

Angénieux Special Report

Contents: Angénieux Full Frame Collection



This Special Edition is a retrospective of FDTimes articles from previous editions about Angénieux Full Frame lenses.

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Angénieux Type EZ are affordable zooms. You can buy them fitted for Full Frame or for Super35. Or you can get a convertible package: the base Full Frame model with a matched, interchangeable Super35 rear optical group. They are made in Japan for Angénieux.

There are 2 models: EZ-1 and EZ-2. EZ-1 with the FF Rear Lens Group is 45-135mm T3. With the Super35 Rear Group, it is 30-90mm T2. The Angénieux EZ-2 configured for FF is 22-60mm T3 zoom. When configured for Super 35, it is 15-40mm T2.



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The long-range Optimo Ultra 12x comes in three format variations: Full Frame/VV, Ultra35 (Super35Plus) and Super35. Versatility is achieved by swapping the rear group and lens barrels of the base lens, which is the Angénieux Optimo Ultra 12x 24-290.



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Twelve Full Frame Optimo Prime lenses: 18, 21, 24, 28, 32, 40, 50, 60, 75, 100, 135, 200mm. All are T1.8 except the 18mm which is T2.0 and the 200mm which is T2.2. Coverage is Full Format with a 46.5mm image circle diagonal.

The fully interchangeable mounts include PL and LPL, so far. Lens data: /i and LDS are supported.

Optimo Primes can be customized to create distinct looks by means of the removable iris assembly and swappable internal element



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There are two Angénieux Optimo Ultra Compact Full Frame Zooms: 37-102 mm and 21-56 mm, both T2.9.

When equipped with a new rear group, these lenses cover U35 (a.k.a. Ultra35 or Open Gate) with an image diagonal of 34.6 mm Ø and a gain in maximum aperture to T2.2. And so, Ultra Compacts with the U35 back become, respectively, a 28-76 mm T 2.2 and a 16-42 mm T 2.2 zoom.

This is made possible by Angénieux's Interchangeable Rear Optics (IRO) technology. It is important to note that these are not speed boosters or reducers—IRO is a dedicated rear optical group.

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Band Pro Lens Service: factory-trained lens technicians, clean room, MYT Works Optiglide system, PAT-ACC 8K resolution charts, Chrosziel lens projectors, state of the art, full-service, fully-equipped lens testing and repair department.

Angénieux Type EZ Zooms

Sept 2016. Angeniéux Type EZ Zoom Lenses made their debut at IBC. They are convertible, affordable, compact zooms that cover both Super35 and Full Frame/VistaVision.

Exchangeable rear lens groups let you swap between Super35mm format (up to 30mm image diagonal) and Full Frame (up to 46mm image diagonal).

The Angenieux EZ-1 covers a standard zoom range. With the Super35 Rear Group attached, the EZ-1 is a 30-90mm T2 zoom. With the FF Rear Lens Group, it is a 45-135mm T3 zoom.

The Angenieux EZ-2 covers wide angles. When configured for Super 35, it is a 15-40mm T2 zoom. Configured for FF, it becomes a 22-60mm T3 zoom.

The technology of "speed boost" by reducing image coverage is at work in the new EZ series. Apertures normally unheard of in a Super 35 zoom lens are achieved: T2.0. Actually, apertures unheard of in a Full Frame zoom are also achieved: T3.0 in a small size and light weight.

Both lenses have a full metal mechanical barrel, with internal thermal drift compensation. In other words, your focus remains constant as temperatures on location fluctuate. You may have to shed layers of clothing as the thermometer rises, but the lens maintains its parameters.

Focus, iris, and zoom rings have familiar wide rotation and industry-standard 0.8M gear teeth. The lens length remains constant because focus and zoom mechanisms are internal. You can configure the lenses for S35 and FF/VV formats by swapping the rear group yourself. EZ Zooms come with PL mounts and you can attach EF or E mounts without returning the lens to a service center.

Band Pro is the distributor in the Americas, Jebsen in Asia/Pacific, Angenieux France in Europe and rest of the world, and there are resellers.

angenieux.com bandpro.com jebsenindustrial.com

Type EZ 1 (Medium)

45-135 T3.0 EZ-1 FF



30-90 T2.0 EZ-1 S35



Type EZ-1 FF / VistaVison 45-135mm T3 Zoom Ratio: 3x Image Diagonal: 46mm Aperture: T3.0 - 32 MOD: 0.6m / 2' Front Diam: 114mm Length: 226 mm / 8.9" Wgt: 2.05 kg / 4.5 lb

Type EZ-1 Super35 30-90mm T2 Zoom Ratio: 3x Image Diagonal: 30mm Aperture: T2.0 - 22 MOD: 0.6m / 2' Front Diam: 114mm Length: 226 mm / 8.9" Wgt: 2.15 kg / 4.7 lb

Type EZ 2 (Wide)

22-60 T3.0 EZ-2 FF



15-40 T2.0 EZ-2 S35



Type EZ-2 FF / VistaVison 22 - 60mm T3 Zoom Ratio: 2.7x Image Diagonal: 46mm Aperture: T3.0 - 32 MOD: 0.6m / 2' Front Diam: 114mm Length: 210 mm / 8.3" Wgt: 2.07 kg / 4.6 lb

Type EZ-2 Super35 15 - 40mm T2 Zoom Ratio: 2.7x Image Diagonal: 30mm Aperture: T2.0 - 22 MOD: 0.6m / 2' Front Diam: 114mm Length: 210mm / 8.3" Wgt: 2.12 kg / 4.7 lb

Angénieux Optimo Ultra 12x



September 2017. The Angénieux Optimo Ultra 12x is introduced. It is a high-end, multi-format zoom with interchangeable modules to cover sensor sizes from Full Frame 24x36 and RED 8K VV to U35 and S35. It is the venerable Optimo 24-290 reference redefined, the zoom lens that accompanied almost every major motion picture production since it was introduced in September 2001.

Now, sixteen years later, the new Optimo Ultra 12x Zoom refreshes the industry benchmark with a completely new design, even better optics and more rugged mechanics. The classic Angénieux cinematic look continues with smooth skin tones and a pleasing balance between contrast and resolution.

The big news involves bigger pictures. With Angénieux's IRO (Interchangeable Rear Optics) technology, the Optimo Ultra covers many formats: Full Frame/VV, Ultra35 (Super35Plus) and Super35. Versatility is achieved by swapping the rear group and lens barrels of the base lens, which is the Angénieux Optimo Ultra 12x 24-290.

(Note: this was written in 2017. At that time, it was configured for S35 format out of the box. Also in the box was the U35 rear group with dedicated focus, iris and zoom barrels. With new FF cameras on the horizon, the FF option was an important component.)

Changing formats is as simple as unscrewing the rear assembly, swapping the focus, iris and zoom rings, and attaching the new rear group. It is a quick and easy task for rental houses and service facilities. Rings and rear groups are calibrated and optimized for each specific lens, with the same serial number on each component. In this way, focus marks remain consistent and re-shimming should not be necessary.

How does the new Optimo Ultra 12x in its basic S35 configuration compare with the venerable Angénieux 24-290? The Optimo Ultra covers a larger image circle: 31.1 vs 30 mm. Maximum aperture is the same, T2.8—as is the 162mm front diameter and close focus of 4 feet. At 472mm long, the Ultra 12x is only 32mm (1.3") longer than its predecessor.

The ingenious format flexibility of the Optimo Ultra offers rental houses and owners a wide choice of formats, focal lengths and apertures in one lens with three sets of rear groups and barrels.

Three Formats

• \$35 24-290mm T2.8 - 31.1mm Ø All \$35 cameras

• U35 (Super35Plus) 26-320mm T3.1 - 34.6mm Ø ARRI Open Gate / 6K RED Dragon, RED Helium 8K

• Full Frame FF/VV 36-435mm T4.2 - 46.3mm Ø for Sony's new VENICE camera, RED 8K VV, Panavision Millenium DXL (8K VV), ARRI Alexa 65 cropped to FF.

Optical Design

- New optical design to enable Full Frame and VV coverage
- Up to 200 LPM resolution. (40 LPM = 4K; 80 LPM = 8K)
- Superb image quality. No ramping of aperture
- Minimal breathing of focus. Fast maximum aperture
- IRO Interchangeable Rear Optics
- Aspheric elements minimize color fringing and distortion
- Short MOD (Minimum Object Distance Close Focus)

Mechanical Design

- Completely updated design from the 24-290 and 28-340
- Improved durability with special anti-abrasion coating
- Easier to service
- Weight reduction of moving components using new materials
- Improved resistance to moisture and dust (with dust traps)
- Precise, assistant-friendly focus ring with 321 degrees of rotation and more than 70 focus marks
- User changeable focus barrels by rental houses and service facilities—focus scales available in Imperial or Metric
- Passive thermal compensation from -20°C to +40°C means focus marks remain accurate in extreme weather conditions and the zoom stays smooth even in very cold climates
- Universal thread accepts many different lens mounts

Lens Mounts

- · Comes with PL mount standard
- Additional lens mounts to come in the future

Angénieux Optimo Ultra 12x: Full Frame, U35, S35

Full Frame 36-435mm T4.2 - 46.3mm Ø

for Full Frame/VV Cameras: Sony's VENICE FF, RED 8K VV, Panavision Millenium DXL, ARRI Alexa 65 cropped to FF



U35 26-320mm T3.1 - 34.6mm Ø

for "Super35Plus" Cameras, ARRI Open Gate, RED 6K Dragon, RED Helium 8K



S35 24-290mm T2.8 31.1mm Ø

for all Super35 cameras





FF/VV 36-435mm T4.2 Kit: Rear Group, Iris, Zoom and Focus Barrel

Accessories

- Screw-in Front Protective Glass Optical Flat
- Carrying Handle
- Angénieux's existing 1.4x and 2x Extenders are compatible with the S35 version, but not with the U35 and FF/VV versions of the Optimo Ultra 12x Zoom

1.4x and 2x Extenders



Carrying Handle



Angénieux Optimo Ultra 12x Zoom Specs

Lens Configuration	24-290mm T2.8	26-320mm T3.1	36-435mm T4.2
Format	S35	U35 (S35+)	FF / VV
Focal length (mm)	24-290	26-320	36-435
Aperture	T2.8-22	T3.1-22	T4.2-22
Image Circle (mm)	Ø 31.1	Ø 34.6	Ø 46.3
Iris Blades	9	9	9
Front diameter (mm)	162	162	162
Length (mm)	472mm	481mm	523mm
Length (inches)	18.6"	18.9"	20.6"
MOD (meters)	1.22 m	1.24m	<u>≤</u> 1.35m
MOD (inches)	4'	4'1"	<u>≤</u> 5'
Weight (kg)	12.6 kg	12.75 kg	12.75 kg
Weight (lb)	27.7 lb	28.1 lb	28.1 lb

Angénieux Optimo Primes



Angénieux unveiled Optimo Prime Lenses at the Cannes Film Festival on May 23, 2019. Leading rental houses and cinematographers from around the world gathered in a conference room of the Radisson Blu to learn about the concept, specifications and details. The meeting then moved to the rooftop terrace overlooking the bright blue Bay of Cannes and the Old Port grid-locked with the latest models of mega yachts. Prototype Optimo Primes were set up on cameras for all to see. What did these lenses look like? Breathtaking. Classic Angénieux.

The next day, Bruno Delbonnel, AFC, ASC was presented with

the Pierre Angénieux ExcelLens Award for Cinematography. And then, the Angénieux team was enroute from Paris to Los Angeles on Air France flight 72 to officially present the first Optimo Prime prototypes to the worldwide cinema community.

There are twelve Full Frame lenses in the Optimo Prime series. The initial 6-lens production run was 21mm, 28mm, 40mm, 50mm, 75mm and 135mm—scheduled for delivery in Summer 2020.

The complete 12-lens set consists of: 18, 21, 24, 28, 32, 40, 50, 60, 75, 100, 135, 200 mm. All T1.8 except 18 and 200 mm.



Amnon Band (Band Pro), Emmanuel Sprauel (Angénieux) and Severine Serrano (Angénieux) unveiling Optimo Prime at Cannes. Photo: Pauline Maillet.

Angénieux Optimo Primes unveiled at Cannes



Bruno Delbonnel, AFC, ASC and Angénieux Optimo Prime 40mm at Cannes. Photo: Pauline Maillet.

- Coverage is Full Frame, 46.5mm image circle.
- The fully interchangeable mounts include PL and LPL, so far.
- Both Cooke/i and ARRI LDS lens data is supported.
- The lens gears are industry-standard 0.8M and all in the same positions across the entire 12-lens set.

The Optimo Primes not only match the look and feel of Angénieux's celebrated Optimo Zooms, but also nicely complement the new Optimo Ultra 12x (which comes in Full Frame, Ultra35 and Super35). This is unique in the Full Frame lens arena: having both Full Frame primes and a long-range 12x Full Frame zoom.

Three additional features captivated cinematographers and camera crews at Cine Gear. The Optimo Primes can be customized at the factory or by certified lens technicians to achieve unique looks. There are three essential variables and possibilities limited only by permutations, imagination, resources, desire and (yes) budget. And you'll want a clean room. No, you will not do this on location.

- The iris assembly is removable. Imagine: various numbers of iris blades finished matte black or shiny for flares and in round, oval or other shapes.
- There's an internal element that can be swapped. The front optical group is removed. The element removed, replaced by another and the lens put back together. Imagine the effects of various air gaps, internal element coatings or lack thereof, perhaps a degree of diffusion or frost.
- A special filter/net holder attaches to the rear of the Optimo Prime with magnets. This is where classic silk stockings are attached for gauzy glamor shots or fishing line is stretched for streaks.

Angénieux Optimo Primes - Specifications

Focal length (mm)	18	21	24	28	32	40	50	60	75	100	135	200
Maximum T-Stop	2	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	2.2
M.O.D.	1'2"	1'2"	1'2"	1'2"	1'2"	1'2"	1'4"	1'8"	2'	2'4"	3'3"	4'
Front Diameter (mm)	95	95	95	95	95	95	95	95	95	95	95	≈ 114
Image Circle Ø (mm) 3		46.31										
Weight kg ²	<1.9	<1.8	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.8	<2.0	<2.3
Weight Ib ²	<4.18	<3.96	<3.75	<3.75	<3.75	<3.75	<3.75	<3.75	<3.75	<3.96	<4.4	<5.07
Length (mm) from PL mount	160	140	128	128	128	128	128	128	128	128	140	190
Length (inches) from PL mount	6.30	5.51	5.04	5.04	5.04	5.04	5.04	5.04	5.04	5.04	5.51	7.48
Horizontal FOV 1	97.0°	87.8°	81.3°	72.5°	65.3°	54.3°	44.3°	37.3°	30.1°	22.9°	17°	11.5°
Vertical FOV ¹	65.0°	57.0°	51.4°	44.7°	39.5°	32.0°	25.7°	21.5°	17.3°	13.0°	9.6°	6.5°
Focus Barrel Rotation end stop to end stop	320°											
Focus Barrel Rotation MOD to ∞	300°											
Iris Barrel Rotation	75°											
Drive Gears	0.8 Metric Module (Industry Standard)											

1. Field of View calculated for image sensor of 40.50 mm wide x 22.40 mm high

2. Specifications subject to change, especially weight.

3. Image Diagonal also covers ALEXA 65 5.1K Format, 48.46 mm Ø.

Angénieux Optimo Prime Interview with Severine Serrano



Severine Serrano enroute to LA with Optimo Prime for Cine Gear.

June 2019, Severine Serrano, Managing Director, Angénieux International Sales & Marketing is flying to Los Angeles after Cannes. An Angénieux team is also onboard, hand-carrying two Optimo Prime prototype 40mm lenses destined for Cine Gear. The flight crew kindly obliges as we try out the new Full Frame 40mm on a Sony a9.

JON FAUER: How did the Optimo Prime concept begin?

SEVERINE SERRANO: The Optimo Prime Series had already been on our minds for a couple of years. Since it was a major strategic evolution in our product policy, we needed to wait until the market would provide us with the right trigger.

What was that trigger and when did it happen?

The arrival and wide acceptance of the Full Frame format for digital cinema was the right time for us to seriously consider making Optimo Prime lenses as part of our portfolio.

First of all, there were practical economic reasons. To pay for the huge investment needed to design such a high-end series, it is a *sine qua non* condition to have enough market potential. We saw that the Full Frame Format could generate, for the long term, a complete or major renewal of the lens equipment inventory already on the market. Second, complete compatibility with our Optimo Ultra 12X (36-435mm in Full Frame) was a good motivation, not to say a must. Third, for the Full Frame Format, we thought it was important for us to provide Cinematographers with prime lenses that would be a perfect match for the high quality of our future Full Frame zoom lenses. The point was also to propose a full range of products to our customers: zoom and prime lenses for the high-end cinema lens market.

Did you say future Full Frame zoom lenses?

Yes. [Pinteresque pause]

Was the Optimo Prime series the result of DPs and Rental

Houses asking?

Yes, it was part of our decision process. Directors of Photography and Rental Houses have been asking us to make prime lenses for more than 20 years, particularly after the Optimo Zooms were so well received and established such a high level of esteem for their optical quality. It is always more comfortable when you to decide to launch a product line of such a large-scale to know that the market is waiting for it.

It was more than an intuition. Because of the Full Frame market opportunity and the fact that our customers were asking for it, we confidently made the decision to go for it. Despite the fact that other brands had already launched Full Frame prime sets, we were quite sure that there was a place for Optimo quality prime lenses because they would be totally unique.

Do Optimo Primes match Optimo zooms? And what about EZ Zooms?

Yes, the essence of the Optimo Primes is to match the Optimo Zooms—especially the Optimo Ultra 12X and our other future Full Frame zoom lenses. Regarding the Type EZ lenses, they address a different market segment than the Optimos, even if customers like to mix on some projects.

Please take us through the design process.

It was important to establish a specific plan for the Optimo Prime Series to be able to anticipate the additional work load that we knew would result. For a long time, Angénieux has worked with partners, to a certain extent, in order to keep growing. This is exactly what we are doing on the Optimo Prime series, with a German partner who has been involved from the beginning of the design process. The optical design, manufacturing of optical elements, final quality check and project management is done by Angénieux in Saint-Héand, France. It is a full Angénieux design with our characteristic DNA, famous Optimo Quality and Angénieux look.

The mechanical design is where the partnership comes in. Our German partner is the well-respected company IB/E Optics in Freyung, Bavaria. They are working on the mechanical parts and assembly on behalf of Angénieux. The lenses then go back to Saint-Héand for the final steps and QC. So, the Optimo Prime Series benefits from French and German expertise.

Please tell us more about the interchangeable iris and interchangeable center element.

When you are a manufacturer in this very competitive race to bring new Full Frame cine lenses to market, you must propose some major distinctions. We could have relied on the Optimo quality and the Angénieux look only—but we wanted to continue to satisfy the creativity of cinematographers and to serve the industry in a novel way. This is why we are offering modules and customization possibilities for the Optimo Primes that allow users to create their own unique and individual variations of the look. These are essentially several series of lenses in one. It is good for cinematographers and good for rental companies.

There is even more to come. As the famous French writer Jean de La Fontaine said, "*Patience et longueur de temps font plus que force ni que rage*," which means something like "Patience and persistence prevail over strength or rage."

Optimo Prime Q&A with Christophe Remontet and Dominique Rouchon



Christophe Remontet

May 2020. This is an edited discussion with the Angénieux team of Christophe Remontet, Managing Director, Cinema Optics and Dominique Rouchon, Deputy Managing Director, Sales-Marketing & Communication, Cinema Optics.

Jon Fauer: It's good to see you back in the prime lens business.

Dominique Rouchon: I would like to emphasize that the Angénieux business actually started with Primes. In 1951, Pierre Angénieux introduced 16mm and 35mm format cinema lenses, including the famous 18.5mm f/2.2 beloved by Orson Welles. This was accompanied by an entire set of Angénieux 35mm format Primes: 14.5, 18.5, 24, 28, 32, 40, 50, and 100 mm. Some are still in use today, often rehoused with new mounts.

For many years, customers have been asking us to make a new Prime set. As Paul said, listening to customers' requests was our starting point. We also studied their real needs. We tried to make their dreams come true.

How does the look of Angénieux Primes compare with Zooms?

Dominique: Some cinematographers call the Angénieux look organic, others say creamy, warm or cinematic. I think with the Integrated Optical Palette (IOP), you could say the Optimo Prime Series is impressionistic. We are getting an extra dimension with the Palette that we can discuss later. But yes, people tend to think that the Angénieux look is very natural and realistic. We very much respect all skin tones. As you said, it provides a kind of romantic look.

Please explain the rear filter holder.

Christophe Remontet: There are two holders for rear screw-in filters. The filter diameters are 40.5 mm for Super35 format and 46 mm for Full Frame. The idea behind this is that we wanted to make the lenses as compact as possible. To do that, we wanted to move the internal elements towards the rear as much as possible. In a Full Frame lens, this is relatively easy—because the sensor is very large, so the space around it is also very large. However, in Super 35 digital cameras, there are often baffles in the camera's lens cavity area that we must avoid.

When it came to putting on the rear filter holder, we decided to have two different sizes: one so that the lens could fit into Super35 digital camera cavities, and the other for Full Frame, where we have more room. Also, for example with the 135mm Full Frame version, there is more relative illumination in the corners by us-



Dominique Rouchon

ing the Full Frame filter. If you're the 135mm Prime on a Super35 camera, you can just put the smaller filter on, and it works perfectly. If you're using a Full Frame camera, then the longer focal length by design requires a larger diameter at the rear. You just have to switch that out and it's done. Note that the choice of S35 rear filter holder is for lenses of 50mm and above.

You may ask, "Can I put the larger diameter filter holder on all the lenses?" The answer is yes. You may also ask, "Can I put the smaller S35 filter holder on all the lenses?" And the answer is also yes, but you may vignette.

Please tell us more about the middle internal element, which I think you call the Palette.

Christophe: The complete system's name is actually Integrated Optical Palette. This is a reference to the fact that Optics are often called the brushes of the Cinematographers.

That is the reason why we compare exchangeable internal lens elements to the palette of the painter. The idea is that with only one lens, you can have in fact several different brushes, different looks, in other words, you have different series of primes in one.

Dominique: We brainstormed with Amnon Band and his team about that. We wanted to have a universal word that everybody could understand. We are lucky to have a French word, palette, that is perfectly relevant in English. You have discussed impressionism and that is exactly in this line of thinking. When we say the brush of the DP is the lens, we have these references of impressionism when talking about Angénieux lenses. Therefore, we thought that a painting reference would be appropriate to describe the special key features we have on these Optimo Prime lenses.

Can you please explain what this Palette does and what effects can be achieved?

Christophe: The internal glass element can be exchanged in a clean room at the Angénieux factory, service centers of by rental companies qualified lens technicians. At the outset, the main categories we'd like to propose to our customers are vintage look, flare effects and anamorphic look. The idea is to take into account the optical design so that the effects will be the same with each lens across the entire set. The effect will remain the same, whatever the focus distance.

For example, how do you achieve the anamorphic look?

Christophe: An anamorphic look can be achieved by combining

Optimo Prime Q&A



Lens data connector (with cover—production models have the standard 4-pin Lemo connector)

the internal optical element with streaks plus an oval iris to simulate on these spherical lenses bokehs that match real anamorphic lenses.

Anamorfaux. Is that an interchangeable iris possibility?

Christophe: Yes. We have proposed various irises in addition to the standard nine blade iris. There can be a three blade, six blade, oval iris and a completely round one with at least 15 blades.

Presumably there could be others if there is a demand. How did you achieve a vintage look with the optical Palette?

Christophe: We asked our optical designers, "Can you please calculate a look that simulates, for example, the Angénieux 25-250 HR look (1991)?" Basically, the idea was to keep very good optical quality in the center and to have smooth fall-off toward the edges.

With all of these disparate artistic and economic ideas coming from rental houses, DPs and distributors, how do you translate them all into optical calculations?

Christophe: With great difficulty. But seriously, we're lucky. We've developed in house a very powerful image simulation tool. We can take a picture of a person, or a scene in New York or anywhere else, and then we can simulate what it would look like through any of our optics, including what would happen with the use of the optical Palette elements to change it. We're able to use computer simulation to refine our ideas relative to what people are telling us.

So, the optical simulations include Palette choices?

Christophe: We can see the real effect of the Palette: before and after, with and without. It is very efficient.

Dominique: That's one of the reasons why there will be a close relationship between us and the rental companies in order to define other looks that cinematographers may request. Then we can explore with them how to address additional possibilities.

Like a secret sauce to make the recipe unique to a particular production or DP. I can imagine rental houses and cinematographers clamoring for custom-made Palettes and presumably willing to pay for them. The idea of being able to show visual representations is certainly a compelling thing.

Christophe: Yes, being able to simulate the optical Palette is absolutely unique on the market.

Is the Palette internal element the same physical piece that goes in all of the focal lengths, or are they unique to each one?

Christophe: The very interesting point is that you can put the same optical Palette element into all the focal lengths. For example, if you are happy with a vintage look element, then you can use that same element in all the focal lengths, from 18mm up to 200mm. Certainly you would want to have one in each of the lenses because you cannot replace them on location. You need a clean room. The optical designers have done a very good job so that we can have the same components in all the lenses.

Dominique: Jon, if I were in your shoes, I would not resist asking Christophe what would be next.

Wow. Usually those are the questions that torment your souls.

Dominique: Maybe Christophe can give us a little bit of perspective of where we are with the next products.

Christophe: For the Integrated Optical Palette of the Optimo Prime Series, we are now moving from concept to reality. We have organized webinars with customers and our partners Jebsen and Band Pro. We all know that we can't visit them right now, but we will use webinar tools to communicate as much as we can in the coming weeks. If we think beyond the Prime lenses, we are definitely working on new Full Frame Zooms in addition to the Optimo Ultra 12x FF/VV. We have already started on these new Full Frame Zooms. Actually, we cannot say more now, but we will continue to develop and enlarge our footprint on cinema lenses.

Well, as Hollywood producers say, "Always leave them wanting more." Thanks for an enlightening discussion and for leaving us with additional topics to discuss in the coming months.







Angénieux Optimo Primes are Full Frame, easily, repeatable and quickly tunable. Their Integrated Optical Palette (IOP) lets cinematographers create unique looks by combining IOP permutations the way a painter blends textures and hues.

Just as Julius Caesar described in De Bello Gallico (ca. 50 BC) "All Gaul is divided into three parts," so are the Optimo Primes IOPs made up of three components. The swappable, 2mm thin internal palette element sits inside the lens, between the focus and iris groups. There is a vast selection of internal elements for the palette—including Glimmerglass, Pro-Mist, Black Satin, Blue Streak, Hollywood Black Magic—in various grades. Lots more are on the way. Note: when the internal element is flat, Tiffen labels it "Optimo Prime internal filter," shown above.

Next comes the Iris Cartridge, with a choice of blades and shape, round, 3-bladed, oval anamorphaux, and so on. The Rear Filter is external, accessible from the back. Actually there's a 4th team of the IOP look customizing department: front filters.

Combining one or more of these paint brushes dramatically affects the overall look. Interestingly, because of their uniquely designed position inside the lens, IOP elements offer new looks not possible with front or rear filtration alone. For example, a 1/8 Black Pro-Mist inside the lens gives the image a vastly different look than if you a 1/8 Pro-Mist front filter.

Randy Wedick, Band Pro CTO explains, "Putting the internal element in the center of the lens seems to create bi-directional reflections. Light bounces off the front surface of the filter onto the front optical group, and off the rear surface of the filter into the rear optical group.

"This then kicks of a series of complex reflections, flares and interactions that you wouldn't get by putting the filter in the front of the lens (before the image is made), or on the rear (after the image is made). You are creating light interactions at the moment of conception of the image. It's why people like vintage lenses. But without the pain of vintage mechanics in vintage lenses."

Equally unique is that this process is easily reversible, returning the lens to its original configuration within minutes. Official stage one IOP options include Clear (Coated & Uncoated), Glimmerglass, Black Satin, Black Pro-Mist and Low Contrast from Tiffen; and Hollywood Black Magic and Blue Streak from Schneider.

Iris Cartridge Options include 3-Blade and Oval (coming soon). Rear Filtration options are available from Tiffen and Schneider Optics. Many more looks are in R&D right now, along with customized looks upon request. Band Pro will continue to seek cinematographers' and clients' suggestions and comments for future IOP releases.

Band Pro has a full-service optical department. Instead of breaking an internal element of the palette, as I did by dropping it on the floor, I suggest you let their experts swap yours, at least the first few times. Band Pro is exclusive distributor for Angénieux in the Americas at *bandpro.com*.

In EMEA, contact Angénieux at *angenieux.com* and in Asia/ Pacific, *jebsenindustrial.com/angenieux/* for Jebsen CineCast.

Optimo Prime IOP Looks



50mm T1.8 with Tiffen Black Satin 1/8



135mm T1.8 with Tiffen clear coated



50mm T1.8 with Tiffen Black Satin 1/8



135mm T1.8 with Tiffen clear coated



Tiffen Optimo Prime internal elements, above and below, are 2mm thin.





Thanks to Randy Wedick, Tim Smith, Amnon Band, Emin Nalbandian, Brett Gilespie and the team at Band Pro for all the help with this article: sending internal elements, visiting FDTimes with the lenses, demonstrating the process, and patiently posing to demonstrate the many looks of Optimo Primes.

Optimo Prime IOP Looks



28mm T1.8 with Tiffen uncoated clear



24mm T1.8 with Tiffen Gimmerglass 1/8



24mm T1.8 with Tiffen Black Pro-Mist 1/8

Randy Wedick is Chief Technology Officer at Band Pro. He is a talented, working cinematographer, respected voice in the industry, with a great understanding of technique and technology from lens to living room, from capture to post.



28mm T1.8 with Tiffen uncoated clear



24mm T1.8 with Tiffen Gimmerglass 1/8



24mm T1.8 with Tiffen Black Pro-Mist 1/8

Tim Smith joined Band Pro's executive management team as Chief Creative Officer. He is an Associate Member of the ASC. With three decades of experience as a senior advisor at Canon's Cinema Division, Tim has seen the introduction of countless products and formats. He is now looking forward to his new role at Band Pro and continuing to help cinematographers in their creative endeavors.

Swapping Optimo Prime Integrated Optical Palette (IOP) elements

1. Let's open an Angénieux Optimo Prime to swap the IOP element. Work in a clean room, not outside or in back of the camera truck.

You will need the Angénieux Optimo Prime IOP Tool Set.



2. Randy Wedick takes us through the process. It is easier than I expected.Do not attempt unless you are a trained lens technician or have been trained by one.

Wear gloves. Halyard Purple Nitrile ones are stylish and make it easier to find loose black screws than if you wore cool black gloves. Store those screws in a lens rear cap or similar container.

Ready to swap the IOP Element of a 28mm Angénieux Optimo Prime? Let's go:





3. Remove outer retaining ring with 8 screws. Use a magnetic screwdriver. Some lenses have a threaded shroud—use Front Ring Spanner.



4. Thread the front group spanner onto the lens group.



5. Remove 8 more Phillips head screws. Remove O-ring.



7. Revealing a Tiffen Optimo Prime internal element.



6. Extract the entire lens group assembly.



8. Thread the Inner IOP Tool onto the inside of the IOP ring.

Swapping Optimo Prime IOP elements



9. Insert the Outer IOP Tool to unscrew the IOP retaining ring.



11. Extract the Inner IOP Tool with the internal element and retaining ring attached.



13. Unscrew the internal element.



15. Out comes the internal element, ready to be swapped for another.



10. Remove the IOP Outer IOP Tool.



12. The iris assembly is seen below the internal element. This is where you begin to swap the iris assembly using the same inner IOP tool to remove it.



14. Remove the retaining ring with the internal elements spanner.



16. "Rewind" in reverse order to put it all back together.

Randy Wedick's Optimo Prime IOP Seminar at Cannes



Randy Wedick is a former camera assistant, always a cinematographer, and now CTO at Band Pro in Burbank, CA (distributors of Angénieux to the Americas). As a leading expert on the Angénieux IOP internal optical palette system, Randy was invited to Cannes to present seminars on Angénieux Optimo Prime lens customization.

Jon: Who attended your seminars at Cannes?

Randy: About 75% of the people were from rental houses and 25% were cool DPs. I also had a private session with Darius Khondji, ASC, AFC. Actually, Darius Khondji is one of the main reasons that I got interested in cinematography. I've seen most of his films and have always been impressed. Around 1999, when I was at a production company where he was working, we met briefly and I asked him all kinds of questions. He was so patient. And now, 23 years later, I met him again at Cannes and he was the one asking me questions. That was just totally crazy.

I got a chance to spend some time with him and show him the Angénieux Optimo Primes. We talked about some of my test images. He provided some really good criticism.

What did he suggest?

He said I should shoot wide open and always include minimum focus. We also looked at various IOP looks with a model on a set. There were a bunch of lights and he said, "Why are all these lights on? Turn all them off except this one dimmed down to 10%. You don't need anything else." It was side lit, moody, very close, wide angle, wide open on a Full Frame camera. And then he said, "Oh, this is what I was looking for."

How do you give these presentations? Do you actually take a lens apart and put it back together again?

It's a three part seminar. It's sort of like a magic show. There's a brief PowerPoint-ish presentation essentially about how we got here, why people are customizing lenses, and what the differences are.

The second part of the presentation is a live demonstration of the process of changing the look by swapping IOP elements, iris and rear filter. The third part of the session is walking over to a lit set with lenses and lights and models and seeing it live. It's like a tasting menu of internal filters on different lenses.

How is the Angénieux IOP system different?

DPs are constantly looking for different paths to various looks.

With vintage lenses, you're either using older mechanics or colors and coatings that don't always match. Or you're building up a color-matched set that takes years to get and then you have to get it rehoused.

If you're a DP with lots of time and a big budget, you can go to places like Panavision or ARRI Rental where they can pull the lenses apart, detune and put them back together. That's not available at your typical rental house. They would have to employ one of the cabal of super geniuses to do this for you. It's only available at the very tip of the top.

Or, you could have your lens re-coated or de-coated. But then

Optimo Prime IOP Seminar at Cannes



Cutaway view of Optimo Prime's 3 points of IOP customization



Optimo Prime 28mm at left and with focus group removed, right.

you're forever stuck with that one look and you'd better hope that it stays in fashion throughout the lifetime of the lens so you can make your money back. All of these things are like a threelegged table: availability, price and time—or lack of time.

The Angénieux Optimo Prime IOP system was invented to fill the space for cinematographers and projects requiring highly customized looks, but who would also like the ability to return back to the original, modern look. Whereas some de-tuned lenses require a very high-level optical technician to make adjustments, the Optimo Prime IOP system is cartridge based, with threaded assemblies and keyways. You can't really mess things up too much and it's easily done in 10 minutes or less once you get the training.

What do you mean by cartridge-based system? Is it modular?

Yes, the cartridge based system consists of a center internal optical element, an iris module and a rear filter. It allows for some intense experimentation and also the ability to reverse that experimentation and bring the lens back to its default settings.

Did you change internal elements in the demos at Cannes?

Yes. These demos, which we have been doing all over the Americas, are usually not just with me. A skilled lens technician works on the lens while I do the presentation. At Cannes, Arnaud Esbelin, Angénieux Program Manager for Cinema Optics was doing the hands-on work. In the US, it's Band Pro lens technician Ronald Monte.

How is the Internal Optical Element different from a filter at the front or rear of the lens?



Tools of the trade for Optimo Prime service and customization



Internal Element removed, ready to be swapped for another.

The Internal Optical Element is positioned at Principal Focal Point—where the light rays converge within the lens. If your Internal Element has, for example, uncoated surfaces, the light is going to ricochet inside the lens. These complex reflections and internal barrel flares are things you wouldn't have if you put an uncoated filter on the front. That's why the simplest uncoated filters generated so much interest recently.

Furthermore, if you have a diffusion element, it also takes on different and interesting qualities than front filtration. Another benefit is that you can use the same strength with every focal length. You don't have to change out the filter strength when you have an 18mm with a heavy diffusion and a 100mm with a might lighter grade.

Please explain why you can stay with the same grade of filter.

It's because of the field of view. The wider focal length lens takes in a greater amount of the front filter area, effectively with more dispersed particles of diffusion. A telephoto lens will shoot through a much smaller, and therefore denser area of diffusion.

The Internal Optical Element can save Camera Assistants lots of time and aggravation switching filters to maintain consistent a diffusion effect whenever there's a lens change. Often it's a guessing game. Sometimes it's not. With the Internal Optical Element, you can be sure that the density you pick is going to remain consistent across all the focal lengths.

Randy will discuss the remaining variables of the IOP system in a future edition of FDT.

Angénieux Optimo Ultra Compact Zooms



putting extra weight on the mount and harder to balance with lighter, smaller cameras.

Focal Length	Zoom Ratio	Max. Aperture	Close Focus	Image Circle	Weight	Length ¹	Front Diameter	Object Dims at MOD
21-56 mm	2.7x	T2.9	2 ft 600 mm	46.3 mm			114 mm	
37-102 mm	2.7x	T2.9	2 ft 600 mm	46.3 mm	5.7 lb 2.6 kg	9.25 in 235 mm	114 mm	449 x 237 mm at 37mm 159 x 84 mm at 102mm

- Zoom and focus groups controlled by classic Angénieux rod mechanical guiding system.
- Focus scale rotation: 310°.
- Focus, iris, zoom gears: standard 0.8 Module.
- User changeable focus scales available in Imperial or Metric.
- Passive athermalization from -20°C to +45°C.

- Available in PL mount.
- Front protective optical flat accessory.
- IRO ready (Interchangeable Rear Optics technology).
- /i Technology metadata via mount or external 4-pin Lemo connector.
- 1. Length measured from front to PL lens mount flange.



Angénieux Optimo Ultra Compact Zoom 37-102 mm T2.9 Full Frame

Angénieux Optimo Ultra Compact Zoom 21-56 mm T2.9 Full Frame

Inside Angénieux Optimo Ultra Compact Zooms



Clément Mondésert is the Project Manager for Angénieux Optimo Ultra Compact Zooms.

Jon Fauer: When did the Optimo Ultra Compact Zoom project begin?

Clément Mondésert: The genesis of a new zoom has been a continuous process. We always scrutinize the market to understand the requirements of end-users and to consider products that might fulfill their needs. Anticipation drives our product policy. It was clear that as soon as the Full-Frame format appeared and started to expand to the point where it is now, we knew we would have to renew our entire product line in order to offer Full-Frame optimized Optimo zoom lenses.

We started with the Optimo Ultra 12x with an IRO (Interchangeable Rear Optics) for Full-Frame as well as Super35 and Ultra35. Next, we launched Optimo Primes to cover the Full-Frame format. Then, it was time for our lightweight spherical zooms to go Full-Frame as well.

Please describe the design process.

The first step was long and hard work to establish the parameters. Our optical engineers aimed at maximizing optical quality, minimizing optical defects, in a small envelope, with defined limits of size and weight. Thanks to computer simulations with our Angénieux custom-designed software, we are able to be quite accurate in predicting the optical performance of the lens.

The optical combination determines the product architecture. Then we work on the mechanics to define how we move the optical elements that must all be perfectly aligned with each other. It is also a challenging process to make everything very precise and compact. The architecture and the detailed design of the lens take into account additional constraints: all the components must be reliable, available and industrially feasible—that is, readily manufacturable.

As soon as we have the first product, we conduct a set of tests. Not only do we proceed with conventional optical tests, but we also subject the lens to specific environmental tests. This ensures that performance is consistent at different temperatures (the zoom is passively athermalized), when shipping, when dropped,

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and after an endurance test representative of the product life. Consequently, before shipping the first serial production units, we know that the lens is robust enough and meets the most demanding requirements.

Did someone go out with a prototype and shoot tests?

This time we did not made a traditional prototype. We unveiled the Ultra Compact in September 2021 in New York and you saw our first product. Serial production started next. In three months, we were able to go from the first product that we showed to the market to the first commercial deliveries in December. And so, the one you saw in September was not a prototype. It was our first production model.

How did you arrive at the Full-Frame zoom focal lengths (e.g. 37-102, 21-56)? Did you multiply the Super35 values by 1.5?

The Full-Frame Optimo 37-102 and 21-56 Ultra Compact zooms are heirs to the famous and award-winning Super35 Optimo 28-76 and 15-40. They correspond respectively to similar fields of view and 2.7x zoom ratios. In that sense, the Optimo Ultra Compact zooms are of the same lineage as the venerable Angénieux lightweight Optimo zooms: similar 2.7x zoom ratios, high-end, short, light and fast lenses.

Are these Full-Frame lenses "simply" wider diameter versions of the classic Angenieux Optimo Super35 zooms?

Being heirs to a famous family of lenses does not mean that they are a simple reboot or copy of the former ones for a larger sensor format. For Optimo Ultra Compact, the Angénieux team completely designed new zooms from a blank page. Since we originally developed the 28-76 and 15-40 some 15 years ago, improvements have been made both in our optical calculations and design tools, as well as our industrial capabilities. We also learned a lot from our last product developments (Optimo Ultra 12x and Optimo Primes)—not only technically, but also industrially.

Making a completely new design enabled us to harvest these new means to explore new possibilities and to enhance the overall performance. So in a sense, yes, these lenses follow in the footsteps of the historical Optimo zooms that were developed 15 years ago.

Clément Mondésert on Optimo Ultra Compact Zooms



On the other hand, you cannot say that we developed the same zoom that we developed 15 years ago. In terms of industrial capabilities, we are now able to manufacture optical and mechanical components that we were not able to make before. In that sense, the Optimo Ultra Compact is completely new.

Is there an S35 or U35 "speed booster" IRO for these lenses?

Our strategy as a first step is for the Optimo Ultra Compacts to be unveiled and delivered as Full-Frame-only versions. But the lens is IRO ready. It can have an interchangeable rear to adapt to other formats in the future. (*Jon's note: That future is now, announced in Nov 2022. See next page.*)

Are the Optimo Ultra Compacts made entirely in France?

Our answer is an emphatic yes. The entire design was conducted by our technical team (optical, mechanical, electronics) based in Saint-Héand, France. Our factory gathers, in the same place, the technical design and production teams. Our production lines are very comprehensive. We machine glass for our lenses in-house. Next door, we have mechanical machining. And, when you go through another door, you are in the integration line where all these components are mounted, assembled by experienced and skilled technicians, and where the zooms are tuned.

How would you compare Optimo Ultra Zooms to EZ Zooms in terms of optical design and quality?

EZ zooms are a real success because they are very lightweight, have good overall optical quality and are more affordable. However, if you put an Optimo Ultra Compact and an EZ Zoom on a lens projector, you will see the differences in terms of resolution, distortion, chromatic aberrations, etc.

Optimo Ultra Compacts are well balanced for coverage of the entire frame: from the center to the edges. On the EZ Zooms, we made some compromises. There are far fewer compromises on the Optimos. Furthermore, Optimo Ultra Compact lenses are equipped with lens metadata and have a full-closure iris, which is not the case with EZ zooms. The image circle coverage is also wider with the Optimo Ultra Compacts. They cover Full-Frame (46.3 mm diagonal), or more, at all focal lengths and focus distances, whereas EZ Zooms exhibit a slight loss of relative illumination in some conditions.

I would say there are two main technical differences. First is the architecture. Optimos are designed with a rod-variator, a concept inherited from the classic Super35 Optimos. This way of guiding the optical elements makes the zoom very accurate and robust. It also enables our zooms to be very lightweight zooms compared to other technologies. Cams tell the optical elements where to be and the rods let them travel smoothly. We don't have heavy, traditional ball bearings.

EZ zooms do not benefit from these technologies. And, in terms of detailed design and production, Optimos also inherit the highend features of the family. Each product line has its reasons that are based on the type of application and production.

Do Ultra Compact Zooms match EZ Zooms in color, contrast and look?

That was not the intention. Ultra Compact Zooms match the Optimo line of Angénieux lenses: Optimo Primes and Optimo Ultra 12x. It was an important target to really have the same look for the entire high-end Optimo Full-Frame range of lenses.

How did you achieve the incredibly light weight and small size of the Full-Frame Ultra Compact Zooms?

Certainly, we use aspheric optical elements. The optical materials are a very important part of the size. And thanks to computational simulation, we are able to assess, more or less, the weight of the final products quite early in the project. That's key to our decisionmaking when we begin. So, we know the weight of each optical combination even before having drawn any mechanical parts.

Do the Ultra Compact Zooms have an internal palette option as you have with the Optimo Primes?

No. Zooms are much more complex than Primes. For example, the iris of an Optimo Ultra Compact Zoom moves in relation to an optical element in the zoom assembly as you change focal length to correct for certain parameters. An internal optical palette would not be consistent.

Angénieux Optimo Ultra Compact FF & U35 Full Pack





Angénieux IRO rear group transforms the 21-56mm T2.9 Full Frame Ultra Compact to a 16-42mm T2.2 U35 format zoom lens.



Angénieux IRO rear group transforms the 37-102mm T2.9 Full Frame Ultra Compact to a 28-76mm T2.2 U35 format zoom lens.

Nov 10, 2022. Stop the presses. Angénieux announces a "Full Pack" version of their Optimo Ultra Compact 37-102 and 21-56 Full Frame zoom lenses. The Full Pack includes each lens with both a Full Frame and an Ultra35 (U35) rear. That can be changed easily to cover the entire sensor area of Full Frame cameras or the U35 (Open Gate) area of the ARRI ALEXA 35.

This is made possible by Angénieux's Interchangeable Rear Optics (IRO) technology. It is important to note that these are not speed boosters or reducers—IRO is a dedicated rear optical group.

Angénieux Ultra Compact 37-102 T1.9 and 21-56 T2.9 Zooms were introduced at Cannes on July 15, 2021. Both lenses cover Full Frame/VV, with an image diagonal of 46.3 mm Ø.

When equipped with the new IRO group, these lenses cover U35 (a.k.a. Ultra35 or Open Gate) with an image diagonal of 34.6 mm Ø and a gain in maximum aperture to T2.2. And so, Ultra Compacts with the U35 back become, respectively, a 28-76 T 2.2 and a 16-42 T 2.2.

I guess this was inevitable. Angénieux's estimable Optimo Ultra 12x Zoom can be configured three ways: FF/VV, S35 or U35.

Angénieux Type EZ Zooms configure as FF/VV or S35.

There was a hidden clue to convertibility as early as September 2021 when pre-production Ultra Compact Zooms were handcarried from Saint-Héand to Band Pro's rooftop premiere launch in New York. If you looked closely, and that was decidedly difficult considering the dimming New York evening sky and the copious quantities of cocktails and champagne that flowed, you might have noticed a small oval window above the iris and zoom rings that proclaimed the lens was FF/VV. Why would it be in a window and not permanently proclaimed and engraved on Angénieux 21-56mm T2.9 Full Frame. 46.3mm image coverage Ø.



Angénieux 37-102 T2.9 Full Frame. 46.3mm image coverage Ø.



the lens barrel itself below the logo and name? And how do you change iris and zoom rings?

Severine Serrano, Managing Director, Angénieux International Sales, explained:

- The Full Pack version of the Ultra Compact Zoom comes with 2 IRO rear modules: one Full Frame and one U35 (Open-Gate).
- There is only one iris ring. It is engraved with T-Stops for both FF and U35.
- And there is only one zoom ring, engraved with focal lengths for both FF and U35 formats.
- To change between FF and U35, a lens technician just needs to flip the ring around (a quick and easy procedure).
- The focus ring is untouched. Focus distances remain the same.
- As with the Optimo Ultra 12x, you must match its lens serial number with its FF and U35 IRO rears.
- And yes, existing owners can upgrade their original Ultra Compact zooms to Full Pack versions.

Band Pro Lens Service

Amnon Band, President and CEO of Band Pro, discussed their recent advances in optics: "My first project with Angénieux began 5 years ago with the EZ zooms. At that time, we had one lens technician. Once I signed the Optimo Prime contract and then got exclusive Angénieux distribution for the America, I knew I had to raise the bar, with the most sophisticated optical test instruments and top-shelf technicians. It's a big responsibility. I went all the way with technology as well as personnel. That's why we installed a clean room, the latest MYT Works system, PAT-ACC 8K resolution charts, Chrosziel lens projectors, and more. We now have a state of the art, full-service, fully-equipped lens testing and repair depart.

"We recently hired technicians who can fix lens cleanses almost with their eyes closed. We're expanding, we're getting deeper and deeper into the lens repair and lens service, which by the way, educates us tremendously as to what to do next. We listen to customers coming in and giving us feedback. Emin Nalbandian and Ronald Monte completed a week of training at Angénieux. Ricardo Monte, who worked at Cooke, is next in line for Angénieux certification. In April, they are all getting ZEISS training.

"So, everything is connected. The training, the equipment, the personnel. If you want to be successful in the lens business, it comes with an investment. You need to be committed."



Emin Nalbandian checking an Optimo Prime with a Sony VENICE in the lens test room. Emin oversees Band Pro's Optical Department, with two Full-Frame lens test projectors, collimator, MYT Works Optiglide setup, Class 100 cleanroom and more.



Ricardo Monte joined Band Pro's Optical Department as Senior Lens Technician following 4 years at Cooke Optics. A cine lens-meister with a prolific career at Panavision South America, Visual Products, and Otto Nemenz, Ricardo's knowledge and technical expertise is famous.



Emin Nalbandian, Band Pro Chief Optical Technician, repairing an S4/i.



Ricardo Monte working on an Angénieux Optimo Prime.



Ronald Monte joined his father at Band Pro as a 2nd generation cine lens expert. His background includes work as a camera assistant and rental house prep tech. He had a thorough understanding of cine lens diagnostics, repair and fine-tuning. If this father-son team can't fix your lenses, probably no one can.

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