modern tests

newest cameras, lenses & important accessories

BRONICA SQ: PRO 2¼ SLR SYSTEM

MODERN PHOTOGRAPHY APPROVED

LIMITED WARRANTY BY:
Hindaphoto Div.
GMI Photographic Inc.
1776 New Highway
Farmingdale, NY 11735

MANUFACTURER'S SPECIFICATIONS: Bronica SQ 2¼ x 2¼ in. (6 x 6 cm) single-lens reflex camera. Body No. 1102897. LENS: 80mm f/2.8 Zenzanon-S in interchangeable bayonet mount, apertures to f/22, focusing to 2 ft. 7½ in. (0.8 m), accepts 67mm threaded accessories. SHUTTER: Electronically-controlled Seiko #0 leaf type in each lens with speeds of 8-1/500 sec. plus T; mechanically-controlled 1/500-sec. speed usable without 6-v silver-oxide or alkaline manganese battery in body, X sync. VIEWING: Interchangeable waist-level finder with light-excluding hood, built-in magnifier, user-interchangeable viewing screens; standard screen has central split-image rangefinder surrounded by microprism collar, full-focusing matte outer area with vertical and horizontal orientation lines. OTHER FEATURES: Interchangeable 120 and 220 film magazines incorporate ASA 25-3200 dials and electric contacts for automatically keying film speed into optional meter finders; six contacts on the back of each lens in camera body, and above front of finder screen relay set shutter speed and metering information, transferring shutter-speed control to auxiliary shutter/metering dial on finder when meter finder is in place; built-in mechanical interlocks prevent lens removal without cocking shutter, film magazine removal without inserting dark slide, shutter cocking without film in magazine; battery-check LED outside screen area in finder lights as shutter blades close to complete exposure or when battery-check button is pushed; hinged film-wind crank advances one frame per 360° turn; multiple-exposure control; spring-loaded depth-of-field preview lever on each lens; shutter-release-lock collar; optional CdS MF Finder S, powered by battery in camera body, incorporates two angled CdS cells, provided with match-diode metering center-weighted readings off viewing screen. PRICE: $1,350 with 80mm f/2.8 lens, collapsible waist-level finder.

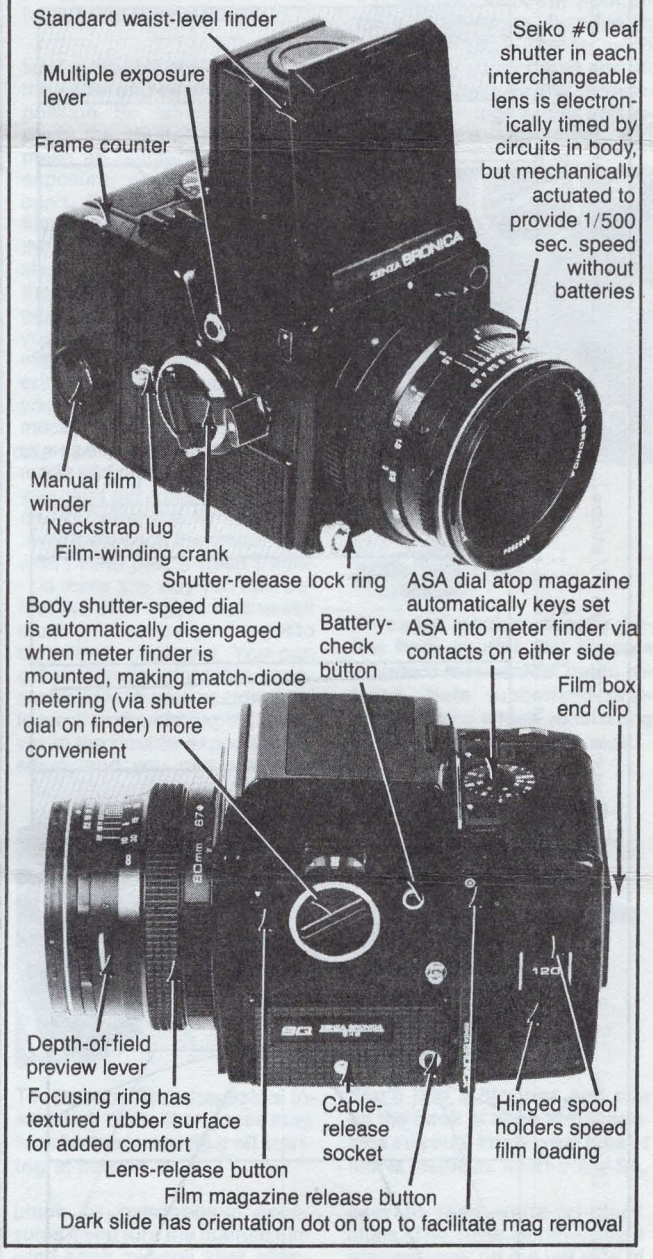
After nearly two decades of producing 2¼ square SLRs with focal-plane shutters, Zenza Bronica has gone the route of the legendary Hasselblad 500C/M and introduced a professional-caliber medium-format SLR with a separate leaf shutter in each of its inter-

The square look certainly resembles you-know-who's Swedish 2¼ SLR, but the Bronica SQ has system electronics, simpler construction.

changeable lenses. And as if to emphasize its clean break with past tradition, the new Bronica SQ is entirely new, with none of its lenses or accessories compatible with the now discontinued lines of focal-plane-shutter 2¼ x 2¼ Bronicas, or with the current 1⅝ x 2¼ in. (4.5 x 6 cm) format Bronica ETR-S. While many photographers will be tempted to see the SQ as "Bronica's Hasselblad," such is not the case, however. It is, as we shall see, more of a scaled-up ETR which draws on Bronica's long and successful experience with through-lens metering and electronic shutter control systems. As the originators of the world's first auto-exposure 2¼ SLR (the Bronica EC-TL) back in 1976, Bronica's engineers have evidently attempted to combine the proven appeal of the leaf-shutter Hasselblads with the advanced electronics of the EC-TL, and the leaf shutter ETR-S and to do so in a rugged and relatively simple machine. The SQ, which is quite conservative in some respects, is certainly not intended to challenge such cameras as the Rollei SLX in terms of total state-of-the-art automation. But of all the many 2¼ square SLRs Bronica has offered over the years the SQ probably comes closest to meeting the needs and wants of today's professionals.

Before we begin to examine the SQ in detail, let's say a few general words about the great leaf shutter versus focal-plane shutter controversy—a debate which has raged among medium-format SLR fans and manufacturers for eons. Historically, the best known 2¼ SLR makers have tried both shutter types, and for good reasons. The focal-plane variety usually provides a higher top speed (typically 1/1000 or even 1/2000 sec. instead of 1/500 sec.) and permits greater flexibility in optical design (that is, faster and/or closer-focusing lenses), including the potential use of barrel-mounted large-format lenses on bellows. However the large focal-plane shutters required in 2¼ x 2¼ SLRs have traditionally been somewhat delicate, and rather vulnerable (since they're situated directly in front of the removable film magazine), and their top flash sync speed has usually been limited to 1/30 or 1/40 sec. (an exception is the Has-

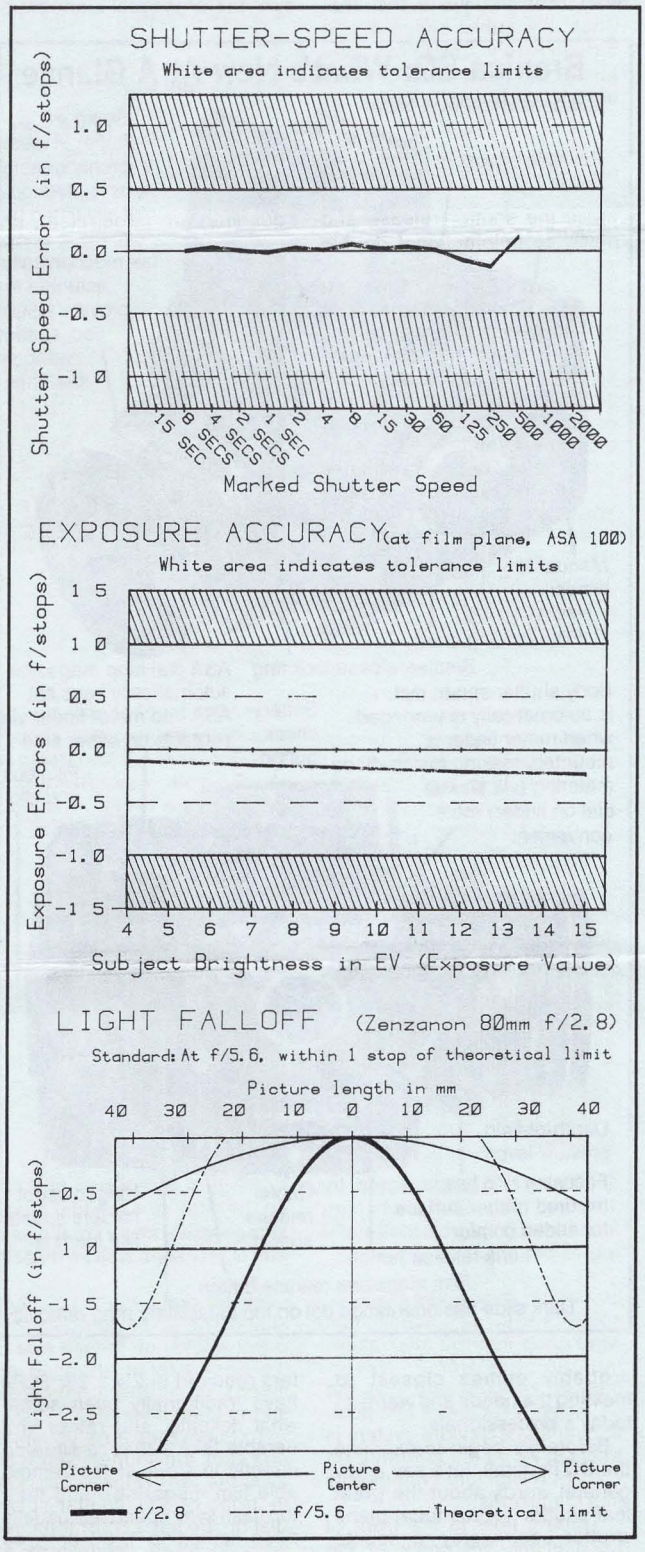
Bronica SQ: What's New At A Glance

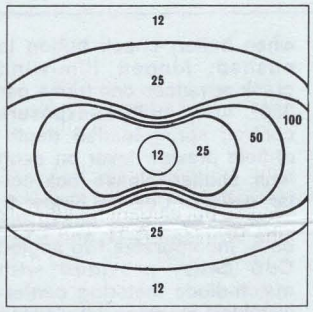


selblad 2000 FC which syncs at 1/90 sec.). This flash-sync-speed restriction is particularly worrisome to pros who often use fill flash outdoors or shoot flash pictures in bright indoor environments where ghost images caused by ambient light can pose insurmountable problems. In short, while interlens leaf shutters have their limitations, they're well protected inside each lens and provide electronic flash sync at all speeds. And if one shutter should happen to misbehave at the wrong time, you can usually reach into your bag for another focal-length lens/shutter unit and continue shooting. This last feature is vital to the working pro and more than worth the extra (theoretical) cost of having a shutter in each lens.

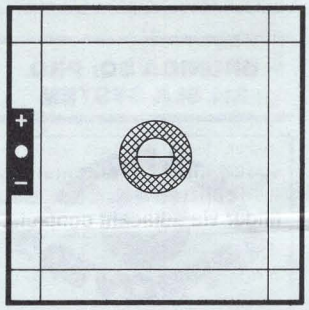
In its general layout, the Bronica SQ is undeniably similar to the Hasselblad 500 C/M or for that matter to the Bronica ETR-S, which can be viewed as a scaled-down and electronified version of same. It centers around a boxy main body section to which lenses bayonet in at the front, film magazines snap on at the back, and viewing hoods and finders slide and click in place on top. However, there are many important differences which make the SQ noticeably more convenient, and highlight the adrantages of starting with a more-or-less clean slate and a respectful but critical view of the competition.

Let's begin the inevitable comparison by loading a roll of film. Atop the magazine toward the collapsed finder hood are two textured finger grips, one on either side of the magazine. Push these in with thumb and forefinger, as indicated by a pair of white deltas, and the bottom-hinged back section of the magazine opens and you may lift out the film holder section. Like the 'Blad, the SQ loads using the "double-reverse curl" system, and the left-hand spool-retaining lugs are hinged to facilitate the process. Snap an empty spool into the bottom chamber and snap the





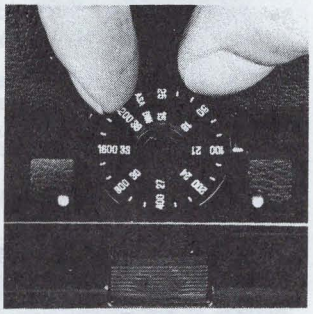
Edge-weighted metering? Not really, but CdS MF Finder S has two downward-pointing, angled cells providing two areas of maximum meter sensitivity, one on each side of center of horizontal band. Whatever the theoretical limitations on this system, it provides excellent overall accuracy.



Bronica SQ's finder shows meter display area at left only when CdS meter finder is mounted. Entire LED array is shown for clarity, but only one symbol appears at a time in normal metering. Central focusing aids are large, easy to use; fine Fresnel outer area is very bright and contrasty.

GENERAL PERFORMANCE

Checkpoints	Our Standard	As Tested
FINDER:		
Apparent viewing distance	Between infinity and 20 in. (0.5m)	26 in. (0.67m)
(CdS MF Finder-S)	same as above	22 in. (0.57m)
Apparent distance of EV scale of meter head)	Between 39 in. (1.0m) and 20 in. (0.5m)	7.9 in. (0.2m)
View area compared to film area	Vertically and horizontally more than 90%, less than 100%	Vertical: 95.2% Horizontal: 94.3%
Parallax error compared to film	Vertical: 1.32m Horizontal: 1.58mm	Vertical: 0.23mm (downwards) Horizontal: 0.36mm (left)
Focusing accuracy at maximum aperture	Within depth of focus	½ toward camera
Image magnification	1 15X	1.09X
PICTURE SIZE:	56mm ± 1.4 x 56mm ± 1.4mm	55.2 x 55.7mm
SHUTTER:		
Camera insulation from sync	More than 7 megohms	Infinity.
Sync contact efficiency	More than 60%	82%
Synchronizer delay time	X: within full opening	Okay
Shutter blade bounce	Not allowed	None
LENS:		
Focal length	80mm ± 5%	82.5mm
Maximum aperture	f/2.8 ± 5%	f/2.86
Distortion	± 2%	0.4% (barrel)
CAMERA SIZE:	4¾ in. wide, 4 5/16 in. high, 7. in. deep, (111x109x178mm) with lens and magazine, waist-level finder	
WEIGHT:	Body: 2 lb. 4 oz. (1020g) with film back and waist-level finder, battery Lens: 1 lb. 0 oz. (470g)	

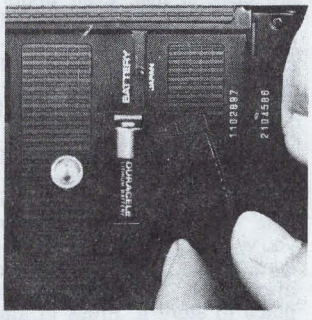


Lift and turn ASA dial until proper digits appear opposite index line on left and film speed info is automatically transmitted to CdS meter finder via adjacent contacts.

hinged spool lug in place, and do the same with the fresh roll in the top chamber, making sure the paper leader points upward with the black side facing you. Now pull the leader, black side out, over the wide top roller around the spring-loaded pressure plate, under the thinner bottom roller and thread it through the take-up spool and you're almost done. Finally turn the manual film wind knob on the right-hand side of the film holder counterclockwise until the arrow on the paper leader coincides with a red arrow in the top film chamber insert the loaded holder into the magazine with the integral film counter facing upwards and snap the magazine shut. To position the first frame, turn the film-wind crank on the right side of the camera about 5½ turns until it stops and the film counter will read "1 " Before you begin shooting, lift and turn the milled edge of the large (1-in.-diameter), legible ASA dial atop the magazine so the proper film speed (ASA 25-3200) is opposite the white index line.

So far, everything has been quite conventional. True, you don't have to remember to thread the film under a film-guide bar as with Hasselblad magazines, and the frame counter is more conveniently positioned atop the SQ's magazine, but this is small stuff. It will likewise come as no surprise that you can't fire the SQ's shutter until you remove the dark slide from its slot on the left, and you can't press in the unlocking button or remove the film mag from the body until the dark slide is in place, right way up (there are orientation dots on the slide handle and slot).

So where is the great leap forward in operating convenience, you ask? Ogle at the right side of the magazine and it may occur to you that two of the Hasselblad's hallmarks are absent—those curious little "film advance" and "shutter cocking" warning windows. They're not needed on the SQ for a simple but elegant reason—like the Bronica EC-TL and ETR-S that preceded it the SQ has a virtually foolproof system of true blank and double-exposure prevention. Although you can remove the film mag.



Battery compartment cover is easy to open and mounts securely, but 6-v battery is hard to remove without long, stout fingernail or narrow implement.

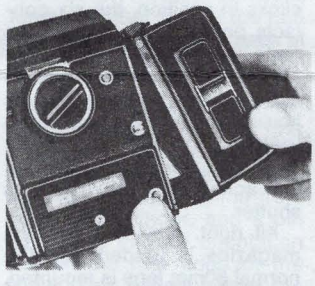
To load film line up arrow on film's backing with red arrow in insert and snap into position in mounted magazine.

either before or after the shutter is cocked, you cannot ordinarily fire the shutter without a film magazine in place. More importantly, you cannot ever fire the shutter with the film mag in place unless the film has been advanced to the next frame! The ingenious mechanism responsible for the latter feature resides on the lower right-hand corner of the front of the magazine, about an inch below the film-advance-coupling gear It is a tiny pin surrounded by an elongated collar. When you hook the top mag-mounting lugs into their respective slots on the body and hinge the magazine downwards to lock it in place, this pin and collar enter a round hole on the lower right-hand corner of the camera back. In the center of this hole is a second pin which jumps back as you press the shutter release. If you mount a film mag that hasn't previously been wound on to the next frame, its pin will ex-

Attaching SQ's neckstrap is a complex procedure using reverse curls and a pair of split rings. It's out of keeping with the camera's functional simplicity but at least you don't have to do it very often.

tend a tiny bit past the end of the collar and be locked in that position. So, when you try to press the shutter release and make an unintentional double exposure, you'll find that you can't. But once you wind the film to the next frame, the pin in the magazine retracts so the shutter-release pin can enter the collar on the magazine. Ingenious. What's more, even if you set the intentional double-exposure lever forward, uncovering the red dot that indicates you're in double-exposure mode, fire the shutter set the lever back to normal-exposure mode and mount the magazine, you can't get a blank exposure. As you wind the film-advance lever it will cock the shutter but won't wind past a fresh frame.

Is there any way you can defeat the SQ's ingenuity and still louse up? Yes, but you've got to be willfully negligent. You can get unintentional double exposures only if you accidentally leave the double-exposure lever in the double-exposure position, and you can even get

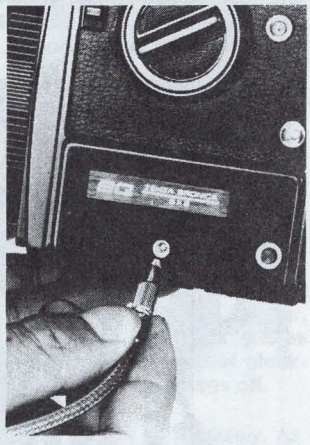


To remove film magazine insert dark slide, then press mag lock button in and lift it off starting at bottom.

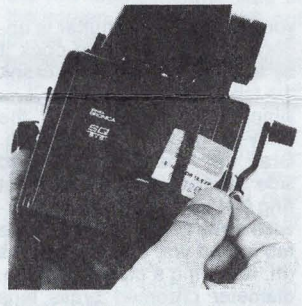
blank or overlapping exposures if you turn the manual film wind knob mid-roll after aligning the first frame. Nevertheless, we conclude that the SQ's nearly foolproof film positioning and exposure system is the best we've encountered on a 2¼ SLR with interchangeable film magazines.

Turning now to the front of the camera, we come to the satin black finished lens. Inboard of its front-most ring is a thread that accepts standard 67mm screw-in filters or accessories. Four bayonet lugs on the outer surface of the front ring are for mounting square lens hoods in the proper orientation. About ½ in. back you'll find the lens aperture ring which you turn by grabbing knurled ears on its left- and right-hand sides. Then comes a large, legible depth-of-field scale and finally, about ⅜ in. forward of the rear of the lens, the nearly ½ in. (12 mm) wide, textured rubber focusing ring.

The 80mm Zenzanon-S lens focuses very smoothly from infinity to minimum distance in just under 180° The focusing ring is very comfortable and all scales (except for the orange-on-black footage scales and index line) are large, clear, and



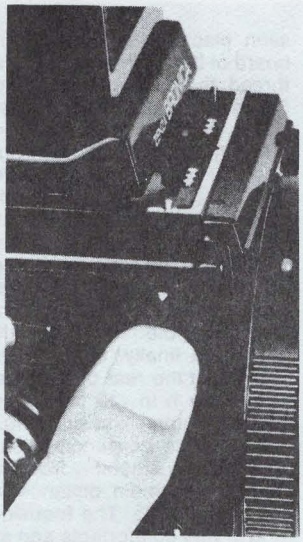
Threaded socket directly below body shutter dial accepts standard mechanical cable release. Note rubberized gripping surface which runs along camera bottom to other side.



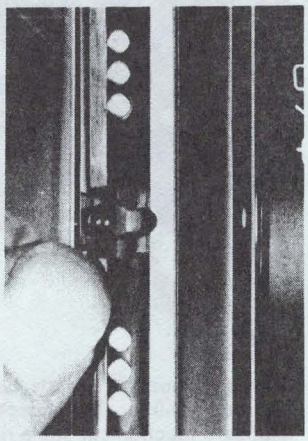
You'll find a film box end clip on the back of each film magazine so you'll know what type of film is inside as well as its ASA.

easy to read white-on-black digits. The silver depth-of-field preview lever on the left side of the lens barrel (in shooting position) is of the convenient spring-loaded variety.

To remove the lens, you must first cock the shutter, which allows the lens-release tab, just in front of the shutter-speed dial on the left side of the main body to move downwards as



When you mount meter prism, contacts under its leading edge mate with those shown in front of finder screen. Finders won't come off until you push down on meter lock (at finger).



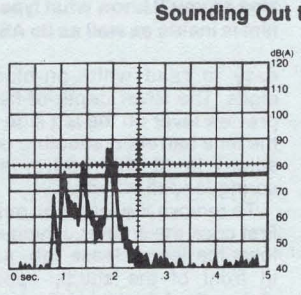
LED at front edge of finder screen lights as shutter closes or when battery check button is pressed.

you press it. If the shutter is uncocked and you fail to cock it by turning the film-wind crank the tab won't move and the lens simply can't be taken off the body—a good safety feature. Grab the lens by the knurled side sections on the rear-most ring and turn it about 20° clockwise while pressing the release tab in and you can lift the lens off, revealing a cavernous 3 in. diameter chromed brass lens mount having four mounting lugs. Just inside the top of the camera body mount you'll see six downward-pointing, gold-plated, spring-loaded electric contacts. Farther down, at about 10 and 4 o'clock are shutter-cocking lugs which tension the springs in the electronically-timed, but mechanically-powered, shutter in each lens as you wind the film to the next frame. And on the lower right (looking into the open mount) you'll see the pivoted catch for the lens-release lock. In the very center, a couple of inches back, is the very deep, slightly trapezoidal, front-surface mirror, which is hinged at the back. Directly behind the mirror (more easily visible from the back with the film mag removed) is a one-piece, top-hinged, matte black light baffle which comes into position just before the mirror returns as you wind the film to the next frame. Unlike the Hasselblad 500 CM's two-piece baffle, which sits vertically, the SQ's baffle is angled back, with its bottom edge about ¾ in. forward of the film aperture.

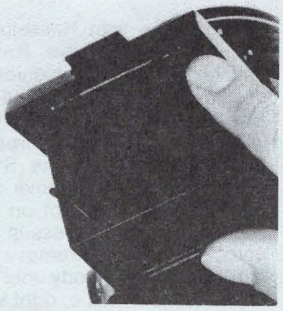
On the back of the lens, after you finish admiring the beautifully finished chrome-on-brass mount, you'll notice six studlike, gold-plated electric contacts and the shutter cocking lugs running in arcuate grooves. The cocked position is denoted by a pair of green dots, and in the unlikely event the shutter becomes uncocked, the pins will fall opposite curved red warning lines indicating that the shutter should be mechanically cocked (by turning the pins manually) before mounting the lens. When you align the raised red dot on the lens with the orange dot above the camera lens mount, insert the lens, and turn it counterclockwise until it clicks in position, the six contacts on the back of the lens mate with the spring-loaded contacts in the body. This enables the electronic shutter releasing and timing signals originating in the camera's electronic circuitry to control the action of each interlens shutter.

All right, now that our film magazine is loaded and the normal 80mm lens is mounted,

Sounding Out the Bronica SQ

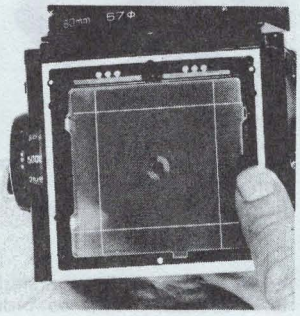


Although this camera's noise level peaks at 86 dB and includes three sound energy spikes to greater than 75 dB, its average noise output measures 75 dB, or slightly quieter than average for a 2¼ SLR. The results of these measurements were borne out in informal listening tests.

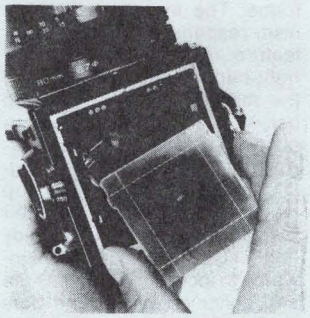


Press tab within front of collapsible viewing hood toward left and viewing magnifier will snap up into place (note large spring).

let's shoot a few pictures using the folding waist-level finder To erect the finder, you pull upwards and forward on a striated plastic tab just above the ASA dial of the mounted magazine until the center-hinged sides of the hood click into place. Now push a little tab under the top edge of the front section and the 2½ X magnifier springs up to form an effective light shield. Since this finder is not meterized, you presumably take a meter reading of your subject and set the aperture on the lens, and the shutter speed on a click-stopped dial atop the left side of the main body. The shutter dial has a large, easily grippable knob and large readable digits that appear in a little window to the left of the erected



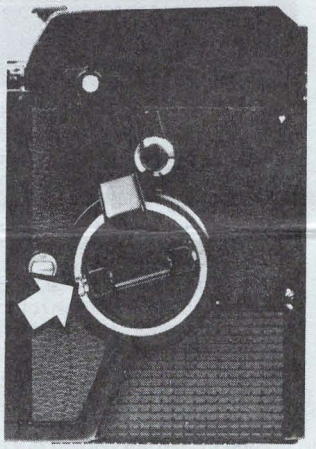
Move right-hand tab (at finger) back into similar position to the left-hand tab, and screen is easily removed (see text).



To replace viewing screen, just pop it into place (note one-way tab in proper position at back edge of screen unit) and move tabs forward so bars retain side tabs on screen.

viewing hood. Speeds from ½ to 1/500 sec. (2 to 500) appear in white, while full second speeds, down to 8 sec., appear in orange-on-black. All settings are easily visible from the top, a decided convenience on a camera that's most often used with a waist-level (actually chest-level) finder.

The view through the Bronica's finder is one of the brightest and most contrasty we've seen on any 2¼ square SLR. It is brilliant to the corners, and its central focusing



Comfortable, hinged film crank advances film one frame per smooth 360° turn. Removable hinge allows crank removal, possibly presaging manual winder grip or motor.

aids, a horizontally divided split-image rangefinder surrounded by a thickish microprism collar, are large enough to be really useful. Although the manufacturer describes the outer focusing area of the screen as "matte" it actually consists of an extremely fine, circular Fresnel pattern. The standard viewing hood imparts a slight pincushion distortion to the viewing image, but it's usually not noticeable, except possibly when shooting such things as paintings and architecture. As you turn the lens's focusing ring, most subjects snap into focus quite decisively, even in the outer focusing area, and the split-image rangefinder and microprism are easy to use, even under marginal lighting conditions. If this leaves you with the impression that the SQ's focusing and viewing image is much better than average for a 2¼ SLR that is indeed correct.

Having brightly viewed and precisely focused on the subject, the time has now come to take the picture. Presumably you've already set the exposure, pulled out the dark slide and found a convenient(?) place to store it. Press in the soft action, medium travel shutter button on the body's lower right side with the dial set to 1/125 sec. and you'll hear a

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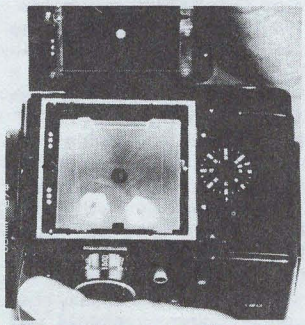
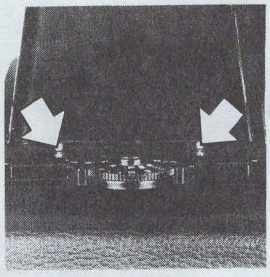


When you mount meter prism, contacts under its leading edge mate with those shown in front of finder screen. Finders won't come off until you push down on meter lock (at finger).



Contacts on sides of each film magazine's ASA dial mate with those on the bottom of CdS MF Finder S to key in ASA automatically. Result: busy pros have less to worry about.

moderately loud, moderately long click. This general sound output level is par for the course for a camera of this type in which the shutter closes, the mirror and light baffle fly up out of the way, the diaphragm stops down to the set aperture, and the shutter opens and closes again to make the actual exposure. Like the classic Hasselblad, the Bronica SQ does not have either an instant-return mirror or an instant-reopening lens diaphragm (both return to viewing position as you wind the film to the next frame) and this is why it's actually quieter and less vibration prone than many, if not most of its current and erstwhile competitors. Indeed, it's one of the least shake-prone cameras of its ilk, enabling us to make sharp hand-held pictures at 1/60 and even 1/30 sec. with the normal lens. We attribute this commendable performance at least partially to an efficient mirror-damping mechanism (see strip-down box on opposite page).

So far, professional and advanced amateur photographers could be forgiven for wondering why Bronica bothered to incorporate electronic circuitry in the SQ at all. Part of the answer is to be found in the accompanying performance charts, which indicate that the shutter (in the 80mm lens) is one of the most accurate leaf shutters in any 2¼ camera we've ever tested. We attribute this to the superior accuracy of electronically timed shutters in general, and the Bronica's in particular. Also, since the timing circuitry is in the camera body rather than in the lens unit, the SQ, like the ETR-S, has its shutter-speed dial on the body which, as mentioned, we judge to be a more convenient location than on each lens. The price you pay for this accuracy and convenience: You must have a functioning 6-v silver-oxide or alkaline-manganese battery in the compartment on the bottom of the main body to get the full range of shutter speeds. The only mechanically-timed speed available sans battery power is 1/500 sec. This *will* allow you to shoot pictures with electronic flash or in bright outdoor conditions with high-speed film all right, but photographers are well advised to carry a fresh spare battery at all times, particularly in cold weather when battery output drops. We would have preferred to have a different mechanical speed, say 1 125 sec., operate without battery power since it would allow you to continue shooting under a wider range of lighting conditions. But evidently this was not possible.

Perhaps an even more important reason for the SQ's electronic approach is that it permits metering options that are difficult if not impossible to achieve in a mechanically based camera. Indeed, the

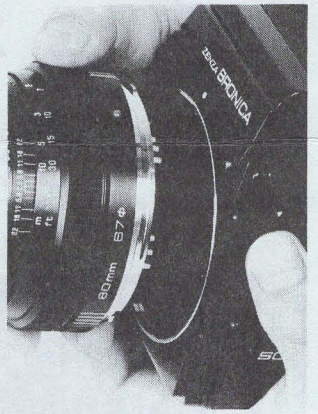
To remove any finder, press finder-lock tab on body as shown, slide finder back and lift it off.

Bronica's electronics permit a "systems" concept of add-on metering options that presently include a fully coupled chest-level, match-diode meter finder the CdS MF Finder S (quite a mouthful), a soon-to-be-available eye-level meter prism with similar capabilities, and a promised AE (auto-exposure) finder, presumably also an eye-level prism type. The beauty of these meter finders is that they can be relatively light (since most of the electronics are in the camera), and can couple to and even override the camera's controls without a single dangling connector wire in sight. The clever but simple design that permits these things can be found on other Japanese cameras besides the SQ (notably the Mamiya M645 1000S and the Bronica ETR-S), but not on any European entries—a set of electric contacts atop the camera, in front of the focusing screen. Let's see how they work with the Bronica's CdS MF Finder S.

Six spring-loaded contacts within top section of SQ's lensmount mate with those on mounted lenses to transfer shutter-timing and exposure information to and from the camera circuitry.

Studlike contacts on the back of SQ's lenses mate with those near top of body mount to transfer shutter timing and exposure info.

To remove the collapsible finder, press downwards on the small finder lock tab at the upper, front corner of the right-hand side of the body as you slide the finder back and off. This reveals the interchangeable screen and adjacent components. At the front, in a little raised section about ¼ in. above the screen itself, are six, flat gold-plated contacts, three on either side of the battery check LED. Just in back of the front corners of the finder frame are too small, spring-loaded orientation studs. In the middle of the front and rear finder-frame edges are, respectively, a slot that accepts an orientation pin on the front edge of the finder, and a pin that slides into an orientation slot on the rear edge of the finder. This system allows the finders to mount securely and

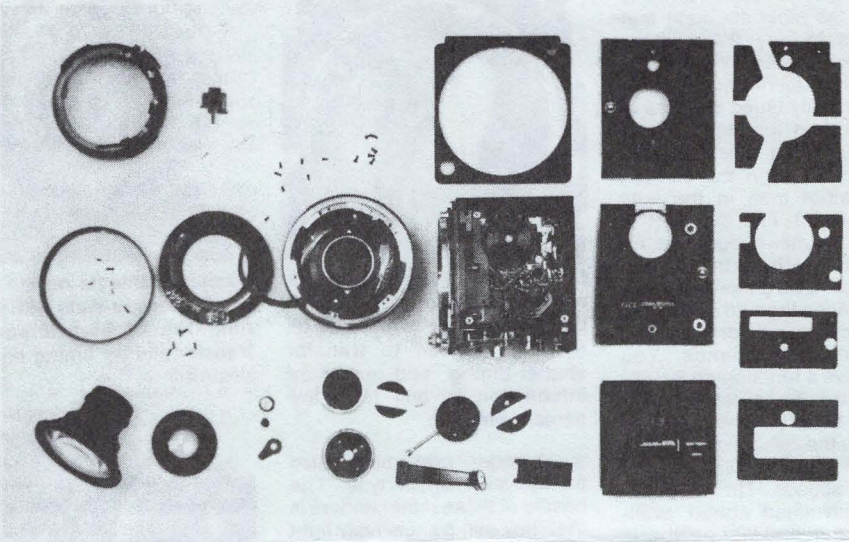


To remove lens you must first wind crank to cock shutter, then press lens lock tab as shown and turn barrel clockwise before lifting lens off.

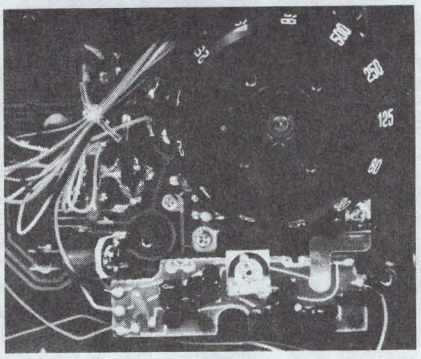
swiftly as well as precisely. As long as we've got the finder removed we may as well tell you how to remove and replace finder screens. Push back on a pair of upward-pointing tabs (they're on the sides of the screen) and the bars that retain the two tabs on either side of the screen unit itself move out of the way allowing you to remove the screen (the easiest way is to partially invert the camera until the screen falls into your hand). Obviously, replacing the screen is the reverse of this procedure—there's a fifth tab on the rear edge of the screen so it can't fit in the wrong way.

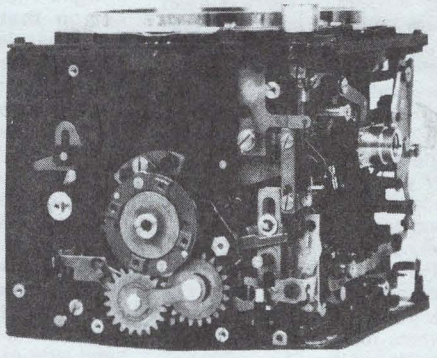
Now that the screen is locked in place, let's install the meter finder. Before sliding it on, notice that its bottom frame has

Inside The Bronica SQ

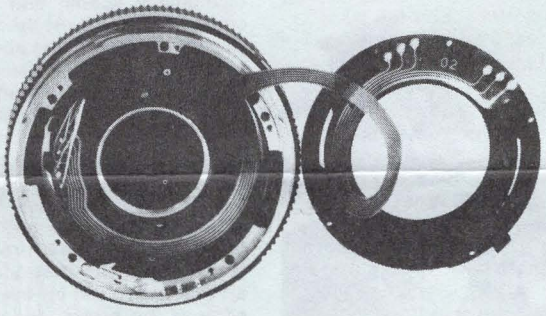


Basic stripdown of Bronica SQ shows amazingly simple construction for a 2¼ SLR, with a minimum of mechanical assemblies. This is made possible by an electronically controlled shutter and exposure info relay systems.





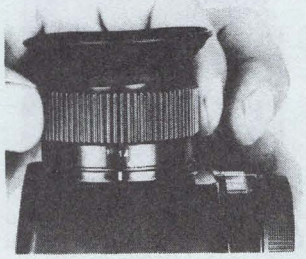
Shutter-speed dial, above left, shown with related electronics reveals that SQ, unlike most electronic 35s relies on fixed resistor circuitry, not IC chips. Mirror box assembly, above right, shows spur gear train used for shutter and film wind, mirror cocking. Mechanical construction and parts are based on Bronica's proven 4.5x6 cm SLR, the ETR-S.



Disassembled shutter unit, left, an electronically controlled version of the Seiko #O, is timed by electromagnet (black box at bottom of left-hand section) but powered by conventional spring (not shown) under shutter-cocking gear train (left). Rear lens barrel disassembly, above, shows electronic contacts (left), and flexible circuit which relays exposure and timing info to camera body and/or meter finder circuits.

six spring-loaded, gold-plated on its front edge that mate with those atop the camera, and a pair of additional similar contacts on the back edge which contact the flat pair of contacts atop each film magazine. These last contacts key in the set ASA automatically. The beauty of this system is that it lets you switch back and forth among magazines having different speed films inside without having to remember to change film speeds manually. The SQ is the only 2¼ SLR having this automatic film-speed keying feature, and it's certainly a worthwhile one for the working pro who's usually busy concentrating on picture taking, not film-speed setting.

Before we begin match-diode metering, let's take a quick glance at the CdS Meter Finder itself. On its bottom surface is a clear glass flat to pro-



Focusing eyepiece atop CdS Meter Finder is adjustable for a broad range of eyesight, surmounted by rubber cup that won't scratch eyeglasses.

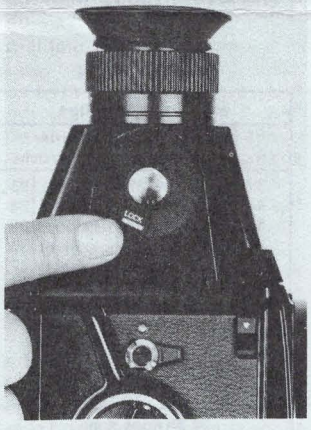
tect its innards. Peer up through this glass and you'll see two angled, downward pointing CdS cells nestled in little recesses on the angled sides of the finder body. Atop the finder is a focusing eyepiece (adjustable from −3 to +2 dipters but unmarked), and on the side is a large (1¼ in diameter) auxiliary knurled shutter-speed dial. On the side of the meter's shutter dial is a silver "meter on" button, and there's a locking tab marked "lock" which lets you lock the meter in the off position for storage. Here's how it all works.

Slide the Meter Finder onto the camera body and focus the eyepiece (on a detailed distant subject with the lens set at infinity), select a shooting aperture, and set it on the lens and you're ready to go. Press in the silver button on the side of the meter's shutter dial (on the right side of the meter housing) and glance at a narrow, vertical black strip on the left-hand side of the viewing image and one or more LEDs will light up. If the shutter speed set on the meter's shutter dial will give you an underexposure at the selected aperture (and the ASA set on the film magazine) you'll see a

modern tests

Press "meter on" button on side of CdS Meter Finder and LED display stays lit for 30 sec. Well placed auxiliary shutter dial on side of meter has "half-step" intermediate settings (see text).

a red minus sign toward the bottom of the black strip. If the settings will give you an over-exposure, you'll see a red plus near the top. And if your settings are in the correct-exposure range you'll see a bright green circle in the center of the metering area. The LED display remains on for a bit over 30 sec., giving you ample time to turn the meter's shutter-speed dial forward (to slower shutter speeds) or backward (to faster shutter speeds) until the green "proper exposure" signal lights up. As mentioned, once you mount the meter finder the actual shutter-speed control function is transferred from the shutter dial on the body to the one on the meter. Furthermore, while the body shutter dial can only be set to "whole" shutter speeds such as 1/60 1/125 and 1/250, the shutter dial on the meter has intermediate shutter-speed settings, de-



Pull out lock tab (at finger) on meter finder's shutter dial and "meter on" button above it can't be pressed in. It's a good safety feature, but we wish you could also lock meter on for extended shooting.

noted by white dots in between all speeds from 8-1/500 sec. This allows "aperture preferred" match-diode metering to within half a stop, eliminating a lot of extraneous fiddling with the aperture ring while metering. As you can see from the accompanying charts, the CdS MF Meter Finder S offers commendable accuracy throughout its extensive metering range and will provide accurate readings with ASA 400 film down to f/2.8 at 1/8 sec.

Obviously, a timed, pushbutton metering system which turns itself off in about 30 sec. has the advantage of conserving battery power—which is particularly important when it's the shutter-timing battery that's also providing the power to read the light level and light the LEDs. However, there are times when you'd rather have the meter on continuously. Unfortunately there's no way to do this. Bronica's engineers have thoughtfully provided a lock on the meter's shutter dial to pre-

It sure doesn't feel like a 35, but SQ has one basic similarity—focusing is most conveniently done with left hand under lens while you wind film and meter with your right.

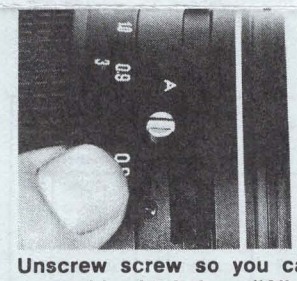
vent you from inadvertently pushing the "meter on" button in (as might accidentally happen when the camera's in a case or in storage), but there's no way to lock it on. This is a pity because it's a pain in the finger to have to keep pressing the button every half minute during an extended shooting session, and it breaks the photographer's concentration. It would be a simple matter to incorporate a "meter on" lock without an extensive redesign of the present meter finder and we suggest that Bronica does so.

Aside from this minor foible, the Meter Finder works splendidly and even the most hardened advocate of separate hand-held meters will be won over by its convenience, controllability and accuracy. Once in a while, the readouts will flicker between plus or minus and the correct-exposure signal, necessitating a slight alter-

Bronica SQ plus CdS Meter Finder, 80mm lens is a well balanced, conveniently arrayed package. Film-wind crank winds up in position shown after advancing each frame, permitting handy, quite rapid shooting sequences.

ation in viewing angle or choosing another aperture/shutter speed combination, and occasionally we found it impossible to get a green "go" signal at f/2.8 at 1/500 sec. though we could at the equivalent setting of 1/250 sec. at f/4. According to the meter-range chart below, the latter shouldn't have happened, but it is a minor discrepancy that cannot spoil what we regard as an excellent metering system. As you can see by studying the accompanying meter sensitivity chart the SQ's Meter Finder provides a symmetrical pattern, but with maximum sensitivity concentrated in two points near the ends of a horizontal central band—kind of a "dumbell-shaped" pattern. A classical center-weighted pattern it is not, but well over 95% of our field test slides shot under a wide variety of lighting conditions were nevertheless correctly exposed.

In addition to its technically astute and well executed design, we're pleased to report



Unscrew screw so you can move ridged tab from "A" to "T," then press shutter button and lens will stop down to set aperture, shutter will stay open for time exposures until you move tab back to "A." T setting works without batteries.

that the Bronica SQ is a camera that handles exceptionally well in the field. It is fairly light (about 8½ oz. less than a Hasselblad 500 C/M), very well balanced, and has a convenient rubberized, textured gripping surface around the bottom and bottom sides of the main body (though some nitpickers claimed this detracted from the camera's otherwise "classy" appearance). All controls operate smoothly but precisely and are well positioned, especially the removable film-wind crank (which portends a possible future motor and/or an ETR-style vertical right-hand grip surmounted by a 35mm-style wind lever). And the SQ is also very well finished, reasonably quiet and quite refined. Gadgeteers and high-tech fanciers will doubtless bemoan the SQ's lack of an instant return mirror and quick-return diaphragm as well as such niceties as high shutter speeds, built-in (rather than add-on) metering, and even automatic electric film wind (like the Rollei SLX). But those seeking a well engineered, fine performing 2¼ SLR system with its accent on the needs of the working pro will not be disappointed. After years of extending the boundaries of high tech, Bronica has finally produced a 2¼ SLR system that's mechanically rather conservative, electronically rather advanced, and strategically aimed at the heart of the pro-and-advanced amateur market. For just these reasons we predict that this superbly integrated camera will be more successful than any of its predecessors.

We've already detailed the very good handling characteristics and general control layout of the 80mm f/2.8 Zenzanon-S lens, but to round out our remarks, we found that the 80 balances very nicely on camera, all its engraved scales are highly legible and well placed for easy viewing, and the controls are conveniently arrayed and can be operated quickly. The only minor inconvenience to be found is the "T" setting (see photo and caption left) which is a bit tedious and time-consuming to operate, particularly when switching back and forth between timed and instantaneous exposures.

Optical bench analysis: At maximum aperture in the center of the image field we observed slight spherical flare of the overcorrected type, but a well centered, compact image core indicative of high quality. No color defects were observed—a commendable performance—and the lens exhibited a nearly perfect (diffraction limited) image pattern at f/5.6 and smaller apertures.

Off axis, toward the edges and corners of the field, we observed slight flare and slight coma at f/2.8, but no coma or astigmatism. We judge image quality to be good at the widest apertures, improving to very

good from about f/6.3 on down—a better than average performance.

Field test slides: Central on-film images shot at maximum aperture with the 80mm lens were sharp and contrasty with no observable color defects. Crispness improves very slightly at f/5.6 and is retained at smaller apertures.

Toward the corners of the frame, images shot at f/2.8 are very detailed and sharply recorded, but moderate in contrast. Contrast improves noticeably at f/5.6 and smaller apertures.

Flare is very well controlled throughout with little loss of contrast in slides shot against the sun. Weak ghost images are observable only in slides shot at the most adverse shooting angles.

RESOLUTION

at 1:23 magnification				
f/no.	Center Lines/mm		Corner Lines/mm	
2.8	Excellent	52	V. Good	29
4	Excellent	52	V. Good	32
5.6	Excellent	58	V. Good	32
8	Excellent	65	Excellent	37
11	Excellent	65	Excellent	41
16	Excellent	58	Excellent	46
22	Excellent	52	Excellent	41

CONTRAST

at 30 lines/mm				
f/no.	Center %		Corner %	
3.5	Medium	38	Medium	26
4	High	54	Medium	34
5.6	High	72	High	65
8	High	76	High	65
11	High	74	High	62
16	High	60	High	58
22	High	50	High	48

ZENZANON-S TR10 FOR BRONICA SQ

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1776 New Highway
Farmingdale, New York 11735

Lens: 50mm f/3.5 Zenzanon-S
Mount: Bayonet for Bronica SQ
Filter Size: 67mm screw-in
Apertures: f/3.5 to f/22; click-stops at full stop intervals
Min foc. dist: 0.5m (20 in.)
Features: Built-in depth-of-field preview control, multi-coating
Serial No.: 5301089
Size: 3¼ in. diam., 3½ in. long (82x83mm)
Weight: 1 lb., 3.3 oz. (548g)
Price: $875.00

The 50mm f/3.5 Zenzanon-S has its controls arrayed quite similarly to the 80mm normal lens, and it is likewise very smooth focusing, going from infinity to minimum distance in a just-under-180° turn of its ⅞ in. wide rubberized textured focusing collar. Measuring just ⅜ in. longer than the 80, the 50 balances very well on camera and its relatively fast f/3.5 aperture yields a bright, easy-to-focus viewing image. Other operational comments on the 80mm lens apply equally to the 50mm.

Optical bench analysis: At maximum aperture in the center of the field we observed slight red flare and slight zonal spherical aberration, but virtually no other image defects. Stopping the lens down to f/6.3 or smaller yielded a nearly perfect (diffraction limited) bench image pattern.

Off axis, toward the edges and corners of the field, we noted slight flare and very slight lateral color but no astigmatism whatsoever—a much better than average performance for a wide-angle lens of this type. Edge image quality was good at the widest apertures and improved to very good at f/6.3 and smaller

Field test slides: In the center of the picture with the lens wide open, the 50 produced good, sharp images with fine image details well resolved. However, on stopping the lens down to f/5.6 contrast and crispness of the central image improves noticeably, and the lens yields superb image quality.

At the edges and corners of the slides, sharpness is good wide open, but improves slightly at f/5.6 and smaller apertures. No color aberrations were observable in the on-film image.

Shooting into the sun or at adverse angles may produce some weak pinkish ghosts in the shape of the lens diaphragm, but overall contrast holds well, and we judge flare correction to be better than average for a wide-angle covering this format.

PERFORMANCE

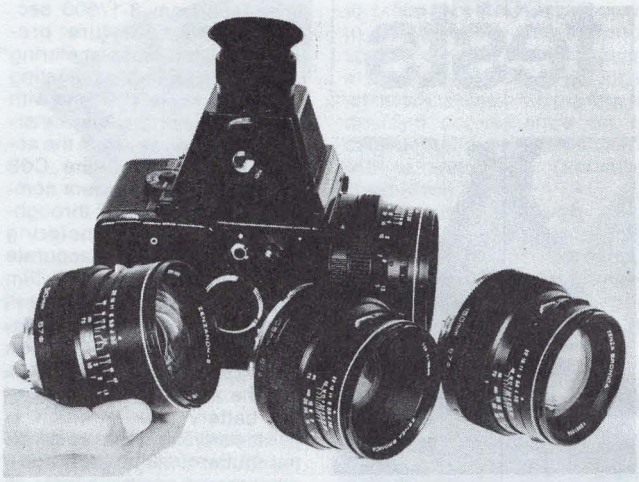
Our Standard	Tested
Focal Length: ±5% (47.50 to 52.50mm)	51.87mm
Max aperture: ±5% (f/3.33 to f/3.68)	f/3.68
Distortion: ±1.5% (less than 1%)	
Light falloff: at f/5.6 +1 stop from theoretical limit (0-2.45 stops)	1.50 stops

RESOLUTION

50 at 1: magnification				
f/no.	Center Lines/mm		Corner Lines/mm	
3.5	V. Good	37	V. Good	26
4	Excellent	42	V. Good	26
5.6	Excellent	53	V. Good	29
8	Excellent	53	Excellent	33
11	Excellent	47	Excellent	33
16	Excellent	47	Excellent	37
22	V. Good	42	Excellent	33

CONTRAST

50 at 30 lines/mm				
f/no.	Center %		Corner %	
3.5	High	57	Medium	26
4	High	58	Medium	26
5.6	High	62	Low	30
8	High	64	High	48
11	High	64	High	45
16	High	64	High	46
22	High	56	High	45



Here's the present system: Bronica SQ with 80mm f/2.8 Zenzanon lens, film magazine and CdS MF Finder S mounted. In front of camera from left to right are 50mm f/3.5, 105mm f/3.5 and 150mm f/3.5 Zenzanons. All are roughly similar in size and identical in control layout enabling fast familiarization and swift operation.

Lens: 105mm f/3.5 Zenzanon-S
Mount: Bayonet for Bronica SQ
Filter Size: 67mm screw-in
Apertures: f/3.5 to f/22; click-stops at full-stop intervals
Min. foc. dist.: 0.85m (2 ft., 9 in.)
Features: Built-in depth-of-field preview control, multi-coating
Serial No.: 10600124
Size: 3¼ in. diam., 2⅜ in. long (82x60mm)
Weight: 1 lb. 2.6 oz. (528.5g)
Price: $875.00

Although it might seem unnecessary to have a 105mm alternative to the Bronica SQ's normal 80mm lens, the 105mm f/3.5 Zenzanon-S is a very useful portrait lens, roughly equivalent to an 85mm on the 35mm format. While it's a bit heavier than the 80, the 105 is only about 5/16 longer and its controls and scales are arrayed almost indentically to the normal lens. The 105 focuses to its minimum distance in an almost exactly 180° turn of its ⅝ in. wide textured rubber focusing collar and, like the other Zenzanons for the SQ, all its controls operate with commendable smoothness and precision. All other operational comments on the 80, including its excellent on-camera balance, and its bright, easy-to-focus viewing image apply equally to the 105.

Optical bench analysis: On axis, in the center of the field at maximum aperture, the 105 exhibited moderate flare attributable to zonal spherical aberration. However color defects were completely absent, and the very good image pattern observable at the widest apertures improved to excellent at f/5.6 and smaller apertures.

Off axis, toward the corners of the image field, we detected slight coma and very slight as-

PERFORMANCE

Our Standard	Tested
Focal Length: ±5% (99.75 to 110.25mm)	105.3mm
Max aperture: ±5% (f/3.33 to f/3.68)	f/3.52
Distortion: ±2.5% (less than (1%)	
Light falloff: at f/5.6 +1 stop from theoretical limit (1.40 stops)	1.00 stops

RESOLUTION

at 1:21 magnification				
f/no.	Center Lines/mm		Corner Lines/mm	
3.5	Excellent	37	Good	23
4	V. Good	37	Good	23
5.6	V. Good	37	Good	26
8	Excellent	42	Excellent	33
11	V. Good	42	Excellent	37
16	V. Good	42	Excellent	37
22	V. Good	42	V. Good	33

CONTRAST

at 30 lines/mm				
f/no.	Center %		Corner %	
3.5	Low	35	High	34
4	Low	43	High	36
5.6	High	57	High	44
8	Medium	54	High	62
11	High	52	High	58
16	High	52	High	50
22	High	46	High	44

tigmatism at f/3.5, but no color aberrations whatsoever This very fine performance improved slightly on stopping down past f/6.3

Field test slides: On-film images in the center of the frame, shot at f/3.5, exhibited good sharpness with satisfactory contrast. Contrast improves somewhat at f/5.6, yielding sharper looking results but with equivalent detail rendition.

At the edges and corners of slides shot at maximum aperture we noted good detail and moderately high contrast. Contrast improves at f/5.6 and holds at smaller apertures.

No color defects were observable in pictures shot with the 105, and overall flare control was good, with some small, weak ghosts observable in slides shot against the sun. However contrast decreases visibly in images shot at such adverse angles.

Lens: 150mm f/3.5 Zenzanon-S
Mount: Bayonet for Bronica SQ
Filter Size: 67mm screw-in
Apertures: f/3.5 to f/22; click-stops at full-stop intervals
Min. foc. dist.: 1.5m (5 ft.)
Features: Built-in depth-of-field preview control, multi-coating
Serial No.: 15501234
Size: 3¼ in. diam., 2 7/16 in. long (82x61.5mm)
Weight: 1 lb. 4 oz. (572g)
Price: $895.00

Turning to the 150mm Zenzanon-S (equivalent to a moderate tele on the 35mm format) we have a lens that is virtually identical in size to the 105 (it's 5/16 in. longer than the 80, nearly identical in diameter and only 4 oz. heavier). The 150 focuses to its mimimum distance in a very smooth just-over-180° turn of its ⅝ in. wide rubberized focusing collar and as you'd expect it balances very nicely on the SQ and yields a bright, contrasty focusing image. All controls and scales are arrayed as on the other SQ lenses and our general operational comments on these optics apply equally to the 150.

Optical bench analysis: In the center of the image field at maximum aperture, we observed slight red flare, slight zonal spherical aberration, but no axial color whatsoever—a very good performance at 3.5 and improving to excellent at about f/6.3.

Toward the corners of the field at maximum aperture we noted slight coma, very slight astigmatism, and slight lateral color Image quality improved at f/8 and smaller apertures.

Field test slides: In the center at f/3.5, on-film image quality was good, with good sharpness and contrast and a very slight reddish fringe visible at bright edges of some subjects. Stopping down to f/5.6 and smaller apertures, contrast improves only slightly.

Edge and corner images shot with the 150 at maximum aperture exhibited good detail but noticeable flare in pictures shot against the sun or other bright light source. Contrast levels toward the edges at f/3.5 and f/4 were moderately low. At f/5.6 on down edge flare lessens markedly and contrast improves to fairly good, holding at smaller apertures. We judge the overall field performance of this lens to be above average.

PERFORMANCE

Our Standard	Tested
Focal Length: ±5% (142.50 to 157.50mm)	148.0mm
Max aperture: ±5% (f/3.33 to f/3.68)	f/3.55
Distortion: ±2.5%	less than 1% (barrel)
Light falloff: at f/5.6 +1 stop from theoretical limit (0-1.20 stops)	1 125 stops

RESOLUTION

at 1:21 magnification				
f/no.	Center Lines/mm		Corner Lines/mm	
3.5	V. Good	33	V. Good	26
4	V. Good	33	V. Good	26
5.6	Excellent	42	V. Good	30
8	Excellent	42	Excellent	33
11	V. Good	42	V. Good	30
16	V. Good	37	V. Good	30
22	Good	33	Good	26

CONTRAST

150 at 30 lines/mm				
f/no.	Center %		Corner %	
3.5	High	50	Medium	32
4	High	60	Medium	34
5.6	High	65	V. Low	26
8	High	64	V. Low	20
11	High	60	V. Low	20
16	High	56	V. Low	20
22	High	50	Low	28

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