlargement. If you scan an 8x10 print you will indeed get the "resolution" but not the true detail. But if you have a cheap flatbed, you may not have much choice.

If you have sticker shock please realize that you are entering the realm of serious digital imaging and the equipment used by pros is not cheap. After all, when you produce outstanding images your profit level allows you to have the necessary class of scanner. If your scanner costs more than you expect then you are probably going in the right direction. A good drum scanner starts at $30K to $40K; with the accessories and everything that you really need the tag ends up at about $60K. We are unable to provide suggestions on low-bid scanners since once you have used a really good scanner you too would appreciate the difference. Besides, your competition already has a drum scanner, a 5000 dpi scanner or comparable. If they don't, then you can beat them with quality if you are clever in your scanner selection. We can't describe it in words, but when you enlarge a 35mm slide to 42 x 36 inches, you know rather quickly if you used a cheap scanner.

What about the Imacon scanners?

The Imacon is a scanner that I liked when I first saw it, in part the sole sample I did with an Imacon scanner looked okay to me. In addition the people at the company were pleasant when I visited their headquarters in Denmark years ago. Yet for two years in a row, Seybold Reports, the most prestigious professional test of high-end scanners has given one of their lower ratings to the Imacon. I quote:

"Imacon FlexTight Precision II lacks color depth, although its highlight and shadow rendering got fair marks. For applications such as newspaper production, these low results are not as important as they might be for other applications. For applications such as fine art printing, it the image quality reproduced here is representative of the scanners general performance, these scanners are unlikely to be suitable."

Imacon Flextight Precision II

We recently got an independent detailed review of Imacon which explained some of the reasons why their basic "roll in curved" system may be inappropriate and may lead to misalignment and the image being out of focus. It is possible that you may not experience these problems and you should go ahead and buy whatever scanner you personally prefer, It is worth adding, however, that we feel that advertising any CCD scanner as a drum scanner, or even insinuating this comparison as in some Imacon ads, is potentially misleading to people who are new to scanning. Only a true drum scanner with a PMT system offers the actual benefits of a drum scanner. You do not get these benefits with any pseudo drum, indeed you may possibly get defects. Besides, my experience with the Scitex flatbed shows that the Scitex EverSmart flatbed scanner can definitely handle fine art quality, indeed many of the larger fine art giclee companies use CreoScitex equipment in their own facilities.

The other problem with most models of Imacon scanners is that you can scan only one image at a time. Kind of rough if you have 50,000 slides (as does the FLAAR Photo Archive). Something that two people have now reported is the propensity of some Imacon scanners to gobble up their slides. You stick it in, and it somehow gets stuck. Whether this is operator error or a bad design is immaterial.

We spoke with a licensed reseller of Imacon scanners. He said he stopped selling them because of various problems. The one I remember is the "it gobbled up and/or twisted my slide" in the feeder mishap.

Yes, thousands of people probably love their Imacon scanner, but we can only report what we hear and read about it. We have visited the Imacon booth at Photokina (excellent Thai food) and are considering re-evaluating the Imacon if we can find the time and resources.

A few years ago (last day of October 2002) we interviewed a community college professor who had evidently updated their early Imacon scanner (which evidently was not without flaws) to a newer model. It is my impression that they like the new Imacon scanner better than the earlier model. Thus in fairness to Imacon it is probably true that their newer models are indeed improved over earlier models. We do not have an Imacon ourselves, not in either of our facilities (we have several Umax and Heidelberg scanners which work just fine).

Here are his comments he sent Nov 3rd after the visit,

Nicholas,

It was good to see you. I hope the show was valuable for you. Thank you for the kind words about the images.We are using the Imacon 848, and the older Flextight II. The 848 is at least 5 times faster than the older model and will take images up to 5 x 7. We restrict usage to medium format and larger because of the occasional problems with small film, and because we have several Nikon CoolScan 4000s that can produce the limit of resolution with 35mm.

The earlier film holders for 4 x 5 did not grip the film tightly enough, and these would sometimes get jammed in the machine. In that situation, as the machine was thumping while trying to eject the film, there was no way to turn off the power short of pulling the plug! Very disconcerting. The newest machine has had only two crashes, and those were due to user error: the 848 has a hinged drop down deck/light table for placing the filmholder. We had a student close the table before starting the scan…. The 848 has worked flawlessly aside from that one problem.

I have not done any side by side comparisons with the CREO, time for testing has to come behind time for teaching and managing. As far as curlon the Imacon, we have not noticed any aberrations with larger format film. We have noticed, however, that vibration to the table during the scan is inadvisable--I suppose this should be self-evident.

The algorithms from in the Imacon software for scanning color negatives have improved immensely since the first versions. I cannot remember the version of the latest software, but in the earliest versions I had even resorted to scanning the negatives as positive and then inverting the tones--a desparate attempt to get a good scan that was not very successful. Thankfully, that is now repaired.

Older models of scanners or used scanners

Avoid any older scanner. Its mechanics may still work but its software will be obsolete. Today's software is so superior to older scanner software there is no comparison. If you take the same scanner, and use two different scanner softwares, the best scan will come from the better software. Yes, a crappy software will result in a crappy image. Might as well be direct and not mince words. SilverFast, Heidelberg's LinoScan, and CreoScitex EverSmart software are the best three we have experienced so far.

Scanner software

We are not a fan of Binuscan; most reviews we have read give it lesser marks then other software. Just got an e-mail from a user of Binuscan who complained that it engendered color shifts. This is typical of any software that forces its color schemes on the end user. This is a result of software engineers who perhaps figure that the end user is incapable of getting a good scan on their own, so they tweak the software to attempt to make it idiot proof. So if in fact you do know color and do wish to make your own decisions, you can't. I have not used Binuscan scanner software myself but so far it just does not interest me.

The scanner software of Howtek drum scanner gets mixed reviews and so far has not fully convinced us of its capabilities. Aztek has a capable software engineer behind it, but the only test results we have seen so far were spotty, that is, the image itself was spotty. We would have to evaluate the software in our own facility in order to get a meaningful result one way or another.


ICG scanner

Recently Aztec has come out with a new flatbed scanner, the Plateau. This scanner hardware looks great. I do not know its software, but feel it worthwhile testing.

SilverFast is far and away the best after-market scanner software available. It is better than anything Epson, Microtek or Umax makes. It's easier for a normal human being to utilize than Linoscan.

Linoscan was made by German software engineers, who are among the best available. Germans, however, are all well trained and understand technical aspects of scanners and color (I live in Germany). The average American (in whose numbers my Detroit born American passport classifies me) does not have that level of technical background. But if you are a pre-press shop, then Linoscan was what you will need.

Linoscan is easy to learn and produces absolutely outstanding color. We tested it with a person who had never even used a scanner before. We gave him no outside remedial help whatsoever. To make the test even more valid, this person had no experience in Adobe Photoshop. In other words, we wanted the test to be "a typical modern end user in the USA." His scans were better than the results of four previous people in my office using Umax scanner software of an earlier generation.

Since Heidelberg no longer sells scanners it is probable that Linoscan will no longer be supported or updated. Hence we recommend switching to SilverFast, which is regularly updated. SilverFast works on Linoscan Linocolor scanners as well as on Umax, Epson, Polaroid, and on most brands of mid-range scanners.

Toaster-sized 35mm slide scanners

Can you use a toaster-sized 35mm slide scanner? Only if you have the Polaroid 4000 or Nikon 2000 (which does 2700 dpi). The Nikon allows enlarging images up to about 24." You need true optical dpi; interpolated dpi is useless. The Polaroid may allow enlargements a tad larger but they will seldom be comparable to a professional scan on a Scitex, Fuji, or Heidelberg scanner. A drum scan will beat all others in brilliance, detail, and quality. Drum scanner prices have dropped and they are now easy to operate on your own. As a result use a toaster-shaped 35mm slide scanner only if you already have one (don't buy one, that's not what you need). Please note, Imacon is not a drum scanner; Imacon has the same CCD technology as any other flatbed scanner.

If you never have to scan a 35mm slide; which means if that all your scans are from 4x5, then a good Heidelberg scanner is fine. Our evaluation studio has two of them (in addition to a CreoScitex EverSmart Supreme, all $45,000 worth, on loan for 2 months; don't have it any more). Linoscan is now the model name for the Heidelberg scanners; LinoColor is the name of the Heidelberg software. You will be happy to learn that the Heidelberg scanner that can handle 4x5 costs less than $2,000. If you have medium format then only your eyes can tell you whether 1200 dpi is enough. If you are scanning 35mm slides, however, your bare minimum for a flatbed would be 2000 dpi.

If you are not scanning 35mm size, but rather actual photo prints, then you can make do with any Heidelberg flatbed scanner. But in general, the scan of an original neg or transparency will tend to be much better than the scan of a photo print from that neg or transparency.

Most people are quickly disappointed with the low-end toaster-shaped scanners such as the Nikon Coolscan III or its Polaroid equivalent. We do not recommend any toaster-sized scanner under 2700 dpi.

The new Nikon Coolscan IV ED is certainly an improvement, dpi is up a tad, speed is up but dynamic range is still rather low. But the 69 MB file size will help when you try to do large format prints (though keep in mind that the new generation of 1200 and 1400 dpi printers require 200 and up to 500 MB files).

The Nikon Super CoolScan 4000ED is their answer to the Polaroid 4000. The “Dynamic range of 4.2” looks like an advertising writer’s dare: will people really notice this number is unrealistic? It is noteworthy that the brochure fails to mention the maximum density.

Check to see whether your Nikon 4000 gives a halo around the object, especially on the viewer’s left side. Two people have reported this problem to us. We have not had the opportunity to check and see if this happens with our units here on campus; they are in another building a mile away.

The new Nikon Super CoolScan 8000 ED will probably wipe out the ill-fated Polaroid equivalent. Most Polaroid scanners are manufactured by Microtek. I don’t yet know who makes the Nikon models, but they tend to be better. The specs on the Nikon model 8000 look good except for the unrealistic dynamic range of 4.2, which is a sort of yellow flat crying out “potential misleading exaggeration.” This is not to say that the dynamic range is a lie; not at all, but merely that this number is not a fully meaningful measure of the actual specs of the scanner. The question is whether the scanner can capture shadow detail adequately. That was always the weak point of the Microtek-Polaroid version.

Once these new scanners are more readily available we will keep our eyes and ears open and report back our findings. We will attend PMA (photography trade show) in early Spring 2004 for example.

Our university just acquired more of the Nikon scanners, so our crew will check them out.

Batch Scanning Attachments

The batch scanner attachment in general, and the batch scanner for the Nikon in particular, tend to be finicky. We do not recommend them. Even if they work, you are still stuck loading each slide into the scanner one by one. This is why, if you have lots of slides to scan, you need a flatbed that can hold 40 to 48 slides simultaneously.

We don’t recommend entry-level flatbed scanners

No HP scanner is intended for serious work; they are for home use. Most Epson scanners are likewise for low-quality cheap scans. Their newer tabloid sized model Epson is rated as excellent for its price class but if you intend to sell your work no one will take any of these scanners seriously.

The low-end Agfa scanners are just relabeled Microtek scanners. They may be okay for entry level low cost scanning but not really suitable for prepress quality. We respect the name of Agfa but they have not been very innovative in the digital; Agfa simply repackages the most economical scanner and resells it under the Agfa name. There is one exception, the Agfa XY-15; that is the same as the Fuji Lanovia, an exceptional flatbed scanner at $40,000+ and worth it. We do, however, not get excited over the Agfa 2000 and those entry and mid-range models. Just not good enough for our picky requirements as professional photographers. If we went to the trouble of using a Leica, Hasselblad, or Linhof for the originals, we don’t want to waste that quality with a cheap scanner. Now you know why we prefer Heidelberg Linoscan for entry level; Fuji and Heidelberg towards the high end, and ICG for drum scanners.

You will get better results with a Heidelberg Linoscan/LinoColor scanner (for medium format and 4x5). Don’t forget, that you can’t get adequate results scanning 35mm slides on any flatbed under 2400 dpi. Furthermore,

if Agfa or Microtek don't accept SilverFast software, that's an even better reason to chose Heidelberg Linoscan or even Umax (you can get SilverFast after market for the Heidelberg though the new Linocolor software seems to be improved).

If you try to buy low bid and get your scanner at one place, your printer elsewhere, and so on. You may think you have "saved" lots of money. But when you attempt to connect all these various units together, and want your scanner to have the same color matching as your printer, then no one is available to help you (sorry, not even FLAAR, we are unable to offer any remedial assistance on installation). The cheapo place on the Internet that sold you either the scanner or printer won't help you because he can't. He or she is just a sales person; they have never actually used the equipment to produce museum quality images.

These are the reasons we recommend a reliable place such as Parrot Digigraphic for scanners; because they know color management, and inkjet printers, inside out.

Each of these organizations has experience and can help you. If you shop on the Internet then UPS will drop a box on your doorstep, and we know exactly what will happen next. Headache after stressful headache trying to get everything to function and communicate with each other. If you are clever and opt for an HP large format photo-quality printer, you get free delivery, free installation, and free training! That's right, an actual person will show up with the box, and discuss everything with you in your own home or your own office.

By the way, although we at FLAAR are hopefully competent to hook up our own printers and RIPs, whenever possible, even we accept reality and prefer for a technician to do the initial setup of everything.

UMAX scanners

We have several Umax PowerLook scanners. They are a good value for their price. Software leaves somewhat to be desired. Be sure to get SilverFast. Avoid Binuscan; the "drum scanner" software is an OEM from Trident, from Howtek, a low end drum scanner. Not very popular. No, we have not used it but have not noticed it shining in any review.

UMAX Powerlook 3000 scanner

The Umax 3000 is considered slow, as in very slow. The 3000 dpi is typical bait and switch. You can't scan at 3000 dpi across the entire surface, only down the usual narrow path, about 4 inches across the middle.

Furthermore the Umax uses potentially misleading advertising. At a recent trade show they claimed it was a "Flat drum scanner" because the image moved not the CCD. That is more smoke and mirrors. It's just a normal flatbed scanner. Something has to move, either the scan head, the light, or the image. It is unlikely that the image produced by this scanner is seriously similar to that of a true drum scanner such as ICG.

If cars were advertised with the kind of claims that are cleverly geared to mislead buyers there would be a Federal law to rein them in. I guess no one bothers if consumers get duped by slick advertising for scanners or wide format printers. Too bad, because Umax makes good scanners; they should not stoop to such shoddy tactics. Perhaps the competition is rough and if the other brand makes comparable claims you have to also.

Someday in the future we will possibly consider evaluating a current model of Umax scanners. In general we feel they are a tad better than Microtek. But Fuji may be much better for prepress quality. Besides, most prepress shops would prefer a Heidelberg work flow, hence a Heidelberg Linoscan scanner.

Fuji flatbed scanners

Fuji scanners are worthy of your consideration, their new model FineScan 2750 now offers 2750 dpi across the entire tabloid-sized bed. If your budget can handle a $10K scanner seriously consider this for excellent quality for medium format and large format. 2750 dpi can handle 35mm enlargements to 24".

Since this product is new and Fuji scanner dealers are hard to find, we recommend sending an e-mail to Fuji's main scanner headquarters. Or, you can telephone Fuji USA, (630) 773-7200. They handle the Fuji Lanovia C-550 Sprint. If you are interested in the Fuji FineScan 2750, their phone # is (800) 755-FUJI. The advantage of tabloid-sized flatbeds is that they can scan 40 slides together as one batch, one after the other automatically.

This Fuji scanner is an excellent choice because it costs less than other 2000 dpi tabloid-sized scanners. Besides, this scanner is not a relabeled Microtek as is the CreoScitex EverSmart Jazz and Jazz+. Thus we feel the price point is in your advantage with the Fuji FineScan 2700. Tabloid scanners such as the Fuji can handle at least 40 mounted 35mm slides across the surface.

We get constant complaints about "bulk feeders" on toaster-shaped 35mm slide scanners. These bulk feeders break down, jam, or otherwise don't work. We made the mistake of buying one ourself. It's much more practical to put 40 slides down on a flatbed than try to jerry rig a pile of slides one by one. We were fortunate, a foundation provided us with a $100,000 grant to do a feasibility of scanners, so we could buy each kind until we found the one that worked the best. Well, if you don't want to spend years and tons of money buying the wrong scanner, we hope our FLAAR reports will give you some tips.

Reality of good scanners

Don't let your wife or partner read this email; they will lock up your credit card and freeze your bank account. Actually although most pro studios use precisely the high-end equipment discussed here, there are less costly alternatives if you are not a full-time commercial company. For example it is cheaper to do your photography with a 4x5 camera and scan it on a moderately priced scanner than doing your photography with 35mm and needing a really expensive scanner handle that tiny piece of film. Other people use Genuine Fractals. Since our two BetterLight cameras and Scitex scanners generate true dpi we have no need of anything like pumping up dpi with Genuine Fractals. Thus we cannot say how they compare under close scrutiny. But if you like the output, and if your clients are satisfied with it too, then you are doing just fine (until your competition starts using even better equipment).

Be warned about "bait and switch" specs in the scanner ads. So when you read the Umax 3000 brochure you may think you are getting "3048 dpi" but it turns out that is only 1220 x 3048. That scanner is extremely slow. Furthermore these low-end entry-level scanners can't handle shadows or anything that is dark.

The most common bait and switch is the "numbers game." Ad agencies realize that most people are easily suckered by the numbers game. Just put large numbers in a scanner ad and people will say, wow, and buy it. We once saw a really cheap scanner advertised with something like 99,000 dpi. It was a $300 scanner. Of course that was interpolated dpi, which is relatively useless.

The other common bait is the claim "our scanner is as good as a drum scanner." This skillful ad went on to ask what did you plan to do with the $13,000 you saved by buying their scanner over a drum scanner. The culprit here was Nikon. I can assure you, having used a drum scanner, and that Nikon CoolScan 2000, there ain't no comparison. The Nikon is great for home use. I love mine, but for serious scanning no pre-press shop would accept it. We prefer a true drum scanner, ICG, not an upright flatbed such as the Imacon which masquerades as a drums scanner in its ads.

Overhead Scanning Systems to handle large originals such as paintings

An alternative to flatbed scanning is to use a professional digital scan-back camera such as the BetterLight. This is the digital system we use in the art museum where we do our tests. Other professional photographers use BetterLight in museums around the country. www.bettterlight.com will show you the basics.

If your artwork is too large to fit onto a flatbed scanner (which is generally the case) then you either have to pay a photographer to photograph your art and then scan it yourself on a flatbed, or digitize the picture directly (yourself, with a BetterLight system). These are the systems that professional studies use. You can get help in putting together your system from Parrot Digigraphic. You just put your 4x5 camera (Cambo Ultima) which holds your BetterLight scan back on an overhead scanner rig (called a repro stand or copy stand). We use a Kaiser rePRO for a copy stand. We have two BetterLight cameras at the art museum here where we are setting up a model photo, scanning, fine art giclee print studio. Contact is mike@betterlight.com; Mike Collette is the person who invented and developed this high-end digital photography system.

A more expensive option than the Kaiser rePRO is the tti from Tarsia (also available from Parrot Digigraphic).

However if your budget is limited, we know that painful feeling. FLAAR is non-profit and we do photography at two museums in Guatemala. We donate our services so have to be frugal when it comes to buying the equipment. We went to two Photokina tradeshows looking for an ideal reprographic copy stand system. We really like Joe Tarsia's tti system, but Enron was a benefactor of our museum. After Enron collapsed we could not exactly afford much. So we decided on the Kaiser rePro system. It works perfectly with PhaseOne, BetterLight, Kigamo, Jobo and any other tri-linear scanning back. Of course you can put a multi-shot medium format scan back on a Kaiser also, but we feel you get better results with a tri-linear scanning back such as BetterLight.

Another option is the Cruse overhead dedicated digital scanning system. We picture this on www.fine-art-giclee-printer.org and www.flatbed-scanner-review.org (no, its not a flatbed but an overhead scanner, so can do everything you need it to). These systems are top of the line for professional giclee printing studios who need to digitize paintings which are too large to fit onto a tabloid flatbed scanner. Contact Michael A. Lind, tel (281) 492-2714, e-mail malind@msn.com

The Cruse color scanner can handle up to about five by eight feet. Models are available from 20 x 30" in increments up to the 60 x 90" size. You can opt for a 220 MB head or a 450 MB head (10,000 x 15,000 pixels). Now that's a real mega-pixel system.

A further advantage of an overhead scanner is that you can add a lightbox and thereby also scan negatives and transparencies.

We are getting an increasing number of e-mails from people who do landscape photography or panoramas. Check out the seamless digital panorama system from BetterLight on www.digital-photography.org, www.cameras-scanners-flaar.org, www.maya-archaeology.org, and either www.wide-format-printers.org or www.large-format-printers.org. Look in the index of each site, either under BetterLight or under panoramas. This camera will take a 500 MB panorama that you can enlarge to 15 feel long. Of course you can also take a 50 MB pano if you prefer to stick with smaller files. This camera is ideal for using with a large format printer.

Scan backs can handle only subjects that don't move (such as landscapes). If you need to do digital photography of a horse race, then you need a 1-shot camera. Thousands of professional photographers use them; we do not. There is not time or space in this report to give the pros or cons on 1-shot vs 3 shot cameras. Focal Press is a good source of books; go to Calumet, they are nation wide, have a toll-free phone number, and know everything about digital photography.

Can you use your mega-pixel digital camera?

Do not attempt to use a point-and-shoot digital camera (such as Sony Mavica or Nikon CoolPix. The Nikon CoolPix distorts severely at close distances and you can't get fully parallel to your art work, resulting in one side of your final print being out of focus. To do serious photography of your artwork you need a 4x5 camera for full control. We use a Cambo Ultima 4x5 from Calumet, Balcar digital lighting, NorthLight Sun Spots, Lowel lights and the BetterLight Super 6000 scan back. We have an 180mm Schneider macro lens but hope to upgrade to the Rodenstock because that is an APOchromatic model. To see the system look at www.digital-photography.org and www.cameras-scanners-flaar.org.

Bare minimum in 35mm digital SLR would be a Nikon D 100 or Fuji equivalent. I much prefer CCD technology. Too much digital noise in CMOS sensors.

If you don't have to do photography of a painting, but just want to use your digital photos, and print them, then the Nikon CoolPix 995, 4000, CoolPix 5000 or 5700, if set to maximum quality, might be okay up to 11 x 17 inch size. You can try up to 24 inches with the 5 megapixel CoolPix 5700 if you don't mind a bit of pixellation. Try larger sizes to see if you are satisfied. If you like the way the results look, then that's what's good enough. But you cannot use that CoolPix or any comparable point and shoot digital camera to photograph your artwork due to the aforementioned distortion at closeup range. Besides, the flash on the Nikon is too far off center.

MAC Computer at FLAAR office at BGSU

We have the Nikon CoolPix ourselves, but this is only for snapshots for the Internet (all the product shots on all 500 of our web pages were taken with a Nikon CoolPix or Sony Mavica). But if you enlarge these prints too much then you will see horizontal bands composed of the individual square pixels. This is called "pixelation" and means you don't have enough resolution. You can attempt to pump up your image with Genuine Fractals (we have no recommendation but we know other people say it works). If you have one of these point-and-shoot cameras be sure to turn the JPEG option off. You want true dpi in TIF format that has not been crunched into a smaller file size. TIF is simply an abbreviation for TIFF; they are identical.

FLAAR now has two training courses on digital photography and hence quite a selection of new reports on digital photography. So rather than updating the present section (in this report on scanners) all the updates on digital cameras are in the other reports.

How much dpi do you really need?

On the subject of dpi: most large format printers require 120 to 150 dpi to print at the top resolution of the printer at 600 to 740 dpi. If your printer resolution is 1200 to 1440, then you may need 200 to 250 dpi. So to print at 1200 dpi on the new HP 5000 printer you do not need to scan at 1200 dpi. Your printer dpi measurement is not the same dpi as the dpi of your image. Your printer only wants 1.5 times lines per inch (lpi) not dpi. Any dpi over that is thrown away. Actually, any excessive dpi will choke the RIP and crash the system (on lesser RIPs for a 600 dpi printer you can choke them at 180 dpi or above). Besides, Photoshop can handle only 30,000 pixel lines of information. If you have a file larger than that you need to find another software such as LivePicture. Your printer will print at its full maximum dpi, 600, 720, 1200, or 1440 easily and with no problem. But those are not the dpi you set your raw image at; use less than a third the dpi inside the actual Photoshop TIF file. Books from Peachpit

Press will explain all this, especially their titles on scanning.

But of course with a 35mm slide you have to scan higher than 1200 dpi because 1200 dpi is only at the dimensions of a 35mm slide. As you enlarge the slide you decrease the dpi across the enlarged dimension correspondingly. A 35mm slide at 42 x 36 inches in size, scanned on the Creo scanner at many thousands of dpi, ends up at about 120 dpi, the minimum required by most good large format printers at that size.

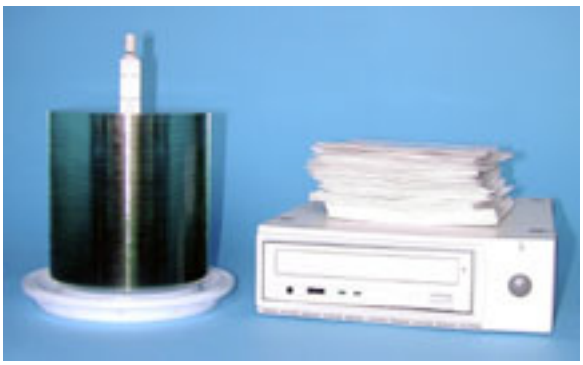
Since so many readers have asked us to help them understand dpi and resolution, we have recently prepared a completely new and separate report on this subject. It is a bonus report, available on www.wide-format-printers.NET,

Which computer to use?

Most professional studios use a Mac to compose the image and then send the image via a minihub or network to their PC outfitted as a Windows NT print server (that's where the RIP is parked). This is how our studio is organized but we cheat because we have a full time computer technician to wire everything up for us. If you are adept at fixing up your own computer system then you don't need any fancily named extras. Most PCs from Office Depot or Comp USA can handle the job, even a used PC (be sure it can handle Windows NT server software if your RIP needs that system). If you wish to keep to 100% Macintosh they you have to have a RIP such as PosterJet which works on a Mac. People often ask what we ourselves use: we have a Mac G4 maxed out with 1.5 GB RAM; a 22" cinema display; a Mac G3 laptop, plus three Macs of earlier generations. The cinema display was well worth the investment, indeed we bought two of them, one for our office in Germany, one in Guatemala. An additional reason to be sure to have a Mac is that many of the better scanners scanners, work only on a Mac (they don't work on a Windows PC).

If you use a RIP to handle all the options available on your wide format printer, then you may need a printer server. What's a RIP? What's a print server? Just order FLAAR's Report-SERIES on RIPs from www.wide-format-printers.NET.

Software



For software Adobe Photoshop is the world standard, ver 5.5 or the newer version 6. After that everyone has their own preferences for the software for the various other tasks. If you are good at handling things on your own you can squeak by the minimalist manner or you can have a pertinent kind of software to handle each individual task as we do. For layout software we find Adobe PageMaker the easiest though only to 44 inches (QuarkXpress can't go larger either). To achieve larger sizes print from Photoshop or Illustrator. Adobe InDesign allows up to 18 feet but has a steep learning curve.

Most people use Photoshop to "clean up" their scanned images. Scores of books tell you how to do this. These books neglect to mention that using Photoshop to clean up a quickie scan is the worst way to handle your work flow. If you have a good scanner that implies you have an excellent scanner software (such as from CreoScitex or Linocolor-Heidelberg). With these scanners your scanned image is perfect out of the scanner; it can go direct to printing with no tweaking. At most you need to remove dust-and-scratches that are inherent from any flatbed (or dirty slide). So you still need Photoshop (and also to resize the image to reach the 120 minimum; 150 maximum dpi that most printers prefer or a bit higher for 1200 to 1440 dpi systems). If you have to tweak the colors in Photoshop then your scanner parameters are not set correctly and you are not using the full features of your scanner software. Most good scanner software is much better than Photoshop. This is why we do not recommend Microtek or entry level Agfa[2] scanners; because SilverFast, LinoColor, and CreoScitex software is better.

Summary

The following e-mail summarizes everything we have said above far better than any:

Subj: I need a good professional scanner

Hello,

I work for a high end stationery manufacturer….. Currently I do all of the scanning, color correcting and file manipulation of all our new stationery items. We have two full time artists that feed me painted pieces, a majority of them are watercolor but I also deal with some oil paintings. The painting sizes at this time is never larger than 11" x 17". Currently I am using a Epson Expression 836XL flatbed scanner. We were on a tight budget 3 years ago and that was what we got. Also I do all my proofing from film on an Imation Matchprint system.

At this point in time I am searching for a more professional scanner. We have been fairly pleased with the results I get from my scanner but it really lacks in getting the subtle depth that some of the paintings have. Light colors that have that painterly pooling of lights and darks, things that are bright or deep reds really flatten out and colors that fade to white end up dirty looking. Things just don't pop out like they did when we sent everything out of house to a drum scanner. Photoshop and I can work some miracles but when the scanner simply doesn't pick up the subtleties I have nothing to work with.

Adobe Photoshop Books

Since I have fallen so into routine I have not kept up on what the technology has to offer. I know that they now have flatbed scanners that are as good as the drum scanners. I'm not looking for top of the line but I do what a better quality scan from a more professional scanner than what I'm working with. Please forward me any advise you can give.

Thank You,

Here is a prepress company that ought to have a Creo, Heidelberg or top of the line Fuji scanner.

The History of Scanning Technology

Gary G. Field has written a brief history of color scanning. This has been published by the 1999 Newsletter of the Technical Association of the Graphic Arts (TAG) and also on p. 64, Jan 2000, Digital Output (a trade magazine).

Where and How to Store your scanned images?

Once you scan, you will need to store your images. Best source for DVD-RAM, CD-R/CD-RW, RAID, etc (for best price) is Dirt Cheep Drives, their email is rgrover@dcdrives.com, tel (281) 534-3919 ext 1086. Dirt Cheep Drives is dedicated to storage (but does not sell scanners or printers). Places that do also sell scanners and printers, however, will not be specialists in storage, which is why it is best to shop for your DVD, CD-burners and hard drives separately. Since 12x CD-burners are now available its probably a good time to upgrade from whatever slower CD burner you may already have.

Please recognize that this company handles exclusively storage. They do not handle scanners nor digital cameras nor wide format printers. So please don't e-mail Robert and ask what scanner to buy! But if you need to store the digital images that result from your scanning, then Dirt Cheap Drives is the best place to help you with storing digital files.

Summary of Where to Buy and/or Where to obtain Further Information

If you need to acquire lighting, tripods or other photographic equipment, FLAAR covers these extensively on www.digital-photography.org and www.cameras-scanners-flaar.org.

Contact for Fuji prepress scanners changes so often we have lost track, plus we do not have any relationship with a specific Fuji dealer (have not found one yet). We are working on this, because Fuji makes excellent scanners.

BetterLight scan backs are like PhaseOne but rated as offering superior quality by a comparative test at PMA Trade Show a year ago. Contact for BetterLight is Larry@ betterlight.com or you can contact the inventor himself (Michael Colette) at mike@betterlight.com.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For the Cruse (overhead) repro stand color scanners, contact kurt.ernst@crusedigital.com and/or Michael A. Lind, tel (281) 492-2714, e-mail malind@msn.com

If you need lighting for digital photography of your paintings, if you opt for the Cruse or the tti overhead scanner solutions, the lighting is included in their turnkey solutions. If you opt for regular photography, the lighting we use is from Lowel-Light Manufacturing, tel 800 334-3426, e-mail info@lowel.com.

If you wish special lighting for digital photography, try NorthLight Sun Spots and/or Balcar lighting. Both are available from Calumet Digital Solutions (contact info is on the FLAAR web sites).

Other

The above information of an actual functioning setup will provide some food for thought. Most people of course will buy the printer first and then worry about how to budget the scanner a year or so later. This is actually how we did things too. Try to avoid using 35mm; you get much better scan from a 4x5 chrome.

We are setting up a model scanning, digital imaging, and fine art giclee print facility in order to provide training. But don't hold your breath because it may take months before we get the site on the air. Bookmark the pertinent FLAAR web sites because we will announce everything there.

Which Scanner is best to handle your Negatives and Transparencies?

How to Digitize objects that are too large for a flatbed scanner? (scanner vs digital camera)

In the meantime, training, books, and articles are listed in each index of every pertinent FLAAR network site under "Training" "Book Reviews." magazines or trade magazines. Hot links to each index are at the bottom of every single page so you can skip from one site to another. Peachpit Press has the best selection.

Books on Photography and Scanning

If you need books on large format cameras try Leslie Stroebel, "View Camera Technique." Available from Calumet, tel 888 280 3686. Note, the books department of Calumet is a different phone number that for scanners and digital cameras. Calumet's book department also offers a variety of titles on digital imaging, digital photography, scanning, and related themes.

A book on scanning you can peruse is *Real World Scanning and Halftones*, by David Blatner, Glenn Fleishman, and Steve Roth, Peachpit Press. You need the 2nd edition.

Most books on scanning are several years old. The few books which exist tend to cover cheap entry-level scanners for home use.

For further information

FLAAR is now offering courses on digital photography. In case you seek assistance on digital photography in addition to scanning, then you need to ask for the PDF reports on digital photography. These are available from www.digital-photography.org.

Advisory

We are quite content with the specific scanners and printers we have in the two FLAAR facilities at the two universities. We would obviously never ask for a scanner that we knew in advance would not be good.

But we can't guarantee or certify any make or model because we don't know the conditions under which a scanner or printer might be utilized in someone else's facility. Heat, humidity, dust, experience level of your workers (whether they are new or have prior years experience): these are all factors that will differ in your place of business as compared with our two universities.

Actually you may have people with even more experience than we do, since we deliberately use students to approximate newbies. FLAAR is devoted to assisting newcomers learn about digital imaging hardware and software. This is why Nicholas Hellmuth is considered the "Johnny Appleseed" of scanners, large format digital cameras, and wide format inkjet printers.

Just remember that every machine has quirks, even the ones we like. However it may be that the specific kind of scanning you need to do may never occasion that shortcoming. Or, it may be that your scanner was manufactured on a Monday and has defects that are atypical, show up more in the kind of media you use which we may not use as often during our evaluations. Equally possibly a scanner that was a disaster for someone else may work flawlessly for you and be a real money maker for your company.

Thus be sure to test a scanner under your own specific work conditions before you buy. Check with other people in your area, or in the same kind of print business that you do. Don't rely on references from the reseller or manufacturer (you will get their pet locations which may be unrealistically gushy): find someone on your own.

Although we have found several makes and models to work very well in our facilities, how well they work in your facilities may also depend on your local dealer. Some dealers are excellent; others just sell you a box and can't provide much service after the sale. If you pay low-bid price, you can't realistically expect special maintenance services later on. Indeed some low-bid internet sales sources may have no technical backup whatsoever.

Most of the readers of the FLAAR Reports look to see what scanners and printers we use in our own facilities. Readers realize that we will have selected the equipment that we like based on years of experience and research. Indeed we have met people at trade shows who told us they use the FLAAR web site reports as the shopping list for their corporate purchases.

Yes, it is rather self-evident that we would never ask a manufacturer to send a product which we knew in advance from our studies was no good. But there are many scanners which are great but we simply do not have them in our facilities. Fuji and Agfa make great scanners but we don't have any in our facilities so can't comment on their current models.

So again the suggestion: be sure to ask around in other print shops, with IT people in other corporations, at your local university or community college. Go to tradeshows…. but don't use the booth…ask questions of people in the elevator, in line at the restaurant, anywhere to escape the smothering hype you get in the booth.

Acknowledgements

We have received SilverFast scanner software from LaserSoft Imaging scanners for evaluations from Heidelberg and Scitex. This means obviously that we know more about the pros and cons of these scanners. When we have the scanner in-house we can photograph it in action too. However no scanner manufacturer pays FLAAR or the university for the evaluations.

Parrot Digigraphic and other sponsors provide FLAAR with a grant to help upgrade the design of the scanner websites several months ago. If you visited us in earlier years we hope you have noticed the new design of www.flatbed-scanner-review.org. Otherwise, however, FLAAR receives no income whatsoever from any camera manufacturer, scanner company, or any reseller of scanner equipment. Thus obviously we do not receive commissions on sales. This makes the FLAAR system unique on the internet.

Reports are distributed by FLAAR at Francisco Marroquin University, FLAARtest@aol.com.

This report for the Photograph Report-SERIES is a March 2004 update of the earlier FLAAR Report on

Scanners for Pre-press: and
Scanning Images for using on a Large Format Printer

Which Scanner is best to handle your Negatives and Transparencies?

How to Digitize objects that are too large for a flatbed scanner? (scanner vs digital camera)