

## ASTRONOMICAL HISTORY

Tele Vue's introduction of the Nagler eyepiece 25 years ago started a revolution in high-quality optics. /// BY MICHAEL E. BAKICH

# The eyepiece that changed observing

Amateur astronomy has marked a number of great moments: the first Schmidt-Cassegrain telescope, the first time a reflector was put on a Dobsonian mount, and the first go-to drive, to name a few. Count with these benchmarks the introduction of the Tele Vue 13mm

Nagler eyepiece. That eyepiece was the first to offer both a large apparent field of view and sharp images.

To mark the 25th anniversary of the first Nagler eyepiece, I traveled to Chester, New York, where I toured the facility and spoke with the Nagler family.

### Lifetime focus

Al Nagler, founder and CEO of Tele Vue Optics, was both an amateur astronomer and a successful optical designer before he formed his company in 1977. As a youth attending the Bronx High School of Science in the 1950s, he built his first telescope — an 8-inch f/6.5 reflector that, with its mount, weighed 350 pounds. And what a start this was. The project earned Nagler a prize (a micrometer) at graduation, \$80 from *Mechanix Illustrated* (payment for an article detailing how he made it), a Stella-fane award, and a job interview at Farrand Optical Company in the Bronx, New York.

Nagler had a productive optical design career at Farrand from 1957 to 1973. While there, he designed the optics for the visual simulator that was used to train astronauts to pilot the Gemini spacecraft and the Apollo lunar module.

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**THE 13MM TELE VUE NAGLER** debuted in 1980 and won wide acclaim among amateur astronomers. Tele Vue produced this eyepiece until 2001, when the 13mm Type 6 replaced it. ASTRONOMY: JAMES FORBES

The lunar module simulator included a star field using 1,000 polished steel ball bearings set into a black globe. They were the correct size and in the correct positions to simulate an accurate star field. Al even had a few bearings gold-plated to simulate Antares, Betelgeuse, and several other reddish stars. “You wouldn’t believe how much realism just that little bit of color added,” he said. Such attention to detail still is one of Al’s finest traits.

In 1977, Nagler founded Tele Vue Optics in Spring Valley, New York. There, he began making projection lenses for big-screen television sets. In 1979, Nagler introduced Tele Vue Plössl eyepieces to amateur astronomers, but even though the Plössls received rave reviews, 1980 stands out in the minds of most observers. That was

the year the Tele Vue Nagler eyepiece series made its debut.

“I knew the design was the most advanced,” said Al Nagler. “What I didn’t know was if amateur astronomers would pay that much for an eyepiece.” Indeed, \$200 was a steep asking price for an eyepiece when other companies at the time were selling “research grade” eyepieces for as little as \$39.95.

At this point, Nagler decided to visit star parties and let people try his eyepieces in their telescopes. Later, as Tele Vue became more established, it used the slogan, “even better than you imagined.” Well, initial response to the Nagler eyepieces was even better than Al imagined. Observers couldn’t believe what they were seeing. The Nagler combined the widest field (82° apparent field of view) with sharp images, not just in the center, but at the field’s edge as well.

Since then, both the Nagler eyepieces (in 2003, Tele Vue introduced the Type 6) and the company have evolved. And, in March 1988, Al took a step that guaranteed Tele Vue, Inc., would stay in the family: He hired his son David.



**KEEPING THE BUSINESS IN THE FAMILY** works well for the Naglers. Changes can be implemented without a lot of red tape. From left to right are CEO Al, vice presidents Judi and Sandy, and president

David. Even David and Sandy’s 10-year-old daughter Allison (not pictured) sees a future with the company: “I help out wherever I can. I can’t wait to start working here for real.”



**TELESCOPES ATTACHED TO TABLES** point at specially chosen targets in one of Tele Vue’s testing labs. Ray Occhi, seated, has looked

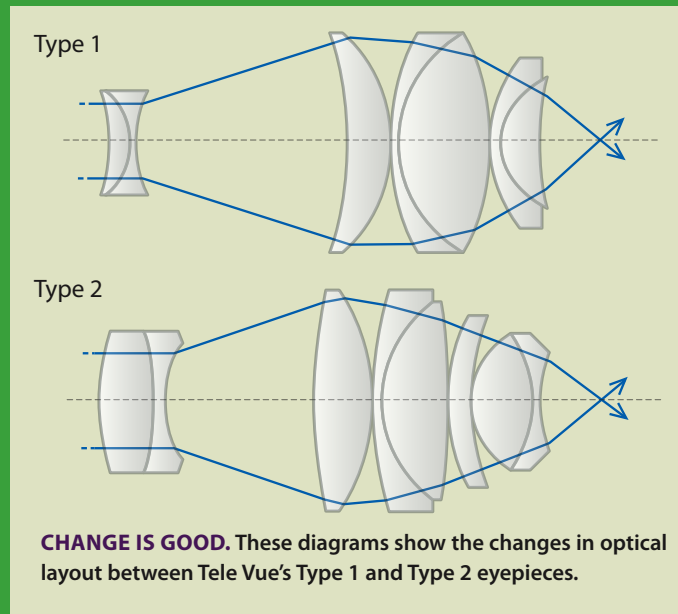
through tens of thousands of eyepieces and filters and, in Al Nagler’s words, “can spot a problem a mile away.”





ASTRONOMY: MICHAEL E. BAKICH

"NOBODY ELSE has ever seen this, let alone looked through it," said Al Nagler about the one-of-a-kind 25mm Nagler Type 2 eyepiece prototype (left). This design didn't work out to Tele Vue's standards and, thus, was never released.



TELE VUE OPTICS

**CHANGE IS GOOD.** These diagrams show the changes in optical layout between Tele Vue's Type 1 and Type 2 eyepieces.



ASTRONOMY: MICHAEL E. BAKICH

**MEASURING THE APPARENT FIELD OF VIEW** of a wide-angle eyepiece like a Nagler doesn't have to be complex. "Years ago," said David Nagler, pictured, "we came up with this simple device as a demonstration tool for star parties. It allows someone to compare easily the apparent fields of view between eyepieces."



ASTRONOMY: MICHAEL E. BAKICH

**SCANNING THE EYEPIECE CASE** in Al and David Nagler's office is like taking an historical tour through the development of high-quality amateur-astronomy optics.

### Family legacy

David Nagler, now Tele Vue's president, recalls the beginning. "Mom and Dad used to sit at the kitchen table boxing up eyepieces to ship," he said. During his college years at Syracuse University, David would come home during breaks and on weekends and put in time at the factory. "I worked as an optics tester. I've personally tested tens of thousands of eyepieces. After I graduated, I realized Tele Vue was where I wanted to be." David, whose degree is in Television, Radio, and Film Production, started writing advertising copy and designing ads for Tele Vue.

"Mom" referenced above is Judi Nagler, who is one of Tele Vue's vice presidents. She

met Al in the late 1950s. Their first date was a visit to New York's Hayden Planetarium followed by a concert. "Can you think of a better combination?" asked Al. They married in 1961.

Tele Vue's other vice president is Sandy Nagler, David's wife. The two met at the Alpha Gamma Delta sorority at Syracuse where David was working as a houseboy, and they married in 1992. Sandy worked at Tele Vue from December 1988 until October 1994, then rejoined the company in 2002. Sandy and David have a daughter, Allison, 10, who is ready to head the next generation of Naglers at Tele Vue. "I help out wherever I can," she told me. "I can't wait to start working here for real."

### Making optics

Al's first "for sale" telescope was the MPT, which stood for "Multi-Purpose Telescope," a 5-inch f/4 refractor, which was introduced in 1981. Today at Tele Vue, one employee assembles one telescope from start to finish. This instills a sense of accomplishment, and there's no lack of pride among employees. Several times during my visit, I overheard someone say (in response to a specific telescope being mentioned), "That's one of mine," or, "You made that one, didn't you?"

How do employees know which scopes they built? Al explained, "When we receive the warranty card packed with each telescope, we post it here." We were standing in

front of a large bulletin board hung, not in an office or a back room, but in the hallway everyone at Tele Vue uses.

After assembly comes optical testing. Each telescope then is cleaned thoroughly. One final optical test — any adjustments are made — and then the scope is packed.

I was surprised at how much is still done "by feel." Several sets of eyes look at a highly magnified image of a false star. Diffraction rings both inside and outside of focus are compared. At any point, anyone can reject the product being tested, sending it back for more adjustment.

"Because we're a small company (20 employees), we can make decisions quickly," said David. "If we can find a better

way to do something, we'll do it." To which Al added, "Yes, and cost is not an issue."

### Q and A

During my time with Al and David, I asked hundreds of questions. Nothing was off-limits, and they answered every question I asked except one. (More on this later.) Here are a few examples:

I asked David what percentage of their products is used in amateur astronomy, and how much ends up in other applications. "More than 90 percent is used by skygazers," he said. "When we started, it was all for astronomy, but the portability and quality of our small refractors appeal to more and more birders as time goes by."

### /// THE FIRST NAGLER EYEPIECE

On July 3, 1979, Al Nagler completed and dated the original technical drawing for the first of a series of eyepieces to carry his name. In November of that year, he applied for a patent, which was subsequently granted. The 13mm Nagler eyepiece went into production in 1980. Two additional first-generation Nagler eyepieces followed: the 9mm and the 4.8mm. These eyepieces made quite a stir when they were introduced. As well as being the highest-priced eyepiece for amateurs, the 13mm Nagler eyepiece was the first:

- with a dual barrel, both 1 1/4" and 2"
- with an 82° apparent field of view
- to combine an expanded field of view and sharp images in the center and at the edge
- with eye relief longer than its focal length

— Michael E. Bakich



ASTRONOMY: MICHAEL E. BAKICH

**AL NAGLER'S DESIGN NOTEBOOK** sits open to the page showing the original drawing and specifications for the first Nagler eyepiece — the 13mm — rests atop the notebook.



ASTRONOMY: MICHAEL E. BAKICH

**TELE VUE'S OFFICES** occupy part of a Chester, New York, industrial park. The building, so far, is nameless. "With a name like Tele Vue,

we'd get people asking about television sales or service," said Al Nagler. "It's something we can add in the future, if we choose to."





RANK doth have its privileges “One day, I was looking at my Tele Vue-85 refractor,” said David Nagler, “and I wondered what it would look like with a silver tube. So, I sent it out for chroming. I really like the way it turned out, and it is unique.”

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“WE ONLY REPLACE AN EYEPIECE with a better one, never for lack of sales,” said Al Nagler. An example of this is the original 13mm Nagler (left). Its replacement weighs one-quarter as much, has the same 82° apparent field of view, and boasts higher-quality optical elements, so it gives a better view than the original.

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THE MPT (which stood for “Multi-Purpose Telescope”) was the first telescope Tele Vue manufactured. It had a 5-inch aperture, a 500mm focal length, and a native focal ratio of 4. The MPT’s focal ratio was variable to f/20 with the built-in iris diaphragm. The last remaining MPT functions as a test scope at Tele Vue.

TELE VUE OPTICS



“LET’S SEE WHAT THIS ONE LOOKS LIKE,” said Al Nagler as he peered into the specially designed rig (called the “trombone”). Tele Vue opticians built this setup to test EverBrite star diagonals. Every diagonal is tested, cleaned, re-tested, and finally packaged for shipment to dealers.

ASTRONOMY: MICHAEL E. BARICH

To Al, I noted that not every Tele Vue eyepiece is still being made. I asked why a certain eyepiece doesn’t survive. “We discontinue an eyepiece only if we can make a better one of that focal length. We’ve never discontinued anything for lack of sales.”

Moving beyond eyepieces, I asked David which of their accessories has proved most popular. “The Paracorr,” he replied without hesitation. (Note: Tele Vue’s Paracorr is an add-on optical accessory that reduces the optical defect known as coma in “fast,” or short-focal-ratio, reflectors.)

“The idea behind it was that we wanted a reflecting telescope to emulate the flat field of our refractors. We wanted to get rid of the coma, but not introduce any other [optical] flaws.” Al added: “The Paracorr showed a limitation in our Wide Field

model eyepiece series. When it removed the coma, it revealed some astigmatism, which led to the Panoptic design.”

David continued, “The Paracorr, along with our Nagler eyepieces, complemented what’s been called the Dobsonian revolution, which began in the 1980s, perfectly. People were using short-focal-ratio reflectors, and we provided ways to help them get the most from their investment.”

At one point, Al and I were walking through the ample warehouse. Tele Vue stocks at least a 6-month supply of most products because they don’t want to run into any shipping-related issues with their suppliers. I asked if many eyepieces were returned. “Quite a few,” he replied. Having seen Tele Vue’s quality-control up close, I was surprised at this answer until Al con-

tinued, “They’ve been dropped, scratched, or had something bad happen to them. They come back here for repair.” But are any eyepieces returned for quality issues? “Less than one in 5,000,” Al beamed.

I asked David how changes in amateur astronomy have impacted Tele Vue. He replied, “It’s easy to design a product in a vacuum. However, with the variety of existing equipment a new product will interact with, it’s increasingly difficult to satisfy all applications with the high-performance standards a Tele Vue product must possess.”

In 1979, Al was awarded a patent for his Plössl eyepieces. I asked how the Nagler design developed from them. “Actually,” Al replied, “I designed the Naglers first. But it was such a radical design with its wide field of view and sharp images. At the time, Tele

Vue wasn’t well-known to amateur astronomers, so I didn’t know if I could sell eyepieces — no matter how good — that cost a lot more than available eyepieces without more name recognition. So I designed a line of Plössls, built up good reviews and good word of mouth from observers, and when I thought the time was right, I introduced the Nagler.” Since then, amateur astronomy hasn’t been the same.

By now, you may be wondering what my unanswered question was. I asked it while chatting in Al and David’s office: Why are there no Nagler Type 3 eyepieces?

“There just aren’t any,” replied Al, “We came out with the Type 4 in 1997.” Having spent several days with the driving forces behind Tele Vue, I was pretty certain they never did anything without a reason, so I

followed up with, “Why didn’t you call the Type 4 series the Type 3?” Al’s two-part reply was both cryptic (“We have to have some secrets.”) and challenging (“That’s all I’m saying. If you can get David to tell you, I’m OK with that.”) I turned to David, but the look in his eye wasn’t inviting. Perhaps I’ll wait until the 50th anniversary of the Nagler to ask the question again.

### And the beat goes on

“What’s the best thing about running Tele Vue?” I asked both Al and David. Both replied so quickly that I have trouble remembering which of them made a certain point. But I remember what they said: “The freedom to do what we want, when we want, and for the right reasons. The joy of working with like-minded people. The

thrill of breaking new ground, doing something that hasn’t been done before. And, above all, the satisfaction of knowing our customers are having a great experience.”

This last point was made obvious many times during my visit, when a voice from the front office would announce over the intercom, “Al or David, technical question on [telephone] line 1.”

One call Al fielded went on for more than 10 minutes. Finally, the customer expressed his gratitude and asked who he’d been speaking to. “This is Al,” was the reply. The customer thanked Al again and then commented on how owning Tele Vue equipment has made his hobby more enjoyable. Al related all this to me. Then, as a large smile crossed his face, he said, “That’s what it’s all about. ■

## /// LET’S HAVE A CONTEST

In 1984, Al Nagler designed a telescope. Al said, “If I’m ever going to make it with a telescope, it’s going to be at the time of Halley’s Comet!” Unlike other products Nagler introduced, he wasn’t certain the scope would sell. “We chose brass for the tube in case sales were bad,” Al said. “We knew we could sell them to designers.” And thus was born ... but wait! The new scope lacked a name.

“We actually looked on this as an opportunity to generate some press for the introduction of the telescope,” said Al.

So a contest was announced to name Tele Vue’s new scope. First prize, fittingly,

was one of the telescopes. The response was great, but none of the names really appealed to Al or his staff.

“We were sitting around one day,” David said, “when Dad announced, ‘I have the perfect name — Renaissance!’ It was perfect, too, embodying what the scope was. But the contest was on, and somebody had to win.”

Luckily, as the contest deadline approached, someone sent in the chosen name. The following day, someone else suggested Renaissance. What to do? “We solved it the only way we could. We gave them both telescopes,” said Al. — M. E. B.



ASTRONOMY: MICHAEL E. BARICH

TELESCOPE WARRANTY CARDS, and especially their customer comments, occupy a prominent location at Tele Vue.



MANY CORPORATE EXECUTIVES spend their days in long, boring meetings. At Tele Vue, you’re likely to find the company president (David Nagler, left) and CEO (Al Nagler) fielding calls from custom-

ers. Their office’s “dual-desk” setup allows for rapid (and occasionally high-volume) exchanges of ideas. “It’s a system that works well,” said David. “It lets us make decisions quickly.”

ASTRONOMY: MICHAEL E. BARICH