

Test Scenario 3 - Open Area Search / Long Range (50 Meters)

This is the same scenario and location as the previous except the subject has moved back 50 yards from the image intensifier

Gen3 PINNACLE Auto-Gated



The Gen3 PINNACLE Auto-Gated tube easily gathers enough light to quickly acquire the subject at 50 yards. High contrast allows details to be resolved such as the suspects bent elbows which raise his hands in front of his chest. However, at this distance, a weapon in hand is not identifiable. The subject can be seen wearing long pants and a jacket, but facial features cannot be seen. A relatively good view of the tree line can be observed. Bushes and trees are easily identified and a good understanding of the surrounding environment is achieved, greatly improving situational awareness.

Gen3 Auto-Gated



Like the ITT unit, the Litton Gen3 Auto-Gated tube performs well on its own, easily acquiring the subject at 50 yards. The image is slightly darker overall compared to the PINNACLE unit, but enough detail is available to resolve that a single figure is standing in the open with a tree line in the background. Enough contrast is present to decipher the subject's hands in front of his chest, though the presence of a weapon is uncertain.



At this distance, the built-in IR illuminator does not add anything to the image quality. Neither the subject nor the surroundings are unaffected.



The built-in IR illuminator is not able to provide useful information to the image. The tree line and subject display slightly more contrast.



The Addition of the Surefire M1 clearly lights up the subject, causing him to have an almost glowing effect against the surrounding environment. While details become slightly washed out due to the reflection of the IR light, the subject is able to be rapidly acquired at this distance.



Like the PINNACLE unit, the Litton Gen3 Auto-Gated tube is helped by the introduction of an external IR light source. While the subject is displayed much brighter against the background, the surrounding area is darkened because of the unit's focus on the lighter subject. A darker object is more noticeable in the subject's hands, but it cannot be identified at this distance.

Gen2 Super High Performance



At 50 yards, the 1x Gen2 SHP tube begins to show some signs of struggle when resolving details. The subject appears much fuzzier than in the Gen3 devices. However, the subject can still be acquired and is visible against the tree line. The lesser contrast of the Gen2 SHP tube will require the user to concentrate on the scan a little harder because it might be easier to lose the subject during rapid scanning. The lack of contrast also affects the ability to identify the subject's posture. While he is clearly standing in the open, his arms, and more importantly; hands cannot be identified. He could have his arms folded, hands in pockets, or holding something in front of his torso.



At this distance, the built-in IR illuminator does not add anything to the image quality. Neither the subject nor the surroundings are unaffected.



The Addition of the Surefire M1 clearly lights up the subject, causing him to have an almost glowing effect against the surrounding environment. However, it also highlights the lack of contrast and detail able to be resolved with the Gen2 SHP tube. The subjects are no more identifiable, nor are his hands. It is impossible to determine if he has a weapon. The lack of contrast in the image allows more of the light to be visible around the environment. The subject does not contrast as much as in the Gen3 units, so image appears to slightly flatten.

Gen2+ MILSPEC



The Gen2+ MILSPEC tube is at its limit in this scenario. On its own, the image intensifier can barely resolve the subject. Even then, a closer study is needed to determine that it is, indeed, the subject. Since no other details are visible on the ground, the user could assume that the subject is in a field, but situational awareness is severely hampered because other objects, such as the tree line cannot be seen. The image is very dark due to the limited amount of light gathered by the tube.



The built-in IR illuminator adds a slight amount of light to the image, but not enough to provide any useable information to the user.



Only after the addition of the Surefire M1 can the subject be acquired. While the image is still quite dark, the subject contrasts with the black background. However, there is little detail seen and the subject's actions cannot be identified. His outline is fuzzy and the most information available is that he is standing. It is impossible to identify the presence of a weapon and situational awareness is further hampered by the lack of detail in the environment.

Gen1+

ATN Gen1+ Viper
Open Area Search
Subject Standing 50 yards
Partly Cloudy, 1/4 Moon
No IR Illumination
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The Gen1 tube fails completely to deliver any image whatsoever. Even under good ambient light conditions, the subject at 50 yards is completely shrouded in darkness. This would leave a law enforcement professional blind of all intents and purposes, even at close distance.

ATN Gen1+ Viper
Open Area Search
Subject Standing 50 yards
Partly Cloudy, 1/4 Moon
Internal IR Illuminator
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The built-in IR illuminator did not add any value to the image. It is still completely dark with no details discernable.

ATN Gen1+ Viper
Open Area Search
Subject Standing 50 yards
Partly Cloudy, 1/4 Moon
Surefire M1 IR Illuminator
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Not even the additional illumination from the Surefire M1 can provide enough light for the Gen1 tube.

Test Scenario 4 – Open Area Search / Long Range (100 yards)

This is the same scenario and location as the previous except the subject has moved back 100 yards from the image intensifier.

Gen3 PINNACLE Auto-Gated



The Gen3 PINNACLE Auto-Gated tube produces an image of the subject at 100 yards, though details of his posture are unidentifiable. Note the subject is partially camouflaged by the shadows of the surrounding foliage. A quick glance might not discover his presence. A humanoid figure can be seen, however the placement of his hands and the presence of a weapon cannot be determined. The tube provides good resolution with the ability to maintain situational awareness of the surrounding area.



At this distance, the built-in IR illuminator's performance is limited. Because there is not a main subject to focus on, the illuminator provides a somewhat flat view of the scene. It "fills-in" some of the shadowed areas, making them appear a bit brighter. This aids in viewing the subject because the surrounding foliage shadows are evened out. The subject's hands, still are not visible, neither is the presence of a weapon. Note how the use of the built-in illuminator creates a fuzzier-appearing image because it flattens the shadows.



Using the Surefire M1 creates a definite advantage in this search at this distance. The more powerful illuminator helps locate the subject by making him appear much lighter against the foliage background. Detail is better resolved with the subject's arms visibly bent at the elbow. This shows the user that the subject is holding something in his hands.

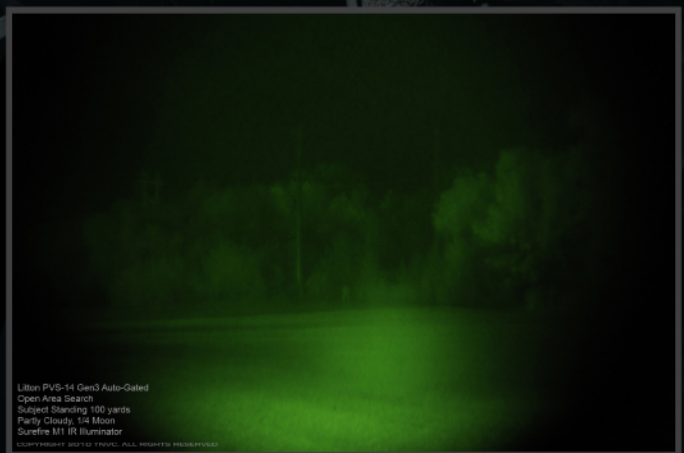
Gen3 Auto-Gated



The Litton Gen3 Auto-Gated tube creates shows a limitation in this scene because it does not produce as bright an image as the PINNACLE unit. The heavy foliage creates a lot of shadow which heavily obscures the subject, making him almost impossible to see. In this situation, an additional IR light source is required.



The addition of the built-in IR illuminator does little at this distance. Again, the light gathering limitations of the Gen3 Auto-Gated tube hamper the ability to resolve the subject against the foliage. However, the illuminator does provide a slightly brighter image and the subject does stand out a bit more against the tree line. The definition of his right shoulder, arm, and leg can be seen. However, the details of his posture are unidentifiable.

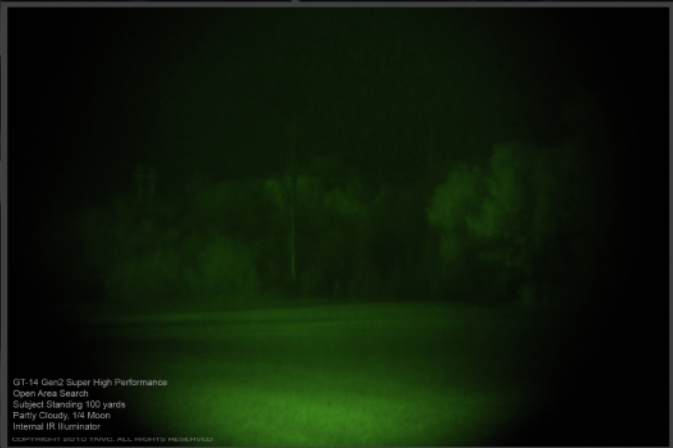


Using the Surefire M1 creates a definite advantage with this image intensifier. The image seems to flatten a bit because shadows are lightened. The subject can be clearly seen at this distance, though the details of his posture are not resolved. He is standing, but the user cannot see the positioning of his hands. Of particular note, however, is the ability to maintain situational awareness with the Gen3 tube's light-gathering abilities. The surrounding area is still visible and secondary subjects or threats could be identified if present.

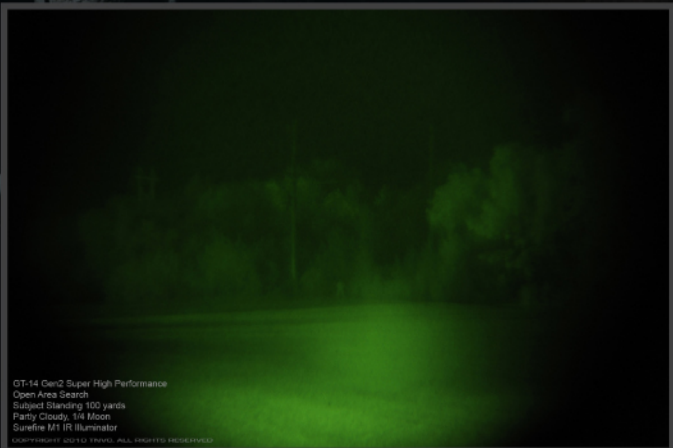
Gen2 Super High Performance



The Gen2 SHP tube produces a full image at this distance. The far tree line is visible, though the subject is partially obscured by the shadows, making it more difficult to detect his presence. It is impossible to determine whether or not a weapon is present. The fine detail seen in the Gen3 tubes is lesser in the Gen2 SHP unit. While it still performs admirably, the overall image is darker and details are grainier.



The addition of the built-in IR illuminator does little to aid the image at this distance. A slight brightening is detected, but the tube is fighting for light and requires additional illumination.



The subject can now be seen against the tree line with the introduction of the Surefire M1. Though resolution is fuzzy, it is possible to detect a man-sized subject at this distance. Details cannot be made out at this distance with this tube, so it is impossible to determine if the subject has a weapon.

Gen2+ MILSPEC



The Gen2+ MILSPEC tube has reached its limitation at this distance. There is no way to identify the subject at 100 yards. The foreground grass is visible.



The addition of the built-in IR illuminator does little more than slightly brighten the appearance of the grass. The subject at 100 yards is still not visible.



Using the Surefire M1 adds the slightest bit of help. But, the tube is clearly at its performance limits. The subject can just barely be made-out, but it is impossible to identify him as the subject rather than part of the environment.

ATN Gen1+ Viper
 Open Area Search
 Subject Standing 100 yards
 Partly Cloudy, 1/4 Moon
 No IR Illuminator

The Gen1 tube fails completely to deliver any image whatsoever. Even under good ambient light conditions, the subject at 100 yards is completely shrouded in darkness. This would leave a law enforcement professional blind of all intents and purposes, even at close distance.

ATN Gen1+ Viper
 Open Area Search
 Subject Standing 100 yards
 Partly Cloudy, 1/4 Moon
 Internal IR Illuminator

The built-in IR illuminator did not add any value to the image. It is still completely dark with no details discernable.

ATN Gen1+ Viper
 Open Area Search
 Subject Standing 100 yards
 Partly Cloudy, 1/4 Moon
 Surefire M1 IR Illuminator

Not even the additional illumination from the Surefire M1 can provide enough light for the Gen1 tube.

Thoughts

This scenario provides a good indication of image intensifier performance capabilities. One of the biggest concerns professionals have when using night vision equipment is the distance at which they can detect, acquire, and identify a threat. This evolution clearly displays these abilities and limitations. Conditions were not perfect due to partial cloud-cover, which helped to show what these image intensifiers can do in real-world scenarios. It is quite evident that the older generation tubes provide less performance. In a law enforcement situation, this can mean the difference between life and death. The lower light-gathering abilities of the Gen2+ MILSPEC and Gen1+ tubes would be too dangerous for serious field work because they offer almost no advantage to the officer. Situational awareness is gone. The Gen3 units performed admirably with the ability to acquire the subject while still maintaining situational awareness. Details are easily resolved and detection capability is good out to 100 yards, even with the tricky foliage background. This evolution also underlines the importance of a separate, high power IR illuminator.