



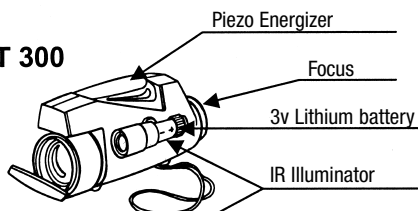
Night Vision Owner's Manual

An Introduction for Consumers

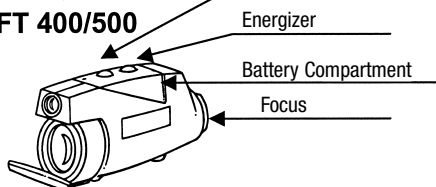
Famous Trails® 

Do not remove lens cap in daylight!

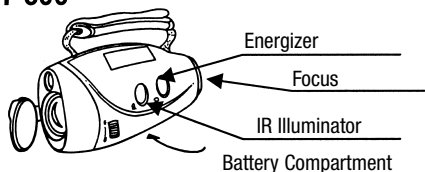
FT 300



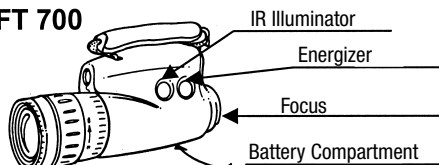
FT 400/500



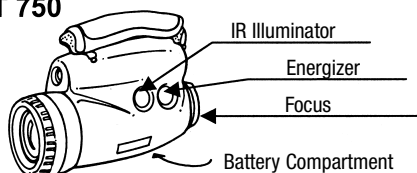
FT 600



FT 700



FT 750



FT 300 "Ariel"

2.5x magnification

- The unit needs no battery — simply depress piezo
- The detachable IR illuminator requires a 3v Lithium battery (*Radio Shack® #23265, Duracell® DL1/3N, Eveready® 2L-76)

FT 400 "Atlas"

2.5x magnification

- Needs 2 "AAA" batteries
- Features a built-in IR illuminator

FT 500 "Neptune"

2.5x magnification

- Needs 2 "AAA" batteries
- Features a built-in IR illuminator
- Water-resistant housing

FT 600 "Titan"

2.6x magnification

- Needs 2 "AAA" batteries
- Features a built-in IR illuminator
- Ergonomic design

FT 700 "Calypso"

3.8x magnification

- Needs 2 "AA" batteries
- Features a built-in IR illuminator
- Interchangeable lens

FT 750 "Calypso II"

2.3x magnification

- Needs 2 "AA" batteries
- Features a built-in IR illuminator
- Interchangeable lens

*The above-mentioned names hold their own trademarks and have no association with Famous Trails.



Owners Manual

Thank you for purchasing this night vision device brought to you by Famous Trails. We hope it will bring you many years of viewing pleasure.

“**Starlight**” or “**Night Vision**” devices work by amplifying ambient light thousands of times to create a visible electronic image. Even starlight or partial moonlight can often provide enough light to allow for viewing. However, please remember that your starlight device is a sophisticated opto-electronic instrument and should be used with the following in mind:

**DO NOT ACTIVATE THE DEVICE DURING THE DAY
WITH THE LENS COVER REMOVED.**

Getting Started

1. Load batteries in battery compartment, either on top or side depending on the unit. Use either AAA or AA batteries (AAA for FT 400, 500 & 600 and AA for FT 700 & 750).
2. To use, depress the Energizer button, and release. A gradual fading of the image is typical. Press the Energizer button again to re-power. If your unit includes a self-energizing power source (i.e., does not require batteries), simply depress and release the top lever one time and repeat as necessary.
3. The infrared (IR) illuminator works to enhance the available ambient light in areas of extreme darkness, or brighten the electronic image in very dim ambient light. Utilize as needed by depressing the IR button (next to the Energizer button on most units). Also, please note that on self-energizing units

only, the detachable IR illuminator requires a 3-volt lithium battery (Radio Shack® #23265, Duracell® DL1/3N, Eveready® 2L-76).

*The above-mentioned names hold their own trademarks and have no association with Famous Trails®.

4. To focus, first utilize the eyepiece-focusing ring to bring the image into approximate focus, then fine focus with the objective lens focusing ring. If only (1) focusing mechanism is present on your unit, then simply focus as necessary.
5. Batteries are not included.

Things to remember

1. The purpose of the pinhole at the center of the lens cover is to dramatically reduce ambient lighting and thereby simulate a nighttime environment. The unit can thus be tested during the daytime with the lens cover in place. However, activating the unit during the daylight without the protection of the lens cover will cause too much light to hit the intensifier and can result in permanent damage. There is a built-in “anti-bloom” function to protect against such an event, but if the unit “flashes” upon being activated in a well-lit environment, it may require several minutes for the instrument to re-set itself before it can be used.
2. You may see very small black spots in your field of view; this is common to many night vision devices. However, such spots will not increase in size nor will they affect optical performance.
3. All Famous Trails night vision devices are covered by a one-year limited warranty. Please see the enclosed warranty card for more information.
4. Finally, please treat your Famous Trails monocular as you would your camera or binocular.



Night Vision Specifications

	FT300	FT400/FT500	FT600
Light Intensification	High	High	High
Image Magnification	2.5x	2.5x	2.6x
Dimensions	5.9"(l) x 2"(w) x 3"(h)	5.9"(l) x 2"(w) x 3"(h)	6.5"(l) x 3.12"(w) x 2.37"(h)
Weight	.94lbs	.94lbs	.88lbs
Batteries	IR Illuminator (23265) Radio Shack	2 AAA	2 AAA
Field Of View	15 degrees (min)	15 degrees (min)	16 degrees (min)
Eyeiece Adjustment	+/- 4 diopters	+/- 4 diopters	+/- 4 diopters
Focus Range	4.4 to 300 ft	4.5 to 300 ft	4.5 to 300 ft
Objective Lens Focal Length	50 mm w/P20 phosphor	58 mm	44 mm
Objective Lens Aperture	f 1.5	f 2.0	f 2.0
IR Illuminator	optional	Built In	Built In
Warranty	1 year	1 year	1 year
Gain	800-900	800-900	800-900
System Gain	10,000–15,000	10,000–15,000	10,000–15,000

	FT700	FT750	G2K
Light Intensification	High	High	High
Image Magnification	3.8x	2.3x	1X
Dimensions	7.75"(l) x 3.8"(w) x 2.6"(h)	6.5"(l) x 3.8"(w) x 2.6"(h)	4"(l) x 2"(w) x 2.5"(h)
Weight	1.44lbs	1.5lbs	8 oz
Batteries	2 AA	2 AA	3 Volt
Field Of View	15 degrees (min.)	15 degrees (min.)	40 degrees
Eyeiece Adjustment	+/- 4 diopters	+/- 4 diopter	+/- 4 diopter
Focus Range	12 ft. to 350 ft.	12 ft. to 350 ft.	1ft. to infinity
Objective Lens Focal Length	85mm	50mm w/P20 phosphor	25mm f/1.6
Objective Lens Aperture	f1.6	f2.0	
IR Illuminator	Built In	Built In	N/A
Warranty	1 year	1 year	1 year
Gain	800–900	800–900	25,000X
System Gain	10,000–15,000	10,000–15,000	2,200X

An Introduction for Consumers

Famous Trails® night vision scopes enable the user to view objects when it is normally too dark to see with the naked eye. The device amplifies the photons from any available light by collecting it through the objective lens and focusing it on the image intensifier. A photocathode within the intensifier converts the photon energy into electrons; they in turn move with increasing speed across an electrostatic field and hit a phosphor screen. This increasing speed of the electrons provides gain and creates a visible image, which is displayed on the phosphor screen.

Famous Trails® systems make it easier to view objects when there is very little light, but cannot work in total darkness. In this situation an infrared illuminator can be used to provide light, enabling the *Famous Trails*® system to amplify it. The infrared illuminator can also be used in lowly lit areas, enhancing images in changing light conditions with consistent performance. These infrared illuminators are available on many of *Famous Trails*® night vision products.

When testing night vision products, *Famous Trails*® measures the quality of the image, the range of the product and gain. Because it is difficult to make out smaller details if long distances or low lighting are factors, systems with extreme gain and high resolution are enormously expensive. The reasonably priced *Famous Trails*® system was created to suit a user's most common needs providing a viewer with a clear, detailed image. Take a night vision device along on your camping or boating trips to enable you to view wildlife with amazing clarity or use it to enhance security around your home.

As you review the literature for products like *Famous Trails*® system, you will find that understanding the specifications of how our system measures up is sometimes difficult, especially when talking about actual use in the field. It is important to understand what is meant by terms like distortion, spectral

response, optical speed, gain and more. It is also important to note that each product was tested with consistent reliable methods to insure the valid comparison of specifications. This is an area where comparison becomes especially difficult, as there are a great number of equipment manufacturers but little published specs comparing products from various companies. The bottom line is that even with technical specs it is hard to tell if the item will perform the way you need it to.

The best way to measure the performance of a *Famous Trails®* product is to try it out at home. Most dealers will allow you to return or exchange a product if you find it isn't a perfect match for your needs. Usually areas surrounding a city or housing development are well lit, so you probably won't need a higher-end piece of equipment. If you are using a device in a poorly lit area such as the woods or desert, you may need a device with higher power especially if you need greater range with little or no moonlight. You won't need to worry about range if the product is used in total darkness, but you will need an infrared illuminator.

We previously explained that the quality of the image, the range of the product, and the gain are all key in measuring how a *Famous Trails®* product performs. Here is a breakdown of how each area ties in with the operation of a product.

GAIN—As conditions get darker, it becomes more difficult for the Famous Trails system to create a clear, well-defined image. As the light decreases or if there is a longer range, it becomes necessary to increase the gain. Additionally if you are using a longer lens for distance viewing you'll need higher gain, as longer lenses do not transfer light as well as the shorter lenses.

Be aware that increasing the gain will not always increase the clarity or range of your view. In areas such as housing complexes, street or house lights will overload the system and actually decrease your viewing abilities. For less populated areas with little light, a Famous Trails scope will allow you a substantial and clear view for a very reasonable sum.

RANGE—To be able to view an object from a certain distance involves the system's ability to magnify an image, its resolution,

how much light is available, and the gain of the product. A long, powerful lens will increase magnification, but as mentioned above will not transfer light well. In conditions with less light, more gain is required to view objects farther away so using a high-speed lens with less magnification will allow more light to be captured and will increase the product's range abilities.

Generally most users don't need long-range capabilities in their products and are satisfied with 1x to 3x the normal image size. For example, a Famous Trails product made for viewing objects at a fairly close range 1x image size. This makes it easy for the user to view the subject without becoming disoriented.

IMAGE QUALITY—The best image to have is one with little distortion, high definition and excellent resolution. The Famous Trails device displays a green monochrome image that is clearest in the center, with blurring towards the edges. The human eye is able to perceive contrasts in green more easily than in other colors so this further enhances image quality. With less distortion you'll see a flatter, less rounded view with a higher definition. Additionally the contrasts will enable you to perceive dark objects against darker backgrounds and the increased resolution will allow you to see identifying details clearly instead of mere shapes.

Buying a Famous Trails® Product

Before purchasing a Famous Trails product, think about how you want to use it and select the device that best matches that use. A scope with moderate gain and a short lens with a 1x magnification would be appropriate for populated areas such as a housing complex. If you are using the scope in a forest with little light, increased gain would enable you to see more clearly and a longer lens would allow for viewing at a greater distance. Inside a building or warehouse a user would want to use an infrared illuminator and would probably not need long-range capabilities.

There are other considerations to be made before choosing your Famous Trails product:

ERGONOMICS—If you will be viewing for a long period of time, a lighter product will be more comfortable. Also, where you wish to carry your device will make a difference when deciding on what size to purchase.

PRACTICALITY—If you will be using your system on camping trips and other places where electricity is unavailable, make sure the battery corresponding to that system is easily available for purchase.

PRICE—Famous Trails specializes in creating affordable products for their users, but prices can range from \$199 to \$10,000. Think about how often and in what way you will be using your product and thus how much you want to spend. A scope or monocular for \$2,500 would be a fantastic piece of equipment to own, but you could also purchase a high definition system that will satisfy all your needs for under \$500.

A Glossary of Night Vision Terms

ANGLE OF VIEW—the angle (in degrees) of your field of view when looking through a device.

BINOCULAR—a device that contains two connected sets of image intensifiers and optics that share a power source.

BLACK SPOTS—black spots on an image possibly caused by foreign substances on the surface of the lenses or marks within the image intensifier.

BLOOMING—a situation where a part of the projection has been overloaded with too much light.

BRIGHT-SOURCE or OVER-LIGHT PROTECTION—a circuit that will decrease or shut off power to a product when over-lighting occurs, protecting the image intensifier. (Over-exposure to bright light sources can decrease the life of your image intensifier) Normal viewing will resume within one to two minutes.

DIOPTER—a measurement unit for the refractive power of a lens, either for a device or for the human eye.

DIOPTER ADJUSTMENT—an adjustment of a device to a user's eyesight. The range for adjustment is usually plus or minus 4 Diopters.

DISTORTION—any variation of the display from the accurate reproduction of an image.

EYE RELIEF—the required distance between a user's eye and the lens of a device to enable a full view of the object. Usually a longer eye relief will afford a more comfortable view, especially for people who wear glasses.

FIELD OF VIEW—the measured view a user sees when looking through a device standing 1,000 yards away from an object.

FIXED-PATTERN NOISE—a light, immobile pattern seen on a viewed image caused by a microchannel plate.

GAIN—the number of times amplification of light by a device occurs. Tube gain is amplification taking place exclusively in the intensifier tube and it can reach 50,000 times or more. It is not as useful a measurement as System gain, which combines tube gain, the power supply and optics. System gain can register at 1,000 to 15,000.

GALLIUM ARSENIDE (GaAs)—a semiconductor substance used in a photocathode of Generation III night vision devices that contributes to increased photosensitivity.

GENERATION—a four-tiered classification of image intensifiers.

- *Generation 0*—needs an infrared illuminator for operation. Operates best in infrared conditions and was designed for long-range viewing. Electron acceleration enables gain to be achieved.
- *Generation I*—does not need an infrared illuminator for operation. Operates best during normal ambient light conditions and was designed for many professional and home uses. Electron acceleration enables gain to be achieved.

- *Generation II*—contains a microchannel plate for increased gain. Generation II devices were designed for more difficult viewing situations and are mostly used by military or scientific personnel.
- *Generation III*—contains a gallium arsenide photocathode and a microchannel plate. Generation III devices are designed for applications such as special military operations due to their high light sensitivity and clear viewing in the darkest conditions.

IMAGE INTENSIFIER or INTENSIFIER TUBE—the part of a Famous Trails night vision system that gathers and increases light to show a viewable image. See “Generation” for the different image intensifier designs.

INFRARED (IR) ILLUMINATOR—a source of light (such as an LED display) that outputs in the near-infrared range (750nm to 3um).

LENS SPEED—the ratio of the focal length to the diameter of the lens. A lower lens speed produces brighter images. (Expressed as f number.)

MICROCHANNEL PLATE (MCP)—the component located behind the photocathode that increases gain in Generation II and III Famous Trails systems by multiplying electrons.

MONOCULAR—a device that contains an image intensifier and optic set for use with one eye.

MULTIALKALI—a semi conductive substance that coats Generation I and Generation II photocathodes.

NEAR-INFRARED—the wavelength of light most present at night and invisible to the human eye. Its range is between 750nm and 3um, the lowest in the infrared category. For more information, look up “Photonic Spectrum”.

NOISE—also called video noise or scintillation, it appears as a slight sparkling within a Famous Trails image.

OBJECTIVE LENS—see optics

OCULAR—see optics

OPTICS—the collective term for all optical parts of a Famous Trails system which includes the objective lens and the ocular.

- The ocular increases projection size of the image.
- The objective lens gathers ambient light, focusing it onto the image intensifier. Can also provide an increase in size of image view. Short focal lengths (image size is 5x or less) and high-speeds (f2 or faster) are found on the best objective lenses. They are coated for the best efficiency in the near-infrared bandwidth.

PHOSPHOR SCREEN—renders a visible green image by exhibiting fluorescence when impinged by the electron flow in the intensifier tube. (The human eye picks up on contrasts in green more easily than other colors) The phosphor screen is positioned at the back of the intensifier tube.

PHOTONIC SPECTRUM—the span of electromagnetic energy ranging from 0.1mm (x-ray) to 1,000mm (far-infrared). The visible range within this span is from 400 to 750nm.

PHOTOCATHODE—a component that changes light (photon energy) into electrons (electrical energy) which in turn move with increasing speed in the intensifier tube. The objective lenses point light on the photoelectric surface of the photocathode, which is excited and passes electrons through the intensifier tube.

PHOTOSENSITIVITY—the measure of the photoelectric current from the photocathode per the input light flux from a tungsten lamp. It is expressed in microamperes per lumen and indicates the photocathode's sensitivity to light.

RESOLUTION—how well an image is rendered and displayed by a Famous Trails device. A constant, it can be expressed as the maximum number of lines per millimeter (lp/mm) that can be distinguished when a white-and-black striped pattern is focused on the photocathode. The best resolution in most Famous Trails systems is at the center of the view, with blurring towards the edges.

SCOPE—a Famous Trails device with one ocular system.

SPECTRAL RESPONSE—the numeric range of wavelengths in the phototonic spectrum amplifiable by a Famous Trails device.

While the human eye can see from 400nm to 750nm, a Famous Trails system can pick up and amplify wavelengths up to 900nm and project an image of the viewed object onto its phosphor screen.

SPECTRUM—see phototonic spectrum

WAVELENGTH—the distance covered by one cycle of a wave.

Electromagnetic energy is transmitted in sinusoidal waves.

Nanometers (nm) and Micrometers (mn) are units of measure in the photonic spectrum.



10211 Pacific Mesa Blvd., Suite 403, San Diego, CA 92121

phone (858) 558-3400 • fax (858) 558-7050

www.famoustrails.com



Famous Trails®

SAN DIEGO, CALIFORNIA

PRODUCT WARRANTY

This Famous Trails product is warranted against defects in materials and workmanship for one (1) year from date of purchase. The item must be shipped at buyer's expense to our offices where we will, at our discretion, repair or replace it free of charge. Please include your original purchase receipt. This warranty is not valid for defects caused by accidents, misuse, improper care, alteration, or abuse, nor is it valid if any service or repair is performed by non-authorized personnel.

Name _____

Address _____

Daytime Phone (____) _____

Model purchased _____ Where purchased _____

Date of purchase _____ Product serial number _____

Product primarily used for _____

Why did you buy this product? _____

Optional Customer Information

(Please help us learn more about our customers!)

(1) Age _____ (2) Sex: M/F

(3) Occupation _____

(4) Hobbies _____

(5) Favorite magazines _____

(6) Where do you go to learn about night vision scopes? _____

(7) Other night vision scopes owned _____

(8) Where bought _____

Thank You!