

Origins of the Modular Digital Camera:

THE HASSELBLAD STORY

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Hasselblad has been producing medium-format cameras for nearly 60 years at its headquarters in Gothenburg, Sweden. As recently as 2002, the company's product line consisted almost entirely of traditional square-format, 56x56mm film cameras, a medium that will probably always have some following, but would hardly be competitive in the digital age.

How times, and Hasselblad, have changed in four years. In January 2006 the company announced the introduction of 39MP digital backs for the second generation of its digital medium-format cameras, breaking a roughly two-year hiatus in which no manufacturer exceeded 22MP. Designed for medium- and large-format cameras, the sensor size—37x49mm—helps provide digital imagery of unsurpassed quality. Other producers of digital backs are proceeding in tandem, yet in terms of market integration, Hasselblad has emerged in parallel with Canon to provide the most advanced and practicable, portable high-end systems of digital photography. A remarkable turnaround.



Hasselblad H2D-39
Modular Medium-Format Camera with 39MP Digital Back

Hasselblad Strategy: Leadership and Versatility

Hasselblad has maintained its prominent position in medium-format photography by offering its clientele just about everything they could want from a camera in both the digital and film universes, while helping its long-time client base to bridge the two. Five tactical decisions were applied to implement this strategy. First, Hasselblad waited for the technology to pass from bleeding- to cutting-edge, then acted in a big way before its competitors.

Second, Hasselblad embraced digital technology, together with advanced autoexposure and autofocus comparable to leading 35mm cameras. Digital engineering not being a Hasselblad strength, the company engaged partners to help it design and produce the finest digital medium-format cameras and lenses on the market (essentially the latest generations of such cameras and optics). In contrast, other major medium-format manufacturers devised digital adaptations to film camera designs, or did nothing to engage the new era.

Third, Hasselblad invested in helping serious photographers cross the film-digital divide. At present, Hasselblad cameras are mostly dual-platform, accepting film as well as digital backs. Moreover, older Hasselblad lenses fit the new hybrid digital models. As a further assist, Hasselblad introduced the leading professional drum scanners (in partnership with Imacon) enabling photographers to combine the maximal resolution of medium- and large-format film with the myriad advantages of the digital darkroom, image conveyance and storage.

Fourth, Hasselblad adopted open standards for its digital backs, and made them available for use with other medium- and large-format camera systems.

Fifth, Hasselblad continues to produce its classic, manual medium-format film cameras. As a further inducement to retain loyal customers, the company makes 16MP digital backs with 37x37mm square sensors to fit even decades-old cameras (a second generation of this digital back has just been announced). If I desired, I could fit my nearly 50-year old Hasselblad Supreme-Wide with a state-of-art digital back. The width would no longer be “supreme,” but image quality of the legendary, non-distorting Zeiss Biogon lens would not be diminished.

A look back through Hasselblad history reveals a spirit of judicious advancement, occasionally bold but tempered by pragmatism reflected in products of high quality and usability, supported by a wide range of accessories, and alas, expensive.

The Setting for Innovation

At the outbreak of World War II, investment in advanced photographic equipment was shifted from commercial to military needs. 35mm and medium-format single-lens reflex (SLR) cameras with swing-away, automatic returning mirrors had been produced in Germany (the Exakta and Reflex Korelle) from the early 1930s. The cameras had just begun to be marketed globally when mercantile manufacture was halted.

In 1946, Victor Hasselblad, avid landscape photographer and scion of a prominent Swedish family, recognized that serious photographers could benefit from more flexible and easier-to-use equipment offering equal or higher quality than the dated products available. At that time, serious photographers were limited to a choice of:

- (1) heavy, awkward large-format cameras requiring a darkroom or tent to load film;
- (2) inflexible twin-lens 35mm and medium-format cameras with fixed lenses for viewing and picture-taking, one atop the other; or,
- (3) 35mm rangefinder models, of which Leica was the most prominent. While perfectly fine for many applications, the absence of through-the-lens viewing left a demand waiting to be met. A further drawback was that films of that era tended to produce significantly better results in medium- and large formats. Also, powerful telephoto lenses could be used only on large-format cameras, which was cumbersome.

New cameras had been introduced after the war with the goal of improving image quality based on stretching conventional pre-war technology. Models were produced in medium format that were essentially enlarged 35mm twin-lens or rangefinder cameras, or miniaturized large-format instruments, that diminished the desirable features of the original format. Production of SLR cameras providing through-the-lens viewing had yet to be revived.

Emergence of the Hasselblad Design

Victor Hasselblad visualized a modular medium-format camera with interchangeable lenses and detachable film backs of SLR design including automatic returning mirror that would accommodate both wide-angle and telephoto lenses. During World War II, Hasselblad had manufactured aerial reconnaissance cameras for the Swedish Air Force. These instruments, similar to aerial cameras elsewhere at the time, were midway in size between the large and 35mm formats, and used detachable film magazines. Expanding on this concept, Hasselblad conceived his hybrid camera in medium format. The new model would offer the big, detachable lenses and interchangeable film backs of large format. The central camera body would house an SLR apparatus and mirror. Film size would be a compromise at 56x56mm, a quarter the area of large-format film but nearly four times that of 35mm film. Conveniences adapted from 35mm format would include rollfilm and a body not very much larger than 35mm cameras.

The Hasselblad 1600F

Introduced in October 1948, the Hasselblad 1600F, named for its top shutter speed of 1/1600 sec. and featuring a focal-plane shutter, was among the most innovative cameras in history. It was the first to apply the concept of modular design of a central body assembly to which a variety of quick-change lenses, film magazines and viewing devices could be attached. The price of the camera was about \$600, or approximately \$5000 in current dollars.



Hasselblad 1600F
Modular Medium-Format Camera with 56x56mm Film Back

The automatic-return mirror of the Hasselblad 1600F had been a cause for concern, but turned out to be fully dependable. However the high-speed shutter—an innovation for its time—tended to break down on early production models. Since many parts had been individually hand crafted, repairs could be difficult. The camera was considered more of a sophisticated and somewhat delicate device than a mechanically robust instrument. Yet improvements were soon engineered that greatly improved its durability and ensured the acceptance of the camera. The first very large, powerful telephoto lenses that could be used in hand-held photography were also introduced to fit the new, modular camera.

The Hasselblad 1600F design and features would be widely emulated. Even the latest medium-format film cameras of Mamiya, Rolleiflex, Salyut (Russia) as well as Hasselblad manufacture appear basically similar in form and function to the original Hasselblad 1600F.

The 1600F was supplanted by a more refined model, the Hasselblad 1000F, in 1952.

Evolution of the Hasselblad

The Hasselblad 500 camera series, introduced in 1957, features shutters in the lenses instead of the camera body. Still produced today as the 503CW, the system avails photographers a selection of 13 regular and 2 macro lenses, 3 teleconverters, 5 viewers, 7 focusing screens, through-the-lens and off-the-film exposure for flash, electric motor drive, and extension bellows for macro-photography. Also introduced was a slide projector to show the large, square medium-format transparencies. Notwithstanding these advances, the Hasselblad 500 series remains an essentially manual system supported by electronic accessories at the discretion of the photographer. Aperture and shutter speed are set by hand, although metered through-the-lens viewers are available (an early Hasselblad accessory was a wrist-worn or camera-mounted, battery-free selenium light meter—a recently acquired example still works after 40+years). As such, batteries are not needed to operate the camera although a metered viewer or hand-held exposure meter are considered a must for all intents and purposes. The contemporary basic 503CW camera with primary lens, viewer and film back sells for about \$4,000. With the latest-generation 16MP digital back designed expressly for the 500-series cameras, the outfit sells for about \$11,000. Hasselblad film cameras, lenses and other accessories produced since 1957 are readily interchangeable with only a few exceptions.

The Electronic Hasselblad

Hasselblad introduced the first of its electronic models in 1991, which comprise the 200 series. Production of these cameras was discontinued in 2004 with the advent of the company's first "H1" digital camera that also accepts film. Featured on the 200 series were an automatic shutter and two modes of through-the-lens light metering, spot metering, and exposure bracketing. While most such features are commonplace in 35mm photography, Hasselblad produced the first medium-format camera to offer these assists. Nevertheless, due to the limited market for the cameras and high development costs, the automatic features of the 200-series Hasselblads were not updated to the sophistication of advanced-generation 35mm cameras introduced in the mid-1990s.

A Camera Dedicated to Ansel Adams

Ansel Adams used a Hasselblad as well as large-format equipment. In his honor, Hasselblad introduced the 205 FCC in 1995, the most advanced of its electronic cameras prior to the contemporary digital series. The light metering system of the camera was designed to track exposure following the Zone System of photography developed by Adams. Specifically, the 205 FCC has a spot meter programmed to gauge incident light according to 10 exposure zones, from light to dark, each the equivalent of an F-stop. The photographer can then adjust exposure and if feasible apply measures such as graduated neutral density (darkening) filters so that both the lightest and darkest critical areas are adequately exposed to show detail. According to Adams and his disciples, such balance results in an optimal photograph, especially in black and white. Another feature of the 205 FCC camera is selective contrast control for black and white photography, again employing techniques popularized by Adams. The 205 FCC, sales of which were discontinued in 2005, sold for about \$10,000 including a primary lens and specialized film magazine.

Lunar Lenses Available on Earth

Hasselblad cameras were used in the US Space Program from 1962 to 1972, in the first Project Mercury flight through the final lunar landing. To best capture the extreme contrasts of vistas from the lunar surface, Hasselblad in partnership with Carl Zeiss optics produced an extremely accurate telephoto lens using quartz fluorite glass. The lens has been available to the public in 250mm and 350mm focal lengths (equivalent to about 135mm and 200mm in 35mm format). According to Hasselblad, the optic was designated “Super-Achromat” because of virtually perfect chromatic correction resulting in image sharpness without color fringing or loss of contrast in corners.

In 2001, Hasselblad introduced a new version of the Super-Achromat, a 300mm lens with an incredibly fast (for medium format) $f/2.8$ aperture, together with a converter to 500mm (equivalent to about 280mm in 35mm format). At a price of about \$25,000, it was by my reckoning the most expensive regular production optic for sale in commercial photography.

A Lens Too Sharp for Portraits

The Hasselblad 100mm CFI lens offers extraordinary resolution and contrast, and is unique in maintaining these qualities wide open at $f/3.5$. The equivalent of about a 60mm focal length in 35mm format, the Hasselblad 100mm lens is so discerning that portrait photographers tend to avoid it, or apply a softening filter. Since many photographers wanted a more forgiving lens for people pictures of about the same focal length, Hasselblad introduced a rather different, 110mm lens tailored to such studio portraiture. Salient features are an $f/2$ aperture and purposefully shallow depth of field.

The Ultimate Fisheye Lens

Square medium format is the ideal setting for the maximal, 180-degree “fisheye” lens, especially since it is not practical to use such optics in large format. Hasselblad has offered a top-quality fisheye lens since 1972. For this optic a system of small, behind-the-lens filters was devised because it would not be possible to place filters over a fisheye lens without vignetting.

Why Many Photographers are Endeared to Hasselblad (and Film)

The original draw of medium-format film photography was reduced by the increasingly excellent films and marvelous electronic assists developed for 35mm format; and likewise by major improvements in large-format photography. Then came digital, of course, to which some users of medium-format film have switched—either to digital 35mm or medium formats. Still, film retains an aesthetic appeal for those appreciating the bokeh of film (its look or feel, in particular with regard to areas in semi-focus) or who are not prepared to spend the roughly \$10,000-17,000 needed for Hasselblad or other medium-

format digital quality, or \$8,000 for an advanced Canon 16MP digital camera (which notwithstanding the smaller sensor can produce imagery comparable to digital medium format if the composition corresponds to the 35mm aspect ratio (1:1.5) of the Canon sensor.) Not to mention other advantages of medium-format film such as the option of either square or rectangular photographs without cropping (by using different film backs), or the desirability of premium-quality enlargements. In addition, Hasselblad users have a choice of some unique optics, as elaborated above; and share a certain camaraderie. Suffice to say that a sizable number of Hasselblad photographers have preferred to stay with film. If desired, the negatives can be scanned with results comparable or better than digital cameras with high-resolution sensors.

A Global Connection, Pre- and Post-Internet

Hasselblad has endeavored to maintain close contacts with photographers. The quarterly journal "Forum," distributed worldwide to highlight the work of Hasselblad shooters, celebrates its 40th anniversary in 2006. The Hasselblad website is among the most informative and impressive sites in the business. Moreover, any Hasselblad owner with a technical question or problem can email the company headquarters in Sweden (as well as many national affiliates such as Hasselblad USA); and will receive a response within 1-2 days. If you have made a mistake, they will tell you in such a disarming way that you are not embarrassed.

In 2004, Hasselblad moved from its dated headquarters to a new facility of striking aerodynamic design, located by the water. A Hasselblad owner passing through Gothenburg is urged to let the company know in advance, so they can be treated to a tour of headquarters, visit the in-house Hasselblad Museum, and possibly meet the craftsman who built or assembled their camera. Lunch may be taken with the employees in the company cafeteria.

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