Optomechanix

Camera Design Case Study for Optomechanics

Camera manufacturers: How they were made

Instrument Design with new Optoform II

Psychology of achievement: Why concur the peak?

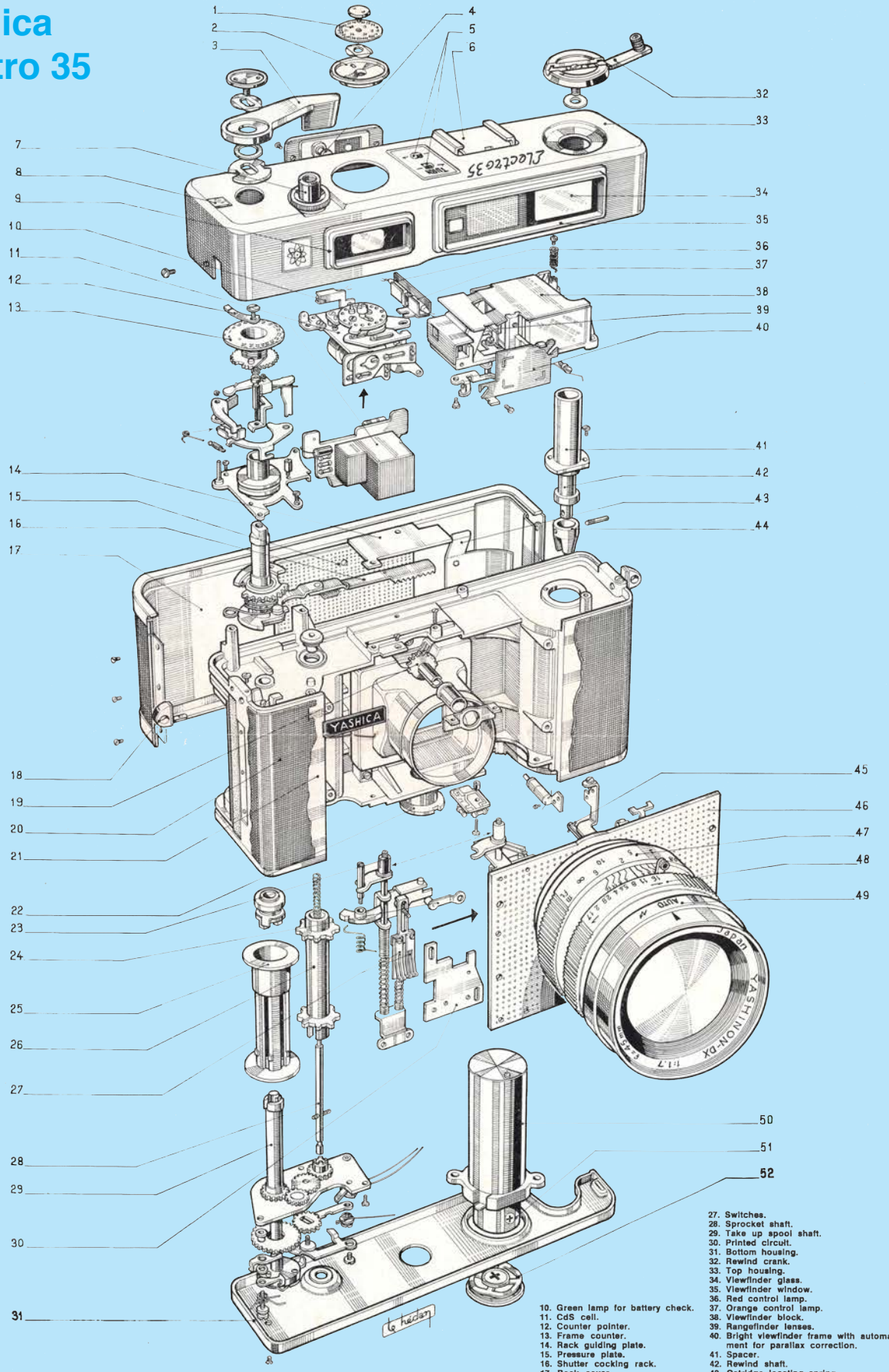
Camera desgin case study for Optomechanics

Apr-June 2022

Photo Courtesy, Digital Photography Review, www.dpreview.com

Technical journal of OMiD, Opto-Mechanical Institute of Design

Yashica Electro 35



1. Film sensitivity dial.
2. Knob for cell setting (ASA-DIN).
3. Film advance lever.
4. Battery check button.
5. Windows (red and orange).
6. Accessory shoe.
7. Release button.
8. Counter window.
9. Cell window.
10. Green lamp for battery check.
11. CdS cell.
12. Counter pointer.
13. Frame counter.
14. Rack guiding plate.
15. Pressure plate.
16. Shutter cocking rack.
17. Back cover.
18. Strap eyelet.
19. Rack pinion for cocking.
20. Leather casing.
21. Case.
22. Tripod socked.
23. Release.
24. Shutter release lever.
25. Take up spool.
26. Sprocket.
27. Switches.
28. Sprocket shaft.
29. Take up spool shaft.
30. Printed circuit.
31. Bottom housing.
32. Rewind crank.
33. Top housing.
34. Viewfinder glass.
35. Viewfinder window.
36. Red control lamp.
37. Orange control lamp.
38. Viewfinder block.
39. Rangefinder lenses.
40. Bright viewfinder frame with automatic movement for parallax correction.
41. Spacer.
42. Rewind shaft.
43. Catridge locating spring.
44. Cartridge rewing drive finger.
45. Shutter cocking control shaft.
46. Front plate.
47. Distance ring.
48. Aperture ring.
49. Mode of action preselection ring.
50. Battery compartment.
51. Mercury battery.
52. Battery compartment lid.

Drawing Courtesy, Le Hedan

Yashica Electro 35 was an affordable rangefinder camera with automatic electronically controlled leaf shutter. Yashica was very good at routing complex wiring inside their cameras. The Electro 35 was packed with a 50-wire spaghetti of colorful wires, like most cameras of that era. It paved the way to the next generation of cameras utilizing flexboards.

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Henry Phillips

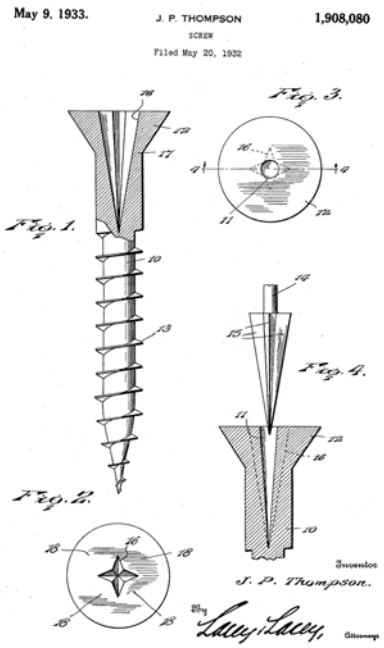
This issue Dedicated to:

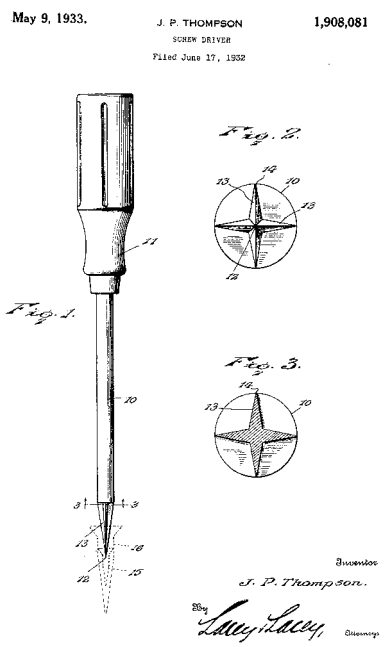
Henry Phillips (1889-1958), was an American businessman from Portland, Oregon. The Phillips-head ("crosshead") screw and screwdriver are named after him. The importance of the crosshead screw design lies in its self-centering property, useful on automated production lines that use powered screwdrivers.

Phillips' major contribution was in driving the crosshead concept forward to the point where it was adopted by screwmakers and automobile companies. The credited inventor of the Phillips screw was John P. Thompson who, in 1932, patented (#1,908,080) a recessed cruciform screw and in 1933, a screwdriver for it.

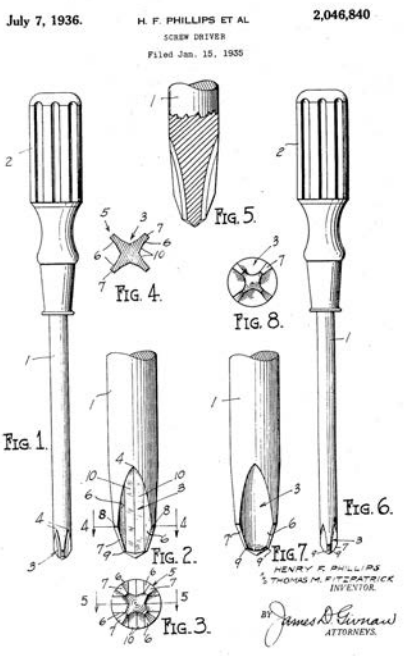
Henry Phillips filed a patent along with Thomas Fitzpatrick in 1936 for the improved version of the screw, and its screwdriver (below, right).

A square screw or Robertson screw also very popular for woodworking, and sheet metal working, is a type of screw with a square-shaped socket in the screw head and a corresponding square protrusion on the tool.





Original 1933 patent by Thompson for the screw, and its screwdriver



Henry Phillips patent in 1936

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Optomechanix is a quarterly journal of Opto-Mechanical Institute of Design (OMiD), with technical articles for practical, hands-on opto-mechanical engineers. This magazine is privately founded.

Cover page photo: Canon consumer camera factory assembly line in Malaysia
Front back: Exploaded view of Yashica Electro 35, revealing its viewfinder optics, and CDS photo cell assembly

Camera Design Case Study for Optomechanics

There is not a soul on earth that hasn't grown up with cameras since childhood. Before the iPhone came along, we had a huge range of cameras being designed for consumers ranging from miniature to 35 mm cameras, 6x6 cm medium format, and from 4x5" to much larger format reconnaissance cameras. With presence of the flip-up mirror for reflex viewing, and having to stop down lenses inside interchangeable lenses, the photographic camera had a sequential design. It means a spring was charged during film advance operation, and during picture taking, the spring was released to sequentially move the mirror up, close down the aperture, release first, and 2nd shutter curtains, flip the mirror down, and re-open the aperture for viewing.

The consumer camera design which we'll be looking at in this issue is a great learning example for optomechanical designer. The optomechanics in a camera is overwhelming: The manufacturing cost was a big concern in cameras due to a huge competition between the European, and Japanese in the world market. The pentaprism optics was developed specifically for the 35 mm format, and it has remained the most widely used design to this day. Cost wise, I'll run by you some numbers to show how much it would cost to produce a camera.

Homepage of www.omidmuseum.com

Every component that occupied the inner space of a camera was designed to withstand shock, moisture, to maintain its optical alignment as a whole, and to prevent light leak to the film. The lens mount had to allow easy interchange of lenses in SLRs, while maintaining a tight tolerance in its optical alignment with the film plane. The way the bayonet mount has been developed for cameras is still far superior to how the observation head, or the imaging camera are mounted on top of today's microscopes. Cameras are far superior in design in their versatility, and adaptability to a wide range of external accessories. The motor drive interface to the camera, or the hot shoe to mount the electronic flash on top of cameras are far superior to how any other optomechanical instrument are designed to this date to accept external attachments.

As you go through the parts lists on pages 6~30, remember they were built around 50-60 years ago, and every part, needed a separate punching fixture to produce them. My friend Bob Shell, ex chief editor of Shutterbug magazine recollects how it was in those days:

"In the '90s I visited a Canon camera factory in Japan. It was the size of a football field, with only three humans in the whole place! All they did was monitor the machines. All of the 'consumer' cameras were made that way. Only the high-priced professional cameras are built by humans. Same for lenses.

The parts must be stamped from sheet metal, then deburred by tumbling in a barrel with abrasives, then washed and dried before assembly. I also visited a Canon factory in Shah Alam, Malaysia, where women built mid-range cameras. The dealer markup on cameras when I had my shops was very low. Maybe 5 - 10% at most. Dealers made their money on filters and other accessories. Filters cost me around $ 3 each in the '70s. I sold the filters for $15 or more each.

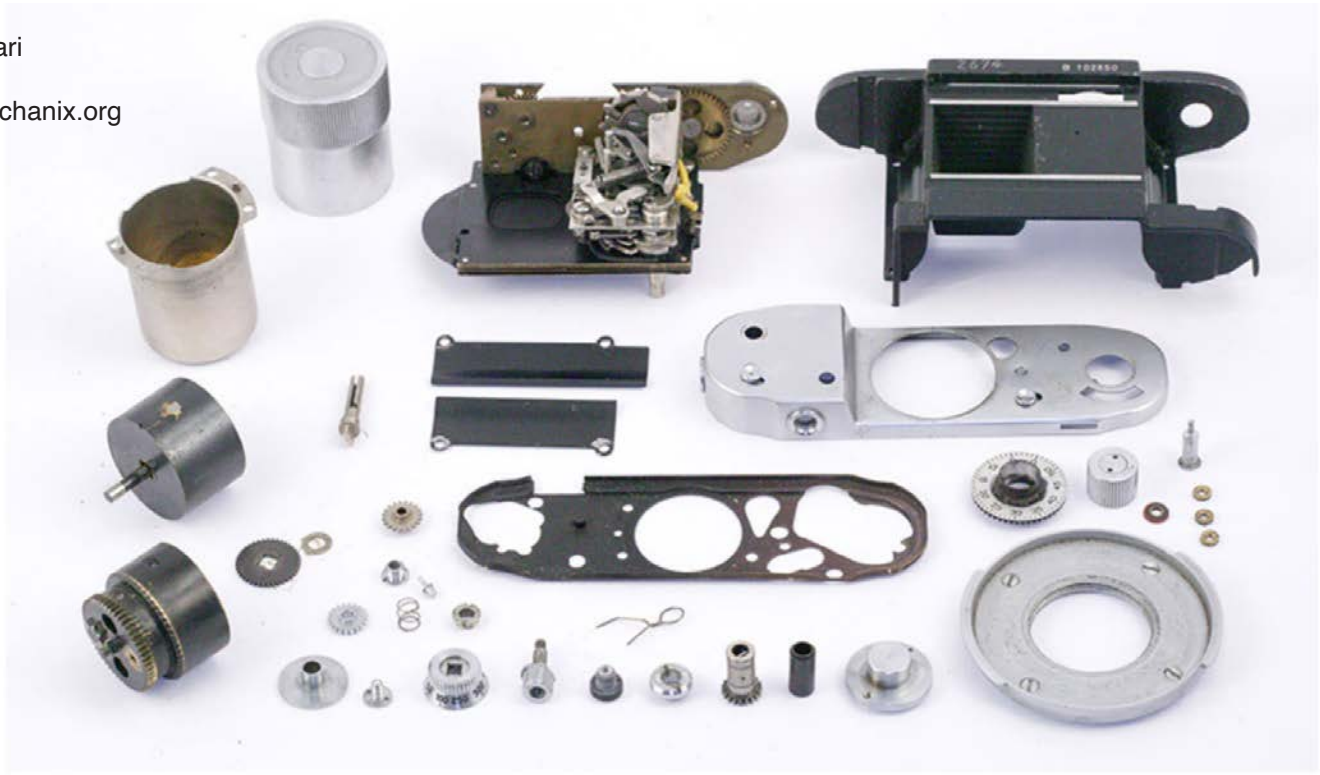
Back in the early '80s I was the US importer/distributor for an old German optical company, Enna Werk, in Munich. You didn't see the Enna name on many products, but they were making parts for Leica, Gossen, Balda, etc. They were also making contact lenses and other precision optical goods. When Gossen, for example, decided to make a spotmeter, it made no sense for them to design and manufacture the lens and prism, so Enna made them. Siegfried Schaffer, their optical designer, designed the first production zoom lens, made for Voigtlander. (Frank Back of Zoomar claimed his was first, built by Heinz Kilfitt, but I believe Dr. Schaffer.) I have a book on the history of Enna. Very interesting. The company name is the founder, Dr. Appelt's, daughter's name spelled backwards! Just as Mercedes was Dr. Benz's daughter.

The German camera industry's problem was that they built their products to last, to very tight tolerances, and their R & D cycle took too long. Rollei showed me a beautiful little digital SLR years ago, but getting it to production just took too long, and the Japanese were well-entrenched in the digital camera market by the time they had preproduction prototypes ready. Due to German labor costs, it would have been far too expensive for most photographers if they'd produced it. Plus, it was only three megapixels when the Japanese were already building six and higher. Steve Manios of Century Precision Optics in Hollywood asked me to get a price estimate for Enna to make an optical relay device for him. Enna worked up a price and I submitted it. He went to a Japanese company, instead because he said the Enna quote was 'too precise,' their tolerances too tight. Enna would not lower their standards and use sloppier tolerances, even when it meant losing the job! Schaffer had his standards and would not lower them for anyone!"

Referring to page 22 with an exploded view of Minolta SRT 101, let's see if we could calculate how much it would cost to produce 80,000 cameras. Back then, products were built to last, so you would put aside 2,000 spare parts to send to factory authorized repair shops for parts replacement in repairs. Each metal punching machine would cost around $1,000 to make, or $150,000 just to produce the tooling for 150 individual parts. Your good vendors would agree to supply 80,000 galvos, pentaprisms, focusing screens, and other optical elements for the lens, and eyepiece, and 80,000 mirrors for reflex viewing plus some 10 million screws, and springs for 2 year's worth of manufacturing, at a capacity of 150 cameras per day.

With only 35 employees, the man hours to produce 80,000 cameras in 2 years would be something like 145,600h. If all those cameras were sold during 4 years (a decent number in the 60's), at $200 each, minus the cost of selling them through camera stores, you'd have a gross sales volume of $4M per year for 4 years. The overhead could range between $1~2M per year depending where you produced it. Cost of materials, and additional tooling could be close to 0.5M a year, resulting in a net annual profit of $1~2M for the first 2 years, and $2~3M for the next 2 years on a single model. This issue will cover the camera industry in the 70's to the 90's based on Bob Shell's experience as the chief editor of Shutterbug magazine.

Ali Afshari
Editor
Optomechanix.org



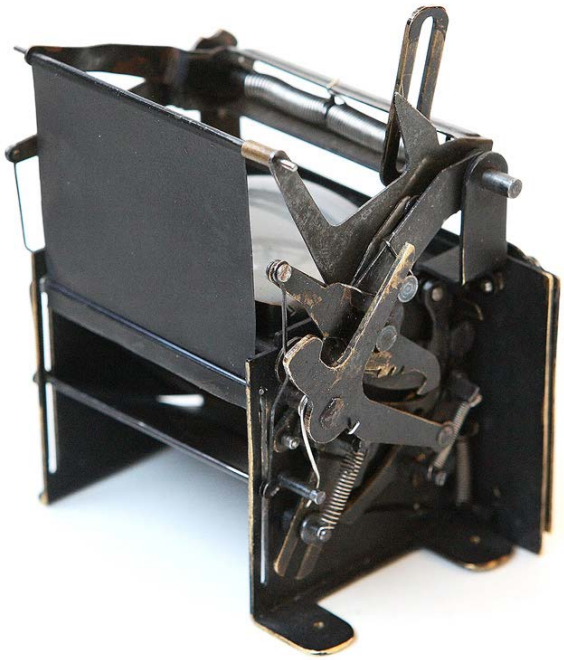
Robot camera parts, and its shutter assembly

The mechanical complexity of 35 mm cameras

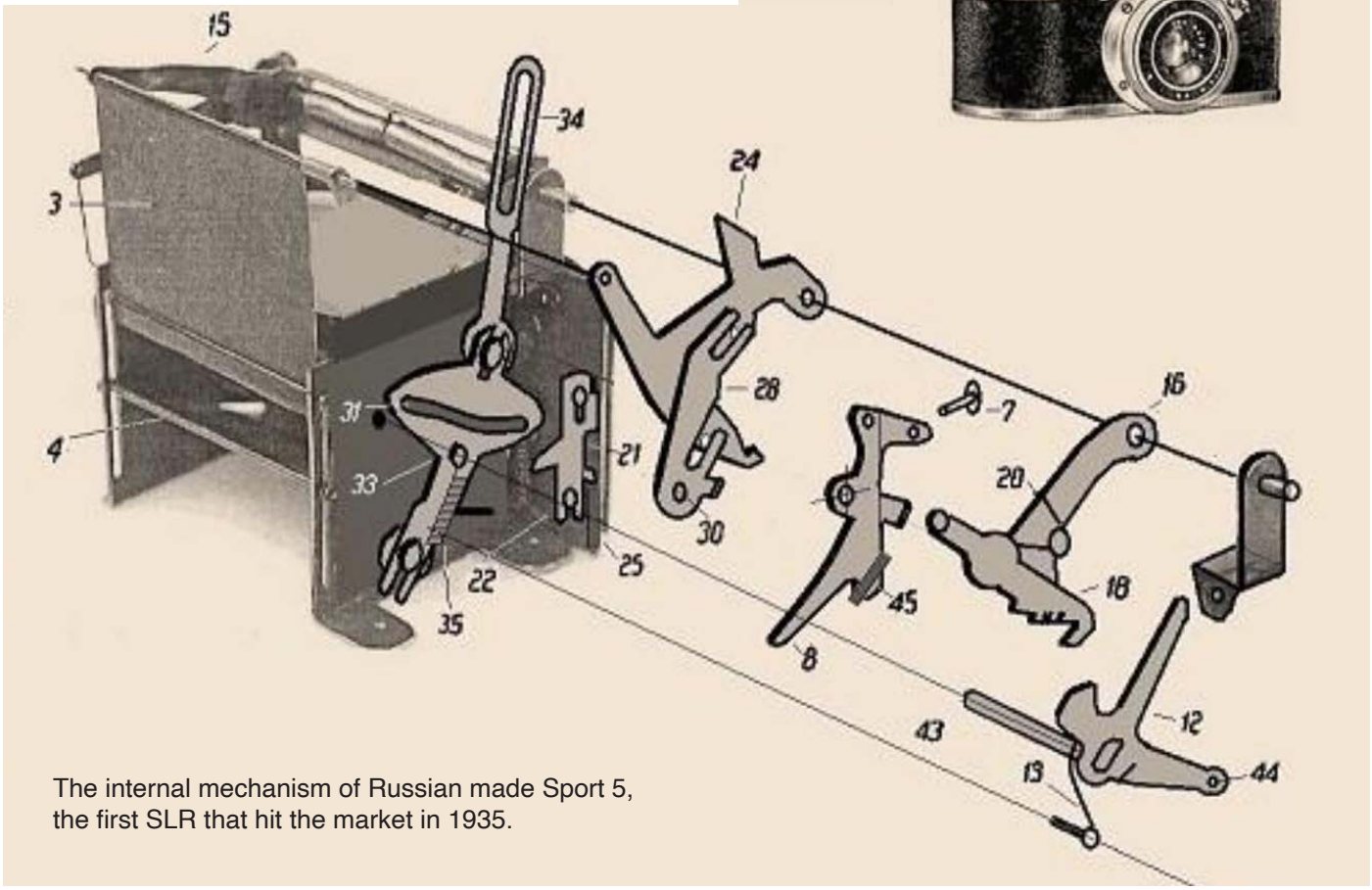
The mechanical camera had so many parts that took a team of precision opto-mechanical engineers, and technicians to implement them. I really don't have much to say about the degreed engineers today that sit behind a computer, calling themselves designers. There was a time when engineers thought through hundreds of parts to function together, and all they had to work with was what they drew on a piece of paper. It's really not conceivable until someone would try to make such a complex mechanism to function. Each lever needed their own fixture to be stamped out of sheet metal, bent to shape, and rivetted with machined pivots, and rods.

Every piece has to clear one another, and most of the time be entriely redesigned after its prototyping to function correctly. The choice of material also played an important role, specially on the high speed components utilized inside the shutter. Sport 5 design (right) is perhaps the simplest SLR ever built but it would still be a challenge for so many design engineers today who lack hands-on, practical experience.

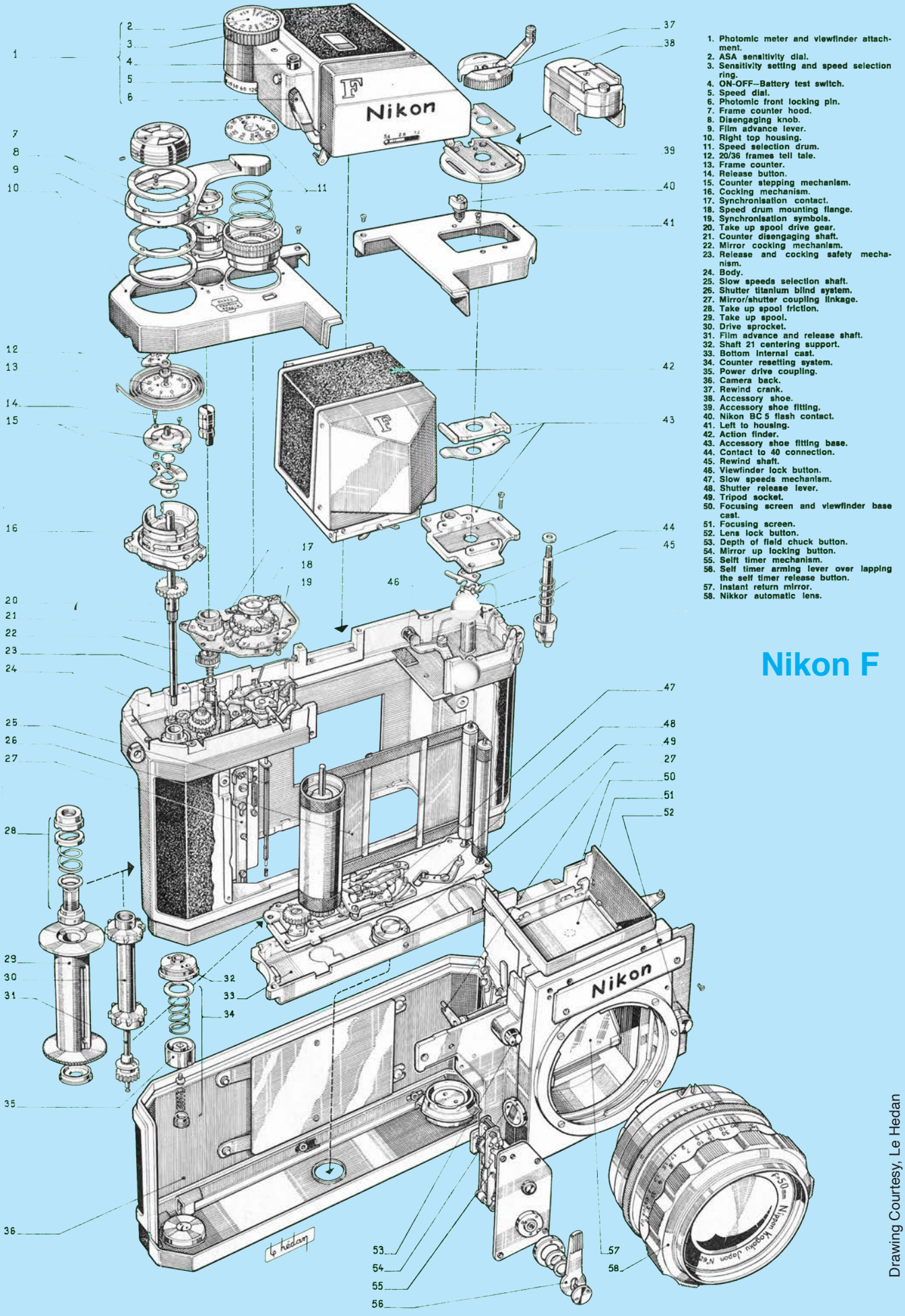
In the next few pages, you are going to read how they were made back then in the photo industry; Their product development, manufacturing logistics, and sales. The manufacturing cost of each camera had to be kept below $40 to make it profitable to produce, and you could now purchase a Minolta SRT-101 (P22) at a camera swapmeet for $15. How could they produce it at that cost? I will briefly explain each design at the bottom of each page while Bob Shell will recall his own memories about camera manufacturers, their technical issues, and how they solved them.



Sport 5 integrated shutter, and mirror mechanism



The internal mechanism of Russian made Sport 5, the first SLR that hit the market in 1935.



Nikon F introduced a radical design in professional photography by offering interchangeable viewfinders, and lenses.

Remembering the photo industry

By Bob Shell, Chief editor of Shutterbug in 80's, and 90's

The following are excerpts of Bob Shell's memories to complement my three volume book called: "Restoring the SLR'. Being the chief editor of Shutterbug for many years, bob was one of the most technical people I knew in photo industry. At Photokina show in Germany, he wrote a daily coverage, and product showcase for every year's latest products while in US, he ran a camera shop, and an authorized factory repair shop for Alpa, and Rollei. He is the author of many books in photographic industry such as the "Canon Compendium'. This is how he describes his life:

"I lived my life pretty much along the lines of Vargas Llosa's philosophy. I've never been rich. Shutterbug paid me far less than the editors of other photo magazines. But I loved the job, so I turned down other offers. Actually, most months I made more money from my job as Photo Guru for BestStuff.com and freelance work than I got from Shutterbug. Money, per se, was never of much interest to me. I was comfortable and could afford to do my photography, and that was really all I cared about. It was my wife who was always riding me to make more money. I could have been perfectly content otherwise."

HOW I BECAME ONE OF THE MOST INFLUENTIAL JEWS IN THE AMERICAN PHOTO INDUSTRY

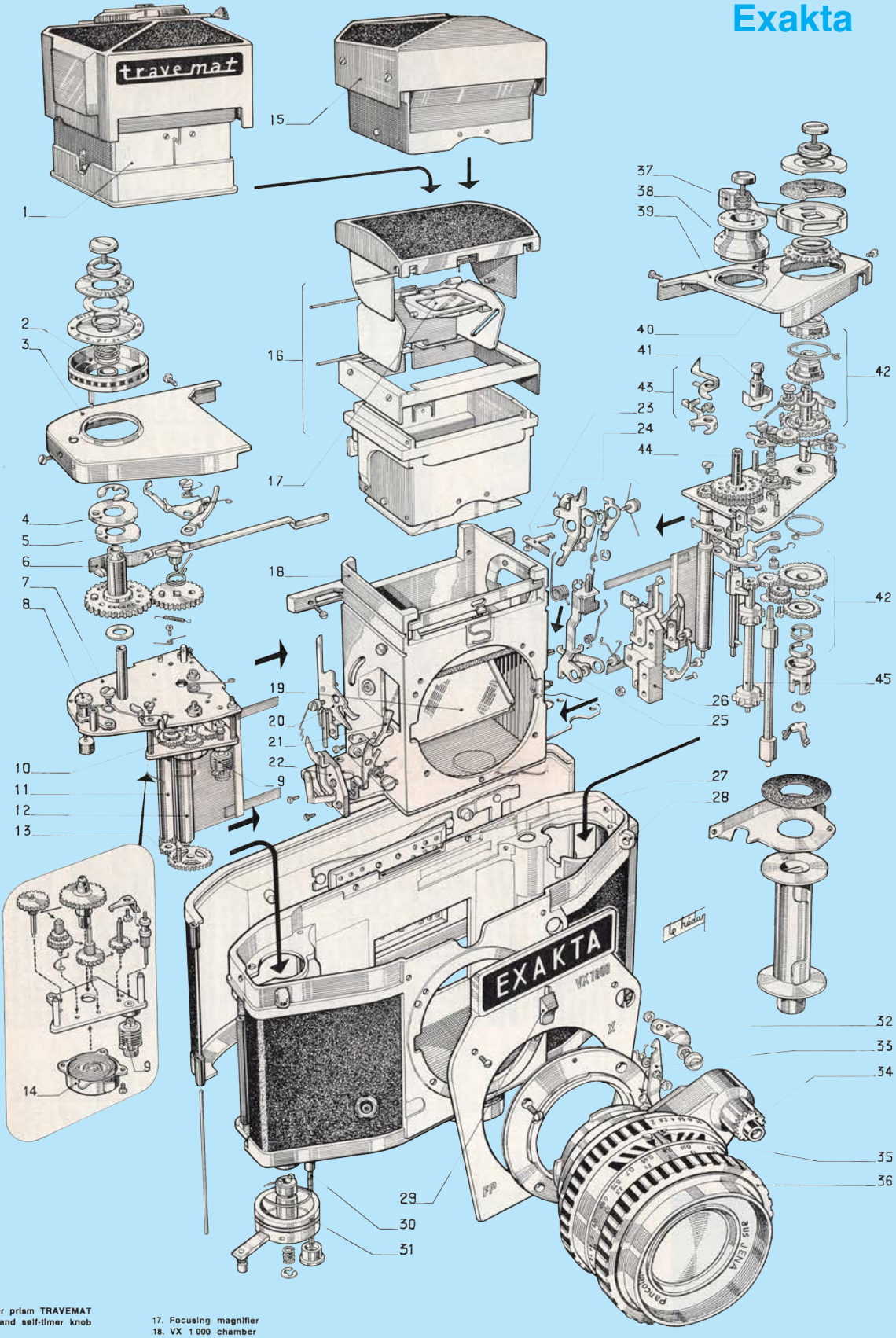
Back in the mid-1990s when I was Editor in Chief at SHUTTERBUG magazine, a little book arrived in the day's mail. The title was something like The Fifty Most Influential Jews in the American Photo Industry. I don't now recall the name of the author. I put the book aside to look at when I wasn't busy and thought no more of it. Days later, during a lull in my busy schedule, I picked it up and glanced through it. There were brief bios of the people included. There was Henry Froehlich, my old friend, and the first man after World War Two to import Japanese cameras into the U.S. (Konica). There was Paul Klingenstein, founder of Berkey Photo, one of the largest distributors of photography equipment in the U.S. for many years, and later founder of Mamiya America Corporation (Now The MAC Group), there was Joe Ehrenreich, first importer of Nikon cameras into the U.S., whose crafty distribution system secured Nikon's first place among professional photographers, there was Fred Spira, founder of Spiratone, major maker/distributor of photographic accessories, there was Burt Kepler, longtime Editor of MODERN PHOTOGRAPHY magazine, later Editorial Director at POPULAR PHOTOGRAPHY magazine, there was Norm Goldberg, camera repairman extraordinary and designer/manufacturer of the first Leica motor drive, and many, many others, but those are the ones that first come to mind.

I'm looking at all the names, most of them men I knew well, and then I see my name and capsule bio. I think I'm very proud to be included in such august company, but there's one little problem -- I'm not Jewish! So I contacted the author and explained that, while I was honored to be included in his fine book, I wasn't Jewish. He apologized for the mistake, I told him I wasn't angry and certainly wasn't offended, just wanted him to know. He said, "Well, consider yourself an 'honorary Jew,' from now on," which I was proud to be. Often after that at photographic conferences and events, people who'd seen the book would say, "Bob, I didn't know you were Jewish!" and I'd tell the story. Now, being misidentified as Jewish leads me to a less pleasant story. There was a man named Ed Romney... Ed Romney wrote books on camera repair, published repair manuals for many cameras, and sold camera repair tools.

One thing he sold was sets of small Phillips screwdrivers for working on cameras. There was only one problem with this; the screws used in Japanese cameras weren't Phillips, they were metric Crosspoint screws. I mentioned this in an article, and Romney declared war on me, saying I was wrong. I wasn't. While Phillips and Crosspoint screws look superficially alike, they are different in one important way. The difference is more easily seen in the screwdrivers. While Phillips drivers are pointed on the tip, Crosspoint drivers are blunt. That's because the slots in the heads of Crosspoint screws don't have a deep depression where they cross, and the pointed tip of a Phillips driver can't sink in, making Phillips drivers prone to slipping off the Crosspoint screw and chewing it up, or just slipping off into the camera mechanism, neither a desirable outcome when dealing with the delicate mechanisms inside cameras. Sets of small Crosspoint screwdrivers were readily available, as I pointed out in my article, and Phillips drivers could be converted into usable Crosspoint drivers by grinding off the tips. Ed Romney began a vitriolic letter writing campaign of letters and emails to me and posting on photography forums, writing to me and to my Boss, Glenn Patch, trying to get me to retract my comments. I refused, because I was not wrong, Romney was.

As it turned out, the man was paranoid and delusional. In his mind, Patch and I were part of a Jewish conspiracy to control the photo industry, fix prices, and, of course, put non-Jewish Romney out of business. He had an incredibly exaggerated idea of his importance to that industry, most members of which didn't even know his name. His hate campaign against Glenn and me got so bad that we had to bring in lawyers to warn him to stop libeling us in his Internet posts. This went on for years, and only stopped when Ed died. I breathed a big sigh of relief when I heard the news, and was criticized in some quarters for my attitude of "good riddance!" I was not sorry the man and his paranoid delusions were gone, permanently. Oh, some of his acolytes kept up the hate campaign for a little while, but without Ed stoking the flames it fizzled out in a few months. And all over a simple mistake in understanding screwdrivers! Ed elevated me as one of the heads of an international Jewish conspiracy that had as much reality as most conspiracies bandied about on the Internet.

Exakta



1. Exposure meter prism TRAVEMAT
2. Slow speeds and self-timer knob
3. Right cover
4. Acceleration cam
5. Slow speeds and self-timer cam
6. Disengaging link
7. Slow speeds and self-timer base plate
8. Film transport indicator
9. Speed regulator
10. Slow speed and self-timer mechanism
11. Small blind drive shaft
12. Large blind drive shaft
13. Continuous reflex return cam
14. Spring motor for slow speeds and self-timer
15. Viewing prism
16. Viewing hood
17. Focusing magnifier
18. VX 1 000 chamber
19. Mirror
20. FP synchro contact lever
21. Disengagement of continuous reflex viewing
22. FP synchro
23. Red « cocked » signal
24. Mirror release mechanism
25. Release
26. X and M synchro block
27. Film pressure plate
28. Carrying strap eyelets
29. Lock control for : prism, hood, TRAVEMAT or EXAMAT prisms
30. Film cutter
31. Rewind crank
32. Safety lock for release
33. Lens lock
34. Preview and release button
35. Mobile depth of field indexes
36. 50 mm Pancolar f/2 lens
37. Film-advance lever
38. Fast speeds knob
39. Left cover
40. Counter
41. Disengaging button for rewind
42. Shutter cocking and film transport mechanism
43. B and T exposure cam
44. Shutter shaft
45. Film drive sprocket

Drawing Courtesy, Le Hedan

Kine Exakta 1936 brought SLR design to the new age. The camera was charged by a single lever (37) above, right.

Ihagee Story

Note on Ihagee: ee-hah-gay, phonetically the letters IHG in German and Dutch (just as the German GmbH, corporation, could be rendered Gay-em-bay-Hah). It stands for something, but I don't recall just what. The company was Dutch owned, and after WW II the owners in Holland tried to get ownership back, but didn't succeed. They started a rival company in West Germany and made a camera called Exakta Real. This camera was extremely well made, but expensive, and didn't sell well. The West German factory shut down, and the Exakta Real is a very rare camera today.

In the Early 70s there were Exakta cameras made at the Praktica factory using their newly developed metal blade shutter that works like a Copal Square but is totally different mechanically. These Exakta cameras were mechanically identical to the contemporary Praktica cameras, but had interchangeable viewfinders, one of which incorporated a meter. They accepted a new series of auto aperture lenses from Meyer Gorlitz and CZJ, using the same old Exakta bayonet but with a pin at the bottom which pushed out of the camera and pressed a button on the lens to close the diaphragm. They had both left and right handed shutter releases, and worked with older Exakta lenses. Several came in to me for service as did the Prakticas. They were not very reliable and parts were practically impossible to get. They were imported and distributed by Exakta Camera Company in NYC, that used to send out a regular newsletter with special prices and tips on using the cameras. They were at the same address as Edixa Camera Company, probably the same company. I bought German lenses from them to sell in my shop. They handled Carl Zeiss Jena, Schacht Ulm, Steinheil Munchen, and others I've forgotten.

A bit later there were some Japanese-made Exakta cameras. I believe they were made by Cosina, but I'm not certain. They had Copal Square shutters, Pentax screw mount with an Exakta bayonet mount adapter, and a left handed shutter release to couple with older Exakta auto diaphragm lenses as well as a regular shutter release on the top right deck. Film advance lever was for right hand operation. I had one come in for repair in my shop. Internally it looked just like the Argus/Cosina cameras being sold at the time, but they looked just like the Chinon cameras sold with the GAF/Ansco name on them. All these cameras are probably in McKeown.

After German reunification the original owners got the Exakta trademarks back and introduced the Exakta 66 and a line of Schneider Kreuznach lenses and some less expensive Japanese lenses made by Tokina. (Tokina made the same lenses for Rollei in mounts for the 6000 series cameras.) The camera was a Pentacon Six/Praktica 66 with rubber body covering to make it look different. There was a very expensive West German meter prism for the camera, that coupled to both shutter speed dial (electrical, not mechanical, coupling via contacts on camera top) and lens aperture ring. The first generation were very trouble prone, so they did some redesign work and put out. Mark II, which was more reliable. They were distributed in the US by Schneider USA and my friend and co-author (on the light meter book) Martin Silverman was the product manager. (The very first Shutterbug color cover was a photo I shot of this camera and several of the lenses.). The lenses were spectacular, but expensive, and the camera didn't sell well and went out of production. The company then put the Exakta name on a bunch of cheap point and shoot cameras from Asia sold through the German chain Photo Quella. I don't know if they still exist, but if they do they are no longer manufacturing anything.

My father was an avid Exakta user and had several as well as the Exa. Once he trusted me not to break them, he let me use them now and then as a teenager.

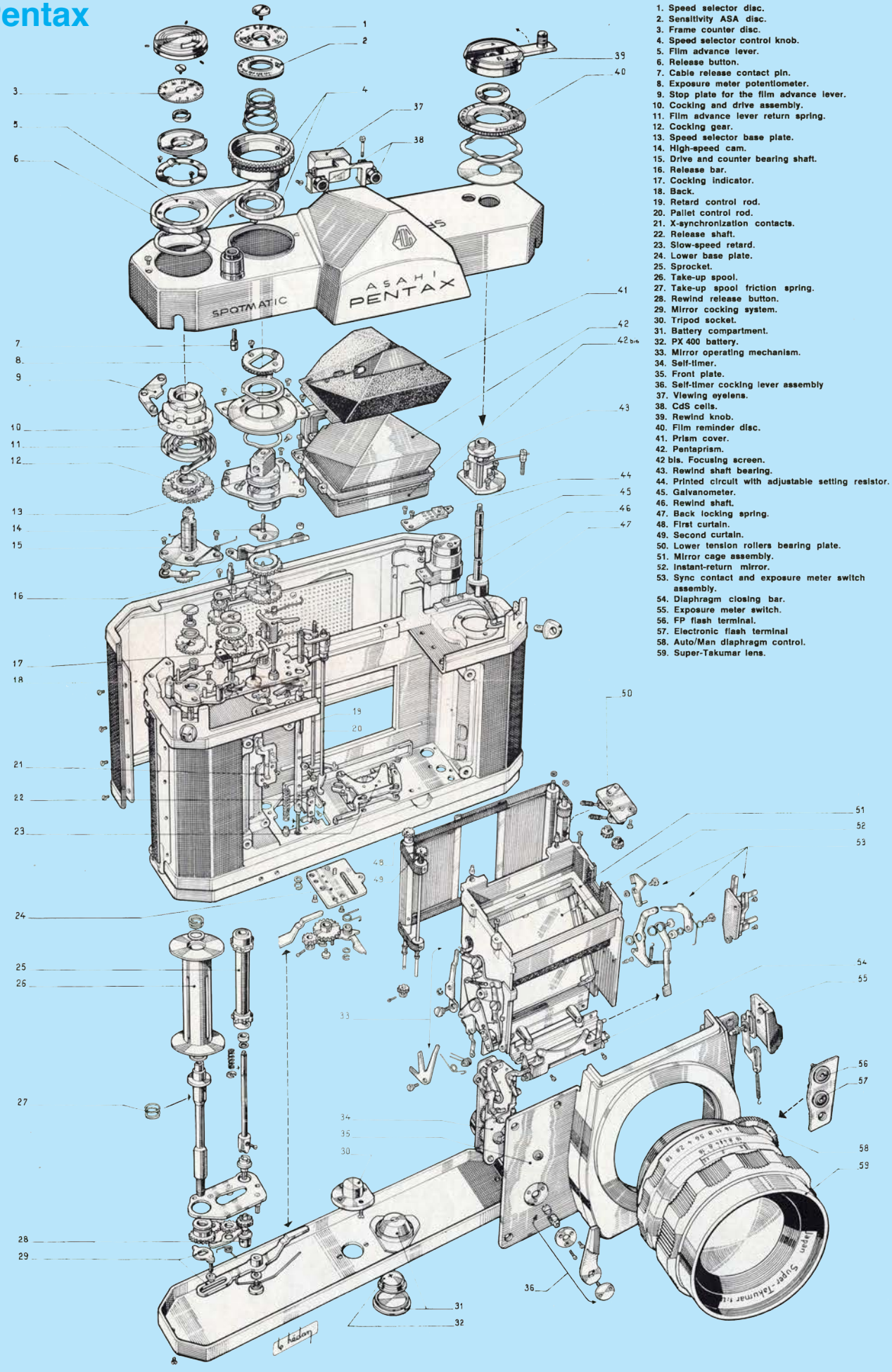
Rollei 35

Rollei 35 series: Original designer worked for Dr. Wirgin, maker of the Edixa cameras. Wirgin didn't want to make it, so the fellow took it to Rollei. Rollei gave me a set of three books they published, one on the TLRs, one on Rollei 35, one on SL66 and SLX (I believe there was also one on the 35mm SLRs, but I never got that one.). My friends at Rollei USA gave them to me along with a Rollei watch. These books are great!! They have engineering drawings, photos of prototypes, production data, etc. I don't recall the authors, but Rollei staff. Text in German and English.

There was a Rollei 35 with coupled rangefinder in prototype. Same small size. Unfortunately, never produced. Last of the Rollei 35 series was an odd little camera with hinged door on the front. To advance film, cock shutter, and extend lens you opened the door and closed it several times. An arc shaped rack attached to the door turned the gears inside the camera. Auto exposure by CdS meter. I have one new in presentation case. This was the only Rollei 35 with molded plastic body. Singapore production, of course. My metal Rollei 35 is the one with CdS meter and LED exposure indicators. Requires a battery that's impossible to find, so I just used it with my Sekonic meters.

I really mourned the demise of Rollei, which got kicked around in the 90s from owner to owner. In the mid-90s it was United Scientific Holdings in England. Later it was owned by a Korean investment group and then ownership went back to Germany. They were ready to go digital in the late 90s and prototyped a very nice digital SLR with integral zoom lens,

Pentax



1. Speed selector disc.
2. Sensitivity ASA disc.
3. Frame counter disc.
4. Speed selector control knob.
5. Film advance lever.
6. Release button.
7. Cable release contact pin.
8. Exposure meter potentiometer.
9. Stop plate for the film advance lever.
10. Cocking and drive assembly.
11. Film advance lever return spring.
12. Cocking gear.
13. Speed selector base plate.
14. High-speed cam.
15. Drive and counter bearing shaft.
16. Release bar.
17. Cocking indicator.
18. Back.
19. Retard control rod.
20. Pallet control rod.
21. X-synchronization contacts.
22. Release shaft.
23. Slow-speed retard.
24. Lower base plate.
25. Sprocket.
26. Take-up spool.
27. Take-up spool friction spring.
28. Rewind release button.
29. Mirror cocking system.
30. Tripod socket.
31. Battery compartment.
32. PX 400 battery.
33. Mirror operating mechanism.
34. Self-timer.
35. Front plate.
36. Self-timer cocking lever assembly
37. Viewing eyelens.
38. CdS cells.
39. Rewind knob.
40. Film reminder disc.
41. Prism cover.
42. Pentaprism.
42 bis. Focusing screen.
43. Rewind shaft bearing.
44. Printed circuit with adjustable setting resistor.
45. Galvanometer.
46. Rewind shaft.
47. Back locking spring.
48. First curtain.
49. Second curtain.
50. Lower tension rollers bearing plate.
51. Mirror cage assembly.
52. Instant-return mirror.
53. Sync contact and exposure meter switch assembly.
54. Diaphragm closing bar.
55. Exposure meter switch.
56. FP flash terminal.
57. Electronic flash terminal
58. Auto/Man diaphragm control.
59. Super-Takumar lens.

Drawing Courtesy, Le Hedan

Pentax Spotmatic design with Japanese approach: The mirror mechanism is mounted from the front, instead of being inserted from the top like Exakta, and Leica SL.

but their R & D was too slow, and by the time they were ready to produce it the Japanese were far ahead. I got to shoot some photos with one, and they were good but only something like 2 or 3 megapixels. The camera was compact and fit the hands well and had an excellent viewfinder. Unfortunately, I don't remember the model name/number. At that time Rollei was selling some nice point and shoot film cameras made for them in Korea and Japan.

Tessina

Tessina was Karl Heitz's other camera line with Alpa. Amazing little cameras. There was even a special spy version with Nylon gears that was silent in operation. I used to carry one around in my pocket for grab shots. The spring motor made it a good action camera. There were all sorts of accessories, even a little pentaprism viewfinder, and an equally tiny light meter. Fun little cameras. I never took one apart, so I don't know how the shutter worked.

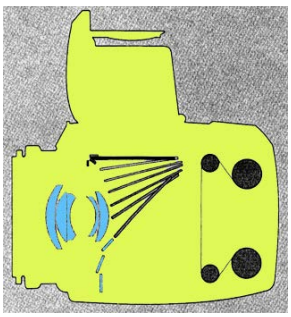
Years ago when mercury cells were banned, owners of older cameras, light meters, etc. had a problem. Those devices did not have voltage regulators in their meter circuits because none was needed. The discharge curve of mercury cells was flat. No other type of battery had a similar discharge curve. So Stan Weinberg (Wein Products) and I set to work to develop one. Lots of ideas that didn't work until we studied zinc-air cells as were used in hearing aids. Working with a chemist, we developed our own electrolyte to produce a flat discharge curve and 1.5 volts. Since Stan put up the money, he had naming rights and we called it Weincell. We contracted with a company in China to make them for us. Stan sold hundreds of thousands of them! I got nice royalty checks the first few years, and then sales declined sharply when digital hit and people stopped using older cameras and light meters, also some older medical devices that also were powered by mercury cells. A few years ago, Stan went out of business, but by then my royalties had declined to a few hundred dollars a year. But the idea made me a lot of money for a while.

Rollei Bankruptcy

After the last bankruptcy, reorganization split Rollei into two companies. The one now apparently running Rollei.de is just a marketing company, slapping the Rollei name on Asian products, like today's Minox. The other company made the 6000 series cameras until they shut down after the market failure of the 6008 Autofocus. The man who ran Rollei USA went to work for Mamiya America Company after the collapse. I can't remember his name right now, Jeff -------. His co-manager was Bernd Francke, no relation to the Rollei founder. Very nice people, and I felt really bad for them when the autofocus camera just didn't sell. Just too bloody expensive!

There was a new camera taking the same lenses, but shaped like Hasselblad 500 that Rollei codeveloped with Sinar to be sold under the Sinar name. Sinar took prepaid orders, but I don't think the camera was ever made. Designed for the Sinar digital backs.

Then there was the Rollei monorail camera developed by Rollei and Tosh Komamura, Japanese distributor of Rollei and owner of Horseman view camera company. Very nice, very expensive. The rail and some other parts were identical to Horseman parts. Tosh was very proud of this camera. He's a very nice gentleman, son of the man who used to make Komura lenses for Bronica (and a few for SL66) and 35mm cameras. I had a 300mm Komura in original SL66 mount. Joe Ehrenreich distributed Komura lenses in the USA and had both Bronica and Rollei at EPOI.

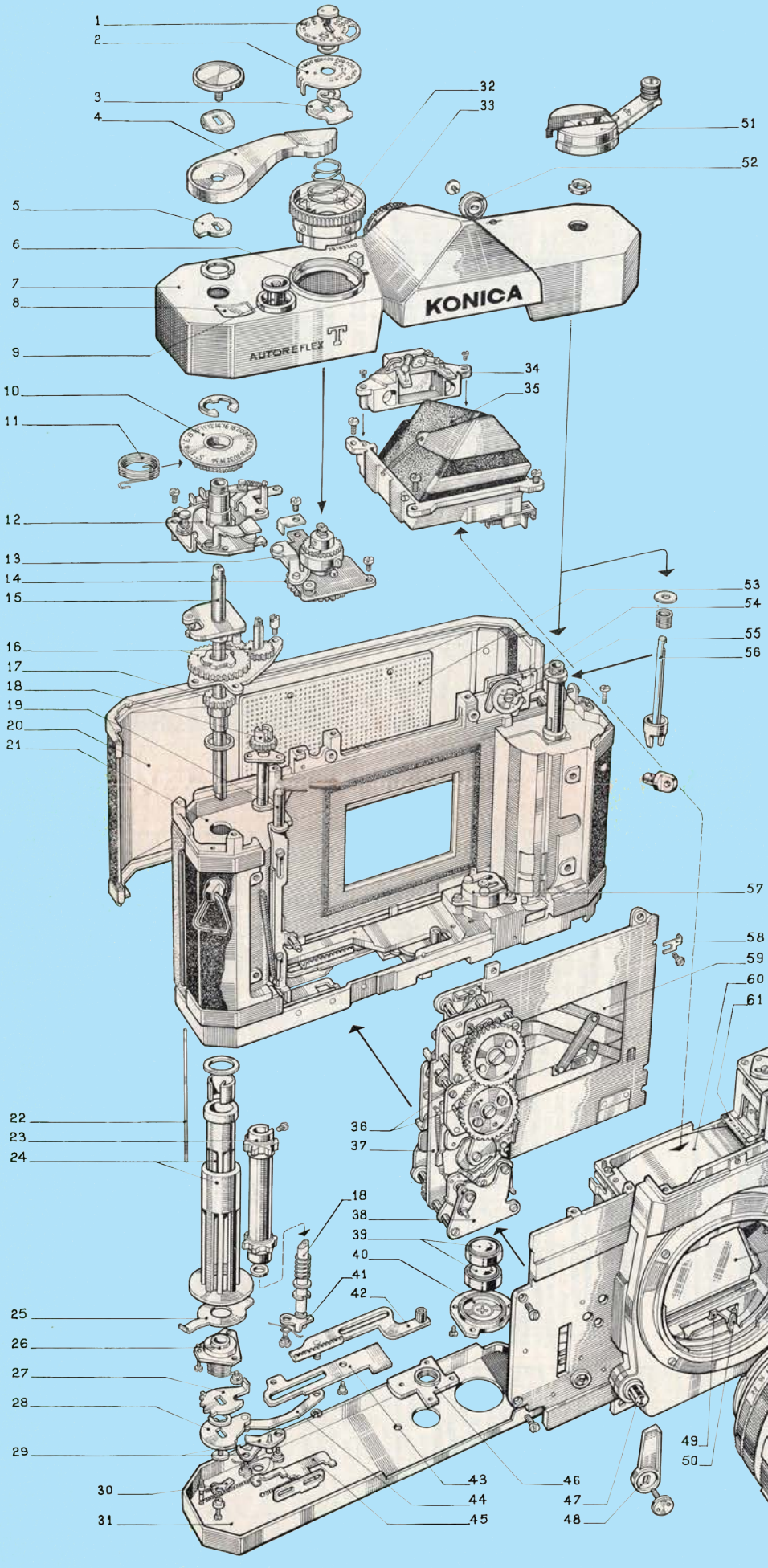


Bronica EC (Electronic Control) was nice camera, but the two mirror pieces wouldn't stay aligned. They were always coming in to my shop to have the mirrors realigned. Nice idea, but a sales flop. I believe it was the last Bronica with focal plane shutter. Early Bronica had soft brass gears. Pro users were always stripping them. Only durable Bronica was S2a, which had steel gears. I had one and used it for years until I switched to SL66. The Nikkor lenses were excellent. Prism viewfinder only showed part of focusing screen. Rollei prism showed whole focusing screen plus more so you could see LEDs in screen frame in SLX. Prisms were same, only mount frame differed. You could rotate prism in 90-degree increments! Nice feature.

Contarex cameras

The mirror mechanism was unique and vibration free. I had a Contarex Super Electronic for years with the motor drive and lenses. I'm pretty sure this was the first camera with electronically timed shutter speeds, and also offered aperture priority auto exposure via an accessory Tele Sensor that fit into the hot shoe. You set the same aperture on the camera and Tele Sensor and the system set the correct shutter speed. The camera, lenses, and accessories were ridiculously expensive, but I was a dealer and they had special prices for dealer personal purchases. Very oddly, the Contarex had instant return mirror, but the diaphragm did not reopen until you recocked the camera. I always wondered about the logic of that. Of course, with the motor drive it didn't matter. The Contarex also had interchangeable film backs, changeable in mid roll.

Konica



1. Speed setting. B exposure to 1/1000.
2. Sensitivity dial.
3. Speed coupling cam as a function of used film sensitivity.
4. Film advance lever.
5. Cocking cam.
6. Unlocking ring to set a speed different from the one given by the automatic selection cam no. 3 " override lever ".
7. Top housing.
8. Counter window.
9. Release button.
10. Counter.
11. Counter return spring.
12. Counter frame with triggering levers.
13. Exposure meter drive gear.
14. Shutter drive gear.
15. Cocking shaft.
16. Cocking gears.
17. Drive gear for take up spool.
18. Gear and shaft for sprocket reel.
19. Release.
20. Back cover.
21. Case.
22. Hinge shaft.
23. Sprocket reel.
24. Quick loading take up spool.
25. Take up spool friction spring.
26. Take up spool base bearing.
27. Cocking stroke cam.
28. Shutter cocking system.
29. Cocking safety latch.
30. Cocking safety latch.
31. Bottom housing.
32. Shutter speed dial.
33. Eyepiece ring nut (accessory shoe).
34. CdS elements frame with printed circuitry.
35. Pentaprism.
36. Gears coupled with no. 32 drum for shutter cam positioning according to speeds.
37. Shutter mechanism.
38. Self timer.
39. 2 batteries for cell power.
40. Battery compartment lid.
41. Film transport disable latch (rewind).
42. Rack.
43. Rack slide.
44. Rack drive rod.
45. Slide lever for linkage of cocking to reflex viewing system.
46. Tripod socket.
47. Diaphragm manual preselection.
48. Arming lever for the self timer.
49. Cam for the automatic setting of the exposure meter according to the type of lens used.
50. Cam for the automatic display of the aperture during release.
51. Rewind crank.
52. Exposure meter switch.
53. Pressure plate.
54. Printed circuit for battery and cells switch.
55. Cells contacts.
56. Rewind shaft.
57. Battery compartment.
58. Wiring retainer.
59. Metal blinds.
60. Fresnel lens.
61. Diaphragm scale.
62. Exposure meter frame.
63. Galvanometer.
64. Cam no. 50 drive.
65. Quick mirror.
66. Synchronisation terminals (M, X).
67. Lens release button.

Drawing Courtesy, Le Hedan

Konica Autoreflex utilized a mechanically controlled Copal shutter, and trap-needle autoexposure control

Mamiya

Cameras were just a small part of Mamiya. They are carbon fiber experts, making golf clubs, fishing rods, tripods, etc. (in Pakistan). They also made other sporting goods, like tennis racquets, fishing reels, etc. One big division made industrial robots. When I visited them in Tokyo, they proudly showed me all this stuff and gave me a very nice carbon tripod and a set of Mamiya cufflinks and tie tack. I was sad to see the Mamiya name disappear from the world of photography. Digital is nice, but it sure killed a lot of great products, particularly medium and large format.

Alpa

The US distributor of Alpa in the 60s and 70s was Karl Heitz. He distributed Alpa, all of the lenses, Gitzo, and several other European product lines. I sold Alpa and Gitzo in my shop. Didn't sell many Alpa cameras due to price, but they were my premium luxury brand. I personally owned Alpa, too, starting with a 5b, 6c and 10d. Karl Heitz had a factory-trained Alpa repairman, Dominic Martucci, who did excellent work. In the late 70s Karl Heitz died and the company closed. Martucci bought the existing inventory of cameras, lenses, and parts, and for years offered custom built Alpa cameras and lenses. Dealer distribution was taken over by a group calling itself TAG, The Alpa Group. They sold the 11si, the last Swiss Alpa.

They also sold the Alpa 3000, a Chinon camera with a cast metal top cover added. It had a standard film advance lever, not Alpa's unique backwards advance lever, and Pentax type screw mount. Several Japanese lenses were offered with this camera branded Auto Alfitar. The camera was a dismal sales flop because anyone could see it wasn't a real Alpa. I believe it offered aperture priority auto exposure and manual exposure. Copal Square shutter, of course. I'm sure so few were sold that it must be a really rare camera today.

Karl Heitz, Mr. Bourgeois, the owner of Alpa also died, and later the trademarks were sold to the company that made the very expensive Alpa medium format viewfinder cameras. The Seitz company, known for their rotating panoramic cameras, did much of the actual manufacturing. Their website, if it's still up, had a nice and mostly accurate history of Alpa with photos of many of the models.

When Minolta camera division was shut down, it was first sold to Konica, and then Konica went bust, and Sony bought it. The Sony Alpha series of SLR cameras are designed and built by Minolta people, as are the lenses. I had a very good relationship with the Minolta people. The President, whose name I can't recall at the moment, was also a classical pianist, and plays beautifully. He used to perform for us at Minolta's parties in Las Vegas during PMA and in Cologne. Wish I could recall his name. Overall, the Minolta people were some of the nicest people I had dealings with in the photo business.

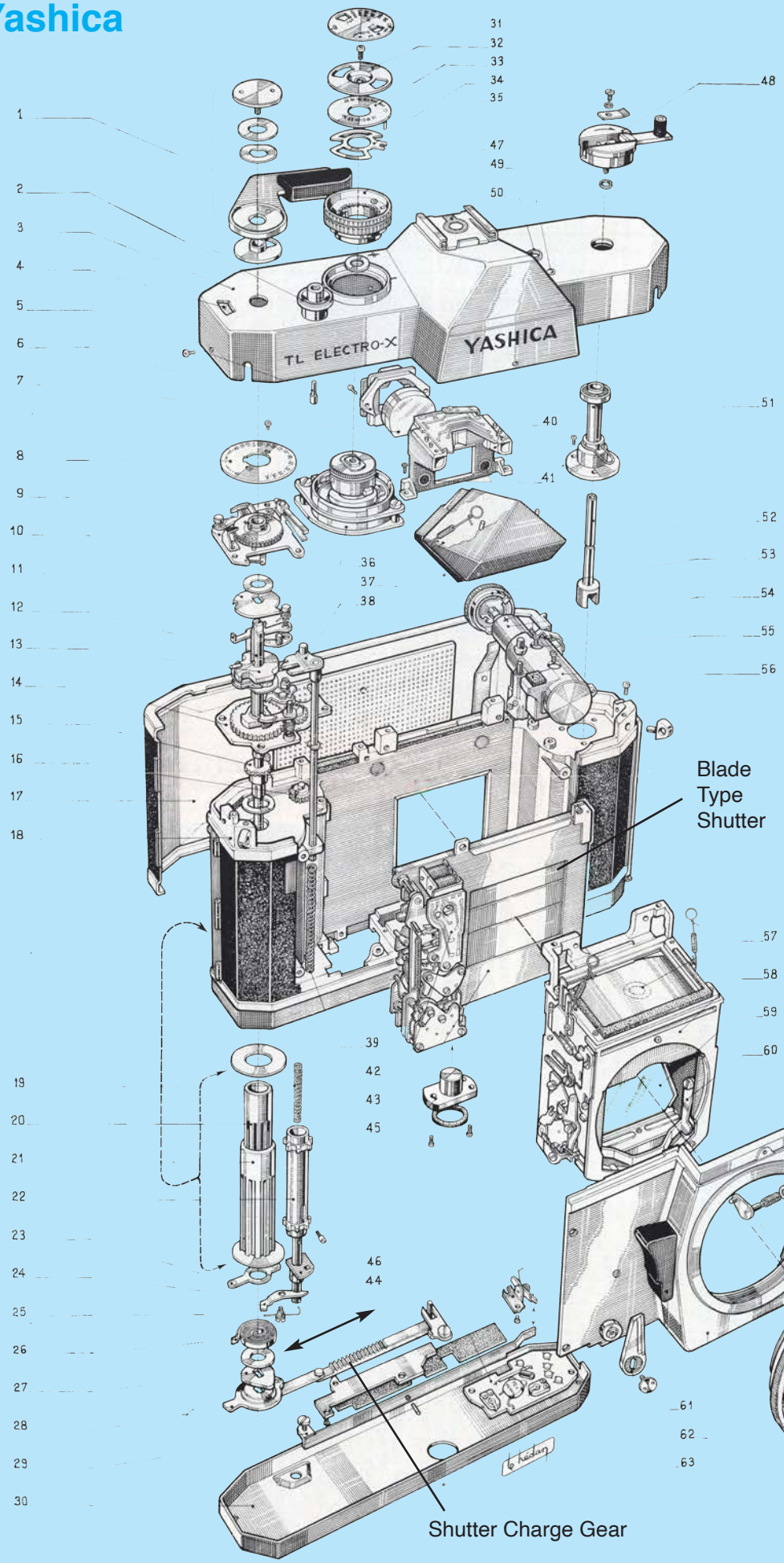
Movie Cameras

I doubt that Nikon actually made their movie camera. It's an open secret that they farmed out much of their production, and I've seen Nikon zoom lenses coming off a Kyocera assembly line.. Mamiya made the camera backs for the Nikon F and F2, and made some of the Nikkorex SLRs (Ricoh made the rest). For years their point and shoot cameras were all made by Goko, and some maybe by Haking. Goko and Haking were the two largest producers of 35mm point and shoot cameras, but you almost never saw them with those names on them. If you bought enough, they'd put any name you wanted on them! Haking, at least, made movie cameras when 8mm and Super 8 were in vogue. I once had a Japanese-made Beaulieu Super 8 that worked very well. I have no idea who made it, perhaps Chinon who made some nice ones.

Rollei Lens Mount ZIV SL706, Alpa Alfitar Lenses

The ZIV SL706 lens mount was a modified Praktica/Pentax 49mm thread mount. However a protruding pin at the 11:00 position, as I recall, pressed against a flange on the aperture ring of the lens. This flange tapered over its length, so that at different aperture settings it pressed in on the pin to different degrees. This allowed the camera's meter to know what lens aperture was set and move the galvanometer needle to the proper position. When Rollei first produced their own version of the SL706, they initially used this same lens mount on the camera they called Voigtlander VSL1. I do know that when they switched the camera to the Rollei QBM (Quick Bayonet Mount) they were left with an in-

Yashica



1. Film advance lever assembly.
2. Release button bezel.
3. Top cover.
4. Counter window.
5. Cable release contact pin.
6. Eyepiece mount.
7. Eyepiece lenses.
8. Counter disc.
9. Counter mechanism.
10. Cocking cam.
11. Cocking interlock.
12. Cocking shaft.
13. Stop cam.
14. Cocking and film advance base plate.
15. Take-up spool drive gear.
16. Sprocket wheel drive gear.
17. Hinged back.
18. Body.
19. Disengaging spring.
20. Inner cage of the fast-catching take-up spool.
21. Multi-slot take-up spool.
22. Sprocket.
23. Bottom bearing of take-up spool.
24. Bottom bearing plate of the sprocket release shaft.
25. Sprocket release shaft detent lever.
26. Film advance lever return spring.
27. Cocking lever control cam.
28. Cam rack system for the shutter cocking.
29. Mirror return lever.
30. Bottom cover.
31. Speed setting disc.
32. Speed setting disc base.
33. Sensitivity ASA/DIN disc.
34. Disc clutch spring.
35. Speed and sensitivity ASA/DIN selector.
36. Potentiometer "brain" (speed-sensitivity).
37. Viewing prism.
38. Release shaft.
39. Release shaft spring.
40. Indicator lamp.
41. CdS cells and module.
42. Printed circuit (speed regulation).
43. Metal blade shutter system, Copal Square S Electronic.
44. Regulating module (voltage and exposure control) "computer".
45. Tripod socket.
46. Release linkage.
47. Hot accessory shoe with FP (M) sync terminal.
48. Rewind knob with crank.
49. Battery test lamp.
50. Opening for battery test push button.
51. Rewind shaft bearing.
52. Rewind shaft.
53. Battery compartment cover.
54. Eveready 544 battery.
55. Battery test push button.
56. Battery compartment.
57. Focusing screen.
58. Mirror cage assembly.
59. Instant-return mirror.
60. Diaphragm preselection control.
61. Exposure metering control plunger.
62. Lens mount flange.
63. Self-timer setting lever.
64. Manual mirror release assembly.
65. Lens mount.
66. Lens (screw-on mount, 42 mm diameter).

Drawing Courtesy, Le Hedan

Yashica TL Electro-X offered the first electronically controlled blade type Copal shutter, cocked by a sliding rack gear at its base.

ventory of Singapore 35mm f/2.8 Distagon lenses in SL706 mount. These were sold to Alpa, where they were relabeled as Auto Alfitar lenses, fitted with an Alpa filter mount on the front and an Alpa auto adapter on the rear. The protruding pin from the SL706 mount was used later by Rollei in the SL2000F and its successors to key the camera's meter to the lens's maximum aperture. Most of the lenses for Rollei's 35mm SLR cameras were Carl Zeiss designs. Initially they were manufactured by Zeiss, but to cut costs Rollei licensed the designs for the common focal lengths and made them in Singapore. Less common lenses still came from Zeiss. When Rollei went bankrupt in the late 70s, Rollei USA had a sale on lenses.

Parallel to the Zeiss designed lenses, Rollei also had a range of Rolleinar lenses made in Japan by Mamiya, and identical except for the mount to the lenses Mamiya sold for their 35mm SLR cameras. When Mamiya decided to stop 35mm camera and lens production, Rollei went shopping for lenses. They first went to Makina Optical, but Makina could not meet Rollei's optical quality requirements. So Rollei ended up getting lenses from Kino Precision, the company that made the original Vivitar Series 1 lenses. I believe they may also have gotten some zoom lenses from Sigma. All of the Japanese lenses that Rollei sold as Rolleinar were excellent lenses. I'd rather have some of them than the Singapore built Zeiss designs. The same lenses were supplied for the Voigtlander cameras under Voigtlander names.

Rollei SL66

Although they made 35mm cameras, Rollei was best known for their medium format cameras using 120 roll film. The original Rollei cameras were twin lens reflex cameras. Rollei's first medium format SLR, designed to go head-to-head with Hasselblad, was the SL66, introduced as I recall in the late 1960s. It was bigger and heavier than the Hasselblad cameras, but in many ways more versatile. It used a vertical travel. cloth focal plane shutter with speeds up to 1/1000 second. When faster flash synchronization was needed (the focal plane shutter had a flash synch speed of 1/30 second), Rollei offered three lenses, 50, 80, and 150mm, with built in Compur shutters that would synch with flash up to 1/500 second. The camera used rack and pinion focusing with a built-in bellows, and could focus very close. In a unique design feature, many of its Carl Zeiss lenses could be reverse mounted without need for any accessories. The bellows allowed the lens to be tilted up to 15 degrees (but not shifted as has often been incorrectly stated), and a special Rolleigon tilt lens could be used with this for more tilt or by counterposing the two tilts, a shift.

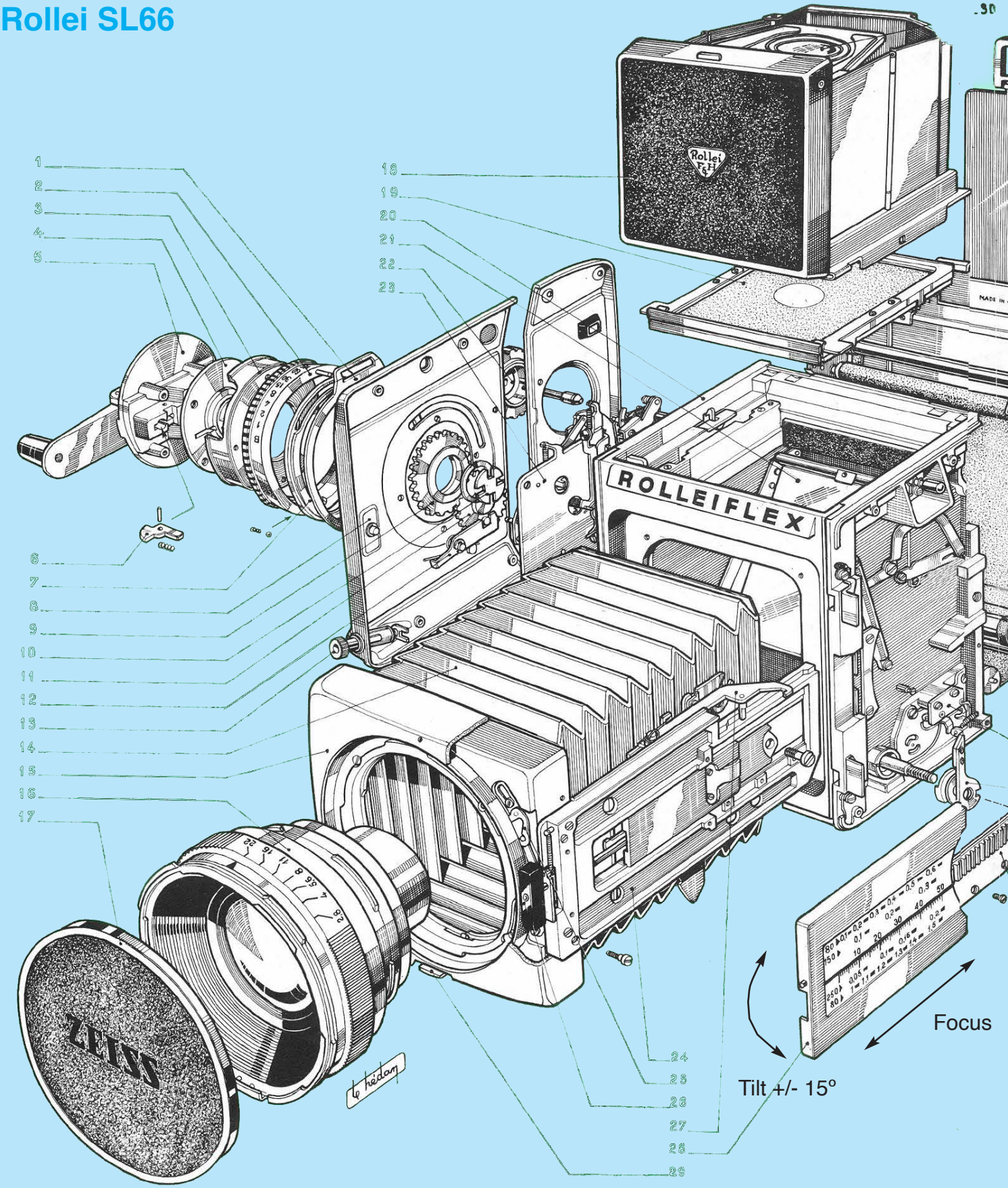
The SL66 prototypes are interesting, there were two competing design ideas. One small like Hasselblad, one big with all the extra features. Big won. Sometime take the right-side cover plate off one (easier on the late models with diamond pattern rubber covering which sticks back easier than the leatherette). The advance crank and shutter release button stay with the side cover. Very modular design. The shutter/mirror/timing mechanism is a truly beautiful design, and so easy to repair or adjust. Similarly, focusing knob stays with left cover when you take it off. Notice focusing scales for multiple lenses inside the knob. Pull out and turn to select scale for lens in use. Beautiful design!! And built to last. I traded my Bronica S2a outfit in on my first one (with 50, 80, 120 Makro and 150 with leaf shutter, metering hood and prism viewfinder. Later added 40.) and never looked back!

The film magazines were available for 6 X 6, 6 X 4.5, and some special image sizes, and could accept both 120 and 220 film. The dark slide handle had a slot where the top of the film box could be inserted as a reminder, and an indicator on the bottom of the magazine told whether there was film loaded or not. There was a slot in the back of the magazine for stowing the dark slide. The magazines could be loaded and advanced to the first frame position off the camera, to save time. There was double exposure prevention, but a switch in the hub of the film advance crank allowed multiple exposures when desired without moving the film. There was also a sheet film magazine and film holders. The standard folding focusing hood could be replaced with a large and very bright (and very expensive) 45-degree prism viewfinder.

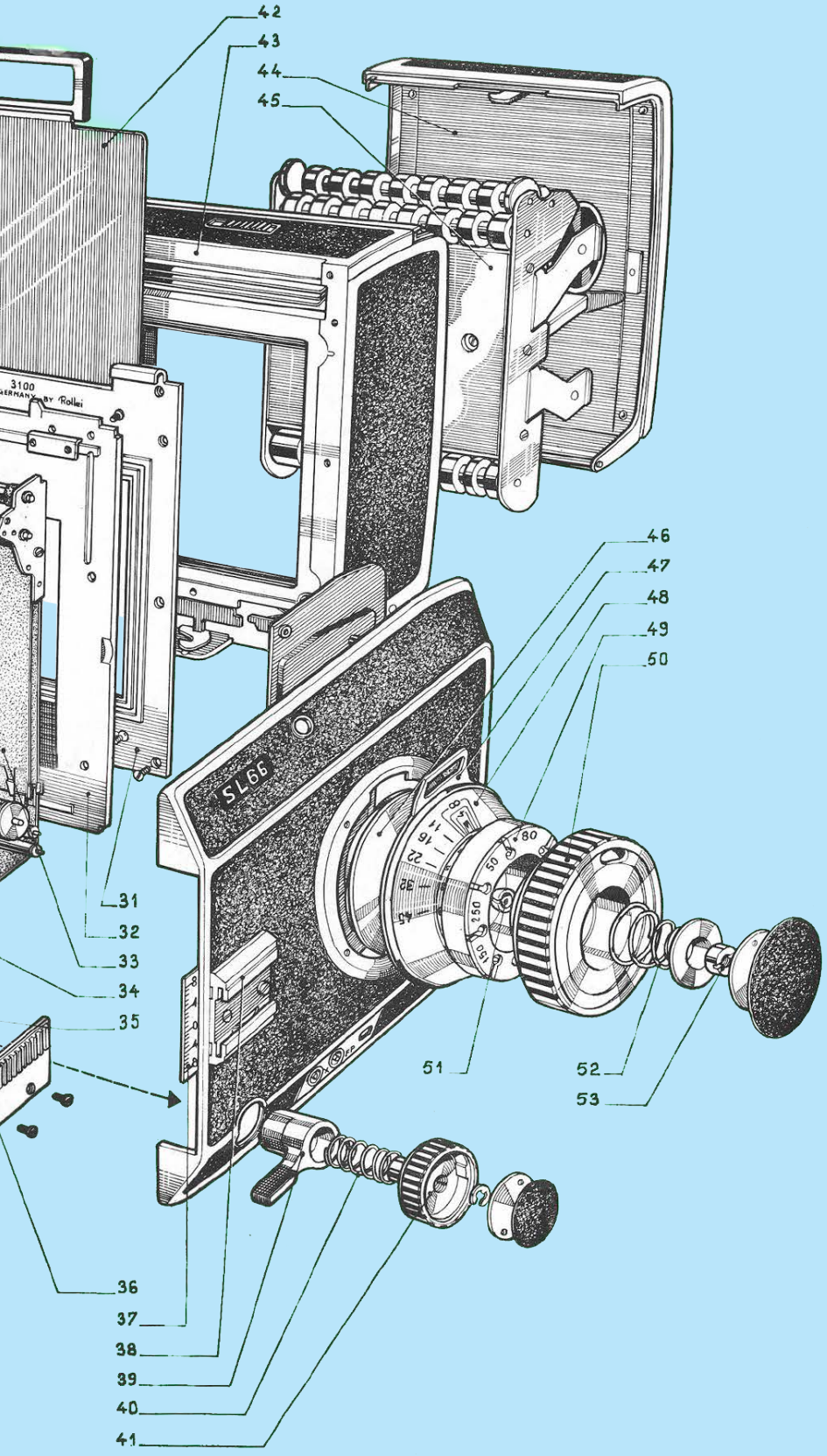
There were many different focusing screens, easily interchanged. The camera by itself did not fit the hands very well, but an accessory handgrip solved that problem. The grip was held in the left hand, whose fingers and thumb operated the large focusing knob, leaving the right hand free to operate the film advance crank. The shutter could be fired by a cable release mounted on the handgrip, or without the cable by the right hand. In practice, the camera was very fast to operate. I owned four of them of different vintages over the years, and worked them daily. To me the most impressive part of the SL66 was its modular construction. It was clearly designed for simplicity of service and easy repair. All parts were large and robust. I loved working on this camera and kept a stock of spare parts, although major repairs were rare. Most sent to me for service had been dropped onto hard surfaces bending the side cover plates and mechanism beneath, or bending the lens support and stripping the Nylon rack.

When Rollei began using their HFT multicoating (essentially the same as Zeiss T*), HFT versions of the lenses were introduced. Very late versions of the SL66 had built in TTL metering, and a lug was added to the diaphragm ring on the lenses to engage a follower on the camera for open aperture metering. I never owned one of these, but repaired several.

Rollei SL66



Rollei SL66 implemented the studio camera controls usually found on view cameras. The focusing knob (50) provides fine adjustment of the lens (16) along the optical axis via a rack gear 36. The focusing rack can also pivot around the central axis of the focusing knob. So, by releasing the shift lock 39, the entire lens could be tilted up, or down by 15 de-

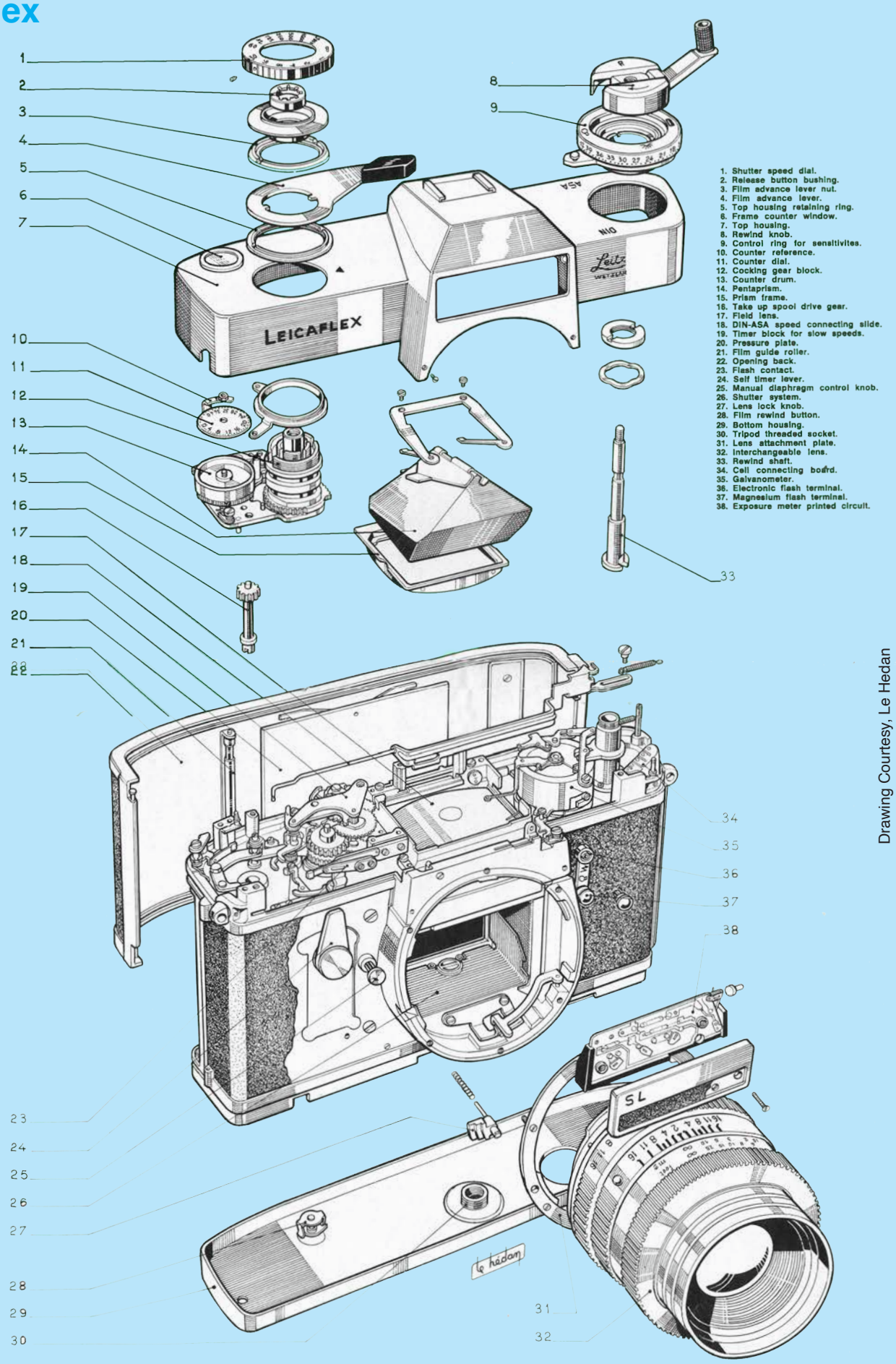


1. Right side carrying strap eyelet.
2. Speed selector.
3. Crank drum.
4. Crank flange.
5. Setting and film advance crank.
6. Safety interlok for intentional double exposure.
7. Speed selector index ring.
8. Manual mirror release.
9. Setting gear.
10. Coupling.
11. Intermediate gear.
12. Intermediate gear lock.
13. Release button.
14. Bellows.
15. Lens mounting plate.
16. Lens.
17. Lens cap.
18. Viewing hood.
19. Interchangeable focusing screen.
20. Camera body.
21. Instant-return mirror.
22. Knurled magazine loading knob.
23. Mechanical drive assembly (shutter and film transport).
24. Macrophotography and vertical tilt slides.
25. Automatic diaphragm control.
26. Lockable depth-of-field preview tab.
27. Infinity stop.
28. Scale for : extension, magnifying factors, tilt angles index.
29. Lens lock.
30. Viewing magnifier.
31. Magazine front plate.
32. Magazine seating plate.
33. Shutter curtains.
34. X and M contact plate.
35. Internal tilt control lever.
36. Focusing rack.
37. Tilt angle value scale.
38. Accessory shoe.
39. External tilt control lever.
40. Compression spring.
41. Tilt control lever locking knob.
42. Magazine dark slide.
43. Magazine body shell.
44. Magazine hinged back.
45. Film carrier.
46. Worm drive (for rack # 36).
47. Left strap eyelet.
48. Depth-of-field scale.
49. Distance scale.
50. Focusing knob.
51. Clutch cone.
52. Compression spring for the focal length selector.
53. Assembly nut for the focusing knob.

Drawing Courtesy, Le Hedan

grees. To accomplish this, the focusing knob is slightly slanted towards the front of the camera, and the focusing rack gear 36 is actually driven by a helical cam at the end of the focusing knob. This design is unique to Rolliflex SL66, and is one of the most versatile focusing mechanisms implemented inside a reflex camera.

Leicaflex



Drawing Courtesy, Le Hedan

Leicaflex SL design utilized a solid metal shell body to house the mirror, and shutter housing inserted from above. It is said that Leica lost money on every SL model they made; An example of how not to design a camera.

Internals of SL66

That exploded drawing of the SL66 (Page 16-17) really brings back memories! I don't know how many I worked on when I was an authorized Rollei repairman, but it was many. The most common damage was dropping the camera and bending the lensboard, which was only supported on the camera's left side. Sometimes I could straighten them, but often the whole focusing rail/lensboard assembly had to be replaced. It was an easy job because the camera was so modular, just time-consuming, and the parts were expensive. The other common problem was the X synch mechanism would go bad. It was a module, too, and very easy to replace. They redesigned it several times to make it more reliable. Whenever Rollei redesigned something, they'd send me a stock of parts with instructions to replace them in every camera that came in whether that part or assembly was bad or not. They paid me to do it. I just sent them the old parts.

On your SL66 just peel off the smaller leatherette pieces on the right side and the back edge of the large piece. That will reveal all the screws that hold the side cover on (some very early ones have more screws, I believe, and you have to peel off the larger piece). Usually, the leatherette will stick back with no trouble later, but if not use just a little contact cement (you can thin with acetone if it's too thick). Remove the screws and the washers on top of some and the whole right-side cover lifts off. The advance crank and shutter release button stay with the side cover. That's all you'll need to do to look at the shutter, film advance, and mirror mechanisms. All the mechanical stuff is on that side. The other side just contains the focus rack mechanism. Should you ever need to remove the shutter, film advance, mirror mechanism, it lifts out in one piece after you remove the screws that hold it to the main body casting, but you can see how everything works without removing it. Very simple, strong, and modular. It's one of the best designed and built cameras ever.

Rollei SLX

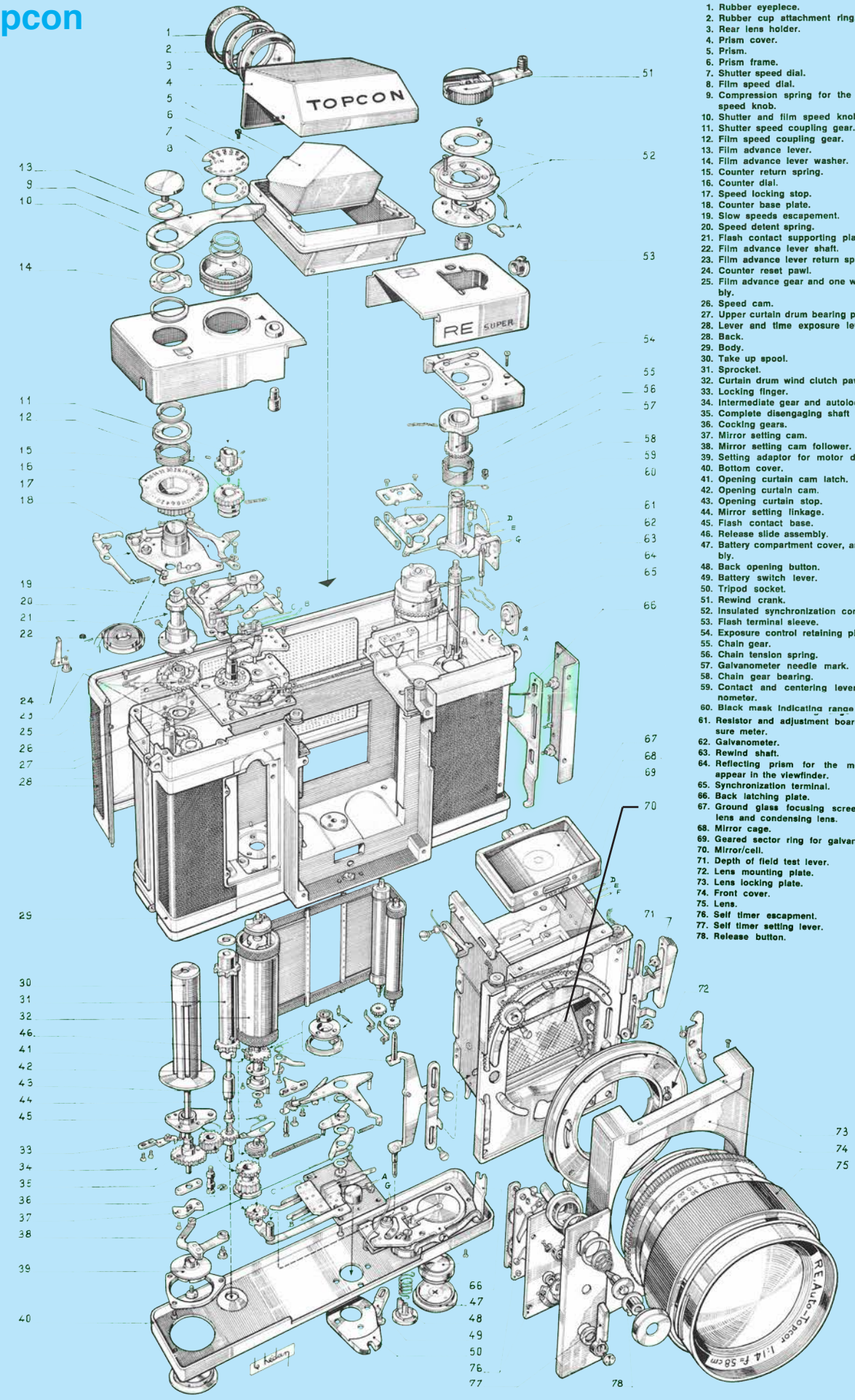
While the SL66 was still current in the late 70s, Rollei began development of the SLX, another medium format SLR. The SLX was a state of the art all electronic camera. It was designed to be simple and cheap to manufacture, with an injection molded plastic body and few mechanical parts. Initially, Rollei announced that it would have a very low selling price. The lenses, developed with Carl Zeiss but manufactured by Rollei featured a revolutionary new shutter design. Instead of springs to drive the shutter and diaphragm blades, Rollei used "linear motors," which were nothing more than two opposing solenoids. Since the shutter timing electronics were in the camera body, not in the shutter, shutter speeds could be more consistent from lens to lens. This was the first camera from a manufacturer with no mechanical linkage between body and lens, just mating electrical contacts. I was astonished at how few parts the shutter had compared to the Compur shutter in a Hasselblad lens. The first series of SLX were built in Singapore, and suffered all the expected problems, giving the camera a bad reputation. Rollei did some redesigning and moved production to Germany after the bankruptcy and restructuring.

The first series of SLX can be distinguished by having red shutter release buttons, and a leatherette covering. The later improved ones have blue shutter release buttons, and a diamond pattern rubber covering, which is much easier to hold on to. The shutter release buttons on the first series can be unscrewed and mounted in any of the three sockets on the front of the camera. The SLX used plastic film holders that drop into the body after opening the camera back, and can be preloaded for quick reloading. When inserted and the back closed, the camera automatically winds to the first frame, and winds off the backing paper after the last exposure. A motor in the bottom of the body cocks the mirror mechanism and winds the film, all controlled electronically. Power is from a proprietary rechargeable battery pack that fits into the side of the camera. Although not designed as a pro camera, many professionals bought and liked them. Unfortunately, most of the problems with this camera were in the electronics and Rollei never produced a repair manual for the camera, or if they did they kept it in house. I was never authorized to work on SLX cameras, but opened up a few out of curiosity. After the SLX began to overcome its initial bad reputation, Rollei developed a more professional version with interchangeable film magazines and many internal improvements

Rollei SLRs

35mm SLRs: Rollei's first 35mm SLR was the SL35. Initially it was made in Germany and was very expensive. When Rollei moved much of their operation to Singapore they shifted production of the SL35 there, & switched to a Schneider-Kreuznach-designed lens from the expensive Zeiss normal lens. Rollei had nothing but problems with the Singapore-built SL35 cameras. I was selling Rollei in my camera shop at the time and every SL35 I sold came back with metering problems. The camera used stopped down metering, closing the diaphragm to take a meter reading by pressing down on a big black button on the top of the camera. After a while the beryllium copper electrical contacts would bend and no longer touch when you pressed the button. This required replacing the contacts, which were not easy to get to. The lens was a disaster, when people focused too close the helical would unscrew and the front of the lens fall off!

Topcon



1. Rubber eyepiece.
2. Rubber cup attachment ring.
3. Rear lens holder.
4. Prism cover.
5. Prism.
6. Prism frame.
7. Shutter speed dial.
8. Film speed dial.
9. Compression spring for the shutter and film speed knob.
10. Shutter and film speed knob.
11. Shutter speed coupling gear.
12. Film speed coupling gear.
13. Film advance lever.
14. Film advance lever washer.
15. Counter return spring.
16. Counter dial.
17. Speed locking stop.
18. Counter base plate.
19. Slow speeds escapement.
20. Speed detent spring.
21. Flash contact supporting plate.
22. Film advance lever shaft.
23. Film advance lever return spring.
24. Counter reset pawl.
25. Film advance gear and one way clutch assembly.
26. Speed cam.
27. Upper curtain drum bearing plate with release.
28. Lever and time exposure lever.
28. Back.
29. Body.
30. Take up spool.
31. Sprocket.
32. Curtain drum wind clutch pawl.
33. Locking finger.
34. Intermediate gear and autolock spring.
35. Complete disengaging shaft for the sprocket.
36. Cocking gears.
37. Mirror setting cam.
38. Mirror setting cam follower.
39. Setting adaptor for motor drive.
40. Bottom cover.
41. Opening curtain cam latch.
42. Opening curtain cam.
43. Opening curtain stop.
44. Mirror setting linkage.
45. Flash contact base.
46. Release slide assembly.
47. Battery compartment cover, and switch assembly.
48. Back opening button.
49. Battery switch lever.
50. Tripod socket.
51. Rewind crank.
52. Insulated synchronization contacts.
53. Flash terminal sleeve.
54. Exposure control retaining plate.
55. Chain gear.
56. Chain tension spring.
57. Galvanometer needle mark.
58. Chain gear bearing.
59. Contact and centering lever for the galvanometer.
60. Black mask indicating range lim[illegible]
61. Resistor and adjustment board [illegible]e exposure meter.
62. Galvanometer.
63. Rewind shaft.
64. Reflecting prism for the meter needle to appear in the viewfinder.
65. Synchronization terminal.
66. Back latching plate.
67. Ground glass focusing screen with Fresnel lens and condensing lens.
68. Mirror cage.
69. Geared sector ring for galvanometer control.
70. Mirror/cell.
71. Depth of field test lever.
72. Lens mounting plate.
73. Lens locking plate.
74. Front cover.
75. Lens.
76. Self timer escapment.
77. Self timer setting lever.
78. Release button.

Drawing Courtesy, Le Hedan

Topcon RE Super utilized a cellenium cell to be placed behind its semi-silvered reflex mirror (70) for light measurement.

Rollei then introduced the SL350, which looked exactly the same except for having a hot shoe permanently mounted atop the prism housing, and used a totally new range of lenses for open aperture metering. They made these in Germany, and must not have made many since I've only ever seen one and it belonged to the former sales manager of Rollei USA. There used to be an Internet discussion group called RUG, Rollei Users Group. I used to belong. There was also CUG, Contax Users Group run by Alexander Tsiris in Athens. I was active in that one, too. Lots of good info in both.

ZIV (Ziess Ikon Voigtlander)

In the early 1970s, around 1973 as I recall, Zeiss Ikon/Voigtlander went out of the camera business. The last camera in their Icarex series was the SL706. I never knew why it was numbered that way. It had the same Praktica/Pentax thread mount, but offered full aperture metering with a new series of lenses. The supplied 50mm Ultron lens is the only normal lens I know of with a concave front element. I was also a Zeiss Ikon/Voigtlander dealer at the time, and sold several of them. Another innovation in this camera was a split sprocket that drove the frame counter and would not advance the counter unless the film actually moved, a brilliant design touch. Once they decided to cease camera production ZIV, as I will call them for short, sold off all of their prototypes and designs for cameras. Rollei bought the design, tooling, and parts inventory for the SL706, along with the same for an unreleased companion model with auto exposure. They also bought everything for an advanced Contarex system. The SL706 featured the unique cylindrical prism focusing screen.

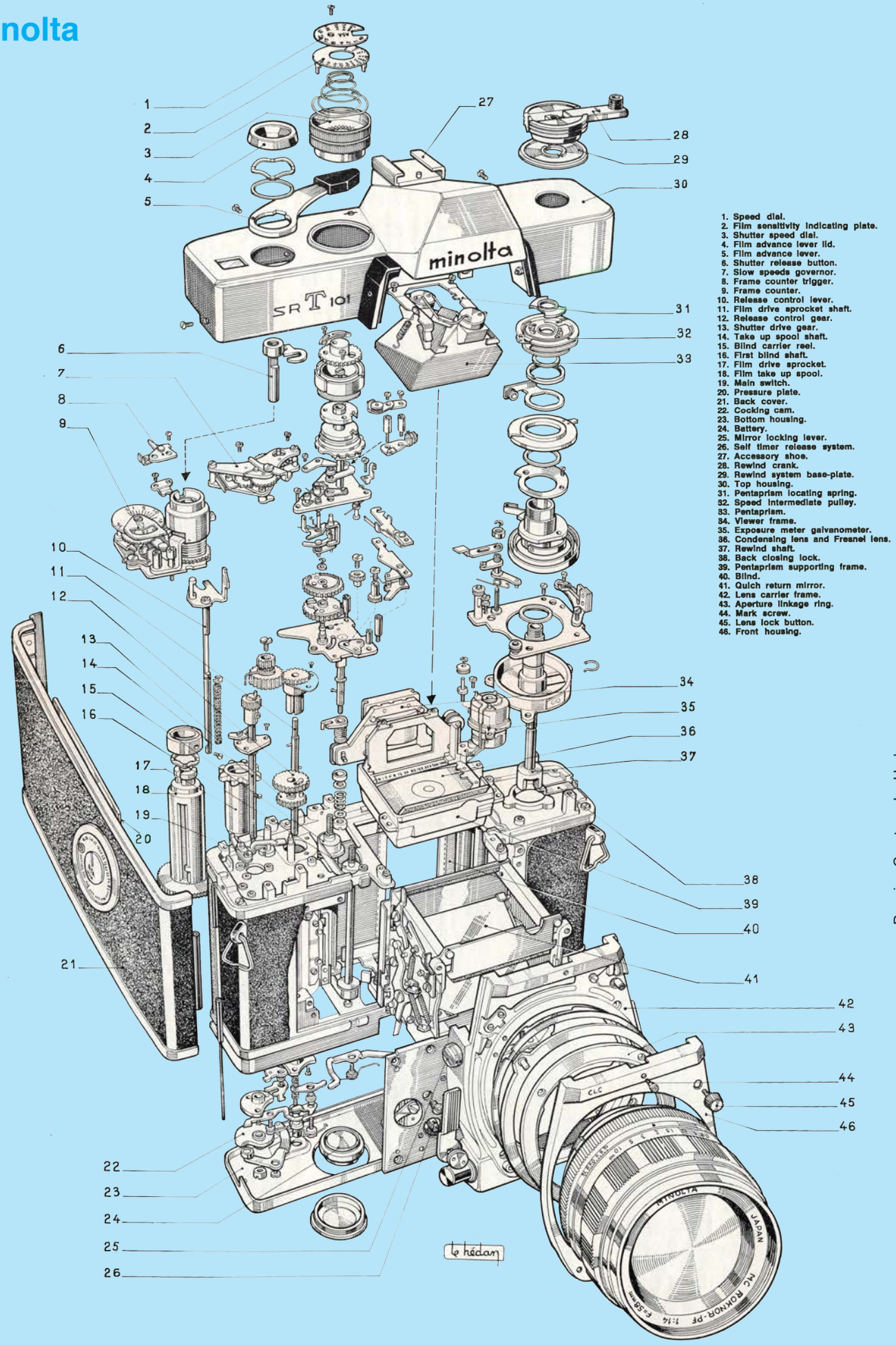
The Rollei SL35M camera is the SL706 with cosmetic redesign of body top shape and a planetary gear set in the film advance lever to shorten the advance stroke. Many of the parts in this camera were from the ZIV parts inventory Rollei bought, many of them marked with the ZIV logo. The shop manual for the Rollei SL35M is identical to the shop manual for the ZIV SL706, with only the first pages changed! The Rollei SL35M was followed by the SL35ME, with aperture priority auto exposure. It used a unique electrical trapped needle meter to automatically set the electronically timed shutter speed. The needle simply bridged two rows of contacts when trapped, varying the resistance in the timing circuit. Odd, but in practice it worked very well.

These two cameras were the first Rollei SLRs with plastic top and bottom plates. They used the Rollei QBM bayonet lens mount and took the second series of Zeiss and Rolleinar lenses for open aperture metering. Both of these cameras were also produced with different cosmetics as the Voigtlander VSL1 and VSL2. They all suffered from serious quality control problems in Singapore. I've had cameras new in the box from Rollei that did not work, new lenses with scratches on the front, etc. At one time Rollei USA was selling brand new nonfunctional cameras to their dealers for about $ 12 each. I bought several to cannibalize for parts and to build working cameras to sell. The Singapore factory complex was a total disaster for Rollei and pushed them into bankruptcy.

But there were two more 35mm SLRs from Rollei before the bankruptcy. The first was the SL35E, a compact SLR using a radically new metal bladed shutter unlike any seen before. Whether this was developed from a ZIV prototype or was wholly developed by Rollei, I was never able to learn. This camera, too, suffered from Singapore problems, but if you got a good one it was very good. I have one that I bought new and used for years with no problems. I also have the power winder and did have the motor drive but sold that. I also have one in Voigtlander garb, the VSL3E. That camera never worked, and never could have worked, because the drive spring for the second shutter curtain is missing! How in the world did that get past quality control??

There was one last 35mm SLR that Rollei developed from ZIV prototypes, and the only one to continue in production past the bankruptcy and restructuring, the SL2000F. This has to be one of the most unusual 35mm SLRs ever designed, and looks more like a medium format system camera. It has interchangeable film magazines, interchangeable battery packs, interchangeable viewfinders, etc. betraying its Contarex ancestry. I owned one of these along with several film magazines and accessories for years, and loved it. The only drawback was the viewfinder that used mirrors and was not as bright as a pentaprism viewfinder. But for fast action shooting it couldn't be beat. Finish one roll of film -- no need to rewind, just do a quick film magazine change and keep on going. Battery running low, just do a quick battery pack change. The SL2000F was replaced by the SL3000.series of cameras, but I never owned one of those, only handled them at trade shows. There was one camera prototype that Rollei did not get. A German projector maker named Weber outbid them for an auto exposure Contarex prototype. Weber showed the camera at Photokina several times, but as far as I was able to find out, they never put it into production.

Minolta



Drawing Courtesy, Le Hedan

Minolta SRT-101 offered entry level full aperture metering SLR with interchangeable lenses. Minolta SRT-101, and Canon FT-b competed in the 70's era.

Rollei SL35M

A good example was the SL 35 M, which was a slightly redesigned Zeiss Ikon SL 706. The repair manual was just a reprint of the Zeiss Ikon manual except for a couple pages! The planetary gears in the film advance lever hub were made of soft 'pot metal' and didn't hold up. They sent me beautifully machined brass replacement gears that solved that problem. Similarly, they replaced the main film advance gear in the Rollei 35, which was plastic, with a beautiful replacement in two pieces, half plastic, half brass. They cared about their customers, a very rare thing! I was very sorry when their overambitious Singapore venture bankrupted them.

I had the odd SL 2000 F modular 35 mm SLR, and really liked it. It was developed from a Zeiss Ikon prototype for a new Contarex. When Zeiss Ikon decided to shut down, Rollei bought everything except for one prototype that was bought by Weber, shown several times at Photokina, but never put into production. It was a beautiful 35 mm SLR, fully automatic exposure, with Contarex lens mount. I don't know why Weber never produced it. There was also a nice little interchangeable lens rangefinder that Rollei produced in Singapore. It offered three lenses. But it was never sold in the US. The only one I ever saw was purchased in Israel. I don't remember the model designation. I tried to buy it from the man who had it, but he wouldn't sell. You should get a Rollei SL 35 ME just to see how they implemented the auto exposure. It used a trapped needle like the Konica Autoreflex, but the trapped needle completed a circuit that varied the resistance and controlled the electronically timed shutter. It was developed from a Zeiss Ikon Ikoflex design that never made it to production. So far as I know, no other camera used that system of shutter timing.

Rollei SL6006

This was called the SL6006, and proved to be a reliable workhorse of a camera. I owned one and several lenses and used this outfit for almost ten years. I bought the pistol grip which mounts on the bottom of the camera and connects by a cable to a port on the right side of the camera. I wanted a remote release but didn't want to pay the asking price, so I built my own from Radio Shack parts. The plug and socket Rollei used are standard DIN parts, easily available, and I only had to figure out which pin did what, which was easy with a multimeter. The shutter release is a two-stage operation, first activating the light meter and stopping down the lens, after which additional pressure fires the camera.

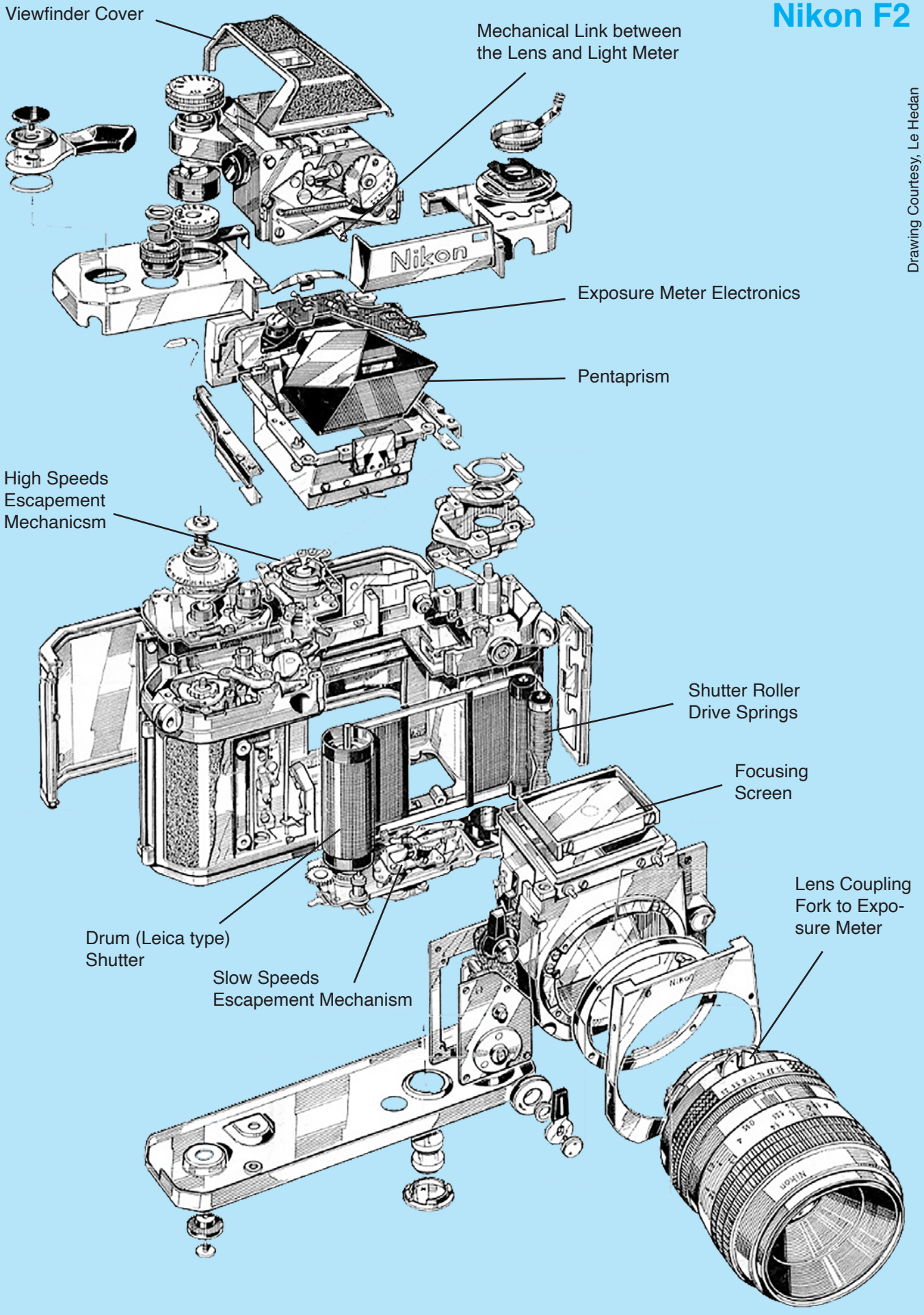
I should have said earlier that the SLX offered shutter priority automatic exposure via a quick stop down operation. When you fire the camera the lens diaphragm quickly begins closing and stops at the proper aperture selected by the metering system, then the mirror flips up, the shutter fires, and the mirror flips back down and the shutter reopens. All this happens very quickly. The SL6006 works the same way. Both the SLX and SL6006 and later 6000 series cameras offered TTL flash control with some Metz flash units.

Where the SLX featured preloadable film inserts, the SL6006 offered fully interchangeable film magazines that accepted the same inserts, with roller blind dark slides that stayed in the magazine, and were opened and closed by a sliding bar on the back of the magazine. There was an ISO dial on the magazine, but it was only a reminder and you had to actually set the ISO on the camera body. In time the SL6006 was replaced by the SL6008, which used a new type of film magazine that automatically transferred the ISO to the camera body. There were several different versions of the SL6008 offering aperture priority auto exposure in addition to the shutter priority system of the SLX and SL6006. The SL6008 integral system featured a new series of lenses with leaf shutters with carbon fiber blades capable of 1/1000 second exposures.

One of these lenses that I had was the 80mm f/2.0 made by Schneider-Kreuznach for Rollei. They also made a spectacular 180mm f/2.8 that I loved. Last in the series that started with the SLX was the SL6008 Autofocus, one of the few medium format cameras with autufocus capability. I tested this camera for Shutterbug and really liked it, but it was too expensive for me, since I would have had to buy new autofocus lenses as well as the camera. In spite of being really good, this camera didn't sell well, and was the end of the line for Rollei's medium format cameras. Rollei and Sinar developed a camera that was more compact than the SL6000 series, showed it at major trade shows, and took orders. If you made a prepaid order they gave you a SL6008i to use until the new camera became available, but I don't think it was ever produced. It would have been specifically designed for digital backs sold by Sinar. Rollei seems to be completely gone now, which I consider a terrible shame.

One thing which really impressed me about Rollei was their integrity and dedication to owners of their products. As an example, when the SL35M first came out the planetary gear set in the film advance lever was made of "pot metal". When

Nikon F2



Drawing Courtesy, Le Hedan

Nikon F2 housed its exposure meter electronics inside its interchangeable viewfinders to avoid near future obsolescence. A coupling fork externally transfers the aperture setting to the links inside the viewfinder for full aperture metering.

people began stripping these gears, Rollei sent every authorized repairman a kit of brass replacement parts, and told us to install them in every SL35M that came in, regardless of whether the gears were stripped or not. They did the same when a problem showed up on some cameras with the flash contacts. When some owners stripped out the film advance gear on the little Rollei 35 cameras, we got brass gears to replace the plastic ones, even though most owners used their cameras for many years without problems. They sent us a totally redesigned flash contact module for SL66 cameras years after those cameras came out because a few people had problems with the flash synch., and there were more examples of this philosophy. A shame that philosophy didn't carry over to Singapore.

Contarex Super Electronic, Zeiss Hologon

I had a Contarex Super Electronic with both of the Zeiss zoom lenses and the 85mm f/1.4 T* Sonnar. Very few of those were made with the T* multi coating right before Zeiss-Icon went out of the camera business in the early 70s. I was a dealer then and picked up some things I knew would be collector's items years later, like the Hologon camera. I had an early Contax rangefinder camera with the winding knob on the front instead of the top. Zeiss collector Mead Kibbey said it had the lowest serial number he'd ever encountered.

Rollei 35, and Edixa

I had several different Rollei 35 models. (Did you know that camera was created by a man who worked for Dr. Wirgin, who made the Edixa cameras. Wirgin didn't want to make it so the inventor took it to Rollei, who made it and sold many thousands. I have a book that tells the whole story, with photos and engineering drawings of the camera, prototypes, some of which were never produced, like the model with coupled rangefinder.)

Zeiss 300 mm f/2.8 Tele-Apotessar

One of my favorite lenses that I had to sell was my 300 mm f/2.8 Zeiss Tele-Apotessar, a very rare German made lens. I got something like $ 8,000 for it from a collector in Japan.

Bauser Rergula Reflex CTL 2000, Combat Graphic 6x9 Rangefinder

I had a rare German-made King and Bauser Regula Reflex CTL 2000 (Mine with the Pentax/Praktica thread mount. I was never able to track down one of them with Nikon mount, although the factory says a few were made. You would have liked the unusual shutter design that preformed the shutter slit and had separate timing cams for each shutter curtain. I also had a Combat Graphic, a 6 X 9 motorized rangefinder camera that looks like a giant Contax I.

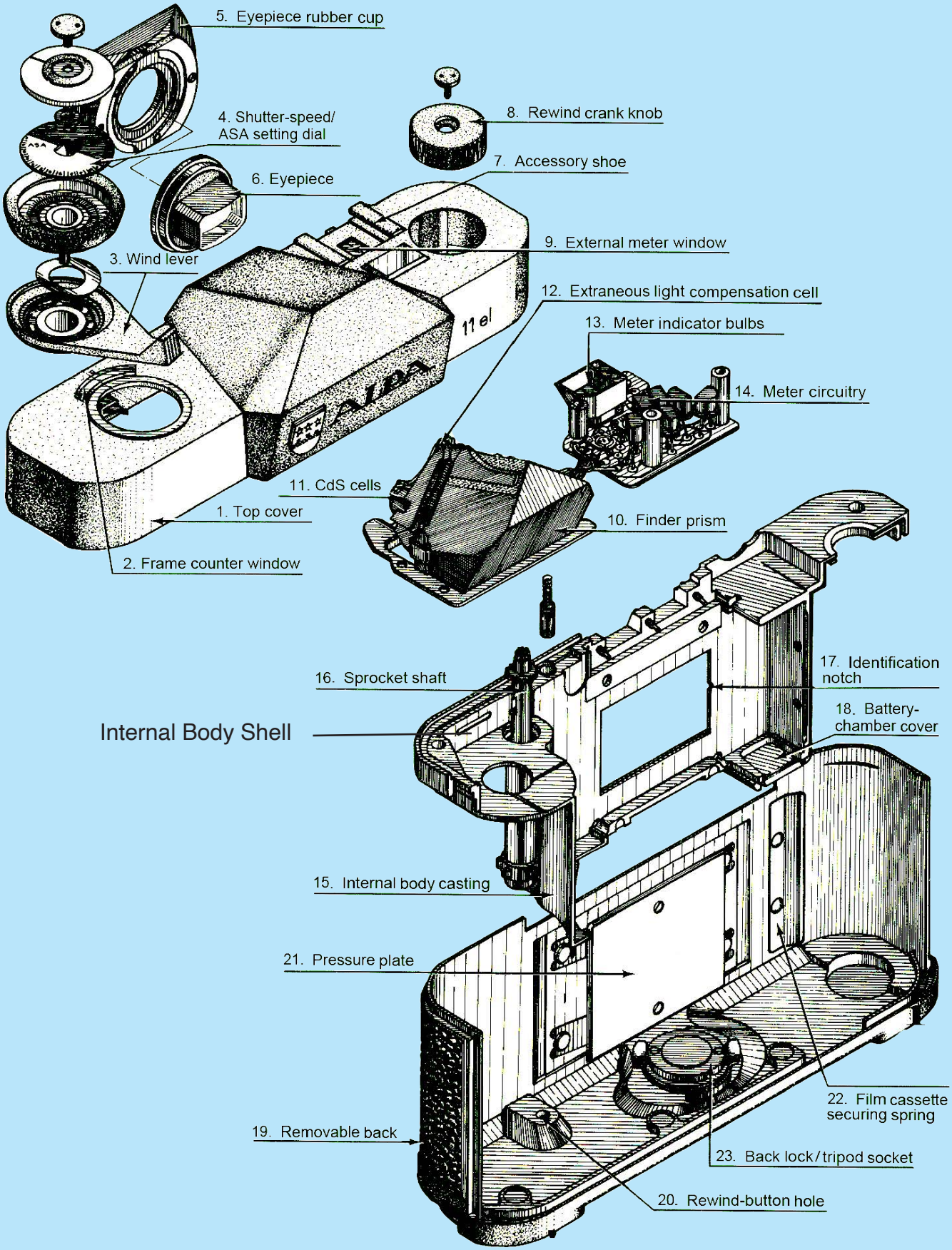
Konica Hexar RF, Yashica Samurai

I had a Konica Hexar RF with all three lenses. (Did you know that Konica wanted Leica to sell that camera with Leica's name on it? True. I was at Photokina standing by the Leica stand when the red-faced Konica people came rushing out after Leica said "NO!". They were very upset because they had lost face in front of the Leica designers who were not impressed with their camera.)

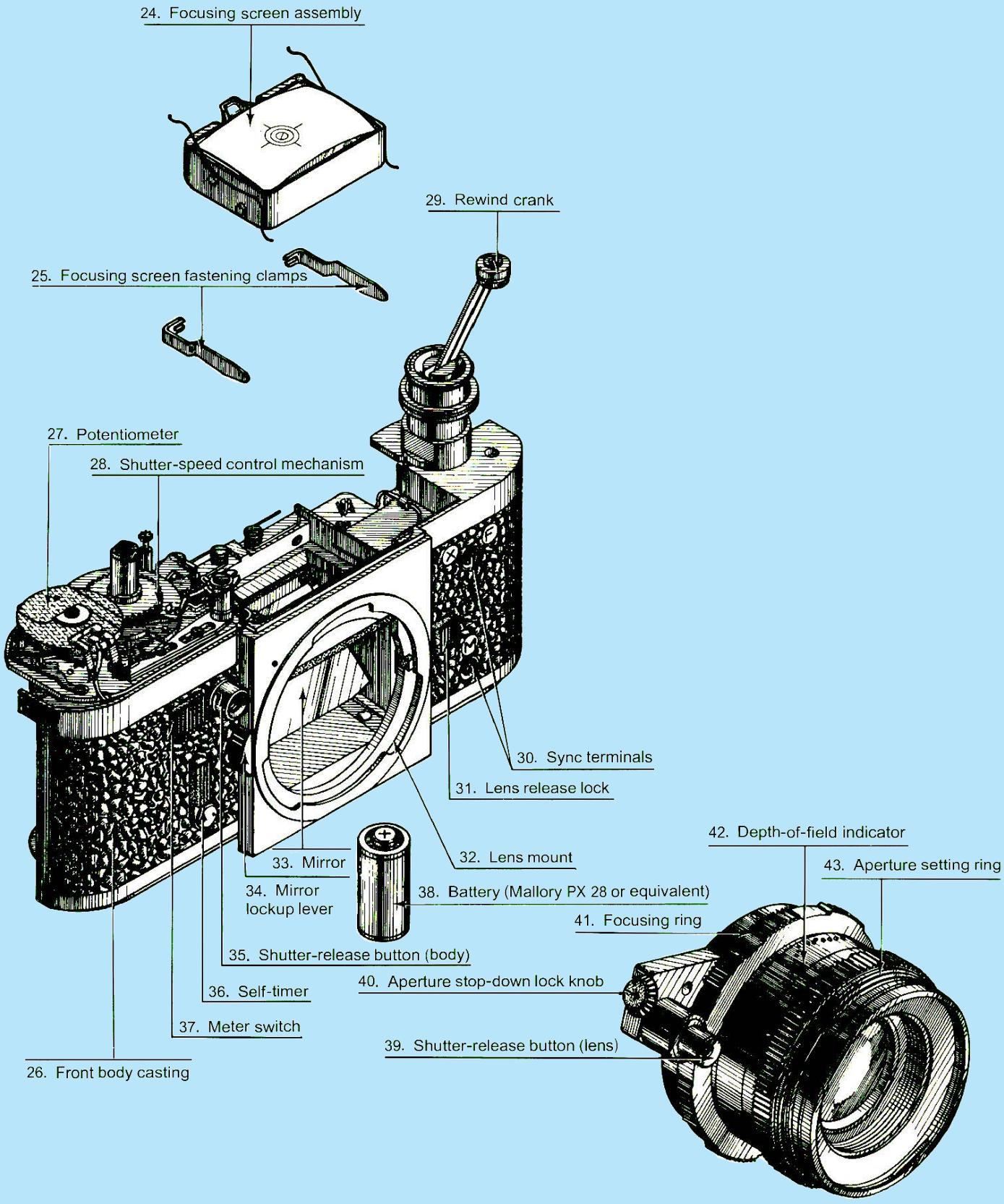
I had a Yashica Samurai half frame camera, a transparent display model showing all the internal workings. Everything worked on it, but you could not take pictures with it because it was transparent.

Almaz

Similarly, I kept my Soviet cameras because they were hard to get. The nicest is the Almaz (Diamond in Russian) made to be a professional SLR by the Leningrad Optical-Mechanical Works (LOMO). It's s very strange beast with a body styled after Minolta's pro camera, a Pentax bayonet lens mount, a shutter copied after the Copal Square shutter, and a prism housing styled like a Nikon F2. It is very well made with coupling for a motor drive that may never have been produced. It has interchangeable focusing screens (I have two different ones), but no light meter. But the camera has a serious mechanical design flaw. If you set the self-timer without first cocking the shutter the camera jams and must be disassembled to unjam. For this reason, many of them have had the self-timer lever taken off.

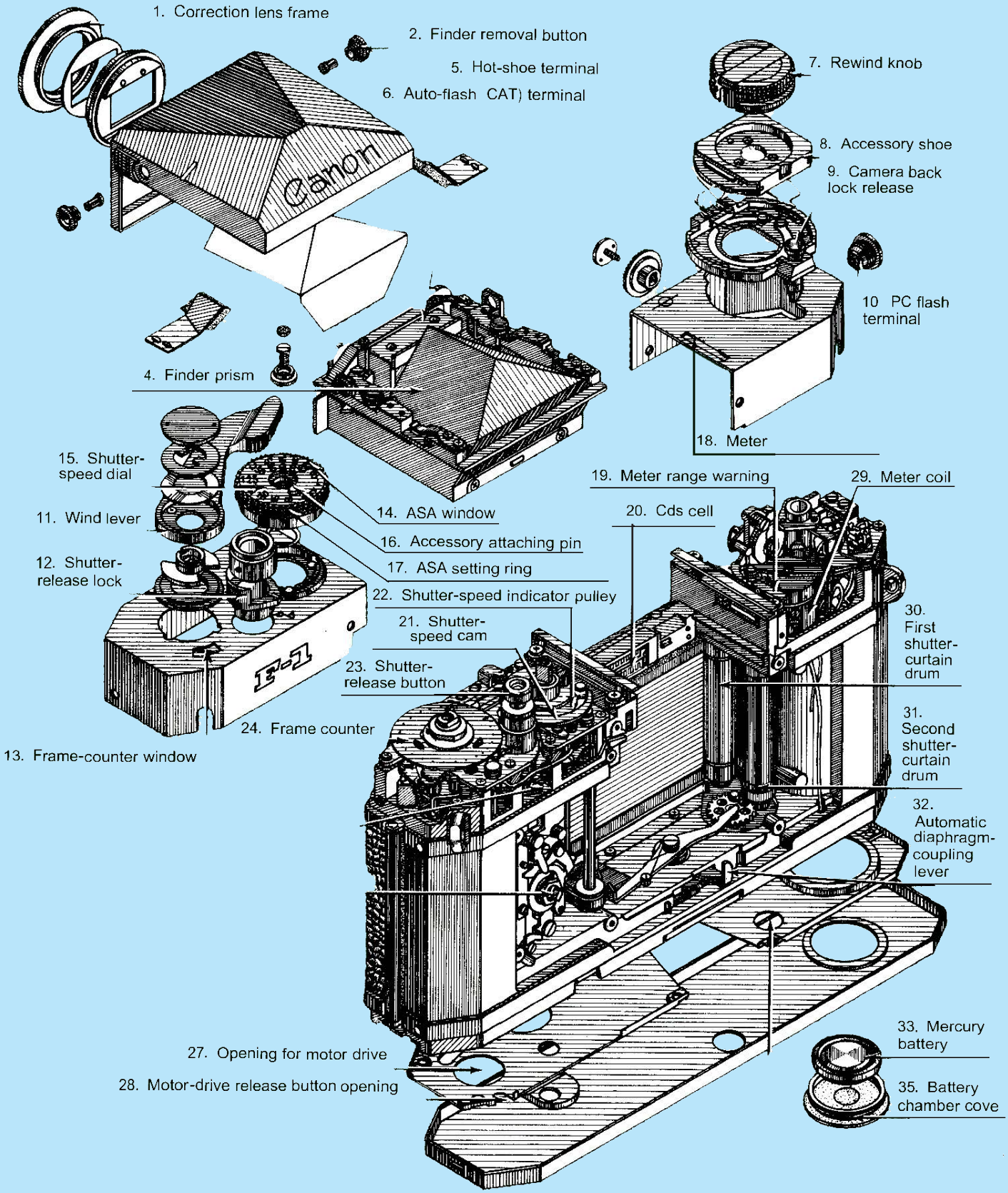


Alpa 11 el camera was constructed from all diecast subassemblies, including the top cover (1), back cover (19), and the lens mount. In this design, the film transport mechanism, the mirror housing, and the shutter are all built inside a single assembly, covered by an internal body shell (above). With this unique approach, both Leica, and Alpa offered rigidity that was unprecedented in 35 mm cameras. The Japanese approach was a diecast body with pressed top, and bottom



Drawing Courtesy, Tetsuo Koyama for Modern Photography

covers. The drawback was the European cameras were difficult to assemble, and repair while the Japanese were more modular. The Alpa, and Leica design were therefore much more expensive to build. The Japanese mentality was to reduce cost, and they eventually excelled in taking over the market. So, the low-cost manufacturing originally began by the Japanese, but as they kept increasing their quality, they became more like the Europeans, losing the market to the Chinese (i.e., in the LED market).

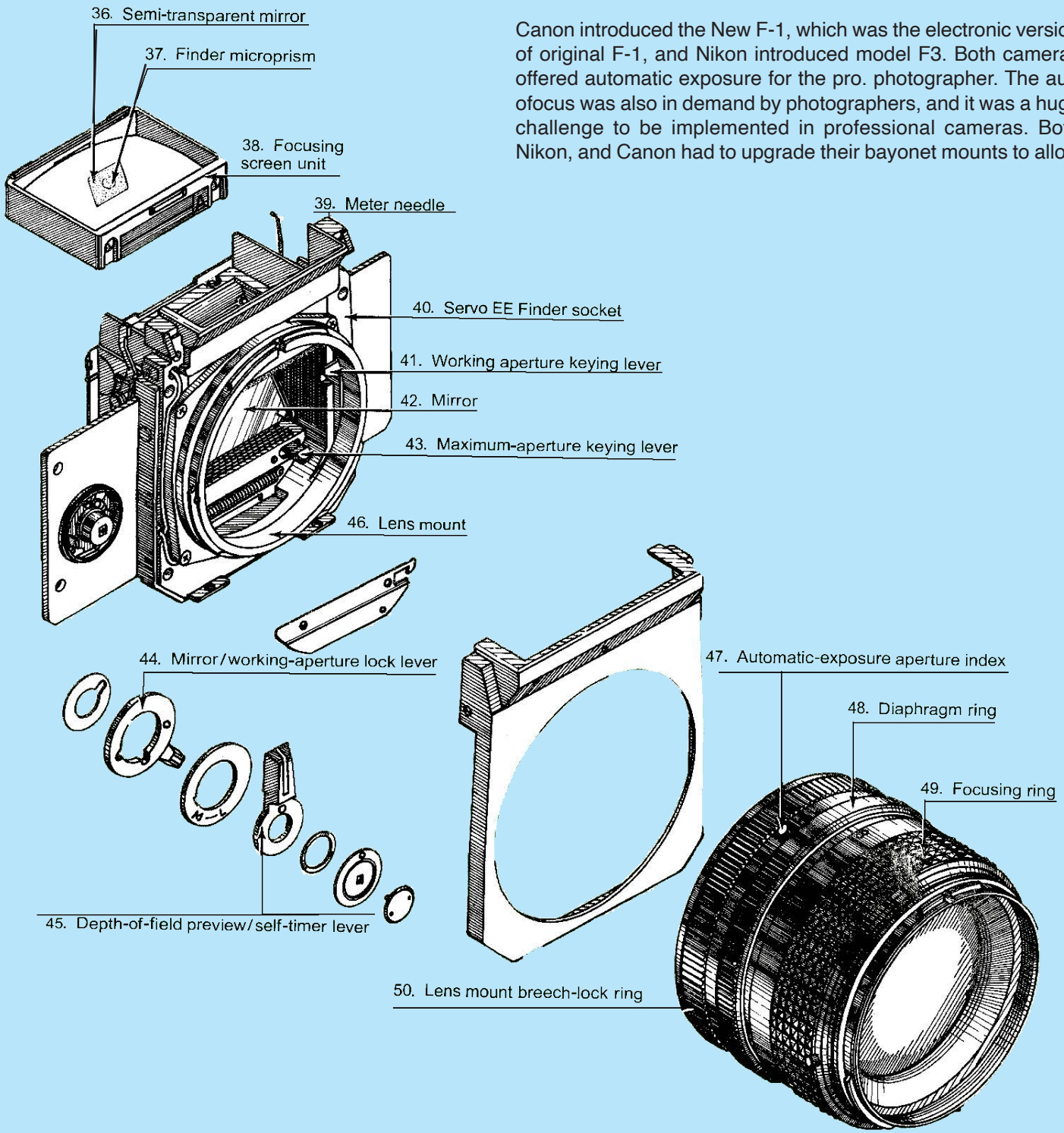


Canon F1 was introduced in 1970, with interchangeable finders, focusing screens, film backs, lenses, motor drives, and metering heads, and flash units. Canon design team led by M. Kakunodate, promised no change for the next 20 years. The light meter in Canon FD cameras utilized a slanted semi silvered mirror at the middle of their focusing screen (36), diverting the light to a CDS cell (20), to drive a galvo (29) that was visible through the viewfinder. While Canon was designed with a built-in light meter (19, 29), Nikon built the light meter inside their interchangeable finders (P24). Nikon feared the electronics field would advance in the next 10-20 years, and they could prepare for it by making the light

Canon F1

meter upgradable. Both designs survived the test of time but then, the unexpected happened: The metering in these cameras relied on constant 1.35 v output of PX625 Mercury batteries which were abandoned because of pollution laws. Using equivalent size Alkaline batteries produced wrong exposure reading, and since neither of the cameras had voltage regulation circuits, the meter in these cameras became obsolete.

Canon introduced the New F-1, which was the electronic version of original F-1, and Nikon introduced model F3. Both cameras offered automatic exposure for the pro. photographer. The autofocus was also in demand by photographers, and it was a huge challenge to be implemented in professional cameras. Both Nikon, and Canon had to upgrade their bayonet mounts to allow



Drawing Courtesy, Tetsuo Koyama for Modern Photography

electronics contacts between the camera, and the lens.

Nikon's vision in placing the light meter inside the viewfinder, passed over to their first autofocus SLR, so they housed the autofocus module inside the viewfinder of their next generation model F3. The design also needed new autofocus lenses, and they only worked with modified F3 models. On the next issue, we'll talk more about the lessons learned in optomechanics.

Seagull DF-1, Great Wall DF-1

I also have some Chinese cameras from the 1980s. Seagull DF-1, a copy of a Minolta SR-1. Peafowl DF-1, was quite similar but from a different factory, and one of only two Seagull DF-1 ETM cameras ever taken out of China. It uses full aperture metering via a follower on the aperture ring, similar in concept to Minolta but not compatible, with LEDs to indicate over, under, and correct exposure. Of course, I also have a Great Wall DF-1, a medium format SLR with, of all things, Leica thread mount for the lenses. I also have the hand grip and extension tube set for it. I got all of these Chinese cameras direct from China in the early 80s, by way of Zhing-zhi Kwan, a friend who owned Chinese restaurants in California.

Seagul Medium Format TLR

I was hoping to import and sell some of these, but the ex-factory prices were too high. I did import the Seagull medium format TLRs for a couple of years but quit because delivery was too slow and there was no quality control. In a shipment of 100 cameras, maybe 75 could be sold without repairs. The Haiou shutter was the weak point. A copy of an old Compur but made from inferior materials.

Contax RX

I switched to the Contax with focus indicator, was that the RX. Anyway I then added the AX for Autofocus with my existing lenses. Very unusual design, like one camera inside another. Also very delicate. I had to open mine up and unjam the AF system after a bump.

Contax Autofocus Rangefinder, Contax 645

I also had the Contax autofocus "rangefinder" camera with all of the lenses (even the Hologon!), but sold all my Contax gear when my lawyers kept demanding more and more money. I never paid a penny for my Contax cameras, they were all given to me in payment for writing the text of their website. I was really upset when Kyocera killed the product line as I was just starting the text for the Contax 645, and wanted one of those. Kyocera's decision took Zeiss totally by surprise, and still makes no sense to me today. The Contax division was showing a profit, as was Yashica. The shutdown put a lot of good people out of work. I got to borrow a Contax 645 for a couple of months, with three lenses. It was an amazing camera, very advanced. I kept hoping some other company would buy Kyocera's photo assets and put it back into production.

Goliani Canon Prototypes

For my Canon Compendium book, I had access to Canon's prototype collection, and included photos of all the original Colani designs that were never made, including one medium format design with LCD viewfinder. Lots of really nice cameras that were never built.

Leica Visit

I had a mint early double stroke Leica M3 with the 50mm f/2 and original reversible lens hood (designed by my friend Bob Schwalberg when he worked for Leica.) I also had an original model Leicaflex (P 18). When I visited Leica in Germany, I got to see their prototype collection, including the original M design that still had thread mount. It would be great if you could get photos of those cameras for your book. Leica would probably give photos of them to you if you explained your project to them. They paid for my trip when I went there.

Walter Zap

Walter Zap inventor of Minox

Walter Zapp was still alive when I went there. Leica had just bought Minox, and I talked with him about the future of Minox. Unfortunately, Leica has reduced it to no more than a brand name slapped on Asian goods. One day I was visiting Leica at their display at Photo+ in NYC and one of the young Leica staff handed me a small package. "Walter said to hand this to you," he said. I opened it and found a Minox pocket telescope, a handy little device he'd shown me in Germany, and which I admired very much. It was made in Wetzlar, not the far east. It's waiting at home for my release. I also have one of the little Minox film cameras and a Japanese Acmel that uses the same 9.5mm film. I wonder if they even make film for those anymore.

Next Installment: Progress in Camera Design, and its progress towards digital age

Instrument design implemented with New Optoform II

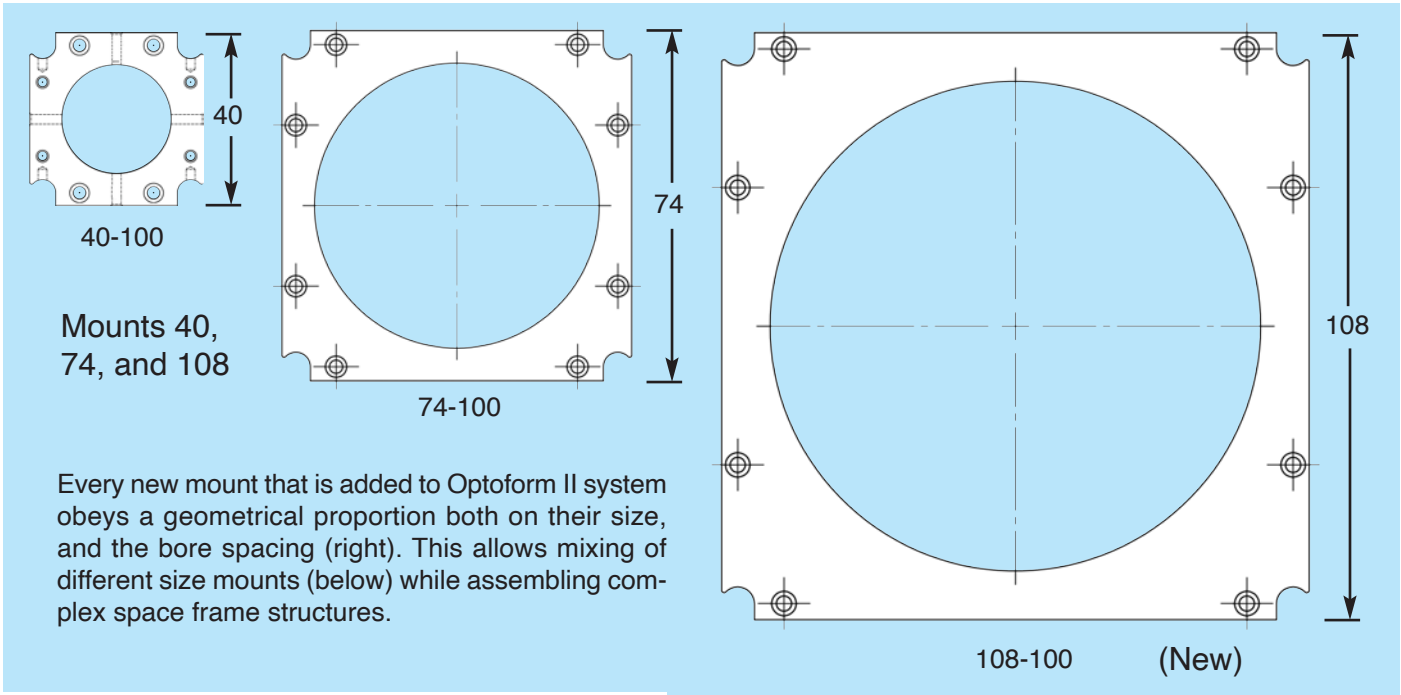
By Ali Afshari

In past issues we covered the basics of constructing a biological microscope with new Optoform 40, and 74. The dimensional size of Optoform 40 is to match with Microbench mounts, and Thorlabs' cage system to simplify its combination. Larger mounts like Optoform 74 follow a geometrical scheme to allow maximum compatibility between the mounts. So in its early days, the basic concept was developed to allow three dimensional beam paths, but it grew both in size, and number of parts to allow construction of 3D structures like microscopes, and various Opto-mecha-tronics instrumentation. Larger mounts like 108, 142, and 278 are designed primarily for biomed applications, where larger platforms are needed to construct their housing. The standard thickness of all mounts are 6 mm, and so are their diameter of support rods.

Let's build something new, that's not available out there. If we claim Optoform II is a modular system level tool, let's not bore ourselves with components. If you'd like to see exploded views of Optoform assemblies, please refer to past issues. In this issue, we'll be utilizing modules to build system level designs. You have seen enough exploded views in this issue. We'll provide you with more exploded views of each instrument on the next instalment.

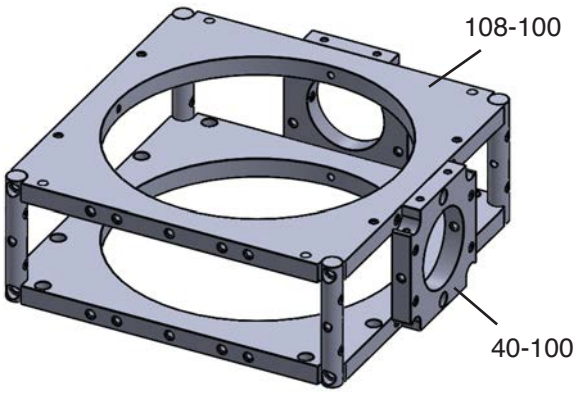
Ok let's get started. Our first instrument we are going to build is a modern microscope with a very popular L-platform. In opto-mecha-tronics design, and its user interface, esthetics are important. Otherwise, microscope manufacturers would give you a 60 year-old microscope housing, with a spaghetti of wires just to be functional. Of course not. They pay many independent designers to come up with modern sculpture for microscopes with state of the art LCD panel user interface. One of the new elements in microscopy is motorized stages, capture cameras, and LCD monitors. All these elements could be easily implemented with Optoform.

By the way, in many cases, you'd find classical Optoform to be useful. One example is the inverted microscope where the illumination housing would be best implemented in circular form, utilizing Optoform's circular mounts (page 33). The rail system would be useful in allowing the illumination housing to translate up and down for i.e., phase contrast microscopy. Instead of being stuck with one system, you could always mix various systems together. Optoform II is entirely metric, with metric screws, and metric rods. Every assembly built with Optoform II can be disassembled using a 2 mm ball driver, except the inner optics that are secured in place via a 1.27 mm Allen driver.



Mounts 40, 74, and 108

Every new mount that is added to Optoform II system obeys a geometrical proportion both on their size, and the bore spacing (right). This allows mixing of different size mounts (below) while assembling complex space frame structures.



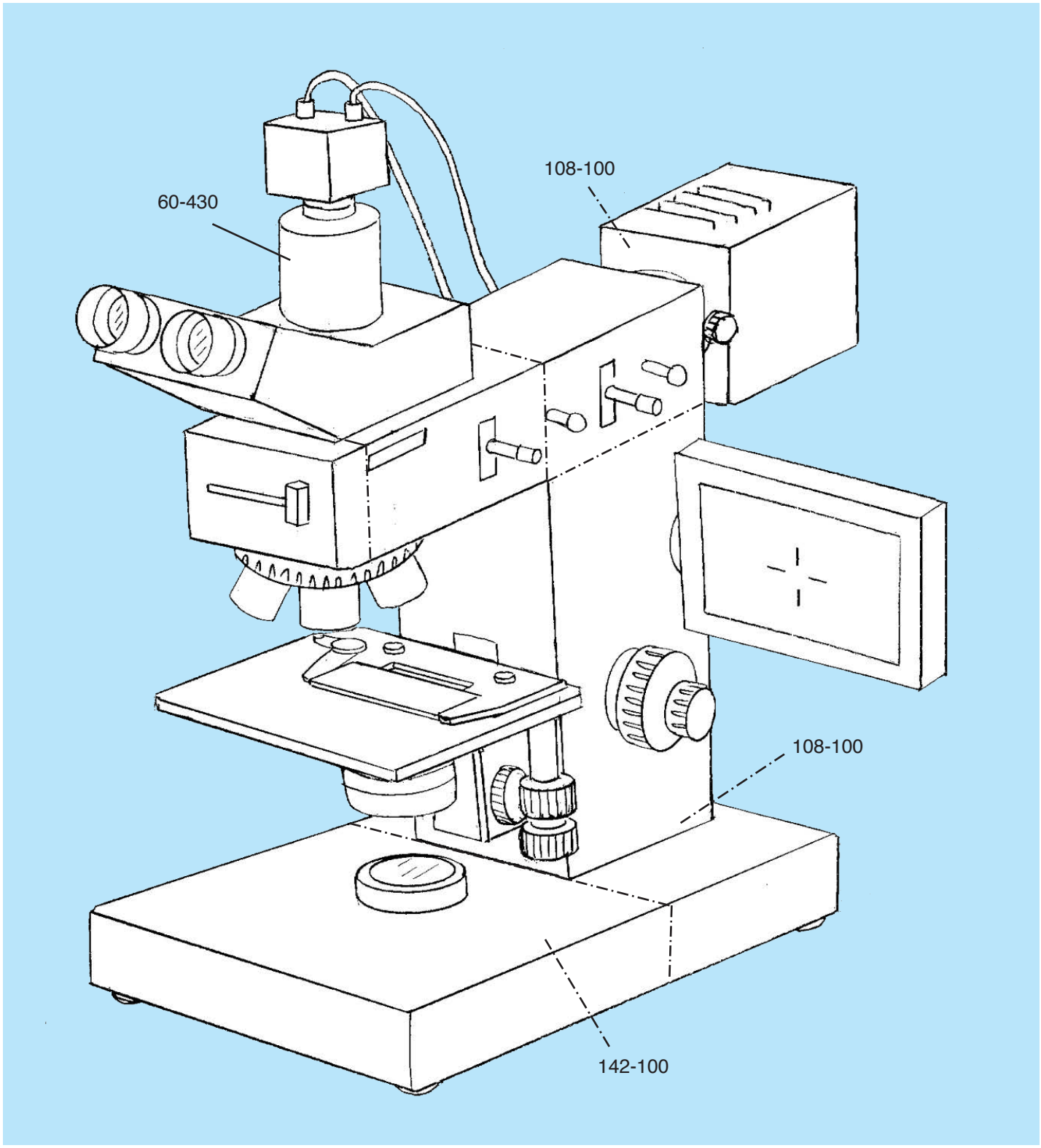
Raiser platforms

The simplest form of a module is a cube. Here, a 104x104 mm platform is created using the male/female 108-100/104 mounts. Thin metal sheet covering reinforces the assembly while keeping weight extremely low. Mounts can be mixed by lining up the mounting bores on the face of the mounts, with the tapped bores on the sides, or along support rods.

The L-shaped upright microsocpe

This is the biological microscope's iconic shape. We could stitch together off the shelf mounts to construct this assembly. Historically speaking, the opto-mechanical designers at Leitz formed the lower portion of this design, consisting the focusing unit, and the sample stage, while the upper part consisting of the illumination optics is a typical Olympus design. This is how the design emerged but there were many earlier name brands that contributed to this design. Since we would like to pick the right aesthetics, Leitz, and Olympus would be among the best options.

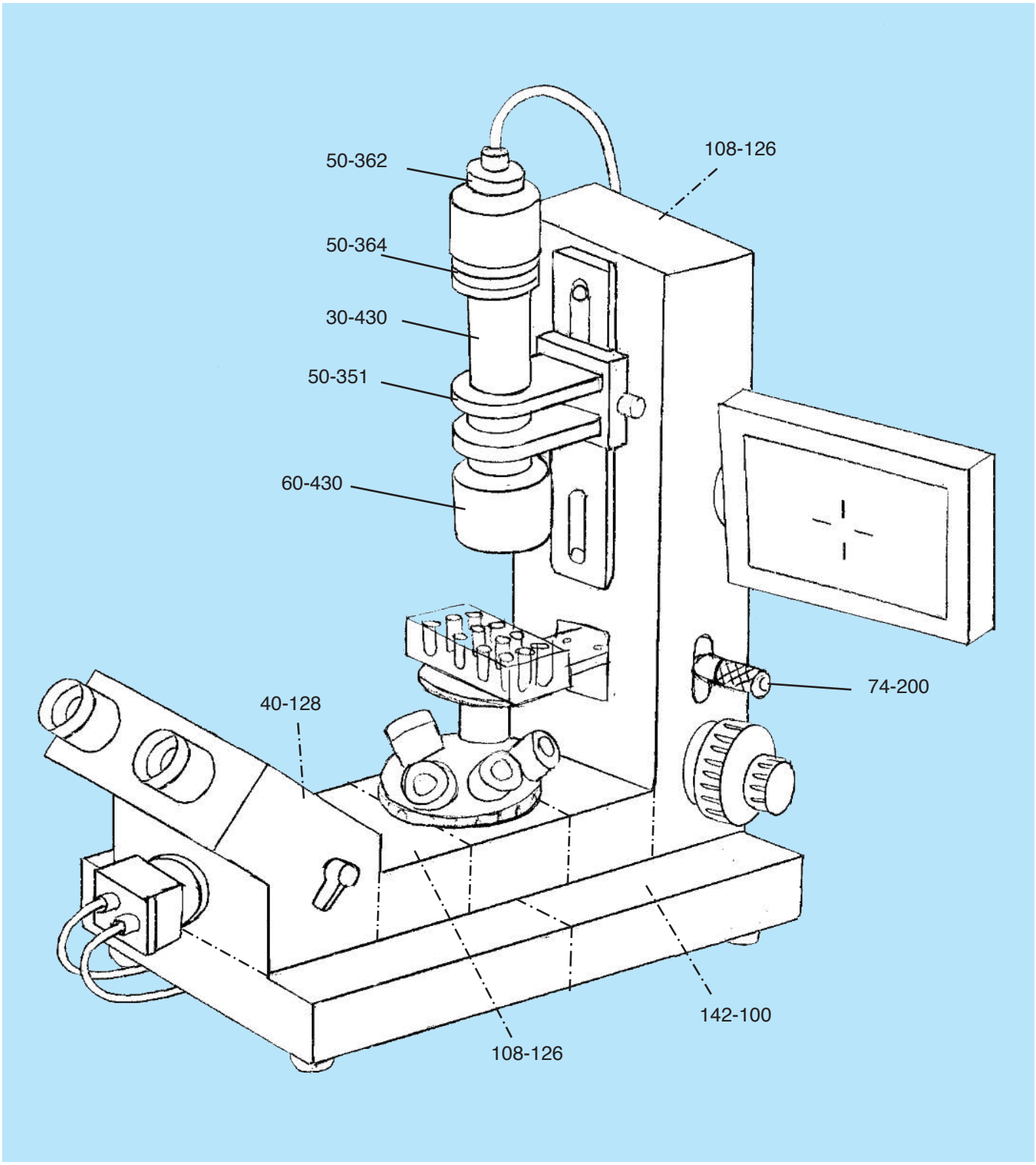
The interactive display could be installed anywhere, in this case, mounted on the right side of the support column. With Optoform II, the support column is a hollow standoff column covered by thin sheet metal covering.



The U-Shaped inverted microsocpe

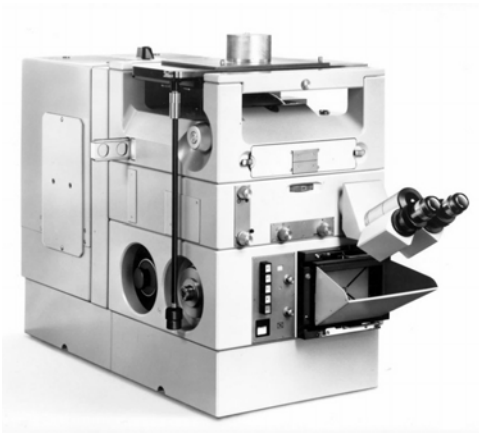
For inverted microscopy, there hasn't been an attractive choice among the vintage designs. We see so much improvement in the modern age on its aesthetics. Zeiss for example, has been a great contributor to sculpture beautiful forms for inverted microscopes. Well, for our setup, we could utilize a compact optical rail to focus the beam from the light source onto the sample. We could then insert various filters, and collimating optics for image improvement.

The location of the CCD camera, and the beam path switching arm are placed around the binocular head, and the LCD panel in this case is placed at the right side of the illumination column.

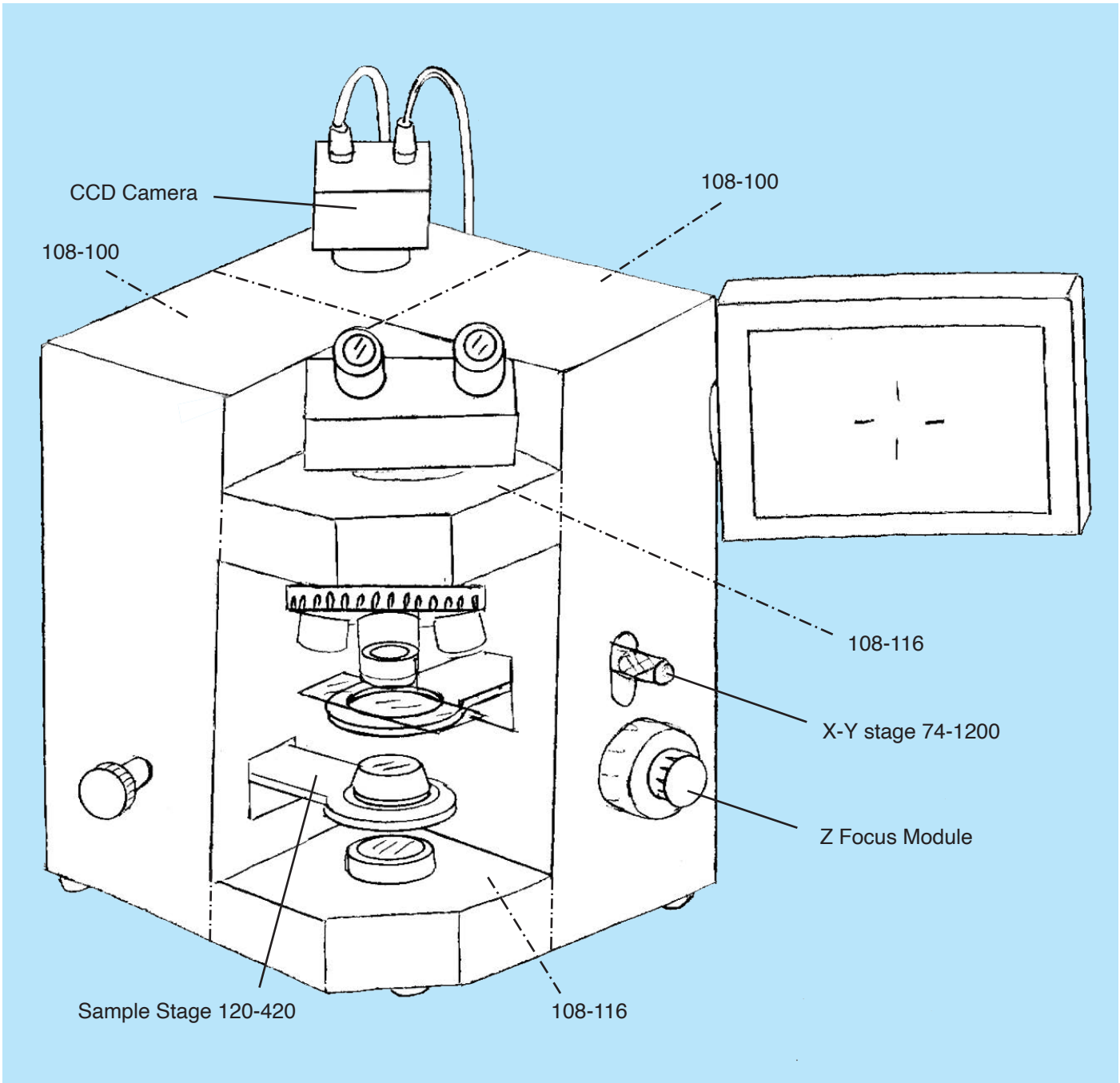


The Corner Microsocpe

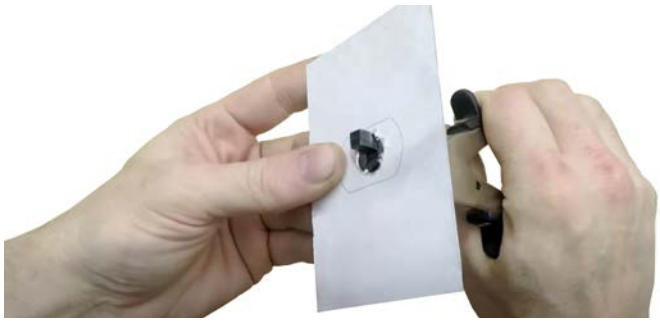
The corner microscope was first introduced by Carl Zeiss in 1973, called Axiomat (right). It consisted of stackable modules that clamped on top of each other to form its cubic form. Although the design presented in this page is not a replication of the Aximat, Optoform II is the only system that could replicate this microscope. The projection glass below the viewfinder is replaced with LCD displays in modern microscopes.



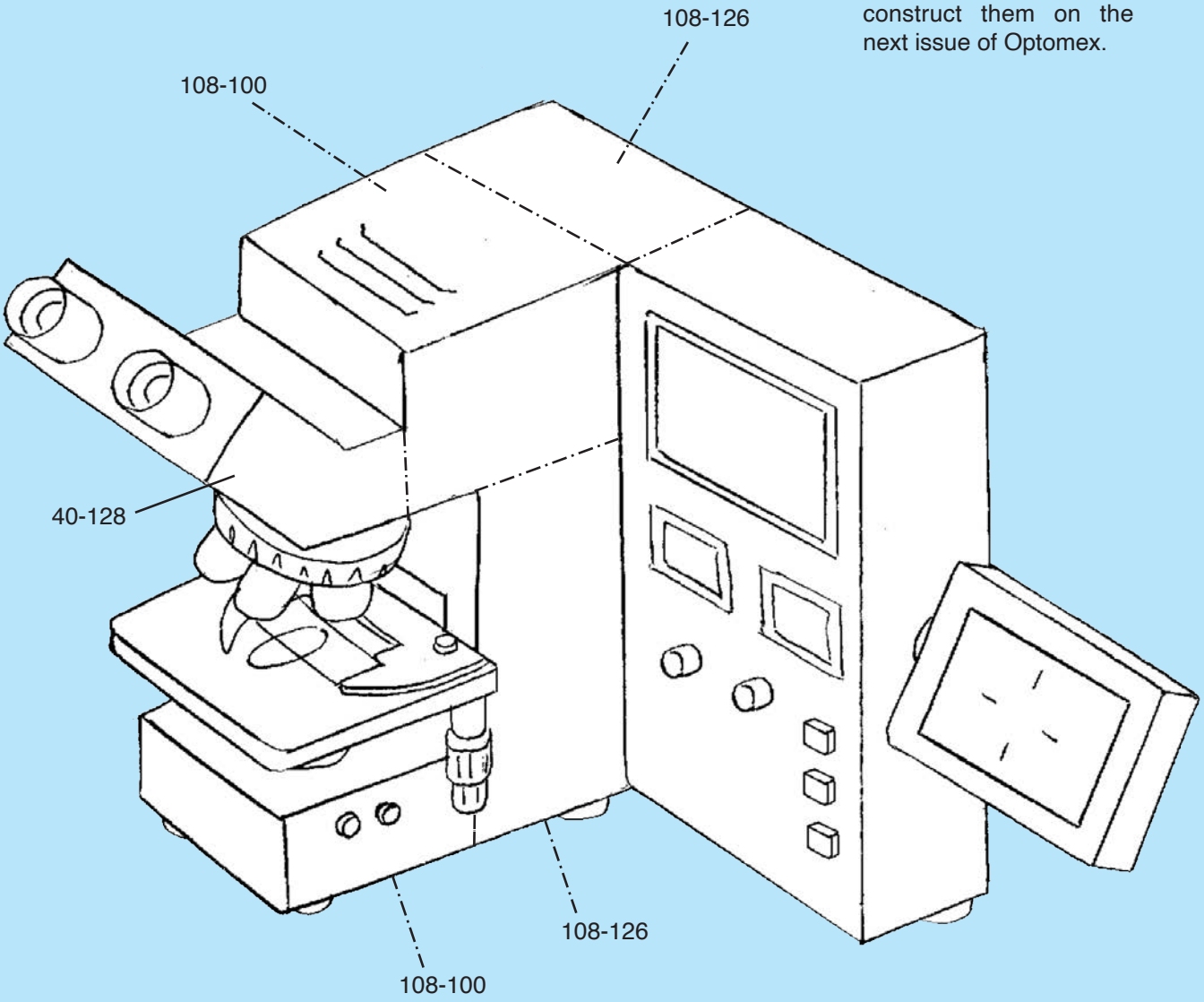
To build this microscope, three columns constructed with 108-100 are side connected to form its L-shaped housing (below). The optical axis of the binocular head, the sample stage, and the condenser reside outside of the L-Shaped housing while the Z focus module, and the X-Y stage both hidden inside the columns. Refer to past issues for how columns are constructed. The CCD camera could easily be embedded inside the housing (opposite page). It is only placed on the outside for interchangeability.



Our last microscope has a side panel to house its electronics board, touch control LCD panel, with push button controls. Right, you could use nibbling tool to create rectangular, and odd shaped holes on thin sheet metal panels covering Opto-form assemblies.



Try to guess the internals of each instrument. We'll construct them on the next issue of Optomex.



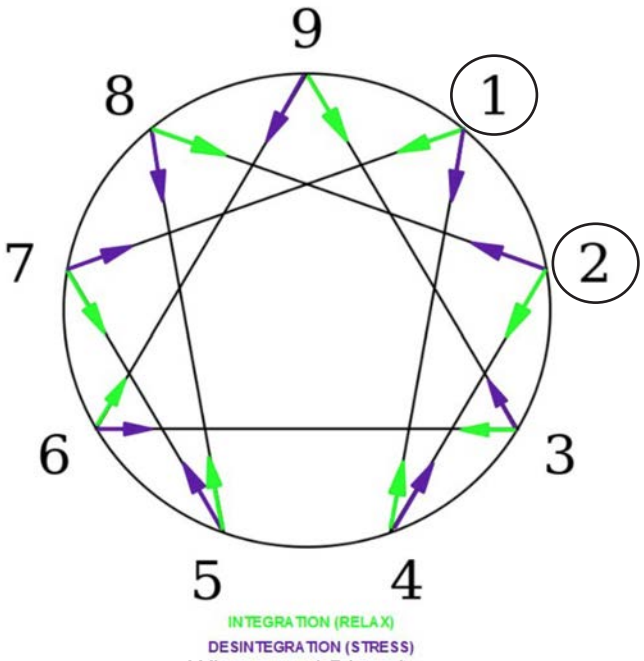
Psychology of Achievement: Why concur the peak?

By Ali Afshari

In the past issues, we studied Enneagram to help us see beyond what we would see through our eyes. The greatest sign of being type 1 is perfectionism. If you habitually correct the position of objects on top of your desk or the silverware on a table while waiting for the waiter to bring the food, or if you constantly criticize your loved one, you are likely a type 1.

So, what could type 1 (performer) do to escape his perfectionism? Take steps to type 7 (enthusiast), like not working all the time, or going to a trip. Chances are, you are only using the left side of your brain. Take steps to type 4 (artist), by taking lessons in one of the arts, like learning to play the piano, or learning to paint.

If you are constantly serving others, and lack self-confidence you are probably type 2 (helper). Take steps towards type 8 (challenger), by learning to say no. You could also take steps towards type 4, by learning an art form so you could make money with. This would help you to become financially independent, and become less dependent on others.



Wings, and Directions

We could also have wings, such as a type 1 being like type 2, or type 9 (peace maker). Many times, people copy their parents as role models, and don't realize they are doing it. Once you learn the Enneagram chart (right), you could also learn to observe the manipulations by type 3's. Their most common tactic is diversion. If type 3 (achiever) owes you money, and knows you are a devoted Christian, he might play you by saying: "I just loved the last sermon at our church. I learned my true purpose in life"! His objective is you'd forget about what he owes you, and have you talk about religion. You'd get the picture after he's gone, but you had felt so happy about yourself during his entire visit.

These are some of the strategies we should be aware of to have a happier life without being eaten alive by sharks. When it comes to life in General, I highly recommend writing a diary, so we would know who we are, and what we really wish to peruse in life. There's a great Asian story comparing life to a traveler wishing to reach a mountain peak. Many travelers would ask those coming back from the peak to hear their experience, and may decide not to try it on their own.

Others who do wish to go to the peak, might change their mind in so many other ways. One common noise in our mind is while going to the peak, we stop at a restaurant, and see beautiful waitresses there. Some would feel a strong desire to stay there, and forget about continuing the path. Eventually, we would leave with a full belly, but for the rest of the road, still think about our desires that aren't being fulfilled. There is still another resort on our path called: "Sadness". We'd accidentally wear someone else's shoes that are actually roller blades, and we'd ride a slippery road back to the bottom. It could take a while to see what really happened, and some people would blame it on the shoes, and others would blame themselves for not being more careful. At any rate, after those wounds are healed, there are more impediments to delay reaching to the mountain peak called: "It's already done, and it's no use", or it's the opposite in the movie: "The Truman Show". He wished to be a world traveler to discover new lands, but he's told: "You're too late, it's already done".

The thing most people forget is the real purpose of reaching the peak is we'll gain a clear picture of our life's purpose. It's only there that we'd be able to see for the first time that the road doesn't end there, and there are more peaks to explore. The most important barrier is our mind, and it's because we confuse ourselves with that side of us who wishes to stay at the restaurant, or who wants to remain at the sadness resort, or uselessness. It is only at the peak that we would realize everything we experienced had nothing to do with who we really are. So, there are people who get to the peak and gain a clear mind, and those who stay at the bottom lacking true self-realization.

Sometimes, we get to the peak alone, and it doesn't feel right. The truth is we all need a partner in life to get to the peak. The mountain peak, as good as it is, could be a lonely place. The purpose of life is not to race, neither to be content. It's a culmination of all our life experiences. We are here to experience life, so we could go back to tell our experience. The path is rally ourselves, and we become the path. We exchange our lives with the path. A marriage of true minds is a blessed life. Nothing comes close to it.

If we want to have a special life, and want to have great stories to tell, then we should challenge ourselves by pursing our very own dreams. In Persia, we have a saying: "This world is like a bride with a thousand grooms". What it means is what you are pursuing, and have fallen in love with, has a lot more prospects than you could imagine. Do what you want to chase it but don't get entangled with your dreams. It's like a scene in the movie: "UP', when the little boy tells the old man: "You are losing your house." The old man replies: "Oh, it's just a house". When you travel by plane, the economy passengers will always pass through the first-class seats before exiting the plane. I find that analogous to how people live their lives on earth. There will be a time that we'll leave everything behind, nothing to carry with us except our life's experience. I hope you'll live your life without fear. As much as you value yourself as a human being, you are here to shine light onto the lives of others, as expressed in this famous poem by Saadi. It hangs on one of the walls at United Nations:

Human beings are members of a whole, in creation of one essence, and soul.
If one member is inflicted with pain, other members uneasy will remain.
If you have no sympathy for human pain, the name of human you cannot retain.

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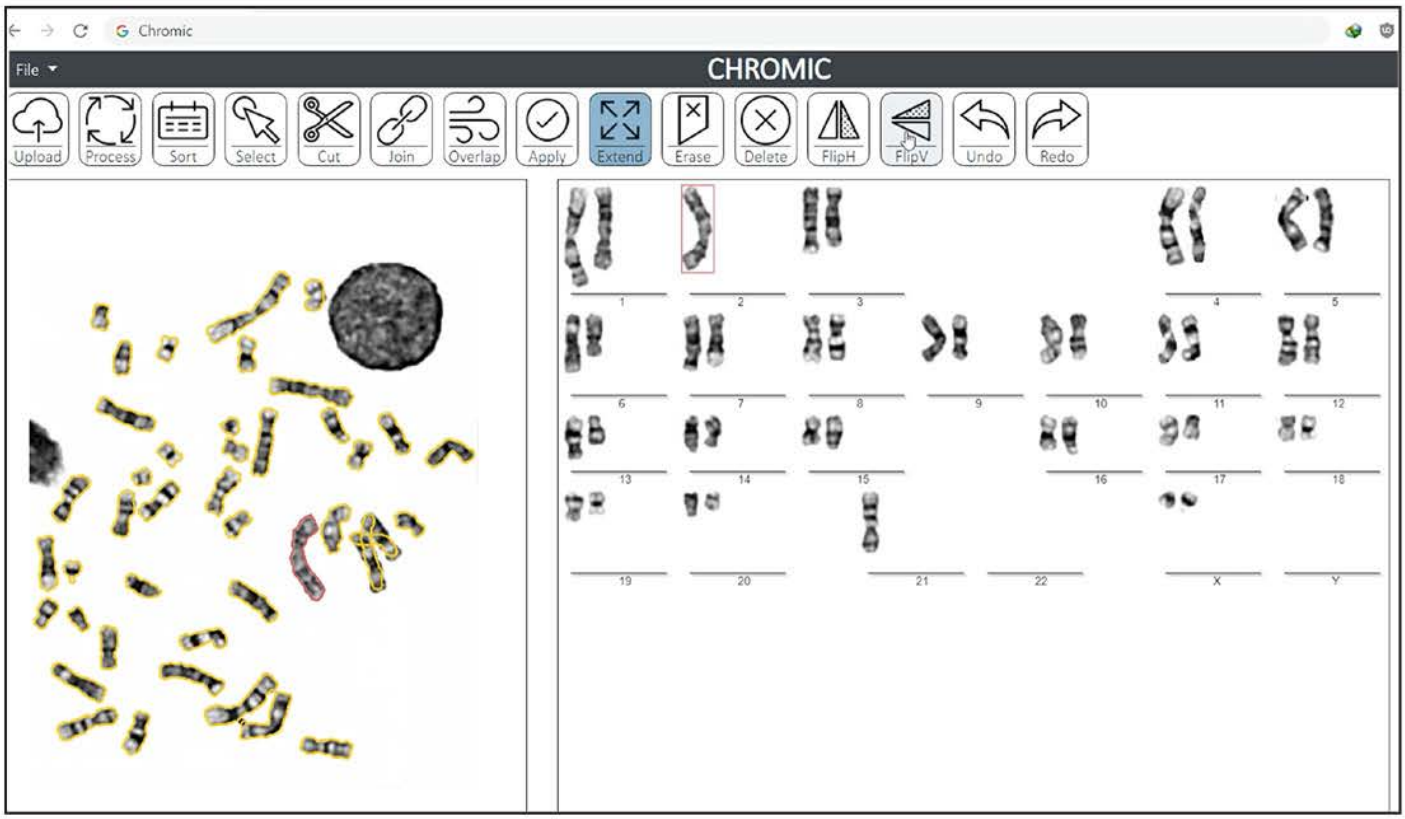

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