



FLAAR
Digital Imaging Resource Center

4x5 Cameras to hold your large format scan backs (PhaseOne, BetterLight, etc)

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Dr. Hellmuth and Tanya Ratyen doing rollout photography of a Mayan plate.



A Report by Nicholas Hellmuth,
FLAAR at Bowling Green State University,
Based on four years using Cambo 4x5 cameras

4x5 Cameras to hold large format scan backs

4x5 Cameras to hold your large format scan backs (PhaseOne, BetterLight, etc)

I have used Wisner technical field camera, Linhof Technikardan, Sinar X, Sinar p2, and Cambo Ultima to hold my BetterLight scan backs. Experience from these five different cameras makes it easier for me to discuss the pros and cons of each.

My knowledge of 4x5 cameras also comes from attending trade shows over many years. At Photokina 1998, Photokina 2000, and again at Photokina 2002 I spent a week each time checking out the latest professional photography equipment. Have also attended PMA and PhotoPlus trade shows every year.



Photokina tradeshow general view

My large format photographs have been used primarily for Japanese coffee table art books on pre-Columbian art and archaeology of Mexico, Belize, Guatemala, and Honduras. Currently 100% of my large format photography is digital, using exclusively the BetterLight Super 6K with the Pano/WideView accessory.

Wooden 4x5 cameras (field camera)

These cameras fold into themselves to make a traveling box about the size of a cigar box. These cameras (as a group) go under various names, “field cameras” is one designation because they are indeed good to use on location. Such designs are also known as a folding-baseboard camera. The cheap ones are not recommended because they are too flimsy and they wobble. The better ones, such as Wisner and other brands, are sturdy enough for professional use.

Most of the beautiful wooden cameras have brass fixtures. Some cameras made of metal or synthetic composites also have brass fixtures. Certain fixtures are more secure than others. We are unable to comment on folding field cameras made of materials other than wood. We would have to take them out into the field, and then into a studio, to evaluate them. However some of these non-wooden cameras have what look like the same brass fixtures as their wooden ancestors. It's the sliding mechanism with turnscrew which is the weak point, especially when the control on the right side of the camera is totally independent from the control on the left side. You end up with a lopsided focus. Nothing is parallel to anything else, not even to other parts of the camera, and even less parallel to the object you are attempting to photograph.

A few brands are popular, but that still can't save them from lack of precision which is inherent in the century-old design of their brass controls. Cameras with sliding brass fixtures are the generic kind of camera to avoid for any studio use with a digital scan back, especially a tri-linear scanning back. With traditional 4x5 film, however, cameras such as Wisner and brands sold by Calumet are acceptable if you are on a budget, or if you absolutely have to tuck your camera into a back pack. But for using these with a digital back you need a more robust design. The reason why cameras with brass fixtures won't work with a scan back is because the CCD requires a nearly flawless plane of focus.

As with other products, “reviews” are often infomercials or thinly cloaked PR releases by the manufacturer, or a captive writer who touts that brand as the world's greatest. We call those pseudo-reviews. FLAAR is different; we only write about camera equipment we use ourselves, and have found to be better than average over years of actual photography. We are not a trade magazine, but a practicing photographer.

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The Wisner is an attractive wooden camera and evokes the most favorable comment. Everyone asks whether its wooden design comes from a museum. The downside is that I don't yet have a viewing prism nor a wide-angle bellows capability. A nice feature is that the camera folds up for easy traveling. For field work on location this is a viable option since it has tilts and swings. When you are out on location your plane of focus is relatively lenient so it does not require precision micro-step nor zero detents that are absolutely required in the studio. FLAAR has successfully used the Wisner out in the field with the BetterLight tri-linear scanning back for shots at infinity. The Wisner is considered as one of the better wooden field cameras made today. But every since I first used a Cambo, I would recommend this studio model over any portable model. Yes, it is worthwhile to make the extra effort to lug the Cambo out into the field. With a digital back you need the extra stability.

If you need training in the use of large format wooden cameras (the camera movements portion, not in large format digital aspects) we recommend the workshops by Ron Wisner. Telephone (800) 848-0448. He has dedicated his life to 4x5 cameras for use with traditional film, especially out on location. I have taken my Wisner 4x5 all over Central America and it holds up well, even when assistants unfold and fold it back up for the first time (which is usually when lesser products would get broken).

What camera do you need in the studio for product photography? Or outside for architectural or landscape photography?

In a studio you absolutely need zero detents or at least micrometer movements and locks that don't wobble. Thus any camera with sliding movements, or simple turn-screw "locks" or levers are insufficient.

These problems are by no means only with sliding brass fixtures on wooden cameras. With the Linhof Technikardan (original model not the improved model) merely locking a lever can throw the camera out of digital focus. The weight of a digital scan back is enough to pull down the Linhof Technikardan as well. It's not a camera I would buy in the digital millennium. Too bad, it folds flawlessly and is easy to transport. This Linhof lasts forever too, albeit wobbly the whole time. But it sure is easier to carry around than a 10 ton gorilla. The Linhof 679, however, looks like a great studio camera for 1-shot or 3-shot digital backs but is just a few millimeters too small for a tri-linear scanning back such as BetterLight.

Zero detents means that the camera automatically stops at its zero point for every movement. In those cases where no zero detent is present, you at least need non-sliding movements. Thus, for example, the Sinar P has zero detents but I believe the Sinar X does not have that feature. Nonetheless, the Sinar X is vastly superior to 75% of the other cameras on the market, namely to any camera with sliding movements. If the movement slides, then it can also slip or slide a bit while you are tightening down the turnscrew.

Arca-Swiss

Arca-Swiss makes only view cameras, from medium format size (for 6 x 9 cm) up to 8 x 10 inches. A combo model with F-metric front standard from the 6x9 cm series and a back standard from the 4x5 inch series is one possible solution for holding a tri-linear scanning back. One advantage of the choosing the F-metric would be the ability of adding an orbix extension. The orbix allows "marked increase in



Arca Swiss monoball holding 4x5 camera

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movement with sort focal length lenses.” In other words, I won’t have a fit trying to use a 58mm lens on a Linhof Technikardan which in addition to wobble has limited movements with wide angle lenses.

The Arca-Swiss M-line (monolith) looks more similar to the Cambo Ultima. The rise and fall movements appear to be geared or at least substantially stable. The F-metric has rise and fall within an open groove. Sliding grooves are what does not work with brass-fitted wooden cameras. Of course an Arca-Swiss is light-years ahead of any wooden camera but I have been so burned by sliding groove mechanisms on wooden and comparable lesser cameras that I would prefer to recommend the Arca-Swiss monolith for holding a digital back. The orbix attachment would be one feature of the F-metric which might make me consider that model.

The Arca-Swiss camera system has such good word of mouth advertising that the company has never bothered with a web site. I see the Arca Swiss cameras only at Photokina and PhotoExpo East trade shows. I can’t say anything more about it, nor picture it, since FLAAR does not have one available. Thus I am not able to judge how they hold up in the field nor whether the F-metric groove system is superior enough to that of a traditional wooden camera to be recommendable. Also, I do not have a recent catalog

Actually the Cambo Ultima is one of the few large format camera designed to give digital studio photographers the precise precision that they need to hold the CCD in absolutely perfect position, so that when you tighten down the knobs you don’t lose your plane of focus.

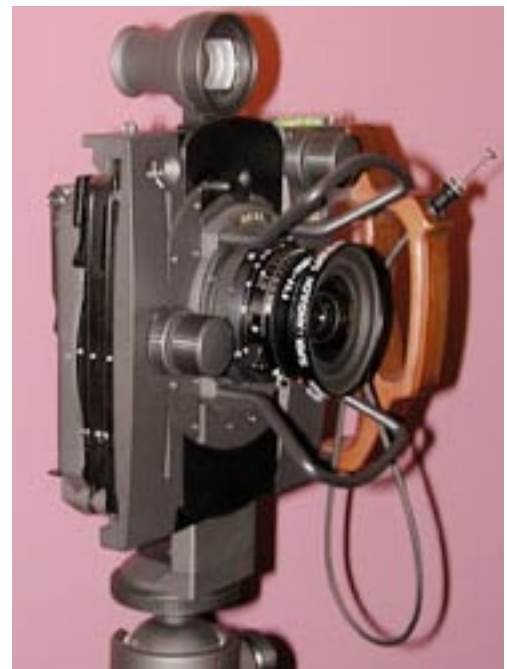
That is precisely the downside of the Linhof. You get it all lined up, but when you turn the lock knobs, the whole system gets skewed out of focus all over again. Also, the Linhof uses an L-shaped support which is inherently weak. It sags with the weight of a digital scan back combined with the drag of the SCSI cables.

Cambo large format

The **Cambo** Ultima is the most precisely designed and manufactured camera I have ever seen; it rivals the Arca-Swiss and Sinar. Since I don’t have an Arca-Swiss and do have a Cambo it’s a lot easier to discuss and showcase the Cambo.

Although the Cambo Ultima is an exceptional camera, and I recommend it wholeheartedly, I do not have experience with entry-level Cambo cameras. They appear to be okay if you need an economical camera for using with 4x5 film. Michael Collette of BetterLight points out that the less expensive model of Cambo actually has a better locking mechanism. I believe the model he referred to is the Cambo Legend. If you have, or are interested in, a tri-linear scanning back, and a camera to hold it, contact him at mike@betterlight.com. But I am used to the Ultima now and don’t want to switch.

For repro stand work we also have the copy stand version of the Cambo. This has just the rail and the standards (front and back). You do not need tilts or swings on a repro stand.



Cambo wide format camera and Betterlight scanback

The informative Cambo web site is www.cambo.com. The exclusive distributor of Cambo in the US is Calumet Photographic. If you wish additional information on the equipment described on this report, you might wish to contact scott.price@calumetphoto.com, tel 312 944 2777 ext 2202, fax 312 944 4035.

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What I especially like about the Cambo is that you can use a 35mm Canon 1Ds or the Kodak 14n with a special attachment. That way you can acquire tilts and swings, on 35mm full-frame sensor cameras. We do not have that to evaluate and write about, nor their sliding back, which is essential if you intend to utilize a medium format back.

CamDynamics

Prior to the advent of the CamDynamics model, Sinar, Arca Swiss and Cambo were the top names. Today, Sinar holds the crown still, but CamDynamics is the new Rolls Royce of large format cameras.

Since the camera is no longer pictured on their web site, and as I did not get any response from my e-mail inquiring about their software, I can't say too much more about the company or its product(s). I saw the camera in person at Photokina 2002. Sure evokes instant envy. CamDynamics deserved the FLAAR award for most innovative 4x5 camera at Photokina.

Since we do not have this camera, there is no way to describe what it does. But if we ever do obtain one, will write a special report on it. Unfortunately it appears that the camera itself has not been manufactured: only some special software, their "lens&light optimizer." Too bad, looked like a Ferrari of cameras. CamDynamics has not appeared, to my knowledge, and any American trade show in the last 16 months.

Sinar X and Sinar P large format

The **Sinar X** camera kindly loaned by Sinar USA was a demo which had seen too many trade shows and too many loans where I guess the other photographers did not take care of it. So by the time it got to me the innards were ground down to stumps and the camera had severe gear problems.

In distinction the Cambo that was provided was brand new, never used and hence never abused. Its gears were in flawless condition and hence made a better impression. I am sure that a brand new Sinar X would also look wonderful, but the only Sinar I had my hands on was old and worn out. I hope to try out a new Sinar to give this Swiss-made camera another opportunity to regain its crown.

Sinar P is their top model. Frankly I found the Sinar X okay; I am sure that if brand new I would have been impressed, but made-in-Switzerland is supposed to mean they are well built. I used to live in Zurich and everything in the country was impressive, from my Swiss girlfriend at the time, to the watches. But the Cambo is the camera I happen to use (made in Holland).

Where we were at the Malta Centre for Restoration, Univ of Malta, broadcasting the February-March 2003 version of the BGSU+FLAAR course on digital photography, they have a brand new Sinar p2. Very impressive 4x5 camera. But we had a Cambo alongside, and it held up against the Sinar p2 just fine (and costs a tad less).

We frequently get e-mails from photographers who want to buy the Sinar P2 with all the trimmings. Yes, this is the ultimate professional studio camera. If you can afford it, or if you are good enough that you will earn enough to pay it off, then go for it.



Sinar X camera at Malta Center of Restoration

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But, if like FLAAR, you are at a university and museum (in other words, no one really pays us for our photography), then you need to be frugal, yet you still seek the same quality as Sinar. Since Arca-Swiss lacks a web site and its hard to find their catalogs I can't easily compare their prices with Sinar, but I would estimate Arca-Swiss is a bit less costly, and yet every bit as rugged (especially since the demo Sinar I had totally collapsed; its fabled gears had evidently lost their teeth over the years; the Cambo Ultima was much superior).

If you do go for Sinar, the Sinar X is just fine; I am not convinced I would go for the P unless I just won the lottery. I am sure that a brand new Sinar would be as good as a brand new Cambo. I just had bad luck to get one from the Sinar demo pool. Plus someone had packed it in a way it slipped out of its form-fit enclosure, but that is not what caused the worn gears on the inside; that came from years of use.

Linhof large format

Most Linhof cameras suffer from disorientation during tightening. As you tighten the system, this very movement moves the camera out of focus. This does not mean Linhof cameras are poorly made. Countless other brands of camera suffer the same malady. The problem is that these famous German brand name cameras were made for use with film. Film is much more forgiving than a CCD.

All Linhof cameras have an L-shaped support. That is not stable enough to hold the weight of a digital back. For this and other reasons we do not recommend any of the otherwise excellent Linhof cameras for using with a digital back. But for film we have used Linhof cameras for years. We still have a 4x5 and an 8x10.

The medium format **Linhof** M679cc in distinction, looks very nice. Looks like a miniature version of the Cambo Ultima. The Rollei X-act is comparable, but I believe it and the Linhof are not large enough for the 7 x 9 cm scan backs. Hasselblad flex-body cameras were too little too late and also won't hold a large format scan back anyway. For a medium format back, if I need tilts and swings, I would rather have a Linhof or Rollei than a Hasselblad.



Medium format **Linhof** M679cc camera

Plaubel

I have not noticed Plaubel cameras before seeing them in several booths at Photokina 2002, nor have I seen any in a studio that I have inspected over past decades. Their equipment looks okay, but without having used one myself it is best if I do not pass judgment.

Plaubel seems to make a wide range of cameras. Just remember that L-shaped camera supports may not be ideal to hold digital backs steady. Until I can see and hold a Plaubel in my hands, I am content with a Cambo Ultima.

Toyo large format

Toyo makes an acceptable wide format camera, indeed this is the 4x5 camera Michael Collette has used on occasion to test his BetterLight tri-linear scanning backs.

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I have not personally used any Toyo camera. I have been spoiled with the Sinar and Cambo Ultima. It would be difficult for me to be convinced that another camera could match or beat the solid construction of a Cambo, Sinar, or Arca Swiss. Even the Linhof 4x5 cameras do not meet my wobble standards (I know, I have two, a 4x5 Technikardan and an 8x10 Linhof Kardan GTL; both wobble). The Cambo and Arca Swiss don't flinch.

Toyo makes three models which a digital photographer should consider:

- Toyo-View 45GII
- Toyo-View 45GX
- Toyo Studio/Field VX125 (jade green) and VX125b matte black)

The Toyo which seems the most tempting is their Studio/Field VX125. Jade green is an appropriate color for an archaeologist who has discovered a royal Maya tomb filled with jade. Archaeologists have to do studio photography and obviously do location photography.

If this camera is sturdier than the Linhof Technikardan, and if it can pack up and be portable, sounds like a winner. In the meantime, however, I still travel with my Cambo.

Other large format cameras

Another dozen large format cameras exist. Most use sliding brass fixtures, precisely the age-old tilt and swing adjustments that are too flexible to recommend. Other cameras have L-shaped supports (Horseman LX series; they are very similar to the Linhof Technikardan, indeed on paper look like a copy; the Linhof original Technikardan is not recommended either). Since Linhof, Arca-Swiss, Cambo, Sinar, and to some degree Toyo make perfectly good cameras, there is not much need to look around for unusual brands. Of course if you already have some other brand, and lack the money to buy a sturdier 4x5, then you can make do with what you already have. But if you are doing serious professional photography with a tri-linear scan back you should be earning enough profit to be able to afford adequate equipment. Besides, if you have sliding brass fixtures and attempt to do precise macro photography you may be getting poor images. Our recommendation is to use only the better equipment. Life is too short to keep attempting to jerry-rig or simply make do with something less than the best.



BetterLight scanback in Wisner wooden camera with brass fixtures. With the Wisner there is no side to side sag from the weight of the scanback. So if you don't raise the standards via the sliding brass fixtures, you have a solid system.

Our recommendation is to use only the better equipment. Life is too short to keep attempting to jerry-rig or simply make do with something less than the best.

Special purpose medium and large format cameras: shift and pano cameras

Gottschalt Kameramanufaktur (Germany), **Silvestri** (Italy) and a few other manufacturers make shift cameras. A shift camera has rise and fall movements only. So you can use it with architecture front on only. This is not a camera to use at an angle to a building (where you need side shifts). I also prefer some tilts as well.

The Gottschalt DS 45 also includes tilts. Thus in some respects this might be a good replacement for my whobbly Linhof Technikardan. The principle advantage of that camera was it was easy to fold and transport. But it wobbles too much for digital photography, a problem with most Linhof cameras other than the non-L shaped 679.

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Gottchalt Kameramanufaktur had the same booth at Photokina 2002 which they had at Photokina 2000. Their cameras look well designed and well made. This is a typical German camera company, a 1-man enterprise based on precision engineering and innovative design. What is unique about their camera is the bellows which allows you to tilt the camera. In effect the Gottchalt is the most flexible of the shift cameras.

I was unable to find any web site for them.

Horseman makes a medium format SW6x9 (cm) model which uses the Rodenstock Apo-Grandagon series (35mm, 45 mm, and 55 mm) as well as a few other comparable lenses. In medium format these are ultra wide angle lenses. Although this is a medium format, not a large format, it is the same kind of shift-lens camera concept as the Silvestri, which also takes medium format backs.

We tried an older model **Cambo Wide**, the model with 90mm lens. It did not have enough movements for my needs. Perhaps the newer Cambo wide models are better. I understand they have added more movements. Otherwise, Cambo makes the best 4x5 I have used so far, the Cambo Ultima. In my experience better constructed than the Sinar X.

On some of these cameras you need a focus-mount for your lens since the camera itself may not have a focusing mechanism. In this case you need a Rodenstock focus-mount.

Silvestri (Italy) makes the widest range of shift cameras that I know of. However I would need to try them out on an actual location shoot to judge how they function. All too often a mere rise and fall is simply not enough for architectural photography. However in most respects the Silvestri and Gottschalt cameras are what Hasselblad should have copied in their ill-fated ArcBody and FlexBody attempts.

Silvestri also makes attachment gizmos so you can put a modern scan back on older Hasselblad 500cm bodies.

The Linhof catalog now includes Silvestri cameras, at least the German version of the Linhof catalog.

Several other shift cameras could be seen at Photokina, but Silvestri and Cambo were the larger companies.

Large Format Reprographic Scanning Cameras

A BetterLight or Anagramm on a repro stand creates a reprographic system from components. Difference is the Cruse is dedicated, a turnkey solution. FLAAR has one of each: one Cruse and one BetterLight. We feel each has positive features; depends on your needs.

METIS, an Italian distributor of digital equipment, showed their DRS reprographic stand. It sure looked like a cheap copy of the Cruse. Since Cruse has a patent on synchron lights it is my understanding they filed a patent infringement suit against METIS. The METIS unit looked like simple sheet metal around a basic structure.



Cruse digital camera repro scanner system in the FLAAR facility at BGSU.

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There is reportedly a French-made digital reprographic system. Looks as though it was put together with various separate parts. I prefer a system designed as a total system. The French system may cost less, but that's because it offers less (name escapes me; I have never seen it at any trade show).

Cruse GmbH showed a unit that had looked solid. Indeed the new Cruse moveable-table repro system wins our award for innovation.

The Cruse CS 185ST features a synchron table. This precision equipment moves the table past a fixed scanning head. You can have a table as long as over two meters (225 cm to be exact). These longer lengths were original designed for scanning hardwood for the veneer industry. But it turned out that the same system was ideal for scanning paintings. By setting the scan head at a 10° or 20° angle it is possible to capture the topographic details of brushstrokes of an oil painting. Thus when this image is reproduced on an inkjet printer, the three-dimensional effect makes the print appear as if it were the original painting.

The Cruse scanner overhead digital camera system is ideal for archives, museums, libraries, photo studios, and naturally any commercial fine art giclée studio.



The Cruse digital camera system is solidly constructed as you would expect for machinery "made in Germany".

Automatic lens control

With a digital camera there is really not that much need any more to open up the lens to focus and close the lens down to shoot. First, you can focus with the lens down because focus is electronic via the software. Second, you won't be shutting your lens down to f 32 anymore anyway. Can't do that with a digital scan back. You will probably be shooting at f 11, or even f 8. At best at f 16 if you have lots of light. With HMI lighting possibly at f 22 if you are lucky.

Thus I don't personally see a need to spend the extra money for any kind of auto shutter. But then again, I don't have to take photos 8 hours a day all week. So if you are shooting every day, hopefully you are earning enough profit to afford an automatic lens diaphragm control.

Summary: Large Format Cameras to hold your Tri-linear Scanning Back What is the best 4x5 camera for large format digital photography?

I spent a week visiting Photokina 2000 tradeshow to answer this question. At Photokina 2000 we selected the Sinar X and Arca-Swiss 4x5 cameras as the best. I was not familiar with the Cambo Ultima at this date. Since at that time Arca-Swiss was in the middle of moving its office from Switzerland to France (to gain entry to the Common Market), no Arca-Swiss was available to test. But Sinar Bron kindly made a Sinar X available to evaluate.

The Sinar X is an impressive piece of precision machinery. Unfortunately the demo unit they sent had two problems: first, it had evidently been used as a demo unit for years by people who did not treat it kindly. Second, it worked itself loose within its shipping container. So when it arrived in Central America it was a bit disheveled. But after a month of use I learned that it's wear-and-tear were much deeper: the internal gears had worn out.

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Nonetheless, Sinar has a solid reputation for well-made cameras. Even after my unfortunately experiences with a demo model, I felt that Calumet was very brave when they suggested that I test their Cambo Ultima against the Sinar X.

When we unpacked the Cambo it made a good impression from the very beginning. We have used the Cambo now off and on for over three years (we dislike getting 30-day loaners; can't learn whether they really hold up).

Based on the several years of testing the prototype Better Light scan back with various 4x5 cameras, I would not advise trying to use a cheap 4x5 camera. That is not the place to save money.

You need a solid camera to hold the weight of the scan back without sagging (the Linhof Technikardan sagged the most; the Sinar X sagged a little, but it was an older demo and possibly loose from all the years at trade shows and all over the country as a demo unit. Perhaps a new Sinar X would not sag as much.

The Wisner portable technical 4x5 camera sagged the least. It was rock solid. But you absolutely need micrometer movements. Sliding movements (movements that slide along an open groove) are the worst kind if you need to do product photography (close-up and macro photography).

Summary: We are totally content with the Cambo Ultima, to the point that we would now like to try out its medium format version (with sliding back) and its 35mm version to hold the Canon 1Ds.

Why use a 4x5 camera to hold a 1-shot or multi-shot scan back?

The above discussion was about 4x5 cameras to hold a large format scanning back. Now lets look at the same cameras as a platform to hold a medium format back. The chip inside virtually all "medium format" scan backs was less than the size of 35mm film negative. Hence there was not much need to have even a medium format system. Large format was absurd overkill.

Gradually the CCD sensors are getting a tad larger, and to hold all the electronics surrounding the chip, the "back" tends to be the size to fit onto a medium format camera. But still, a large format camera is no advantage whatsoever (other than impressing your clients). All you need is a Linhof 679, Rollei X-Act, or a reduced-size version of the Cambo if you prefer camera movements. We do not yet have a special tilt-and-swing camera for medium format backs.

To see how much electronic baggage has to accompany the tiny chip, look at any Kodak 35mm class of their DCS digital cameras. You will note the size of the body required to hold all the parts. The CCD chip itself is a miniscule portion of that.

The real decision of which size studio camera to buy rests with, what size camera do you already have. If you already have a Hasselblad, then all you need is the back. You already have the camera and the lenses. If you require a hand-held solution for spontaneity, then either a Hasselblad or Nikon system is good.

Only if you shoot primarily from a tripod (which we strongly recommend) would it be good to move into a



Sliding back to allow viewing while using medium format back on 4x5 camera.

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Linhof 679, Rollei X-Act, or comparable Arca-Swiss. The reason why FLAAR favors a full-sized 4x5 (Cambo Ultima) is because we have one in-house, so we know how good it is. It's a challenge to get excited about a camera we can't use on a daily basis. Personal usage is the strong point of the FLAAR reviews. However since we obviously don't own every camera ever made (despite my girlfriends belief that this is where all my money has been spent over the decades), we do use tradeshow to check up on other cameras.

We have lusted in our heart for either the medium format version of the Arca Swiss, Cambo, Sinar, Linhof 679, or the Rollei X-Act, especially the newer X-Act-D (for digital). There are over 10,000 photographers every month who read our reviews, often curious to know which competing camera do we prefer. So as soon as the opportunity presents itself, we will test out one or the other or both.

During a brief 1-year period of popularity, the dedicated Foveon CMOS portrait camera was really a digital camera, not merely a back. So you can't put the Foveon onto a 4x5 or even onto a medium format camera with tilts and swings. The Leaf C-Most of that year was a digital back, which requires a regular camera to hold it. So you can put a C-Most onto a large format back if you wished to, or onto the Horseman 35mm holder for that matter since the chips in most of these cameras is really only about the size of a postage stamp.

Bibliography

The two classics on large format cameras are the books by Simmons and Stroebel's 7th edition. Shaman's book is too early for digital backs on the view cameras.

You will note no books with a date of 2003. That is because not too many people are buying large format cameras anymore. The industry is alive and well, but 8x10 is dying out. 5x7 is practically dead already. So few publishers wish to rush out with a new book with a shrinking audience.

Here at FLAAR we still use 4x5 cameras and intend to continue to use them for years to come. If you move up to a BetterLight or other tri-linear scanning back you will need a large format camera to hold it. Even though the publishing dates are back a few years, all the following books are still pertinent, because no new 4x5 cameras have appeared either, other than the Cam-Dynamics.

DYKINGA, Jack W.
Large Format Nature Photography

Anthony Hamber and Phil Green, *Digital Photography*

HICKS, Roger and Frances SCHULTZ
Medium and Large Format Photography. (see our book review before you buy).

KOCH, Carl
Large format Photography in Terms of the Sinar System.

Kodak (by Roger Vail)
1996 Large-format Photography. Kodak, Rochester.
Kodak Pub. No. 0-18E.



FLAAR 4x5 set up at the Malta Centre for Restoration, University of Malta, photographing centuries-old religious paintings with BetterLight.

SHAMAN, Harvey

1991 The View Camera. Watson-Guption.

SIMMONS, Steve

1993 Using the View Camera

STONE, Jim

1997 A User's Guide to the View Camera.

STROEBEL, Leslie D.

View Camera Technique, 7th edition. Focal Press.

STROEBEL, Leslie D.

Stroebel's View Camera Basics

Sources and Resources from Manufacturer's Brochures

The brochures of Sinar-Bron and Rodenstock are excellent, especially the illustrations of the Rodenstock lens brochures.

Sources and Resources on the Internet

<http://advocacy-net.com/largeformat.htm>

(comprehensive selection of large format links)

www.cs.berkeley.edu/~qtluong/photography/lf/

(informal discussion of various issues of large format photography)

<http://bigcamera.8k.com/index.html>

(covers lots about medium and large format photography)

www.nd.edu/~sborman/personal/photo/LF_faq.html

(short (five pages) and useful discussion and definition of basic concepts of large format cameras).

<http://photography.about.com/cs/camerasother/index.htm>

(commercial site filled with ads but has convenient links to medium format and large format camera manufacturers).

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Cambo large format camera on a Gitzo tripod and Manfrotto tripod head, at Lake Atitlan, Guatemala